Making Tracks

2015 Edmonton and Region Household Travel Survey

Summary Report

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Edmonton

Edmonton Metropolitan Region Board
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Acknowledgements

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[1]The Capital Region Board transitioned into the Edmonton Metropolitan Region Board in 2017.

Executive Summary

Background

This summary report describes the weekday travel patterns of residents of the Edmonton Capital Region and travel between the Region and the City of Edmonton. Over 21,000 households were surveyed on weekdays in the fall of 2015, including approximately 15,300 in the City and 5,700 in the surrounding Region. Previous surveys were completed in 1994 and 2005, and changes are highlighted wherever available.

Demographic Characteristics

- The City of Edmonton had 894,400 residents in 2015, a 41.3% increase from 1994. In contrast, the Region had 385,300 residents in 2015, which is an increase of 64.2% from 1994.
- The largest age group in Edmonton is the 25-34 group, which represents a population of younger adults and younger families. In contrast, the largest age group in the Region is the 45-54 group, which reflects a population of mature families.
- The City's population is aging with growth rates highest among the 55-69 age group between 2005-2015. 22-year growth rates are highest among older adults (50-64 years) and especially the 75+ population.
- The average household size in 2015 was 2.43 in the City and 2.72 in the Region. Average household sizes have generally dropped since 1994, except in the City between 2005 and 2015.

Travel Behaviour

- The number of trips made by Edmonton residents has risen to 3.14 million trips per weekday in 2015, an increase of approximately 39.4% over 1994. In the Region, the total number of trips rose to a total of 1.33 million trips per weekday, which is a 63.5% increase.
- In 2015, City residents generated 3.51 daily trips per person while Region residents generated 3.46 daily trips per person. The daily trips per person rates increased for the City and Region between 1994 and 2005, but have since dropped.
- The daily household trip rate has dropped over the three surveys for both the City and Region. In the City, rates dropped from 9.17 to 8.54 daily trips per household between 1994 and 2015. In contrast, rates dropped from 11.09 to 9.41 daily trips per household in the Region.
- Average trip lengths for City residents have generally increased over the 21-year period from an average of 6.7 km in 1994 to 8.0 km in 2015. In contrast, average trip lengths for Region residents have dropped steadily, from 13.2 km in 1994 to 12.6 km in 2015.
- The combined car driver and passenger mode share dominated in 2015 in both the City (77.6% of all daily trips) and the Region (86.8% of all daily trips).
- The transit share among City residents has remained stable since the 1994 survey at 8.6%, although absolute ridership numbers have increased from 194,300 to 269,000. The transit share among Region residents has increased slightly to 2.1% in 2015.
- Cycling has experienced by far the greatest growth, increasing 4.5 times among City residents and 14 times among Region residents since 1994. Mode share in 2015 was 1.7% in the City and 0.8% in the Region.
- Prior to 2005, trips to and from the Central Edmonton grew the most. Trips in the outer suburbs and Region have grown the most after 2005 which is consistent with land use growth patterns over that time in the outer suburbs and surrounding region.

Making Tracks

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1 Introduction

In the fall of 2015, the *Edmonton and Region Household Travel Survey* (HTS) was administered to determine the nature of current travel patterns. The survey was funded by the City of Edmonton, the Capital Region Board[2] and Alberta Transportation. This report provides an overview of the information collected from the 2015 survey, and highlights changes to the results of previous surveys in 1994 and 2005.

The first step in determining the need for transportation infrastructure and services is gaining an understanding of current travel patterns and the underlying elements which affect these patterns. Once these are known, transportation planning models can be developed to project future transportation needs based upon various assumptions about the type and magnitude of regional growth and the location of these developments. The collected information will be used to assess the transportation needs of the City of Edmonton and surrounding region, and to help develop plans and policies such as *The Way We Move* and *The Way We Grow*, Edmonton's Transportation Master Plan and Municipal Development Plan respectively, and the Regional Growth Plan.

1.1 Context

Between 2005 and 2015 the Edmonton Region saw significant changes to its built form and economic conditions, as well as a shift in governance with the creation of the Capital Region Board in 2008. The Capital Region Board Growth Plan was approved in 2010 and identified priority growth areas throughout the region, with density requirements and a related Capital Region Intermunicipal Transit Network Plan defining a future regional transit system to connect the growth areas.

In Edmonton, the City expanded its LRT system with the extension of the Capital Line to Century Park between 2006 and 2010, and the addition of the Metro Line opening in fall 2015, just prior to survey launch. The south section of Anthony Henday Drive opened in 2007 and the northwest section opened in late 2011, providing a strong regional freeway system along the majority of Edmonton's boundary. In the Region, commuter transit services were introduced in the Cities of Leduc, Fort Saskatchewan and Spruce Grove. The 747 all-day bus route was also introduced to link the Century Park bus and LRT station in Edmonton to the Edmonton International Airport.

In the 10-year span between surveys, over twenty new neighbourhoods were developed in Edmonton and the majority of them sit outside of Anthony Henday Drive. This trend places much of the new residential growth outside the areas well served by the municipal transit systems. Employment in the Region was supported by growth in Alberta's Industrial Heartland, and the Edmonton International Airport expanded its terminal and development on site. Economic conditions in the Edmonton Region were in flux during the survey period, with low oil prices in 2015 and lower employment affecting travel trends.

[2] The Capital Region Board transitioned into the Edmonton Metropolitan Region Board in 2017.

1.2 Overview of Household Travel Survey

Between September 14, 2015 and December 11, 2015, approximately 21,000 households in the Edmonton metropolitan area participated in a survey which collected information about the household, the residents of the household, and travel information for each member of the household for a 24 hour weekday period. Approximately 15,300 households in the City provided information on their weekday travel compared to 6,600 households in 2005. The remaining 5,700 households were located within the Region, which compares to 2,800 households in 2005.

The main objectives of the 2015 Household Travel Survey were to:

- Provide current demographics and travel data, including origin and destination, trip purpose, mode choice, time of day, activities undertaken, and trip frequency for updating the regional travel forecasting model being used to forecast travel in the Edmonton area and to assess future transportation policies and strategies.
- Provide current empirical data on travel choices, including mode, and time of day, by a representative sample of households.

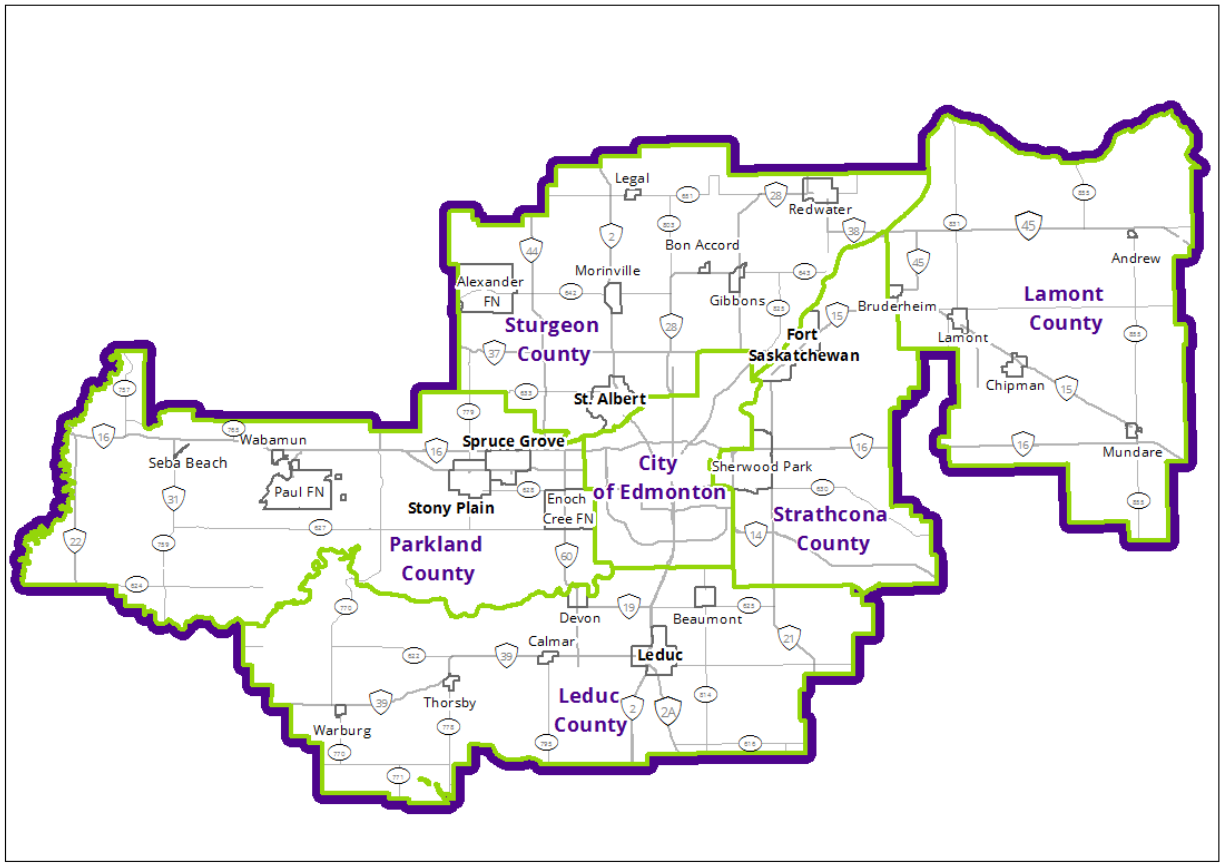
Survey participants were selected based on residential mailing addresses within the Edmonton Region. This differs from the phone-based sample approach used in the 1994 and 2005 surveys, which is a result of the rise in cellphone-only households. The survey method also differed from previous surveys in that it provided the option to complete the survey questionnaire online. Those households who agreed to participate in the survey were assigned a travel day and each member of the household was asked to record their travel log. Household, person, and travel information were collected either online or via phone interviews with trained surveyors.

The survey data was collected in accordance with the Freedom of Information and Protection of Privacy Act of the Province of Alberta (FOIPP). Personal information on the survey was collected under the authority of section 33(c) of the FOIPP Act and will be used to understand travel patterns and to plan a transportation system for the City of Edmonton and the surrounding region, in conjunction with the Capital Region Board and the Province of Alberta (Alberta Transportation).

1.3 Study Area

Figure 1-1 shows the study area. This area encompasses the City of Edmonton, St. Albert, Fort Saskatchewan, Sherwood Park, Spruce Grove and Leduc, as well as all towns, villages, and rural areas within Lamont County, Leduc County, Parkland County, Strathcona County and Sturgeon County. Of note, the study area expanded from the 2005 survey to include the eastern half of Lamont County.

Figure 1-1: Overview of Survey Area



1.4 Reporting of Survey Findings

This report summarizes the results of the *2015 Edmonton and Region Household Travel Survey* and provides details for various sub-areas within the study area. Key among these are two geographies:

- **The City of Edmonton**, which may be differentiated into the following subcategories:
    - **City** – the entire City of Edmonton as a whole.
    - **Three 'Bands'** – Central, Inner and Outer. In reporting from the 2005 cycle, the latter two were referred to as Inner Suburbs and Outer Suburbs.
    - **Six City 'Quadrants'** – Northwest, Northeast, Central, West, Southwest and Southeast.
    - **13 City Sectors** – These sectors split the Central band into Downtown, Downtown Fringe, University Sector and split the other five quadrants into 'inner' and 'outer' portions according to the boundaries of the bands.
    - **25 City districts**. The City of Edmonton traffic zone system is organized into 31 districts. For reporting purposes, certain zone districts with smaller populations (and smaller survey samples) have been combined, yielding 25 districts for reporting purposes.
- **Region-wide**, which may be differentiated into the following subcategories:
    - **Region**, comprising the Urban and Rural Region combined.
    - **Urban Region**, which comprises the City of Fort Saskatchewan, Sherwood Park, the Town of Beaumont, the City of Leduc, the City of Spruce Grove, the Town of Stony Plain and the City of St. Albert.
    - **Rural Region**, which comprises Strathcona County, Parkland County, Leduc County, Lamont County, Sturgeon County and the remainder of the small municipalities.
    - **Four Regional Sectors:** Sherwood Park, St. Albert, the rest of the Urban Region and Rural Region (that is, distinguishing St. Albert and the urbanized part of Sherwood Park from the rest of the Urban and Rural Regions).
    - **12 Regional Districts**, The districts are organized into six larger municipalities (City of Leduc, City of St. Albert, City of Fort Saskatchewan, City of Spruce Grove, Town of Stony Plain, Town of Beaumont), the Sherwood Park urban service area, and five counties (Leduc, Lamont, Parkland, Strathcona [excluding Sherwood Park], Sturgeon), with the county districts including small municipalities within their boundaries.[3]

[3] The regional districts used in the reporting differ slightly from the traffic zone district aggregations used for transportation modelling purposes. In the zone district aggregations used in the transportation model, Leduc County is split into three zone districts, while Spruce Grove and Stony Plain are combined into one zone district.

Figure 1-2: Map of City / Urban Region / Rural Region

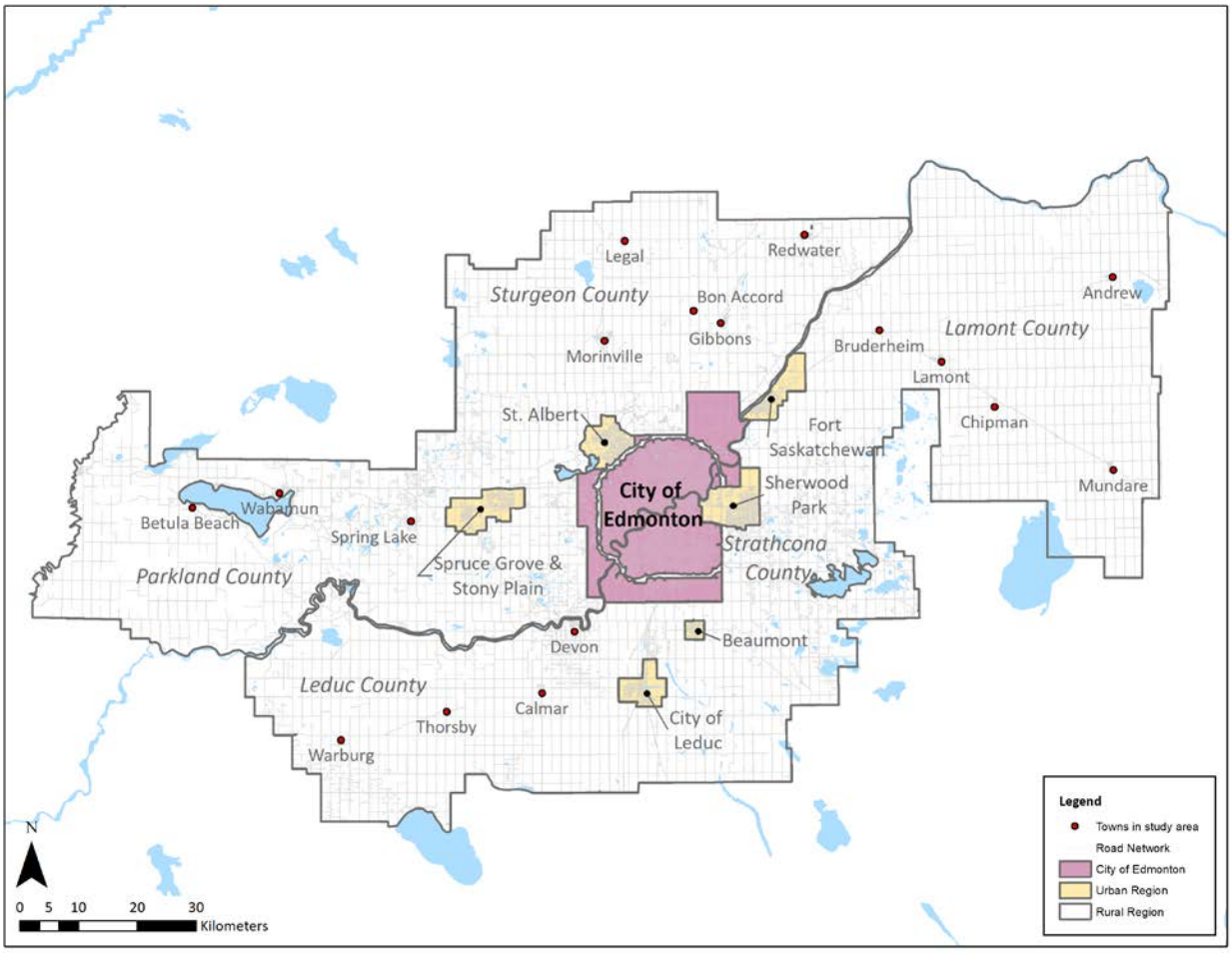


Figure 1-3: Map of Sectors and Bands – Capital Region

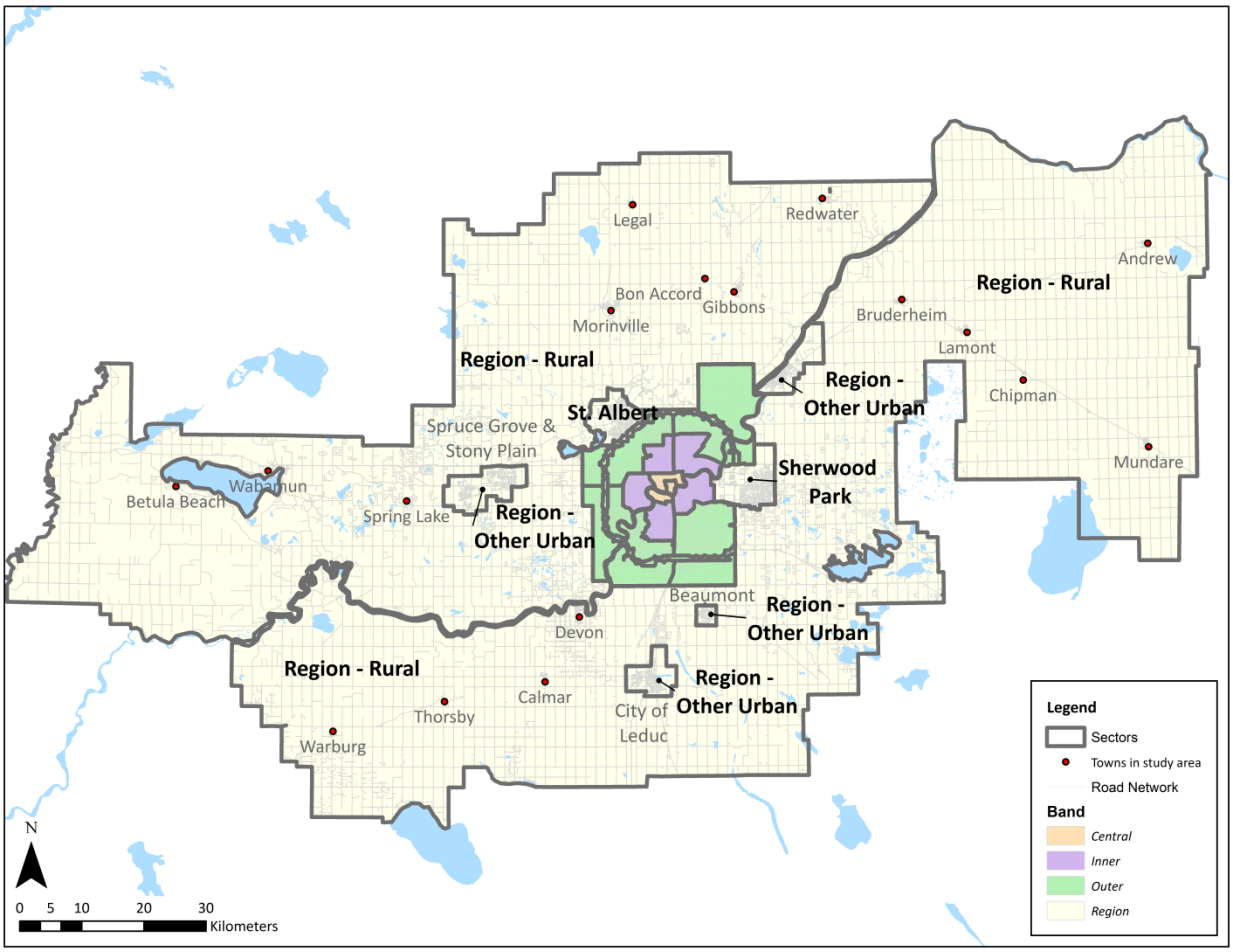


Figure 1-4: Map of Sectors and Bands – City of Edmonton

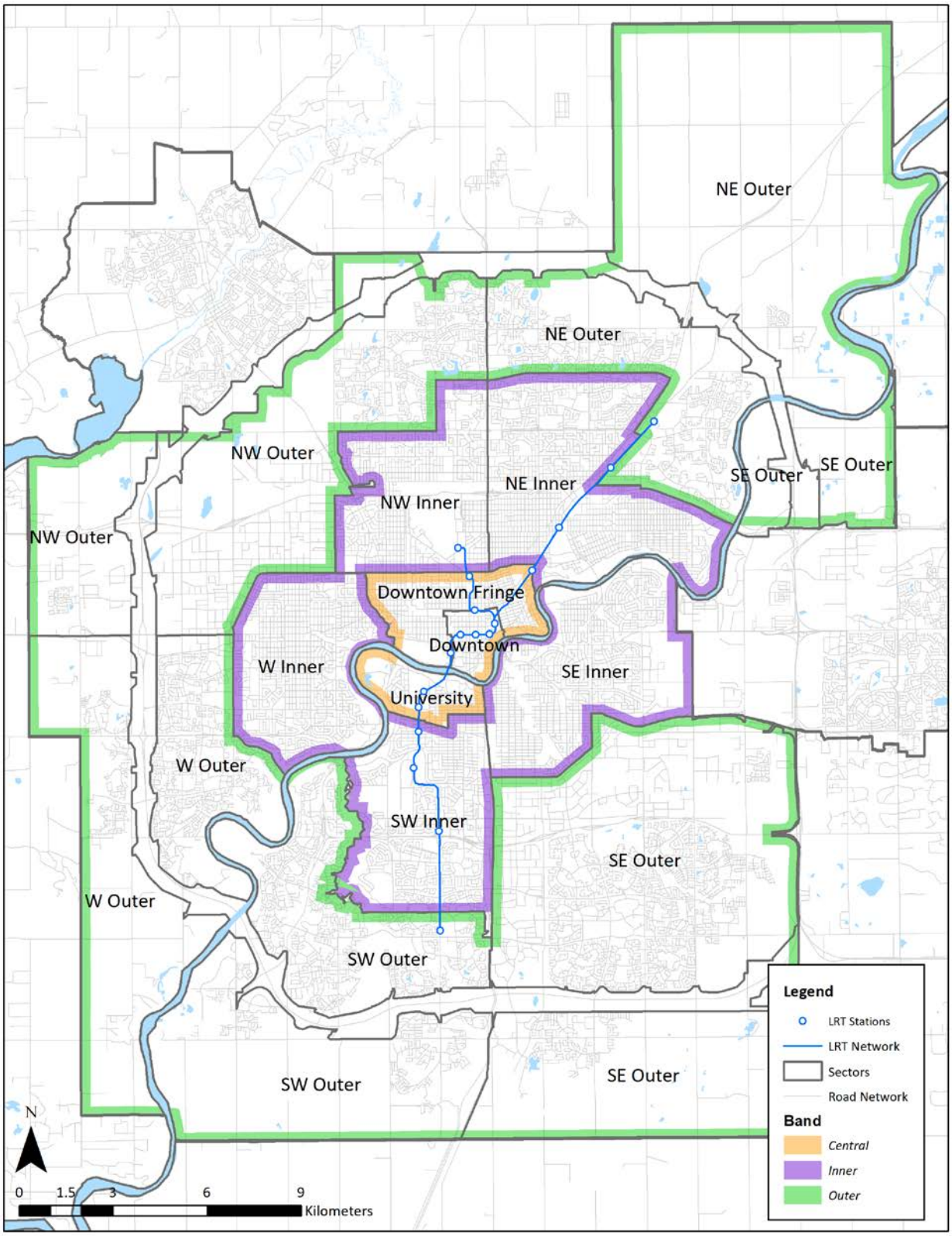


Figure 1-5: Map of City Quadrants

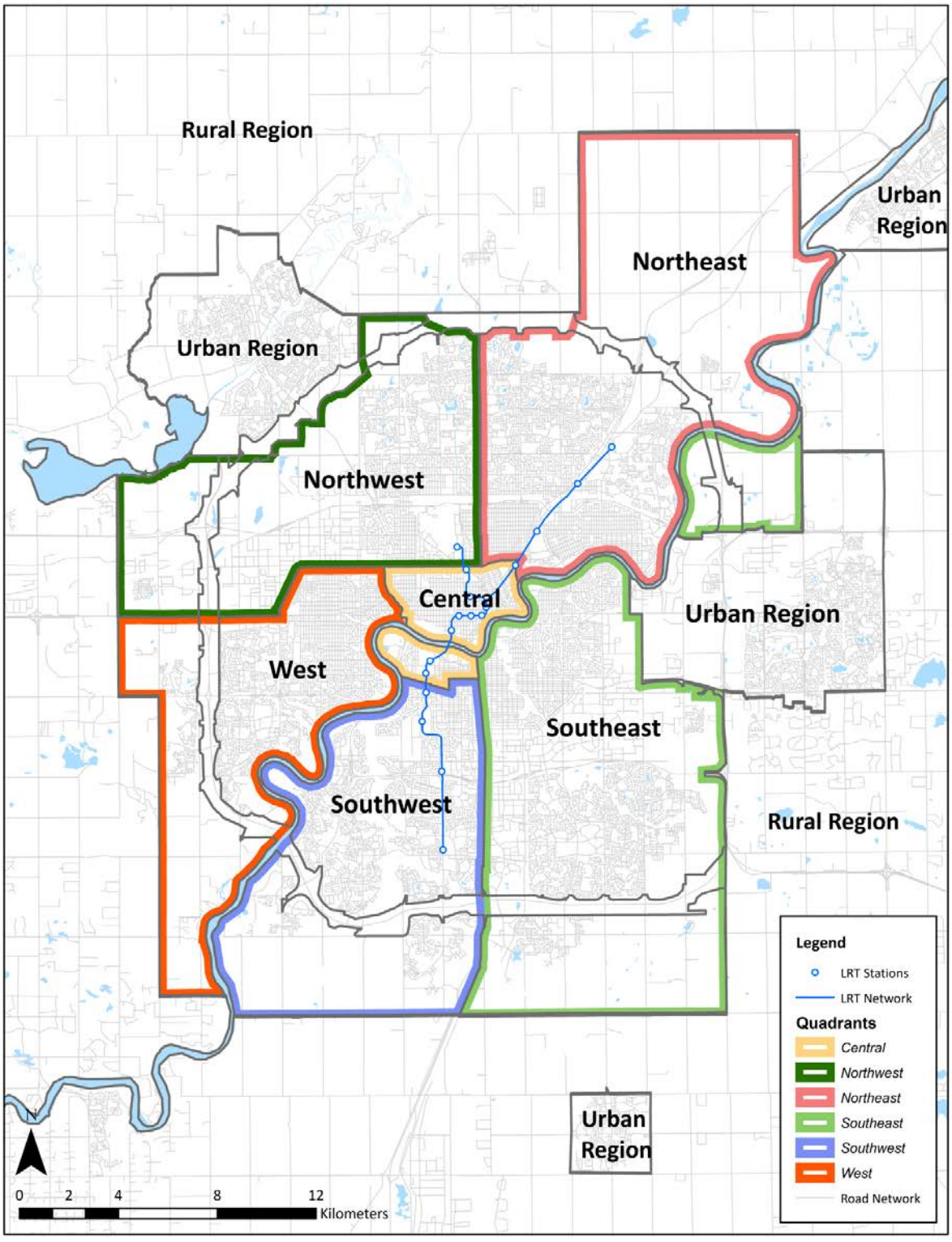


Figure 1-6: Map of Districts – City of Edmonton

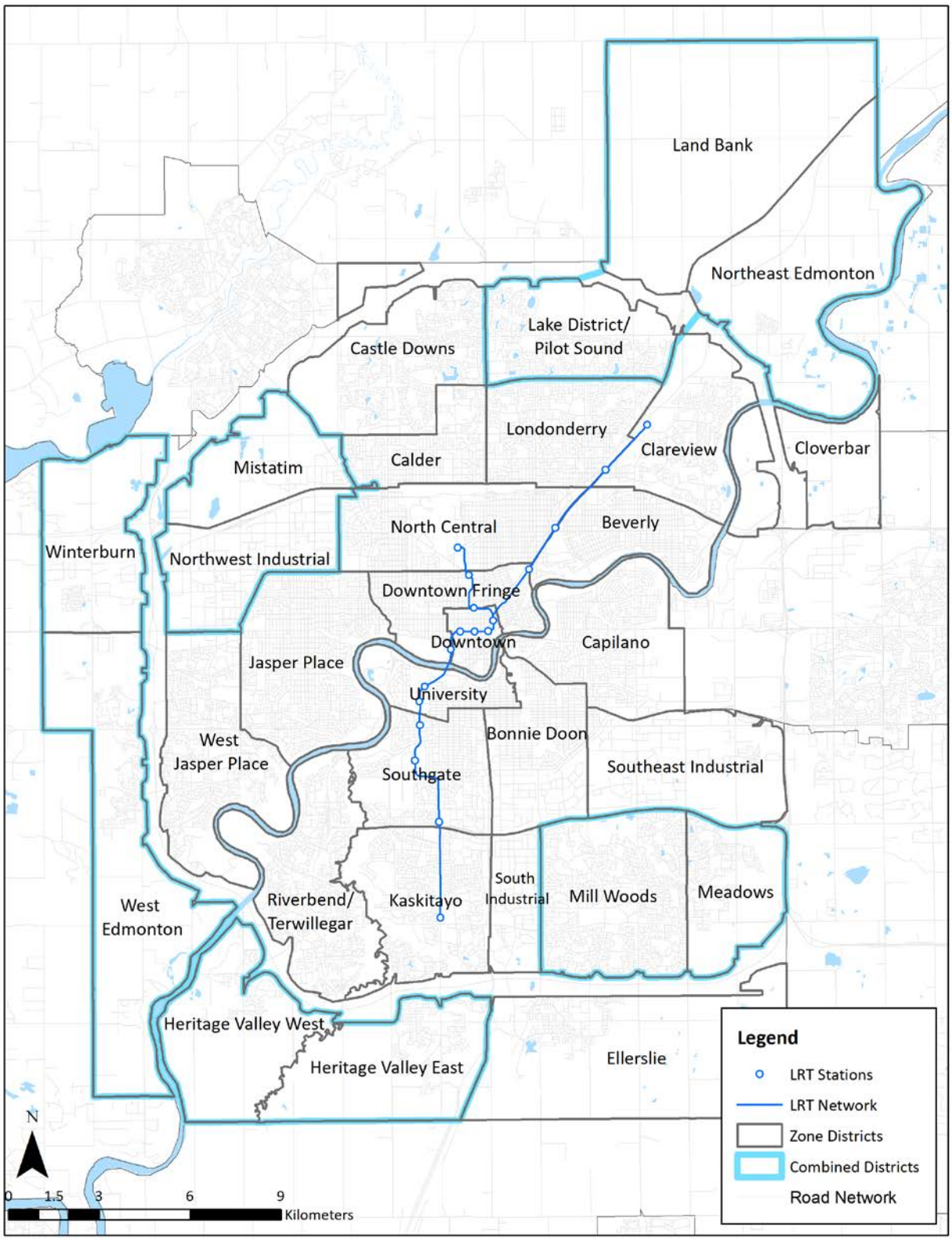
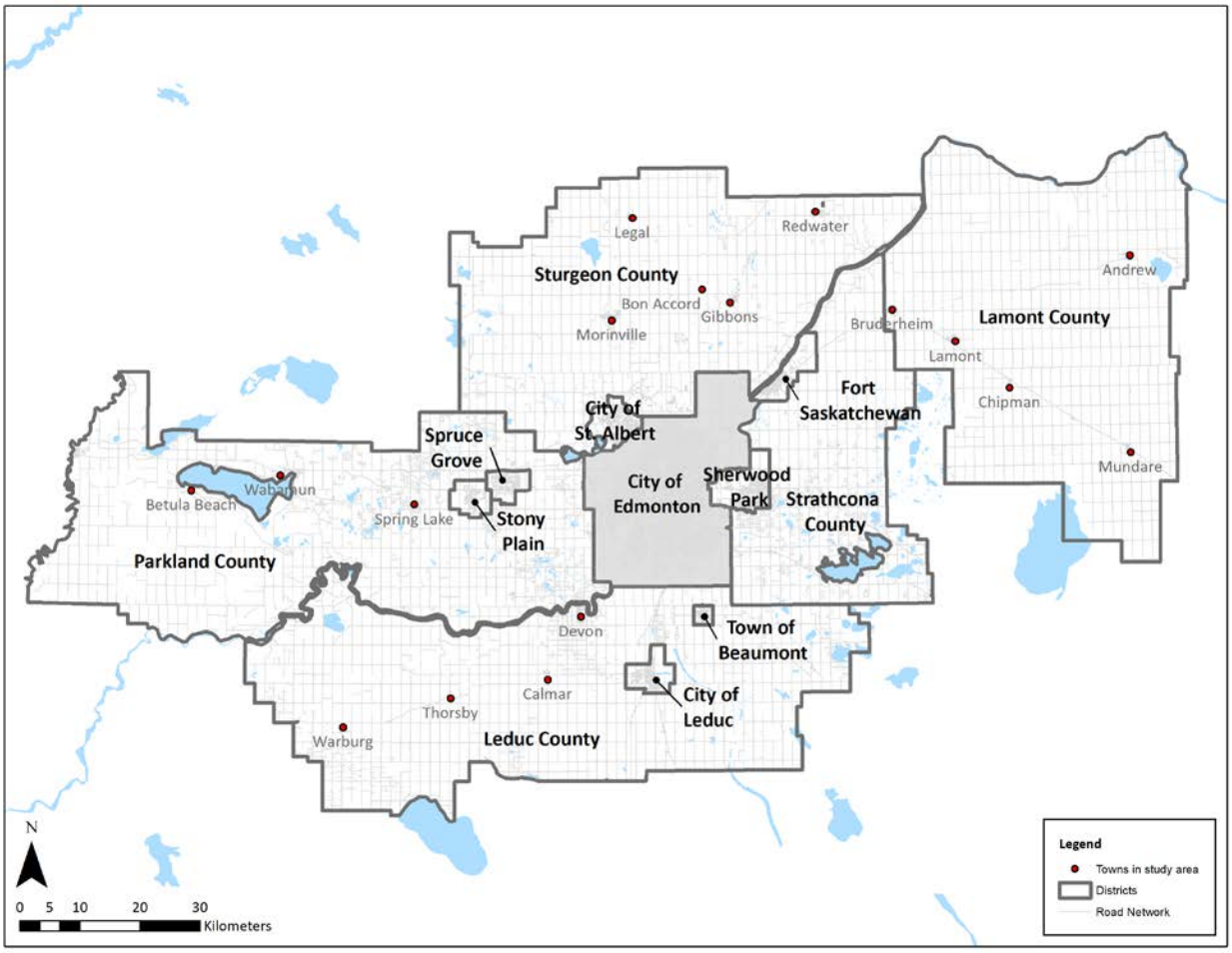


Figure 1-7: Map of Districts – Capital Region



1.5 Scaling

The survey was targeted to obtain an overall sample of 3.9% of all households in the survey area, which corresponds to a total of 19,000 survey completions. Survey targets were set for each district based on private dwelling counts from municipal and federal censuses. The sampling targets for individual districts were varied to allow for oversampling of areas with smaller populations to either increase sample sizes, reduce sampling errors or to provide better data for areas of interest. Sampling districts with larger populations were undersampled, but this has little impact on the expected sampling error. Overall, the sampling rate targets by district varied from about 3.3% to 6.3%. The sampling districts were further subdivided by neighbourhood within the City and by Census Subdivision (CSD) within the Region to ensure that the address listings drawn and surveys obtained were evenly distributed within each sampling district.

The survey data were weighted and expanded to represent the population using a combinatorial optimization method. The weighting controls at a district level included total households, population, age, gender, dwelling type, and household size. For aggregated districts (to Quadrant, Census Metropolitan Area, or individual district), the weighting controls included occupation, income, employment status, post-secondary enrollments, total jobs in the downtown area, transit pass counts for selected transit systems and ETS bus boardings. The weighted survey results were validated

against a number of reference statistics from municipal and federal censuses, vehicle registrations, labour force statistics, post-secondary enrolment, transit monthly sales and transit boardings. The expanded results were generally found to be within expected ranges of the reference statistics.

1.6 Sample Accuracy

Response to the survey was strong in most areas. Overall approximately 21,000 survey completions were obtained after data validation, which exceeds the original survey target of 19,000 surveys. 15,300 surveys were completed in the City and 5,700 were completed in the Region which is consistent with populations in each area. This corresponds to an overall sample of 4.1% of households in the survey area. As with any survey, the data collected may be subject to sources of error or bias that may affect the reliability of the survey results. This lack of precision, or 'sample error', is typically reported as a +/– range about the calculated value.

Overall, the sample error for the household-level survey results is estimated at ±0.9% at a 95% confidence level. In general, the samples available for calculating the values reported here are comparatively large, with hundreds and even thousands of observations, and the associated sample error is consequently fairly small and not a matter for concern. But increasing caution needs to be used when the sample is smaller, which happens as smaller and more detailed components of the full system are considered. The final numbers of useable survey completions and estimated margins of error for the survey results are presented in Table 1-1 below.

Table 1-1: Final Sampling Rates and Sampling Errors

Household District	Population	Households	Surveys	Sample Rate	Sampling Error*
Total	1,279,700	508,900	21,000	4.1%	±0.9%
Edmonton	894,400	367,400	15,300	4.2%	±1.1%
Region	385,300	141,500	5,700	4.0%	±1.8%

*± % at a 95% confidence level (19 times out of 20). Effective sampling error taking into account the sampling design effects associated with data weighting to correct for non-response bias and over-/under-sampling different population segments.

2 Demographic Characteristics

The Household Travel Survey captured detailed travel and demographic information from residents living in the City of Edmonton and surrounding region. Information was collected for households and for the people living in each household. The majority of the information presented in this section is derived from the travel survey. The total population, number of households, age profile, and occupation status are all based on the 2014 municipal census for the City of Edmonton, and a combination of the federal census and various municipal censuses for the Region.

The survey captured travel information which illustrates current travel patterns and behaviours. A number of key changes in travel patterns and behaviours have emerged which appear to be strongly related to demographic changes and shifts.

2.1 Population

As shown in Table 2-1, Edmonton had a population of 894,400 in 2015, which is an increase of 41% from 1994. The City's population grew approximately twice as fast in the 10-year period after 2005 than in the 11-year period prior to 2005, at 26% versus 13%. In contrast, the Region has grown by almost two-thirds since 1994 from 234,600 to 385,300 in 2015. The total population of the entire Edmonton region was 1,279,700 in 2015.

Within Edmonton, the Southwest Suburb saw the greatest population growth increasing from 39,500 in 1994 to 117,700 in 2015, which is an increase of 198%. In the Region, rural areas saw the most growth since 1994 increasing by 81% to 134,100 in 2015.

Table 2-1: Population and Population Changes in the Edmonton Region by Sector

Sector	1994	2005	2015	1994-2005	2005-2015	1994-2015
Downtown	7,000	9,900	14,000	41%	41%	100%
University	11,600	14,300	14,900	23%	4%	28%
Downtown Fringe	43,900	46,600	52,200	6%	12%	19%
Northwest Inner	44,400	42,600	46,900	-4%	10%	6%
Northeast Inner	96,600	89,200	94,400	-8%	6%	-2%
Southeast Inner	59,300	58,600	56,500	-1%	-4%	-5%
Southwest Inner	54,000	52,100	54,200	-4%	4%	0%
West Inner	57,300	55,200	57,300	-4%	4%	0%
Northwest Suburb	36,800	47,700	61,200	30%	28%	66%
Northeast Suburb	44,200	65,000	86,600	47%	33%	96%
Southeast Suburb	85,300	100,800	146,500	18%	45%	72%
Southwest Suburb	39,500	64,000	117,700	62%	84%	198%
West Suburb	53,300	66,400	92,000	25%	39%	73%
CITY	**633,200**	**712,400**	**894,400**	**13%**	**26%**	**41%**
Sherwood Park	38,700	55,000	68,800	42%	25%	78%
St. Albert	45,200	56,300	63,900	25%	13%	41%
Region - Urban	76,700	94,700	118,500	23%	25%	54%
Region - Rural	74,000	87,100	134,100	18%	54%	81%
REGION	**234,600**	**293,100**	**385,300**	**25%**	**31%**	**64%**
TOTAL	**867,800**	**1,005,500**	**1,279,700**	**16%**	**27%**	**47%**

Sources: 1993 City census; 2005 City Census; 2014 City Census projected to 2015. Region: combination federal census, various municipal censuses.

Figure 2-1 illustrates the population densities for the entire study area while Figure 2-2 illustrates it for the City of Edmonton and adjacent urban areas. The Downtown Fringe district has the highest density of population, at 47.2 persons per hectare, followed by Downtown, Londonderry, University and Mill Woods and Meadows. Combined, these represent 28% of the City's population, with the greatest total population occurring in Mill Woods and Meadows. In the Region, the Town of Beaumont has the highest density, at 16.2 persons per hectare, representing 4.4% of the Region's population. Refer to Figure 1-6 and Figure 1-7 for the maps of the City of Edmonton and Region by district.

Figure 2-1: 2015 Population Density – Study Area

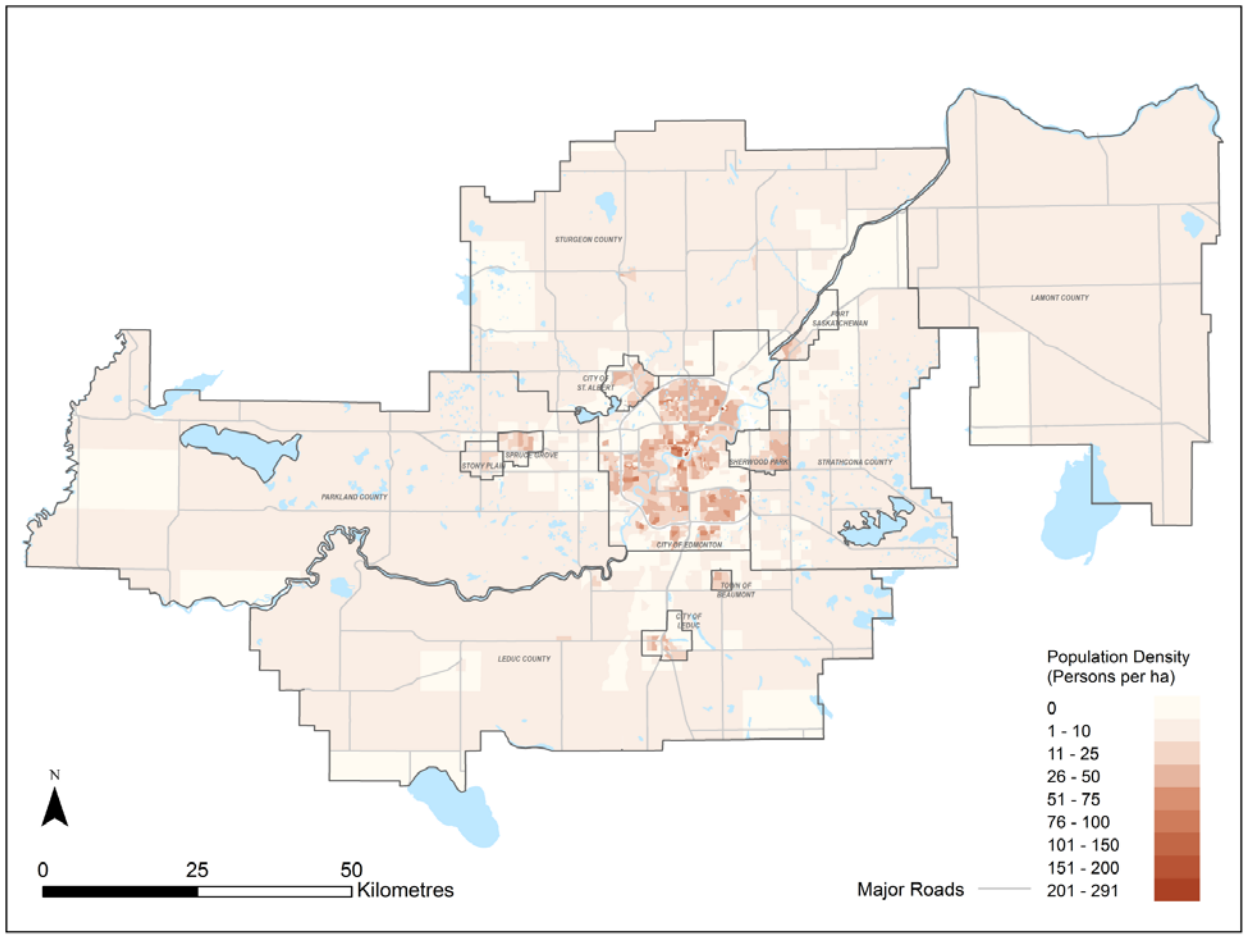
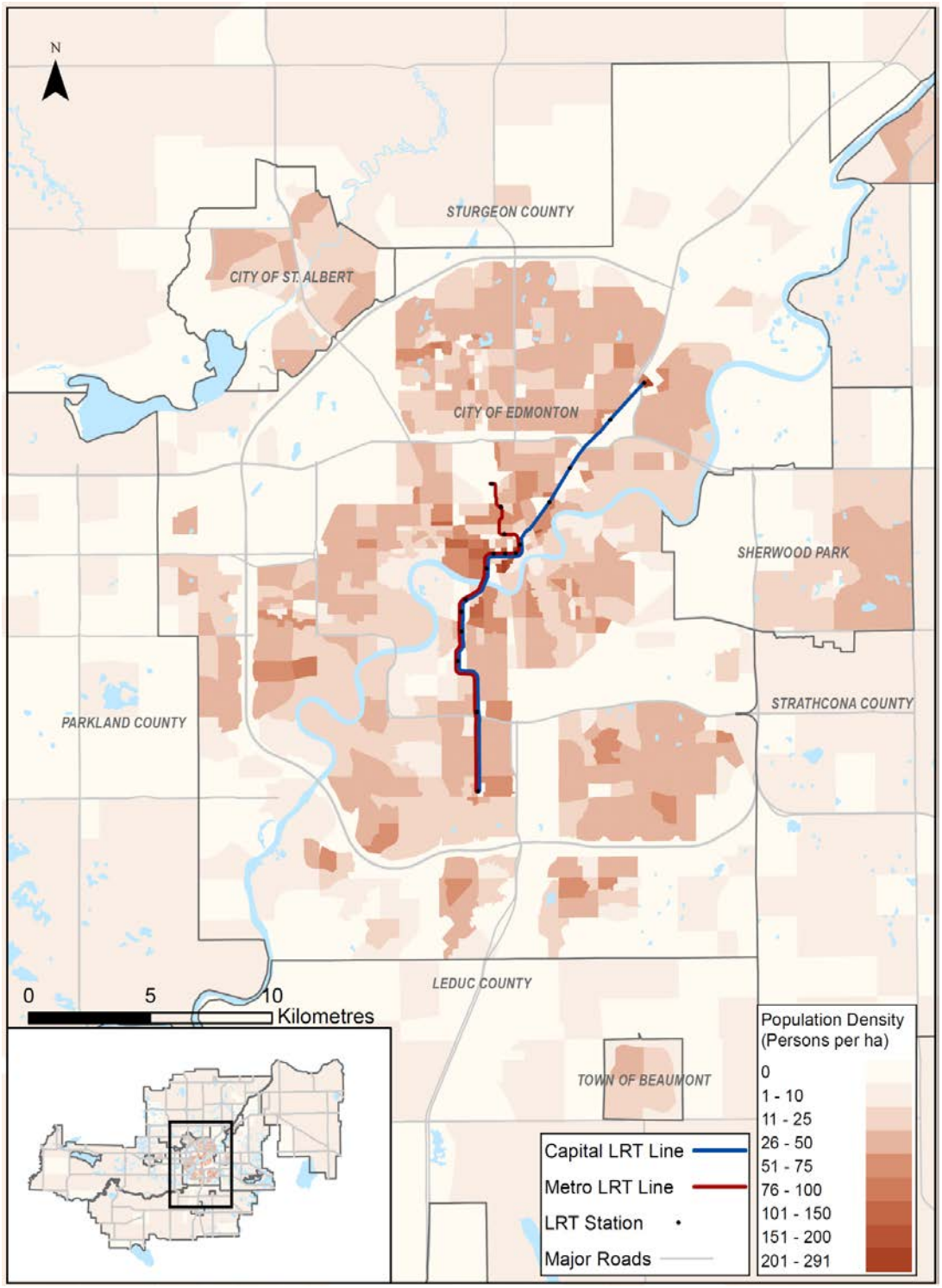


Figure 2-2: 2015 Population Density – City of Edmonton and Adjacent Urban Areas

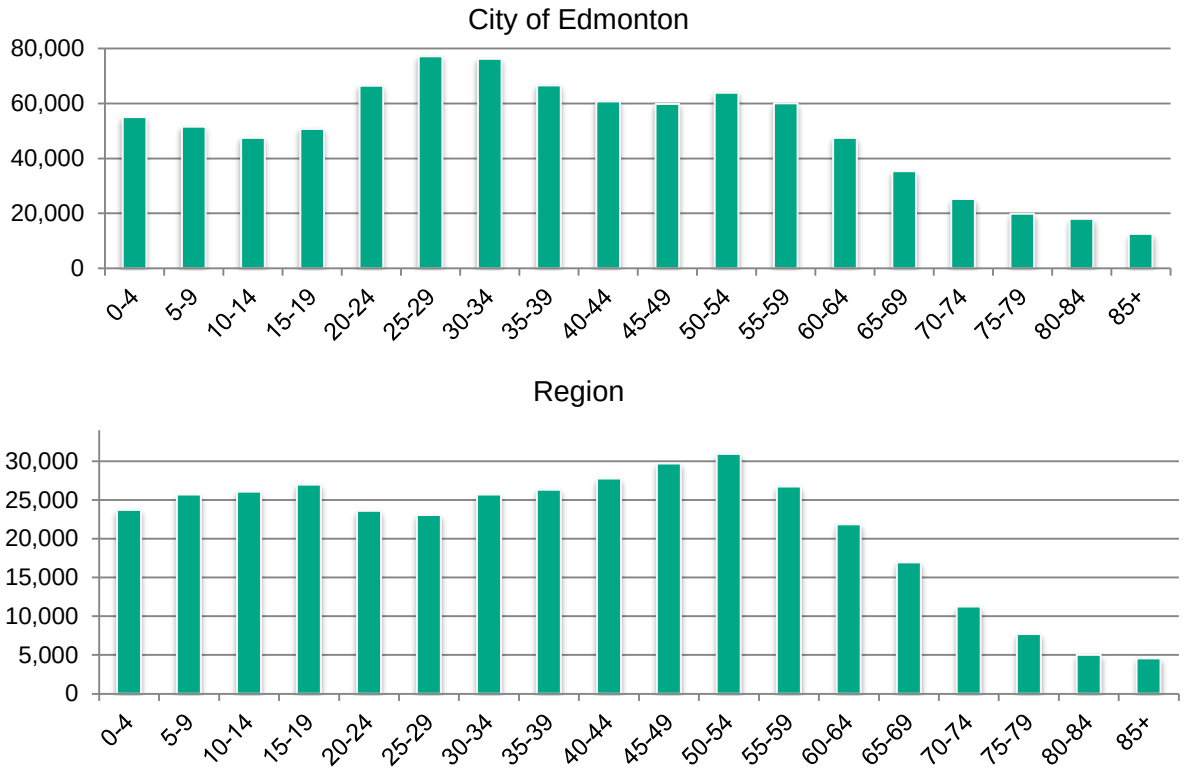


2.2 Age Profile of Edmonton and Region's Population

Information retrieved on the age profile of residents of the Edmonton Region has uncovered significant changes with implications for travel patterns and behaviours. Figure 2-3 plots the age distribution by five-year increments for the City of Edmonton and the Region. Figure 2-4 and Figure 2-5 show the percentage changes in each age category for various time spans for the City of Edmonton. Corresponding data are not available for the Region.

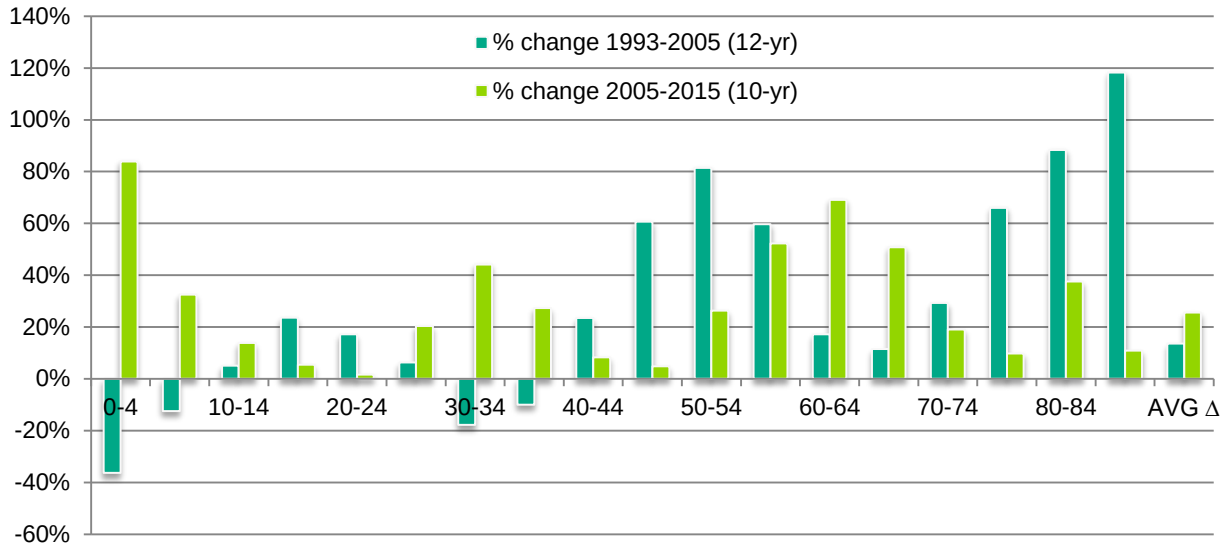
The largest cohort in Edmonton is the 25-34 age group, which represents a population of younger adults and younger families. In contrast, the largest cohort in the Region is the 45-54 age group, which reflects a population profile of mature families. The major trend in the City is towards an aging population, with growth rates highest among the 55-69 age group between 2005 and 2015. 22-year growth rates are highest among older adults (50-64 years) and especially the 75+ population.

Figure 2-3: Age Distribution



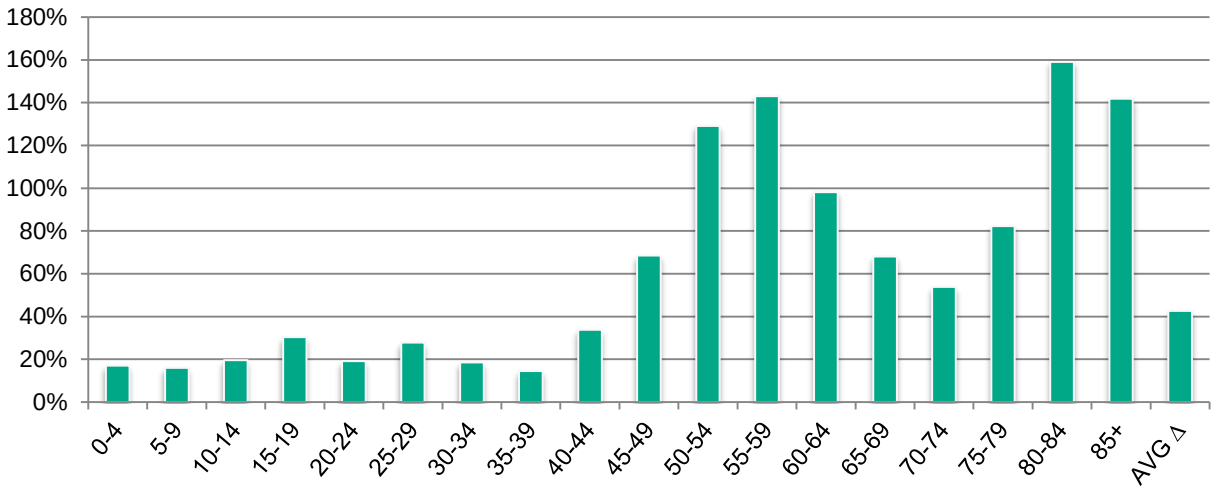
Sources: City: 2014 municipal census; Region: combination federal census, various municipal censuses. All projected to 2015.

Figure 2-4: Population Change by Age Group: 1993 to 2005, 2005 to 2015 – City of Edmonton



Sources: 1993 City census; 2005 City Census; 2014 City Census projected to 2015

Figure 2-5: Twenty-Two-Year Population Change by Age Group: 1993 to 2015 – City of Edmonton



Sources: 1993 City census; 2014 City Census projected to 2015

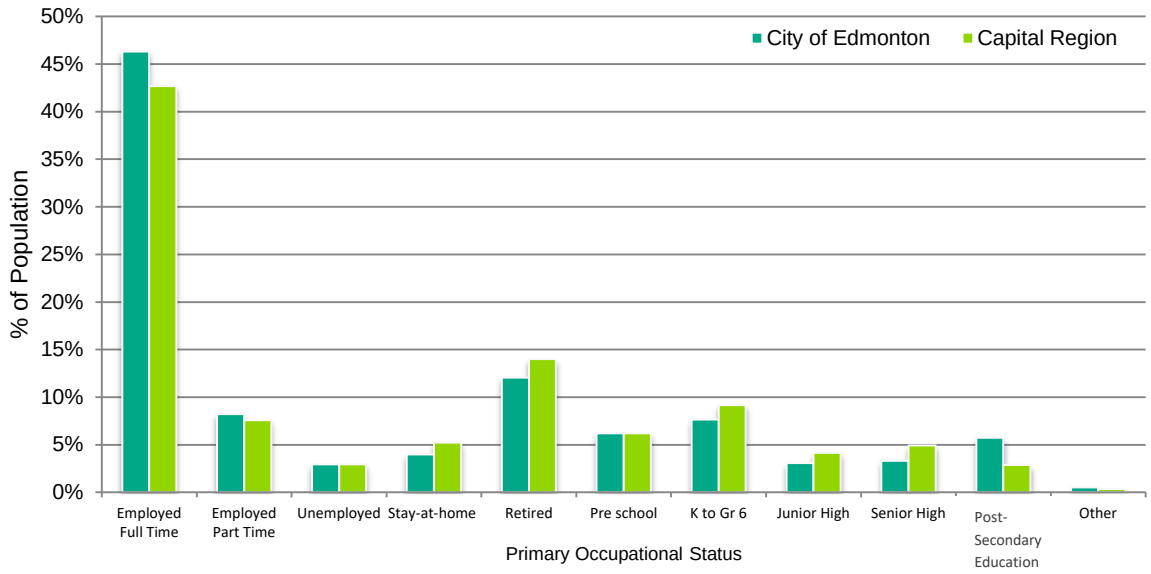
2.3 Primary Employment or School Status

Another dimension of population is each person's primary occupation or school status. This status impacts travel behaviour as workers and students typically commute to and from their workplaces and schools during the morning and afternoon peak periods. Figure 2-6 illustrates the primary occupation or school status for the City and the Region. Figure 2-7 illustrates the trends in primary occupation or school status among City residents since 1994.

More than half of study area residents are employed, with upwards of three-quarters of these workers in full time employment. In the City, 14% of residents are K-12 students, compared to 18% of the Region. Full and part-time post-secondary students represent 12% of the City's population, compared to 7% of the Region. Upwards of one-third of post-secondary students are also employed. Approximately one-quarter of study area residents are neither employed nor in school. These include unemployed people, stay-at-home people, retirees and preschoolers, of which retirees comprise the largest proportion.

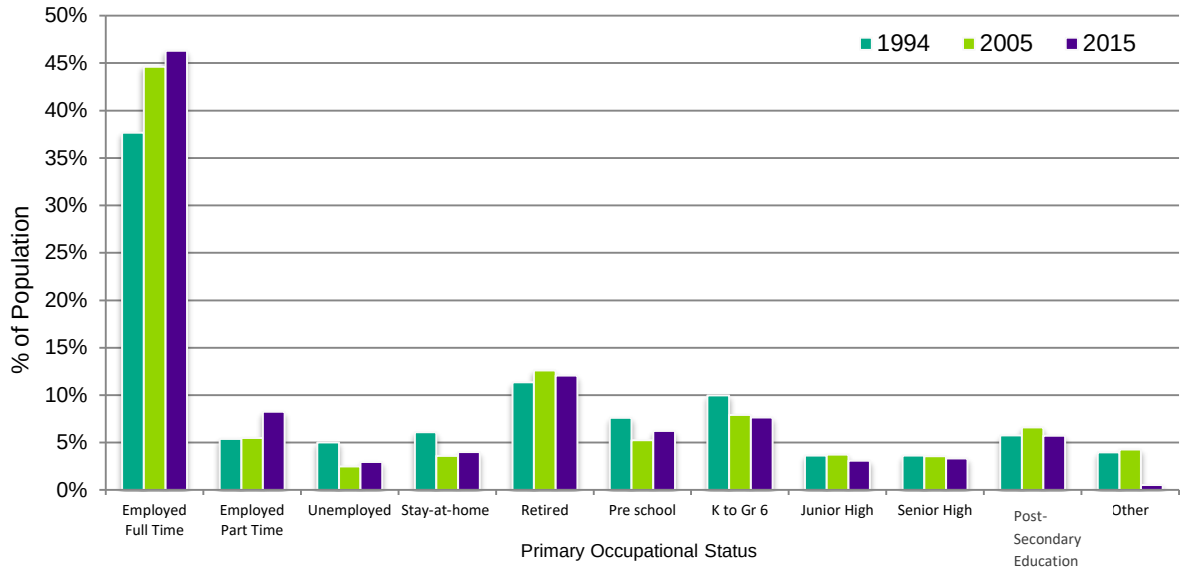
Full time employment has grown significantly among City residents since the 1994 survey, with part time employment increasing moderately. The unemployment rate dropped between 1994 and 2005, but has increased slightly in 2015. The proportion of school aged children has also decreased. Corresponding data are not available for Region residents.

Figure 2-6: Primary Occupation or School Status – City, Region



Sources: City: 2014 municipal census; Region: combination federal census, various municipal censuses. All projected to 2015.

Figure 2-7: Primary Occupation or School Status – City – 1994 to 2015



Sources: 1993 City census; 2005 City Census; 2014 City Census projected to 2015

2.4 Household Size

In 2015, there were approximately 367,400 households in the City and 141,500 households in the Region. The number of Region households has almost doubled in the last 20 years (92.5%), which is nearly twice as fast as the City's growth rate (49.8%). Still, the magnitude of growth is higher in the City, with over 120,000 new households as compared to 68,000 new households in the region.

Table 2-2 highlights the population, number of households, and average household size for the Edmonton region in 2015. The average household size in Edmonton in 2015 was 2.43. This represents an increase in household size from 2.38 in 2005, but is still lower than the 1994 average of 2.56. Average household sizes continue to be smaller in the City than in the Region, which is consistent with the greater mix of multi-story dwellings and the greater proportion of 1- and 2-person households in the City. The average household size in the Region in 2015 was 2.72, which is a decrease from 3.14 persons per household in 2005 and 3.17 persons per household in 1994.

Table 2-3 shows the changes in these characteristics from 1994 through 2005 to 2015. Population and the number of households have grown over the 21-year period, with the number of households growing faster than population, except in the City between 2005 and 2015. This means that average household sizes have dropped, most noticeably in the Region between 2005 and 2015 (-13.4%, from 3.14 persons per household to 2.72 persons per household).

Table 2-2: Population and Average Household Size in 2015

	Population	Households	Avg. Household Size
City of Edmonton	894,400	367,400	2.43
Region	385,300	141,500	2.72
Study Area Total	1,279,700	508,900	2.51

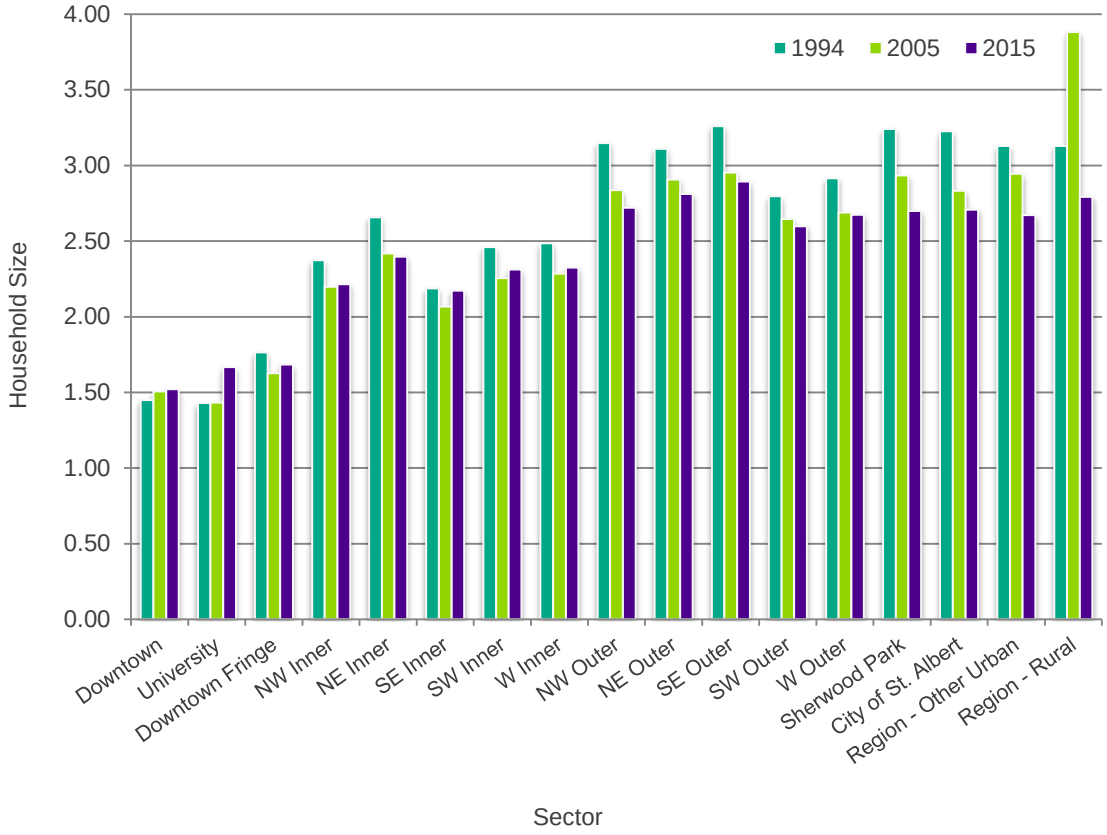
Table 2-3: Changes in Population and Average Household Size

	Population	Households	Avg. Household Size
City of Edmonton			
2005 to 2015 (10-year change)	+25.5%	+24.5%	+2.1%
1994 to 2005 (11-year change)	+12.5%	+20.3%	-7.0%
1994 to 2015 (21-year change)	+41.3%	+49.8%	-5.1%
Region			
2005 to 2015 (10-year change)*	+31.5%	+51.7%	-13.4%
1994 to 2005 (11-year change)	+24.9%	+26.9%	-0.6%
1994 to 2015 (21-year change)	+64.2%	+92.5%	-13.9%
Study Area			
2005 to 2015 (10-year change)*	+27.3%	+31.0%	-2.1%
1994 to 2005 (11-year change)	+15.9%	+21.9%	-5.9%
1994 to 2015 (21-year change)	+47.5%	+59.6%	-7.8%

Figure 2-8 shows the growth in average household size by sector from 1994 through 2005 to 2015.[4] Except for Downtown Edmonton and the University sector, where household sizes have increased, the average household sizes have generally dropped over time elsewhere in the City and the Region. Note that the Rural Region recorded a significant increase in 2005; however, given the general tendency across the study area, it is possible that this increase is an anomaly.

[4] This figure corresponds to and updates Figure 2.5 in the 2005 survey reports.

Figure 2-8: Change in Average Household Size by Sector – 1994, 2005 and 2015



Region - Other Urban: City of Leduc, Fort Saskatchewan, Spruce Grove, Stony Plain, and Town of Beaumont;
Region - Rural: Counties of Lamont, Leduc, Parkland, Strathcona, and Sturgeon and smaller municipalities located within their borders.

2.5 Household Income

Household income is defined as the combined annual gross income (before taxes) for all members of the household. Household income is known to impact vehicle availability and job type, which can have strong influences on mode choice. It also impacts housing location and type, which influence travel patterns and behaviour.

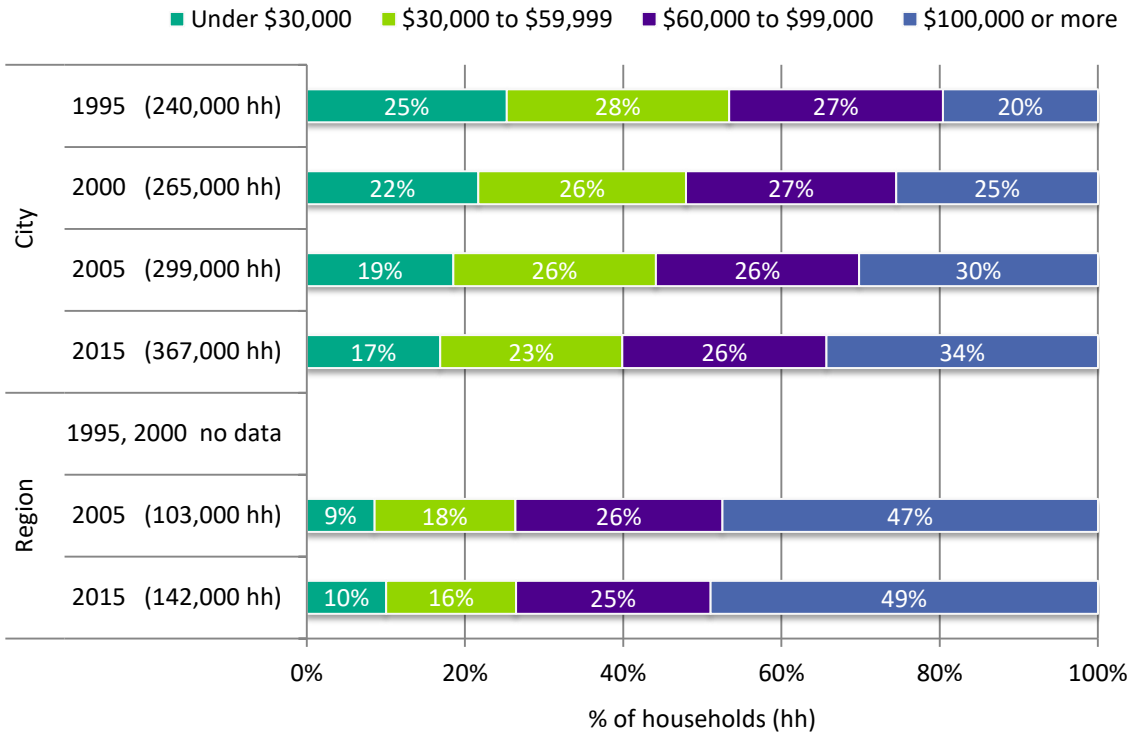
Table 2-4 summarizes the distribution of annual household income per five groups. Figure 2-9 shows the evolution of the distributions between 1995 and 2015, by normalizing the census data sets from previous surveys to 2015 dollars. In general, households in the City have a more even distribution by annual income groups, compared to the Region. The proportion of the lowest income group (under $30,000) is higher in the City than in the Region. The Region represents a more affluent population overall with more than one-third of households in the highest income group ($125,000 or more), compared to less than one-quarter of households in the City.

Table 2-4: Distribution of Household Income Groups - 2015

Annual Household Income	City of Edmonton	Region
Under $30,000	17%	10%
$30,000 to $60,000	23%	16%
$60,000 to $99,000	26%	25%
$100,000 to $125,000	11%	14%
$125,000 or more	23%	35%
Total Households	367,400	141,500

Note: Income was imputed for the 13% of households surveyed that refused or did not know their income.

Figure 2-9: Income 1995-2015 – Normalized to Equivalent 2015



Sources: 1995, 2000: Statistics Canada 1996, 2001 federal census; 2005, 2015: household travel survey results. For the 2015 survey, households that refused to provide income had income responses imputed. Survey results may not necessarily be entirely representative despite efforts to mitigate non-response bias through data weighting. Using available data, households have been apportioned to income ranges determined by the equivalent value in the given year of the 2015 dollar range based on inflation factors for 1996, 2001 and 2005 dollars to 2015 dollars (from Bank of Canada Inflation Calculator). The percentage distributions in the 2015 equivalent $-value income ranges are estimates and should be interpreted with caution.

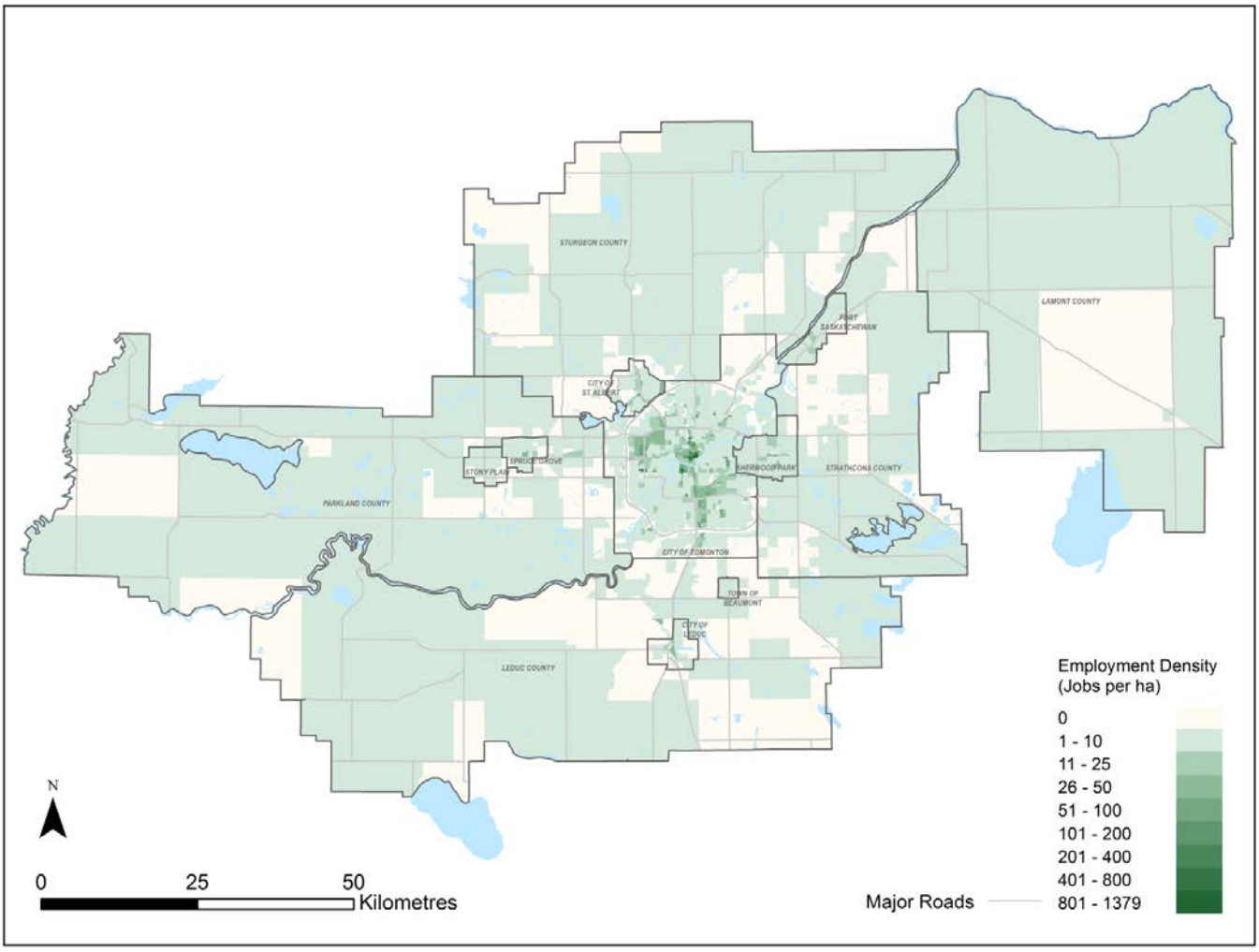
2.6 Employment

Work-related travel forms approximately a quarter of all daily travel activities, placing high demands on the transportation system over relatively short periods of the day. As a consequence, it is important to understand the extent and spatial distribution of employment. Figure 2-10 provides a graphical illustration of the extent and locations of employment for the entire study area, while Figure 2-11 illustrates this for the City of Edmonton and adjacent urban areas.

Employment densities are significantly greater in the City than in the Region. More than half of the City's jobs are concentrated in six districts, with Downtown, University and the Downtown Fringe having the highest job densities. The South Industrial, Bonnie Doon and NW Industrial / Mistatim districts also have notable concentrations of jobs. Outside the City, Sherwood Park has the greatest density of jobs, representing one-fifth of the Region's jobs.

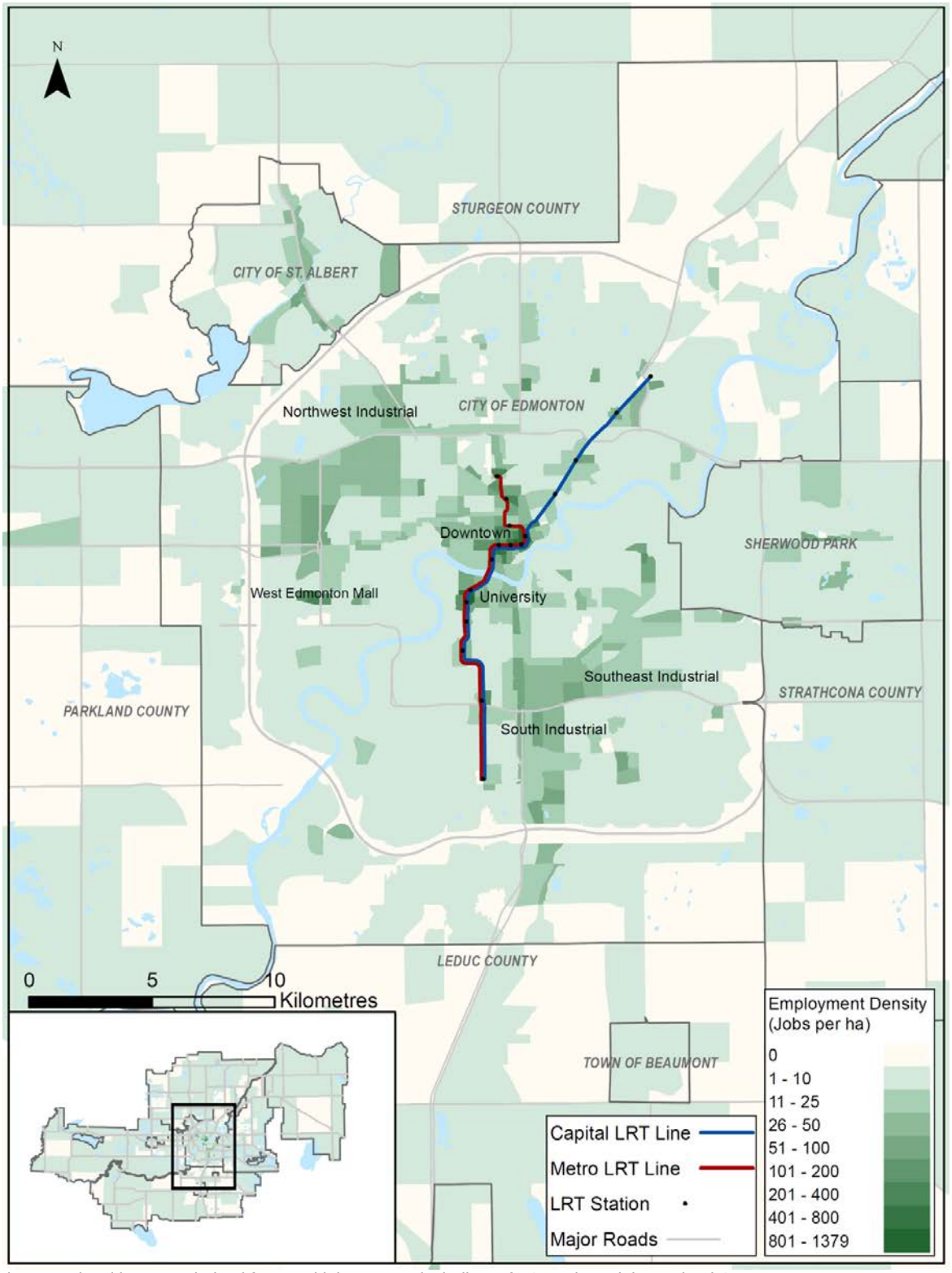
Of note, the number of jobs in the Central Band (see Figure 1-4) far exceeds the number of resident workers. This reflects a major trend of travel into the Central band during AM and PM peak periods. The reverse is true for most of the other bands and districts, with resident workers exceeding the number of jobs to varying degrees. The other exceptions are the Northwest Outer district and the Southeast Outer district, where the number of jobs exceeds the number of resident workers.

Figure 2-10: 2015 Employment Density – Study Area



Source: Employment densities were derived from multiple sources including Info Canada and the Federal Census.

Figure 2-11: 2015 Employment Density – City of Edmonton and Adjacent Urban Areas



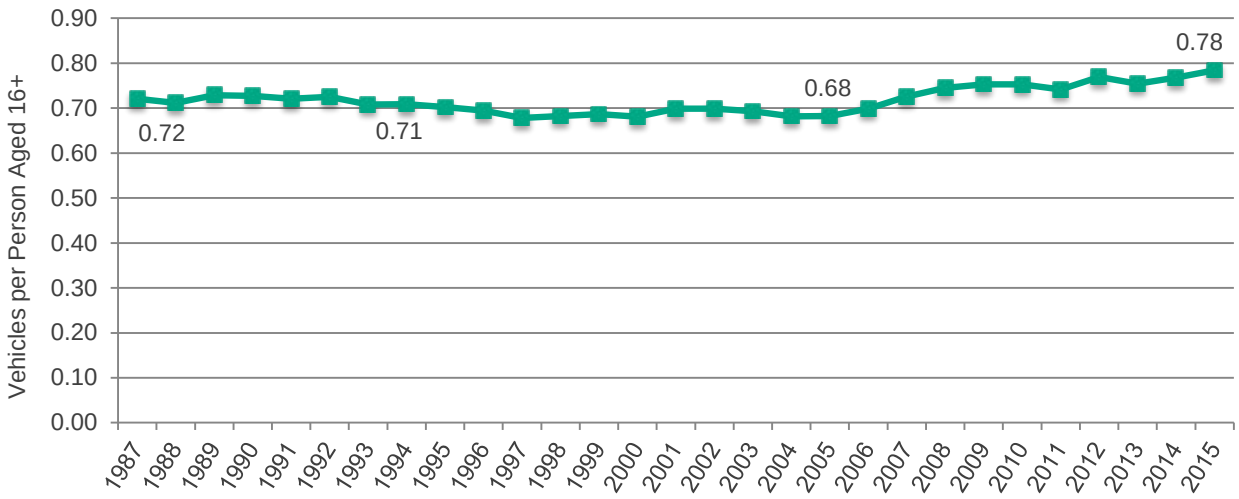
Source: Employment densities were derived from multiple sources including Info Canada and the Federal Census.

2.7 Car Availability

Cars are defined as all passenger cars, pickups, motorcycles, and vans which are available for use by the persons residing in the household. The extent to which a car is available for use is known to have an effect on travel mode choice. Car availability is tracked by vehicle registrations in the provincial vehicle registry. The passenger vehicles per person aged 16+ is shown in Figure 2-12, which is the age required to be eligible for a probationary or full driver's license.

In 2015 there were approximately 0.78 vehicles per person aged 16 or older in the City of Edmonton. The vehicle availability rates remained stable or dropped slightly through the early 2000s, but started to rise slightly around 2005. The numbers of passenger vehicles, driving-age population and holders of driver's licenses have all generally increased in line with the growth in population.

Figure 2-12: Passenger Vehicles per Person Aged 16+ - City of Edmonton



Sources: provincial vehicle registry data for passenger vehicles and motorcycles combined excluding antique plates, and provincial drivers' licensing data, as provided by City of Edmonton; municipal and federal census population counts by age. Estimates for years with missing data were made as the averages of adjacent years.

Table 2-5 highlights the average number of vehicles per household by the total persons of all ages in that household. The City's overall average is 1.63 vehicles per household, while the Region's average is higher at 2.28 vehicles per household. Overall, high vehicle availability means that these households have a lower probability of choosing other modes of transportation.

Table 2-5: Household Size by Household Vehicles

	Household Size (Total Persons of all Ages)					
	1	2	3	4	5+	Total
City of Edmonton						
Total vehicles	88,400	208,100	116,000	111,800	75,500	599,800
Avg per household	0.83	1.68	2.05	2.31	2.35	1.63
Region						
Total vehicles	28,300	114,800	64,600	68,900	45,600	322,300
Avg per household	1.12	2.20	2.69	2.83	2.92	2.28

2.8 Availability of Sustainable Transportation

This section examines the availability of alternatives to the personal vehicle for study area households such as car sharing and bicycling.

Car share memberships give users access to a pool of vehicles as an alternative or in addition to private vehicle ownership. Just over one percent of City households have at least one household member enrolled in an Edmonton-based car share program, especially in 0- and 1-vehicle households. Only 0.04% of Region households have memberships in a car share program. Figure 2-13 summarizes household membership by sector (see Figure 1-3 and Figure 1-4), as defined by at least one person in the household having a membership. The results highlight the higher concentration of household membership in the central Edmonton sectors – Downtown, University and Downtown Fringe – which reflects to some extent the car share boundaries in 2015.

Figure 2-13: Household Membership in a Car Share Program by Sector

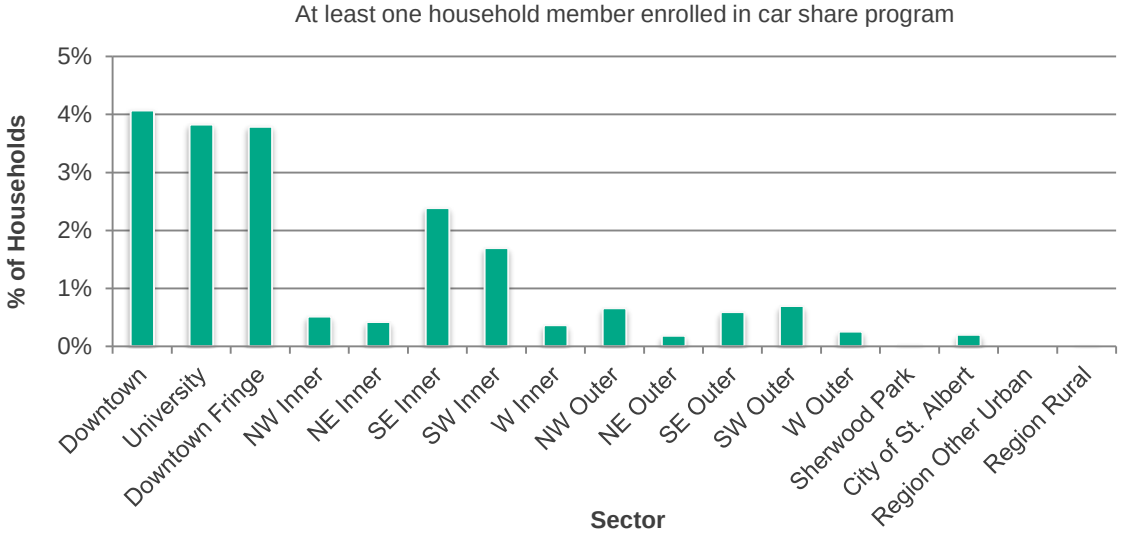


Figure 2-14 summarizes membership by household size for the City of Edmonton. Consistent with expectations, households with low vehicle availability have the highest car share membership rates with the highest rate being 2.2% of 0-vehicle households.

Figure 2-14: Household Membership in a Car Share Program by Number of Household Vehicles – City of Edmonton

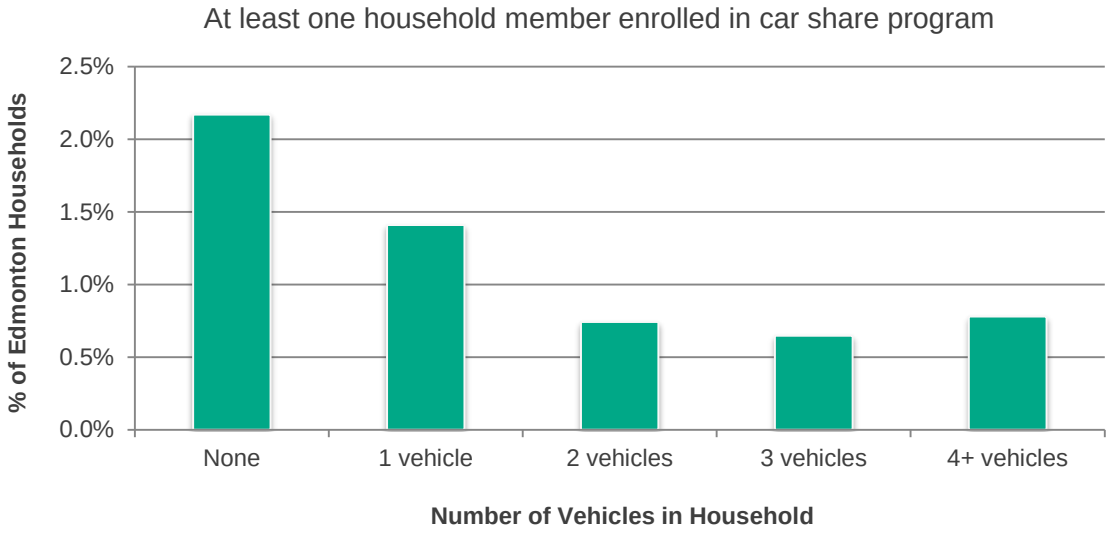


Table 2-6 summarizes the availability of adult bicycles to study area households. Over half of households have at least one adult bicycle, although the proportion is higher in the Region (70%) than in the City (59%). Among City households, the average ownership rate is 1.21 adult bicycles per household, compared to 1.58 bicycles per household in the Region. A smaller proportion of households have at least one child's bicycle, at 23% of Region households and 17% of City households.

Table 2-6: Adult Bicycles by Household Size

	Household Size (persons)					
	1	2	3	4	5+	All Households
City of Edmonton						
% of Households	29%	34%	15%	13%	9%	100%
Total adult bicycles*	51,500	133,500	88,200	101,200	69,900	444,400
Average per household	0.48	1.08	1.56	2.10	2.18	1.21
Region						
% of Households	18%	37%	17%	17%	11%	100%
Total adult bicycles*	12,700	65,100	43,800	58,200	43,100	222,900
Average per household	0.51	1.25	1.83	2.39	2.77	1.58

*Survey results scaled to account for small number of question non-responses, rounded to nearest 100

3 Travel Characteristics

The 2015 Household Travel Survey collected information on all trips generated by all persons residing in the surveyed household during a 24-hour period on a weekday. This section of the report describes the various characteristics of weekday trips in terms of the:

- Total daily trips;
- Trip generation;
- Travel mode;
- Travel purpose;
- Total trip distances;
- Person trip lengths.

3.1 Total Daily Trips

The total number of trips made by Edmonton residents has risen from 2.25 million trips per weekday in 1994 to 3.14 million in 2015, which is an increase of approximately 39.4%. This increase is in line with the City's population increase of 41.3%. In the Region, the total number of trips rose by 63.5% to 1.33 million which corresponds with the population increase of 64.2%. Changes in total trips are described in Figure 3-1 and Table 3-1.

Figure 3-1: Total Daily Person-Trips, 1994-2015

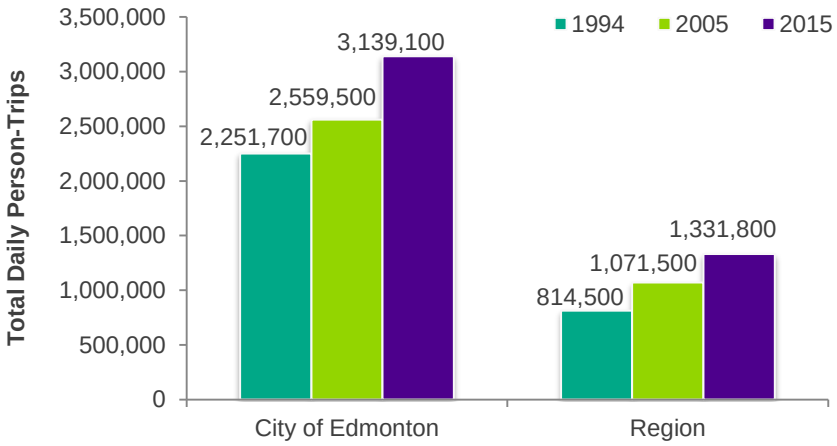


Table 3-1: Total Trips and Changes in Total Trips in the Edmonton Region

	Year	Daily Trips	Period	Change
City of Edmonton	2015	3,139,100	2005 to 2015	+22.6%
	2005	2,559,500	1994 to 2005	+13.7%
	1994	2,251,700	1994 to 2015	+39.4%
Region	2015	1,331,800	2005 to 2015	+24.3%
	2005	1,071,500	1994 to 2005	+31.6%
	1994	814,500	1994 to 2015	+63.5%
Study Area Total	2015	4,470,900	2005 to 2015	+46.9%
	2005	3,631,000	1994 to 2005	+45.3%
	1994	3,066,200	1994 to 2015	+102.9%

3.2 Trip Generation

Figure 3-2 summarizes the evolution of trips rates for persons over the three surveys, for the City and Region. It can be seen that the daily person-trip rate (the number of trips made per person per day) increased between 1994 and 2005, but has since dropped. In 2015, City residents generated 3.51 daily person-trips. The rate for Region residents was slightly lower at 3.46 daily person-trips.

Figure 3-2: Daily Person Trip Rates – 1994 to 2015

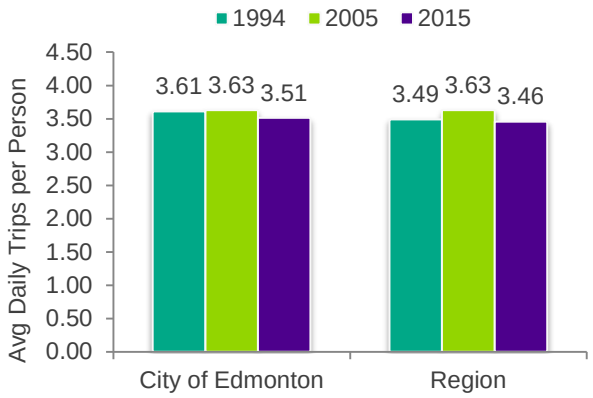
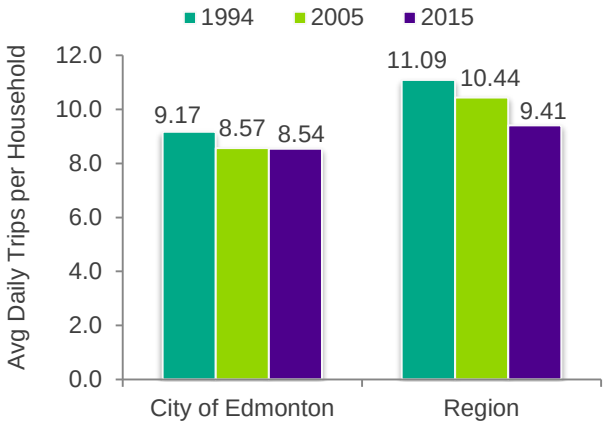


Figure 3-3 illustrates the change of trips rates for households in the City of Edmonton and Region between 1994 and 2015. The daily household trip rate, which is the number of trips made by all persons in a household per day, has dropped over the three surveys for both the City and Region. In 2015, City households generated 8.54 daily trips while Region households generated 9.41 daily trips.

Figure 3-3: Daily Household Trip Rates – 1994 to 2015



3.3 Travel Mode

The mode by which people travel is a particularly important element of a transportation system as it affects the type and nature of transportation facilities and services that need to be provided. This section will summarize the overall mode share, in addition to discussing the relationship between mode choice and several variables such as age, gender, income, and occupational status.

Table 3-2 summarizes the total number of daily trips by mode for residents of the City of Edmonton and the Region, while Table 3-3 shows the change in number of daily trips. The absolute numbers of trips have increased in most modes, which highlights the increasing demand on the transportation system. In the City the number of daily transit trips has increased by approximately 49,000 since 2005, while the number of car trips has increased by almost 454,000. In the Region, the number of daily transit trips has increased by almost 9,000 since 2005, while the number of car trips has increased by about 236,000.

Table 3-2: Number of Daily Trips by Mode

	City of Edmonton Residents			Region Residents		
Mode	1994	2005	2015	1994	2005	2015
Car Driver	1,221,700	1,458,200	1,801,200	483,000	680,200	865,500
Car Passenger	527,200	523,800	634,700	216,700	239,700	290,400
Walk	257,800	284,500	339,100	54,300	85,000	84,900
Transit	194,300	219,600	269,000	9,500	19,500	28,100
School Bus*	25,100	35,400	37,300	48,400	41,400	51,000
Bicycle	10,100	25,300	54,800	700	3,300	10,600
Other	13,600	12,700	3,100	2,000	2,300	1,200
Total Trips	2,251,700	2,559,500	3,139,100	814,500	1,071,500	1,331,800

*In 1994, 2005: School/Work Bus; in 2015: School Bus

Table 3-3: Change in Number of Daily Trips

	City of Edmonton Residents		Region Residents	
Mode	1994 to 2005	2005 to 2015	1994 to 2005	2005 to 2015
Car Driver	236,500	343,000	197,200	185,300
Car Passenger	-3,400	110,900	23,000	50,700
Walk	26,700	54,600	30,700	-100
Transit	25,300	49,400	10,000	8,600
School Bus	10,300	1,900	-7,000	9,600
Bicycle	15,200	29,500	2,600	7,300
Other	-900	-9,600	300	-1,100
Total Trips	307,800	579,600	257,000	260,300

Figure 3-4 illustrates the overall mode share in 2015 with percent changes from 2005, while Table 3-4 summarizes the change in mode share for all modes from 1994 and 2005. The combined car driver and passenger share dominates in both the City (77.6% of all daily trips) and the Region (86.8% of all daily trips). The car driver share is slightly higher in the Region than in the City, at 65.0% and 57.4% respectively. Walk trips represent 10.8% of City residents' trips and 6.4% of Region residents' trips. The corresponding cycling shares are 1.7% and 0.8% respectively. The transit share is highest among City residents at 8.6% of all daily trips, compared to 2.1% in the Region.

The car driver shares have increased slightly for both the City and Region since 2005, while the car passenger shares have dropped. Note that the car passenger shares include modes such as carpooling, taxi, and ride share. The transit share among City residents has remained stable since the 2005 survey, although absolute ridership has increased. The transit share among Region residents has increased slightly. Cycling has experienced by far the greatest growth, increasing 4.5 times among City residents and 14 times among Region residents, with corresponding increases in mode share.

Figure 3-4: 2015 Mode Share

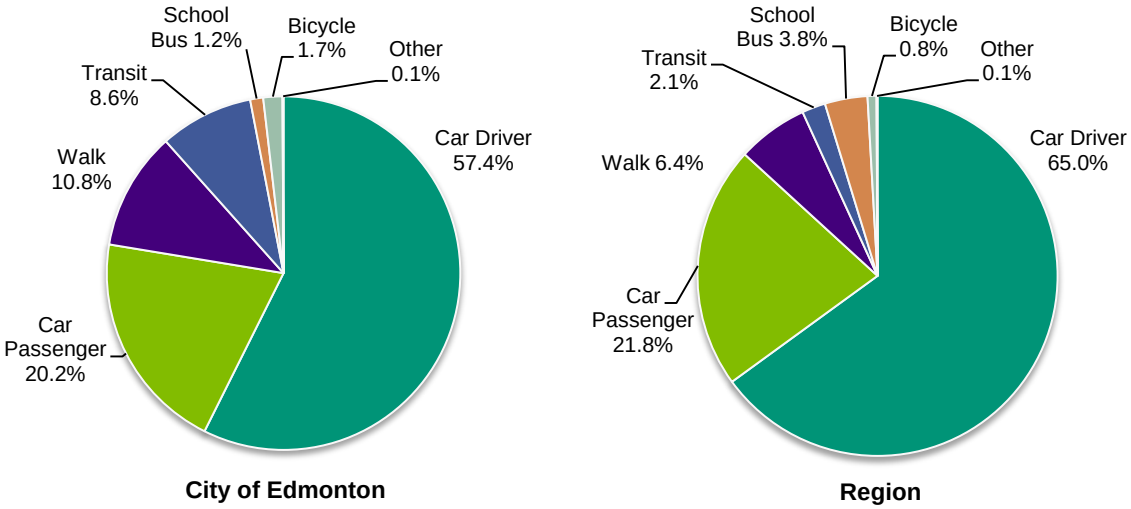
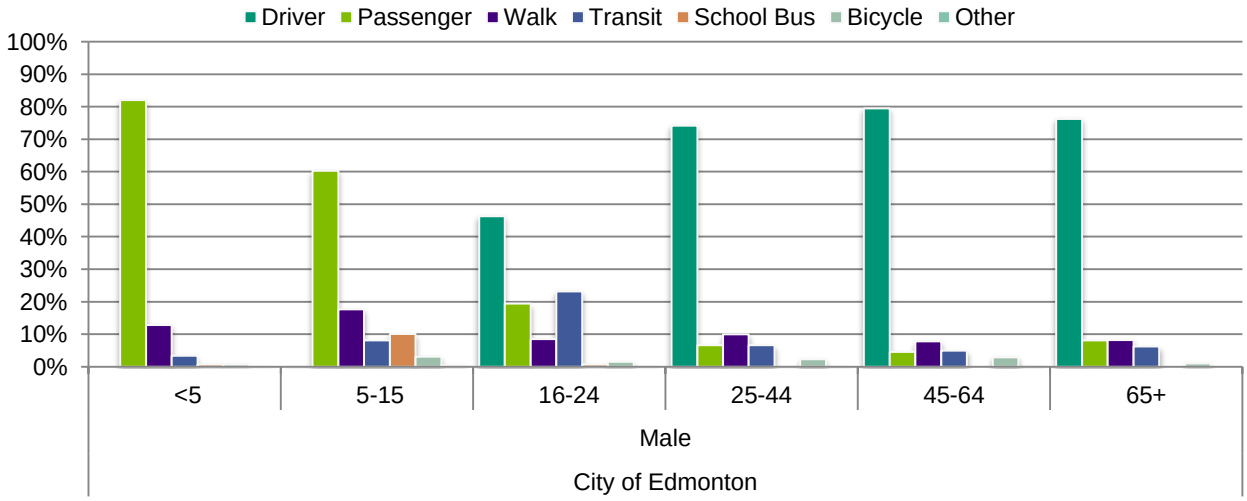


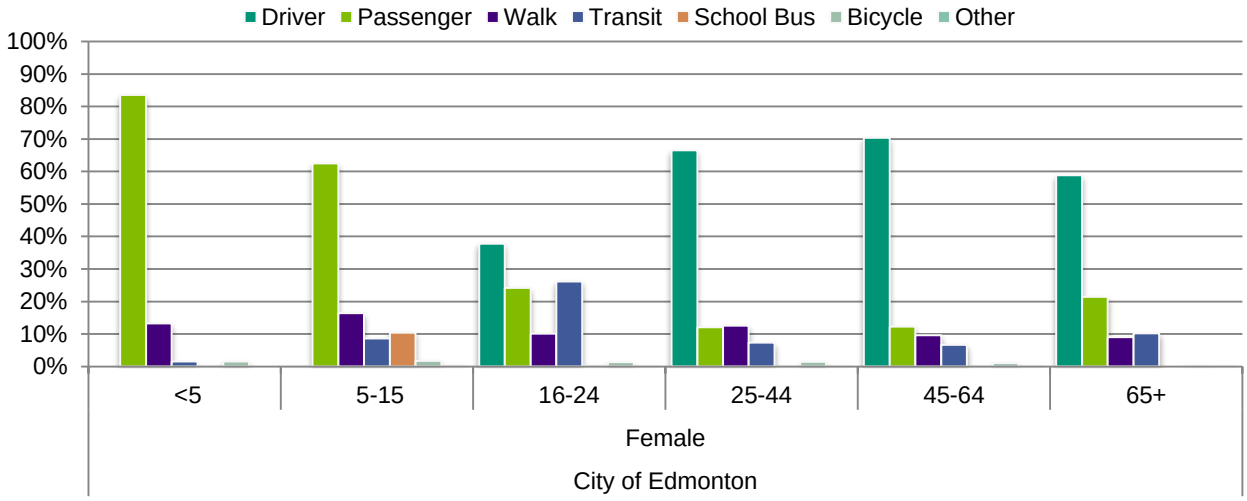
Table 3-4: Change in Mode Share

	City of Edmonton		Region	
Mode	1994 to 2005	2005 to 2015	1994 to 2005	2005 to 2015
Car Driver	+2.7%	+0.4%	+4.2%	+1.5%
Car Passenger	-2.9%	-0.2%	-4.2%	-0.6%
Walk	-0.3%	-0.3%	+1.3%	-1.6%
Transit	+0.0%	+0.0%	+0.7%	+0.3%
School Bus	+0.3%	-0.2%	-2.1%	+0.0%
Bicycle	+0.5%	+0.8%	+0.2%	+0.5%
Other	-0.1%	-0.4%	+0.0%	-0.1%

Figure 3-5 illustrates the mode choice by age group and by gender[5] for both the City of Edmonton and the Region. The car driver shares generally increase with age for the male and female genders, although they drop slightly from age 65 onward. The car passenger, walking and cycling shares are highest for the male and female genders prior to age 16 which is the minimum age for a driver's license. For all older groups, the walk shares are highest among females while the cycling shares are highest among males. For people of driving age (16+), the transit share is generally higher among females than males. The transit shares for the male and female genders are highest among school and university-age travelers.

Figure 3-5: Mode Choice by Age Group by Gender (daily)





[5] Gender was self-identified by survey participants and included the option of "other". Note that responses in this category were very minimal.

Figure 3-6: Mode Choice by Age Group by Gender (daily) – cont'd

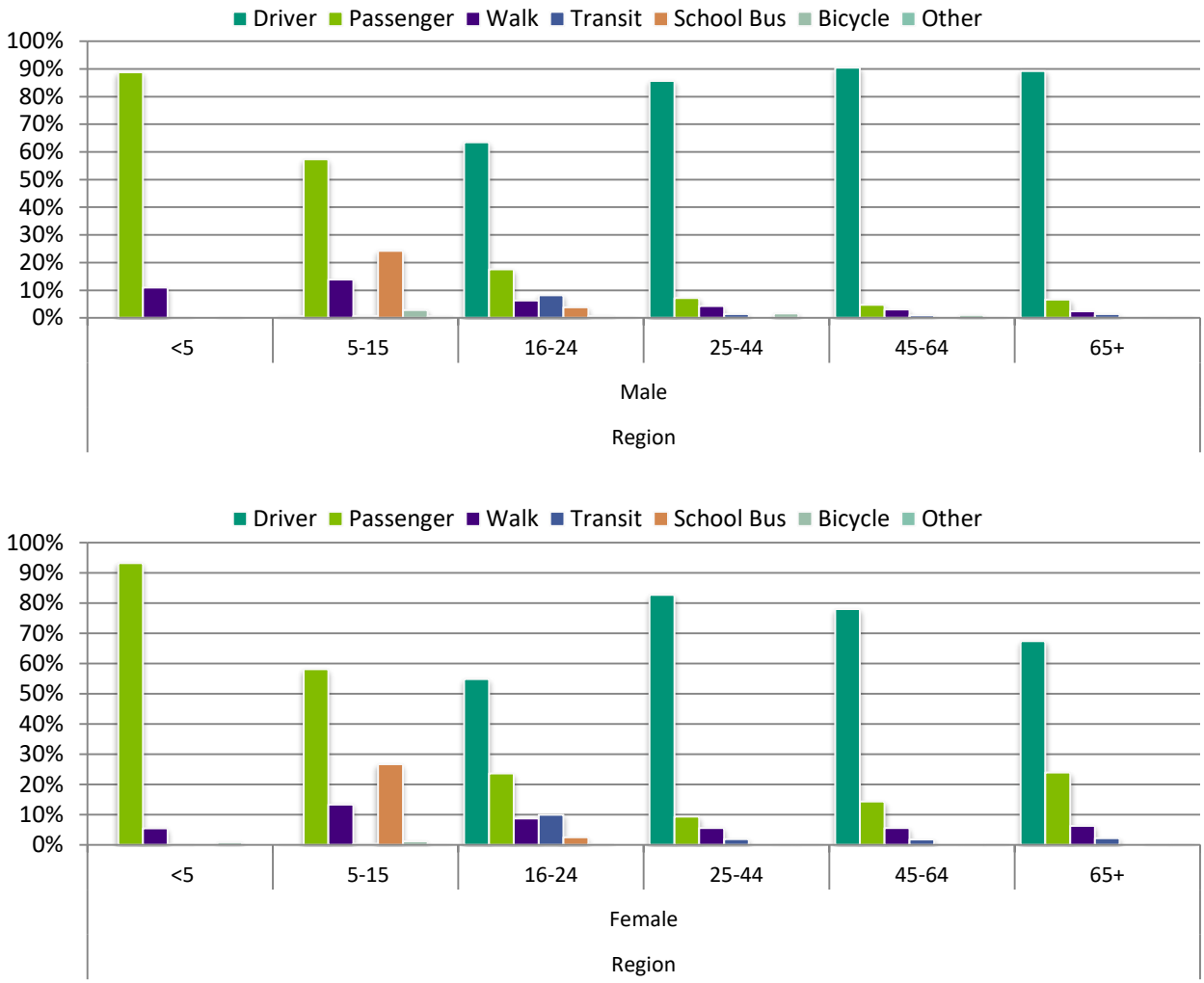


Table 3-5 summarizes how mode shares have changed by age and gender over the previous surveys for both City residents and Region residents. Key changes are highlighted, with the intensity of the highlight reflecting the extent of the change. Since the 1994 survey, the transit share has increased slightly among the 16-24 age group. Over the 21-year period the car driver share has increased by 7% among the 65+ City population, while it increased by 3% in the Region. Also of note is the 6% increase in car passengers <16 years old in the City, with a corresponding 4% increase for the Region.

Table 3-5: Mode Shares by Age and Gender – City – 1994-2015

	Age					Gender		
	<16	16-24	25-44	45-64	65+	Male	Female	Total
City of Edmonton 2015								
Car Driver	0%	42%	70%	75%	67%	60%	54%	57%
Car Passenger	68%	22%	9%	9%	15%	18%	23%	20%
Walk	16%	9%	11%	9%	9%	10%	11%	11%
Transit	7%	25%	7%	6%	8%	8%	9%	9%
School Bus	7%	1%	0%	0%	0%	1%	1%	1%
Bicycle	2%	1%	2%	2%	1%	2%	1%	2%
Other	0%	0%	0%	0%	0%	0%	0%	0%
10-Year Change 2005-2015								
Car Driver	-2%	2%	1%	-2%	2%	0%	1%	0%
Car Passenger	5%	-1%	0%	-1%	-3%	1%	-1%	0%
Walk	-2%	-4%	0%	1%	0%	-1%	0%	0%
Transit	-1%	3%	0%	0%	1%	0%	0%	0%
School Bus	-1%	0%	0%	0%	0%	0%	0%	0%
Bicycle	1%	1%	1%	1%	1%	1%	0%	1%
Other	0%	-1%	-1%	0%	-1%	0%	0%	0%
21-year Change 1994-2015								
Car Driver	0%	-2%	-4%	1%	7%	-1%	7%	3%
Car Passenger	6%	0%	-1%	-4%	-2%	-1%	-6%	-3%
Walk	-9%	-1%	4%	2%	-1%	-1%	0%	-1%
Transit	-1%	3%	1%	0%	-2%	1%	-1%	0%
School Bus	2%	0%	0%	0%	0%	0%	0%	0%
Bicycle	1%	0%	2%	2%	0%	2%	1%	1%
Other	0%	-1%	0%	-1%	-2%	0%	-1%	-1%
Region 2015								
Car Driver	0%	59%	84%	84%	78%	66%	64%	65%
Car Passenger	66%	20%	8%	10%	16%	20%	23%	22%
Walk	12%	7%	5%	4%	4%	6%	7%	6%
Transit	0%	9%	2%	1%	2%	2%	2%	2%
School Bus	19%	3%	0%	0%	0%	4%	3%	4%
Bicycle	2%	1%	1%	1%	0%	1%	0%	1%
Other	0%	0%	0%	0%	0%	0%	0%	0%
10-Year Change 2005-2015								
Car Driver	-2%	4%	-1%	-2%	3%	0%	1%	1%
Car Passenger	4%	-5%	0%	0%	-3%	0%	-1%	-1%
Walk	-5%	-1%	-1%	1%	-2%	-2%	-2%	-2%
Transit	-1%	1%	0%	0%	1%	0%	0%	0%
School Bus	2%	0%	0%	0%	0%	-1%	1%	0%
Bicycle	1%	0%	0%	0%	0%	1%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%
21-Year Change 1994-2015								
Car Driver	0%	3%	-1%	-2%	2%	0%	10%	5%
Car Passenger	4%	-5%	-4%	-2%	-5%	0%	-10%	-5%
Walk	-4%	0%	2%	2%	1%	-1%	0%	0%
Transit	-1%	4%	1%	1%	2%	1%	1%	1%
School Bus	-1%	-3%	0%	-1%	0%	-2%	-2%	-2%
Bicycle	1%	0%	1%	1%	0%	1%	0%	1%
Other	0%	0%	0%	0%	0%	0%	0%	0%

Table 3-6 summarizes the mode share by income level. In general, there are higher auto driver and passenger shares in the Region than in the City for all income levels. The shares of walking, bicycling and transit are highest in the lowest income group (below $30,000), except for the walking share in the Region. These shares gradually drop as income rises, which is consistent with the greater levels of vehicle ownership.

Table 3-6: Use of Modes by Income Level

Income ($000's)	% of House-holds	% of Pop'n	% of Trips	Daily Trips/ Person	Driver	Passen--ger	Walk	Transit	School Bus	Bicycle	Other
City											
Under 30	17%	10%	10%	3.21	42%	14%	20%	19%	1%	3%	0%
30 to 59.9	23%	19%	18%	3.42	57%	18%	12%	10%	1%	2%	0%
60 to 99.9	26%	27%	27%	3.48	58%	22%	10%	8%	1%	2%	0%
100 to 124.9	11%	15%	15%	3.55	57%	23%	10%	7%	2%	1%	0%
125+	23%	30%	31%	3.68	62%	21%	8%	6%	1%	2%	0%
Total	367,400	894,400	3,139,100	3.51	57%	20%	11%	9%	1%	2%	0%
Region											
Under 30	10%	6%	5%	3.07	68%	17%	7%	4%	2%	2%	0%
30 to 59.9	16%	11%	12%	3.50	68%	19%	8%	2%	2%	1%	0%
60 to 99.9	25%	24%	24%	3.44	64%	23%	7%	1%	4%	1%	0%
100 to 124.9	14%	16%	17%	3.54	62%	25%	6%	2%	4%	1%	-
125+	35%	42%	42%	3.47	65%	21%	6%	2%	4%	1%	0%
Total	141,500	385,300	1,331,800	3.46	65%	22%	6%	2%	4%	1%	0%

Table 3-7 breaks down the mode share by occupational status. The car driver share represents the large majority of trips among full time workers, at 74% for City residents and 85% for Region residents. The shares are only slightly lower for part time workers, at 70% and 82% respectively. Stay-at-home individuals, unemployed people and retirees also all have high shares, ranging from 57% for unemployed City residents to 81% of stay-at-home Region residents. Post-secondary students have a 33% car driver share in the City and 49% in the Region. The car passenger share is always significantly lower than the car driver share – even among groups whose incomes might be expected to be lower, such as unemployed persons and post-secondary students.

The walk, bicycling and transit shares are higher among students and people who are not employed than among people who are employed. One notable exception is that, in both the City and Region, the transit share is lower among stay-at-home people than full and part-time workers.

Table 3-7: Use of Modes by Occupational Status (daily)

			Mode Share						
City of Edmonton	% of Population	% of Trips	Driver	Passenger	Walk	Transit	School Bus	Bicycle	Other
Employed Full Time	46%	50%	74%	9%	9%	6%	0%	2%	0%
Employed Part Time	8%	10%	70%	10%	10%	7%	0%	2%	0%
Unemployed	3%	2%	57%	16%	13%	11%	-	3%	0%
Stay-at-home	4%	4%	68%	13%	14%	4%	0%	1%	-
Retired	12%	11%	65%	16%	10%	9%	-	1%	0%
Preschool	6%	5%	-	83%	13%	2%	1%	1%	0%
Student K to Gr 6	8%	7%	-	66%	18%	1%	12%	2%	0%
Student Junior High	3%	3%	0%	53%	17%	18%	6%	5%	1%
Student Senior High	3%	3%	12%	42%	11%	31%	3%	1%	0%
Student PSE	6%	5%	33%	13%	13%	38%	0%	2%	0%
Other	1%	0%	31%	16%	26%	26%	-	1%	0%
Total	894,255	3,139,117	57%	20%	11%	9%	1%	2%	0%
Region									
Employed Full Time	43%	44%	85%	8%	4%	2%	0%	1%	0%
Employed Part Time	8%	9%	82%	10%	5%	1%	0%	1%	-
Unemployed	3%	2%	70%	20%	6%	1%	-	2%	1%
Stay-at-home	5%	6%	81%	12%	7%	0%	-	0%	-
Retired	14%	14%	76%	17%	4%	2%	-	0%	0%
Preschool	6%	5%	-	90%	9%	0%	0%	0%	-
Student K to Gr 6	9%	8%	-	59%	12%	0%	27%	2%	0%
Student Junior High	4%	4%	0%	56%	17%	1%	23%	3%	0%
Student Senior High	5%	5%	29%	40%	13%	3%	14%	1%	0%
Student PSE	3%	3%	49%	15%	3%	32%	0%	-	-
Other	0%	0%	67%	31%	1%	2%	-	-	-
Total	385,366	1,331,801	65%	22%	6%	2%	4%	1%	0%

3.4 Travel Purpose

In transportation planning it is useful to categorize trips by the purpose of travel as it can impact travel elements such as cost, mode choice, and time constraints. The trip purposes include home-based trips which either start or end at home. Table 3-8 lists the total trips by purpose and changes from 1994 and 2005, while Table 3-9 lists the weekday trip purpose proportions for all survey years.

About three-quarters of all trips are home-based, while the remaining one-quarter of trips neither start nor end at home. In 2015, 21% of trips in the City of Edmonton were to and from work, with the total reaching 32% when school trips are included. This ratio highlights the need to plan transportation facilities with consideration for more than just peak period trips. Overall, trips made by City residents have increased more quickly after 2005 than before, with non-home-based trips growing the fastest by 32%. In the Region, home-based trips increased more quickly before 2005 (40% over the 11-year period) while non-home-based trips increased faster after 2005 (54% over the 10-year period).

Table 3-8: Weekday Daily Trips by Trip Purpose – 1994, 2005 and 2015

	Daily Trips			1994-2005		2005 to 2015	
City of Edmonton Residents							
Trip Purpose	1994	2005	2015	Change	% Change	Change	% Change
HB-Work	429,000	516,000	651,000	87,000	20%	135,000	31%
HB-Post-Secondary	71,000	72,000	82,000	1,000	1%	10,000	14%
HB-School	241,000	176,000	255,000	-65,000	-27%	79,000	33%
HB-Shopping	238,000	331,000	353,000	93,000	39%	22,000	9%
HB-Social / Recreation	209,000	336,000	400,000	127,000	61%	64,000	31%
HB-Personal Business	179,000	147,000	226,000	-32,000	-18%	79,000	44%
HB-Pick up/Drop off	132,000	168,000	217,000	36,000	27%	49,000	37%
HB-Other	188,000	209,000	172,000	21,000	11%	-37,000	-20%
Home-Based Subtotal	1,687,000	1,955,000	2,356,000	268,000	16%	401,000	24%
NHB-Work	77,000	141,000	186,000	64,000	83%	45,000	58%
NHB-Other	486,000	464,000	597,000	-22,000	-5%	133,000	27%
Non-Home-Based Subtotal	563,000	605,000	783,000	42,000	7%	178,000	32%
Total Trips	**2,250,000**	**2,559,000**	**3,139,000**	**309,000**	**14%**	**580,000**	**26%**
Region Residents							
Trip Purpose	1994	2005	2015	Change	% Change	Change	% Change
HB-Work	128,000	204,000	244,000	76,000	59%	40,000	31%
HB-Post-Secondary	9,000	19,000	17,000	10,000	111%	-2,000	-22%
HB-School	108,000	92,000	128,000	-16,000	-15%	36,000	33%
HB-Shopping	71,000	123,000	144,000	52,000	73%	21,000	30%
HB-Social / Recreation	84,000	153,000	175,000	69,000	82%	22,000	26%
HB-Personal Business	n/a	59,000	105,000	n/a	n/a	46,000	n/a
HB-Pick up/Drop off	n/a	74,000	73,000	n/a	n/a	-1,000	n/a
HB-Other	193,000	102,000	82,000	-91,000	-47%	-20,000	-10%
Home-Based Subtotal	592,000	827,000	967,000	235,000	40%	140,000	24%
NHB-Work	27,000	49,000	69,000	22,000	81%	20,000	74%
NHB-Other	195,000	195,000	295,000	0	0%	100,000	51%
Non-Home-Based Subtotal	222,000	244,000	364,000	22,000	10%	120,000	54%
Total Trips	**814,000**	**1,071,000**	**1,332,000**	**257,000**	**32%**	**261,000**	**32%**

Note: due to changes in survey response categories and data treatments, Social/Recreation, Personal Business, and Other trip purpose groups may not necessarily align across cycles.

Table 3-9: Weekday Trip Purpose Proportions – 1994, 2005 and 2015

	City of Edmonton Residents			Region Residents		
Trip Purpose	1994	2005	2015	1994	2005	2015
HB-Work	19%	20%	21%	16%	19%	18%
HB-Post-Secondary	3%	3%	3%	1%	2%	1%
HB-School	11%	7%	8%	13%	9%	10%
HB-Shopping	11%	13%	11%	9%	11%	11%
HB-Social / Recreation	9%	13%	13%	10%	14%	13%
HB-Personal Business	8%	6%	7%	n/a	6%	8%
HB-Pick up/Drop off	6%	7%	7%	n/a	7%	5%
HB-Other	8%	8%	5%	24%	10%	6%
Home-Based Subtotal	75%	76%	75%	73%	77%	73%
NHB-Work	3%	6%	6%	3%	5%	5%
NHB-Other	22%	18%	19%	24%	18%	22%
Non-Home-Based Subtotal	25%	24%	25%	27%	23%	27%
Total Trips	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: due to changes in survey response categories and data treatments, Social/Recreation, Personal Business, and Other trip purpose groups may not necessarily align across cycles.

Table 3-10 highlights the breakdown of trip purposes by mode share. As trip purposes vary, so do the opportunities for shifting auto-centric modes to other options like transit, cycling, and walking. For example, home to work is an important part of overall transportation demand because of the prevalence of the car driver mode and the opportunity of attracting commuters to transit.

Car driver is the dominant mode for most trip purposes, especially HB-work, HB-shopping, HB-personal business, HB-pick up / drop off and NHB-work trips. The car passenger share, on the other hand, is highest for HB-school trips. Walk trips have their highest share in HB-school trips. The highest shares for bicycle trips are for HB-work, HB-post secondary trips and HB-social / recreational trips among City residents.

More than half of HB-post secondary education trips are made by transit. Among City residents, HB-work and HB-school also are important for transit. The school bus share (for HB-school trips) is highest among Region residents, with lower shares observed among City residents. These shares are consistent with the public modes that are available to transport students in different parts of the study area.

Table 3-10: Trip Purpose by Mode

	24-Hour Total	HB-Work	HB-PSE	HB-School	HB-Shop-ping	HB-Social / Rec	HB-Personal Bus.	HB-Pick up/Drop off	HB-Other	NHB-Work	NHB-Other
City of Edmonton											
Total Trips	3,139,100	650,700	82,500	255,400	352,600	399,800	226,200	217,000	172,100	185,800	597,000
Driver	57%	74%	20%	2%	61%	53%	60%	70%	56%	71%	59%
Passenger	20%	6%	9%	49%	20%	30%	22%	14%	28%	8%	22%
Walk	11%	5%	10%	20%	11%	10%	9%	14%	11%	17%	12%
Transit	9%	12%	58%	15%	6%	5%	8%	1%	4%	4%	5%
School Bus	1%	0%	0%	12%	0%	0%	0%	0%	0%	0%	1%
Bicycle	2%	3%	3%	2%	1%	3%	1%	1%	1%	1%	1%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Region											
Total Trips	1,331,800	243,500	16,500	128,300	144,000	175,400	104,800	73,200	81,800	69,500	294,900
Driver	65%	88%	36%	6%	73%	58%	68%	74%	65%	80%	66%
Passenger	22%	5%	7%	39%	22%	33%	23%	16%	29%	8%	24%
Walk	6%	3%	0%	18%	3%	6%	6%	9%	5%	10%	5%
Transit	2%	3%	56%	1%	1%	1%	1%	0%	1%	1%	1%
School Bus	4%	0%	0%	33%	0%	0%	0%	0%	0%	0%	3%
Bicycle	1%	1%	0%	3%	1%	1%	1%	1%	0%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

HB=Home-Based, NHB=Non-Home-Based, PSE=Post-secondary Education

3.5 Person Trip Lengths

The length of trips taken is an indicator of the spatial characteristics of travel and the extent to which people are willing to or forced to travel to complete activities. Table 3-11 summarizes the average trip length by trip purpose, while Table 3-12 summarizes it by mode.

Overall, the average trip lengths for City residents have increased over the 21-year period, generally steadily, from an average of 6.7 km in 1994 to 8.0 km in 2015. In contrast, average trip lengths for Region residents have dropped steadily, from 13.2 km in 1994 to 12.6 km in 2015. These findings are consistent with the expansion of the outer suburbs in the City and the surrounding Region. This generates the need for longer trips for City residents, for whom work, shopping and other opportunities have increased in number but may now be further away, and shorter trips for Region residents, for whom these opportunities are now closer.

Trip lengths have increased in the City for virtually all trip purposes since 2005. In the Region, trip lengths have decreased for the HB Shopping, HB All Other, Non-HB Work and Non-HB Other trip purposes. Similarly, almost all modes in the City have experienced an increase in average trip length since 2005. In the Region, trip lengths decreased for the car driver, car passenger, school bus and other modes. The transit trip length experienced a notable increase for both the City and Region between 2005 and 2015, which reflects the longer distances between where transit riders are destined – mainly to workplaces and schools in or close to the Edmonton Central area – and where there is residential growth – mainly outside of the Anthony Henday Drive.

Table 3-11: Average Trip Length (km) by Purpose (daily) – 1994, 2005, 2015

	City of Edmonton						Region		
	Avg km			% change			Avg km		% change
Trip Purpose	1994	2005	2015	1994 to 2005	2005 to 2015	1994 to 2015	2005	2015	2005 to 2015
HB Work	10.3	11.0	12.8	+7%	+16%	+24%	21.1	21.8	+3%
HB Post-Secondary	7.5	7.9	10.0	+5%	+27%	+33%	23.4	26.6	+14%
HB School	3.3	4.4	5.0	+33%	+15%	+52%	6.3	7.6	+20%
HB Shopping	4.5	5.3	5.3	+18%	0%	+18%	12.3	11.2	-9%
HB Social/Recreation	7.6	7.8	8.5	+3%	+8%	+11%	12.1	12.7	+5%
HB All Other	6.5	7.7	6.4	+18%	-17%	-2%	12.8	11.7	-9%
Non-HB Work	7.6	7.6	7.7	+1%	0%	+1%	11.2	10.9	-2%
Non-HB Other	6.1	5.9	6.6	-3%	+12%	+8%	9.0	8.7	-3%
Average	**6.7**	**7.5**	**8.0**	**+8%**	**+11%**	**19%**	**13.1**	**12.6**	**-4%**

HB = Home-Based trip, NHB = Non-Home-Based trip
HB All Other aggregates home-based Personal Business, Pickup/Drop Off, and Other purposes

Table 3-12: Average Trip Length (km) by Mode (daily)

	City of Edmonton					
	Avg km			% change		
Trip Mode	1994	2005	2015	1994 to 2005	2005 to 2015	1994 to 2015
Car driver	8.1	9.0	9.4	11%	5%	17%
Car passenger	6.1	7.3	7.4	20%	2%	23%
Transit	6.9	7.5	9.2	8%	22%	32%
Walk	1.2	1.0	1.1	-18%	11%	-9%
Bicycle	2.9	4.1	4.1	40%	0%	41%
School Bus*	6.9	6.4	6.8	-8%	8%	-1%
Other	8.2	8.7	2.6	7%	-70%	-68%
Average	**6.7**	**7.5**	**8.0**	**12%**	**6%**	**19%**

	Region					
	Avg km			% change		
Trip Mode	1994	2005	2015	1994 to 2005	2005 to 2015	1994 to 2015
Car driver	14.5	15.1	14.2	5%	-6%	-2%
Car passenger	12.6	12.1	11.0	-3%	-9%	-12%
Transit	12.7	14.1	21.5	10%	53%	69%
Walk	1.7	0.9	1.1	-46%	22%	-35%
Bicycle	3.5	3.6	4.2	3%	17%	21%
School Bus*	16.6	10.5	10.3	-37%	-2%	-38%
Other	14.8	11.8	1.6	-20%	-86%	-89%
Average	**13.2**	**13.1**	**12.6**	**-1%**	**-4%**	**-5%**

*In 1994, 2005, School Bus /Work Bus, in 2015, School Bus only; SOV = single occupant vehicle, HOV2+ = two or more occupants

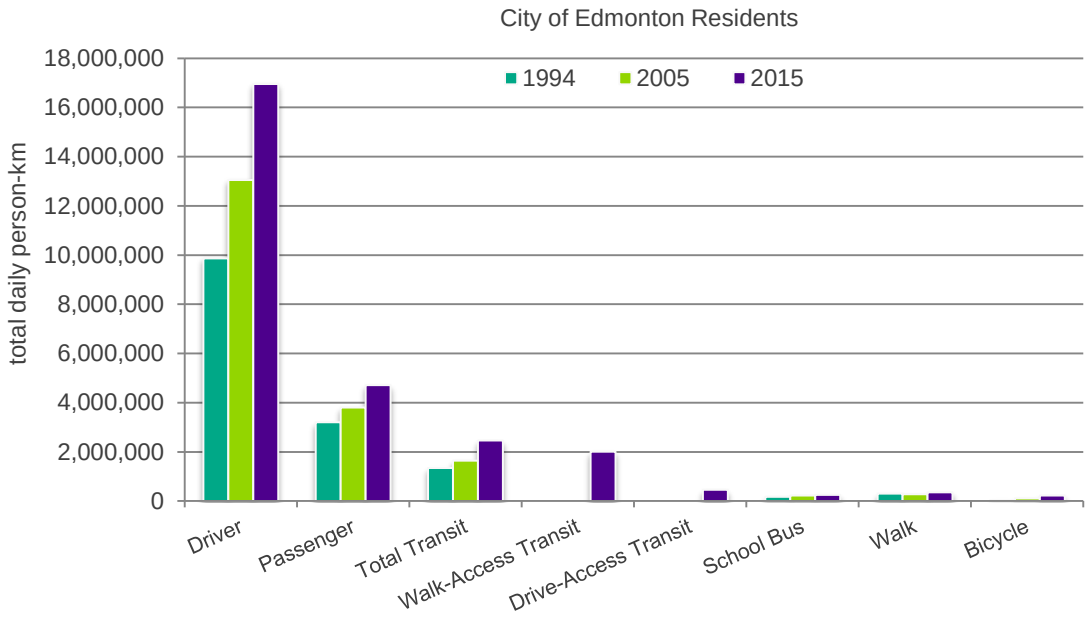
3.6 Total Travel Distances

The aggregate distance traveled is calculated by summing the product of trip lengths and the total number of trips by all residents. The result is the total person-kilometres (PKT), which is an indicator of the overall travel activity on the transportation network. In general, an increase in PKT is expected for increasing city size and development on the periphery. Figure 3-7 and Table 3-13 highlight the person-kilometre of travel by mode for the City and Region for 1994, 2005 and 2015.

The person-kilometres travelled are greater among City residents than among Region residents for almost all modes. This reflects the City's larger population, the numbers of jobs, and the availability of a multi-modal transportation system. In the City, the car driver PKT has grown by almost three-quarters since 1994 to 16,955,000 person-kilometres traveled, in comparison to the City's population growth of 41.3%. Car driver trips grew at nearly the same rate in the Region to 12,305,400 person-kilometres traveled, while the Region's population grew by 64.2% since 1994. This increase illustrates how demand on the City's roads has increased much faster than either the number of trips or the trip lengths show when viewed independently.

Transit person-kilometres have also increased significantly in the 21-year period, growing by 83% among City residents and 273% among Region residents, to 2,463,000 and 605,500 PKT respectively. Most of this growth took place after 2005, which is likely related to the extension of the Capital Line LRT and the outward growth of the City and corresponding bus network growth. The distances travelled to access transit are classified as either walk-access transit or drive-access transit (e.g. park-and-ride). Walk-access transit PKT is ten times greater among City residents than among Region residents, which reflects the large transit service area and the close proximity of transit stops to most of the City's neighbourhoods. Drive-access PKT is about equal among City and Region residents, and double that of Region walk-access PKT. This reflects the importance of park-and-ride and kiss-and-ride lots for Region residents.

Figure 3-7: Person-km Travelled by Mode (daily)



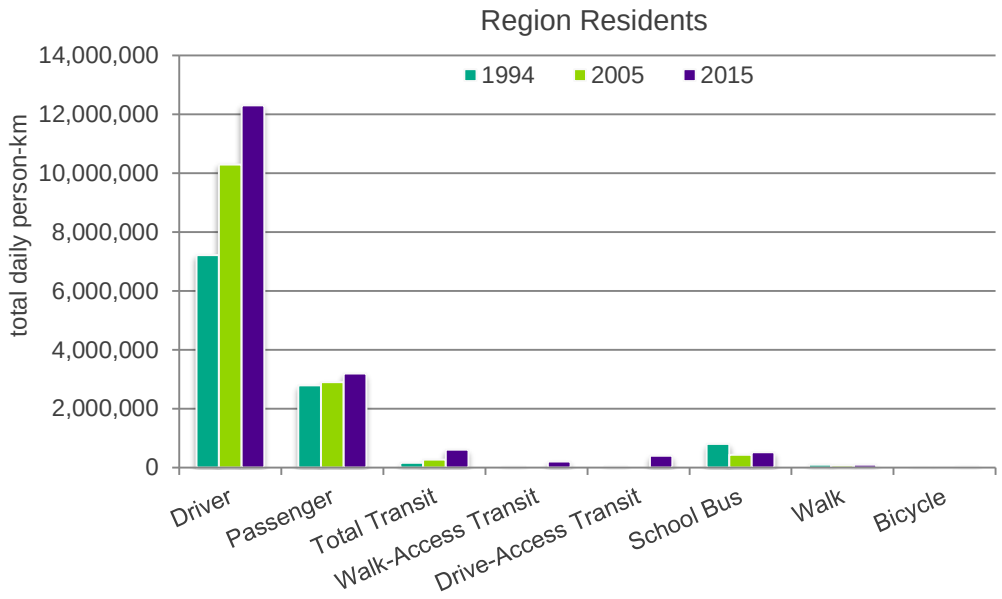


Table 3-13: Person-km Travelled by Mode (daily)

	City of Edmonton			Region		
Mode of Travel	1994	2005	2015	1994	2005	2015
Driver	9,860,100	13,056,100	16,957,400	7,220,900	10,298,300	12,306,100
Passenger	3,198,200	3,806,100	4,719,600	2,795,800	2,907,800	3,192,500
Total Transit	1,348,100	1,647,300	2,462,900	162,400	274,600	605,500
School Bus	173,400	224,600	254,900	805,800	434,000	525,600
Walk	301,600	273,200	360,000	94,200	79,200	96,600
Bicycle	29,800	104,500	227,100	2,300	11,700	44,600
Other	110,900	110,900	8,000	29,800	27,400	2,000
Grand Total	15,022,100	19,222,700	24,989,900	11,111,200	14,032,900	16,772,900

Note: School Bus PKT included Work Bus PKT for 1994 and 2005 surveys.

4 Travel Patterns

In the 2015 Household Travel Survey, trip origins and destinations were tracked so that travel demand between areas could be evaluated. This section reports on travel between the Region and the City of Edmonton, made by residents of the entire study area.

4.1 Intra-regional Travel by City and Region Residents

This section will discuss area to area travel flows. Intra-regional travel (travel within the study area) illustrates the impacts that suburbanization and growth have on travel patterns. Figure 4-1 shows the total daily trips between bands in the City and sectors in the Region for 1994, 2005 and 2015. Refer to Figure 1-3 and Figure 1-4 for the boundaries of the study area by band and by sector. Figure 4-2 shows the change in daily trips for intra-regional travel. Table 4-1 provides further details for the study area.

Prior to 2005, trips to and from the Central band grew the fastest. Since then, trips within the Outer band and Region have grown the most. This is consistent with urban growth patterns over that time and illustrates that there are more households and destinations within these areas than before 2005.

Almost half of all trips, on average, are internal to the band or sector of origin. The internalization rates (the percentage of total trips staying within the band or sector) generally increase moving outwards from the Central band, although they drop again in the Rural Region (where opportunities and activities are relatively sparse). The Central band has the lowest internalization rates, at between 25% and 32%. The Urban Region has the highest internalization rates, at between 67% and 72%.

Figure 4-1: Total Daily Trips for Intra-Regional Travel by Band

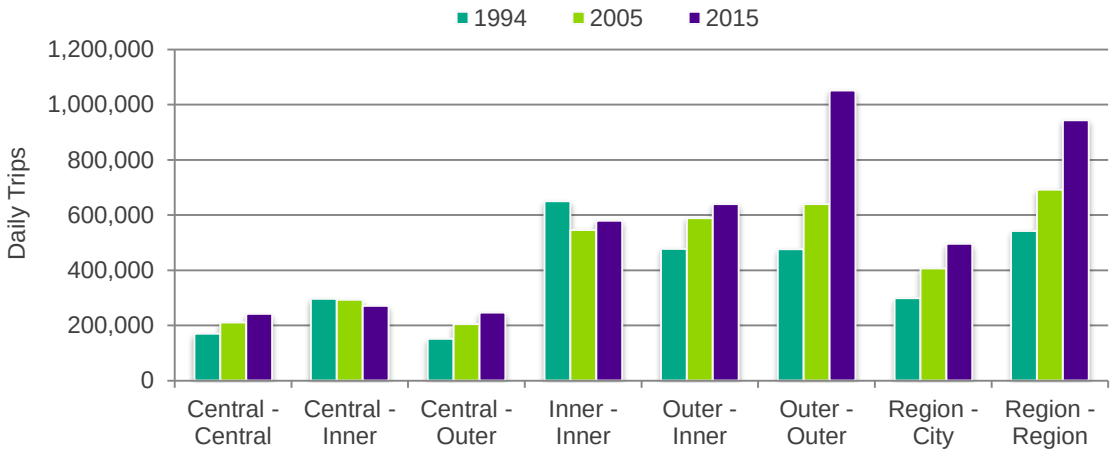
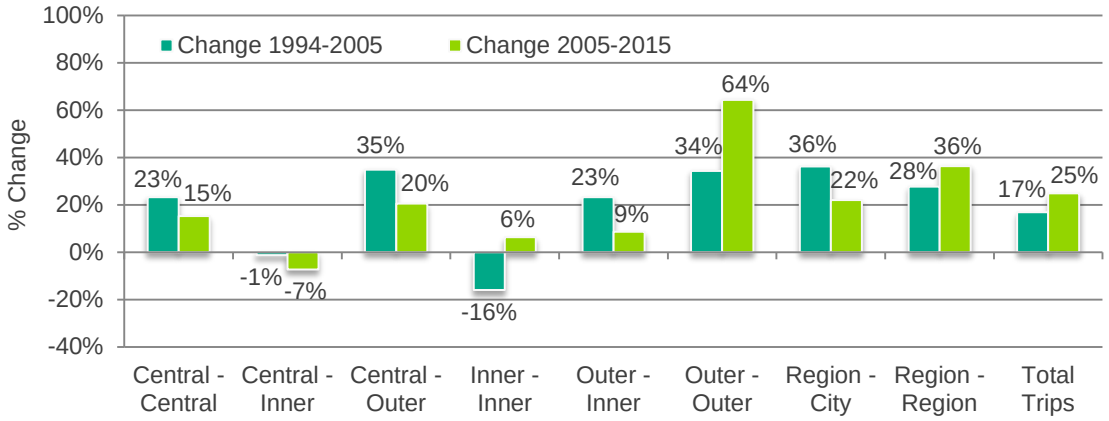


Figure 4-2: Change in Daily Trips for Intra-Regional Travel by Band – 1994 to 2015



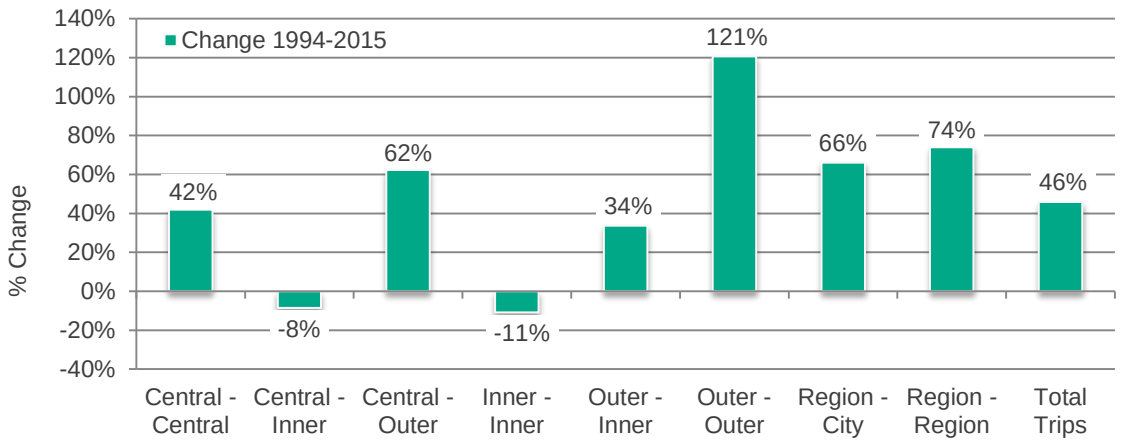


Table 4-1: Weekday Daily Trips Between Edmonton and Major Sectors – 1994 to 2015

	Total Daily Trips			% Change		
Sector	1994	2005	2015	1994-2005	2005-2015	1994-2015
Central - Central	170,600	210,200	242,200	+23%	+15%	+42%
Central - Inner	296,600	292,900	271,500	-1%	-7%	-8%
Central - Outer	151,600	204,300	246,100	+35%	+20%	+62%
Inner - Inner	649,900	545,700	579,800	-16%	+6%	-11%
Outer - Inner	478,000	589,000	639,500	+23%	+9%	+34%
Outer - Outer	476,600	640,000	1,051,700	+34%	+64%	+121%
Region – City Subtotal	298,600	406,700	496,200	+36%	+22%	+66%
St. Albert - Edmonton	66,100	88,900	105,800	+34%	+19%	+60%
Sherwood Park – Edmonton	71,100	107,200	118,200	+51%	+10%	+66%
Reg. Other Urban - Edmonton	67,500	94,000	114,100	+39%	+21%	+69%
Rural Region - Edmonton*	93,900	116,600	158,100	+24%	+36%	+68%
Region – Region Subtotal	542,500	692,200	943,900	+28%	+36%	+74%
St. Albert internal	112,400	123,700	163,700	+10%	+32%	+46%
Sherwood Park internal	94,600	144,600	175,800	+53%	+22%	+86%
Reg. Other Urban internal	145,500	206,500	289,600	+42%	+40%	+99%
Rural Region internal*	95,200	74,500	134,400	-22%	+80%	+41%
Other flows within region	94,800	143,100	180,300	+51%	+26%	+90%
Total Trips	3,064,200	3,581,000	4,470,900	+17%	+25%	+46%

Figure 4-3 illustrates the car driver and transit shares for intra-regional trips for 2005 and 2015. Further details are provided in Table 4-2. The figure demonstrates how transit is a major mode for trips to and from the Central bands, and used less for suburban travel. Between 2005 and 2015, the transit mode share to and from the Central band grew while the car driver share dropped. The transit share between other bands has fluctuated slightly.

Figure 4-3: Percentage of Auto Driver and Transit Person Trips for Intra-Regional Travel by Band

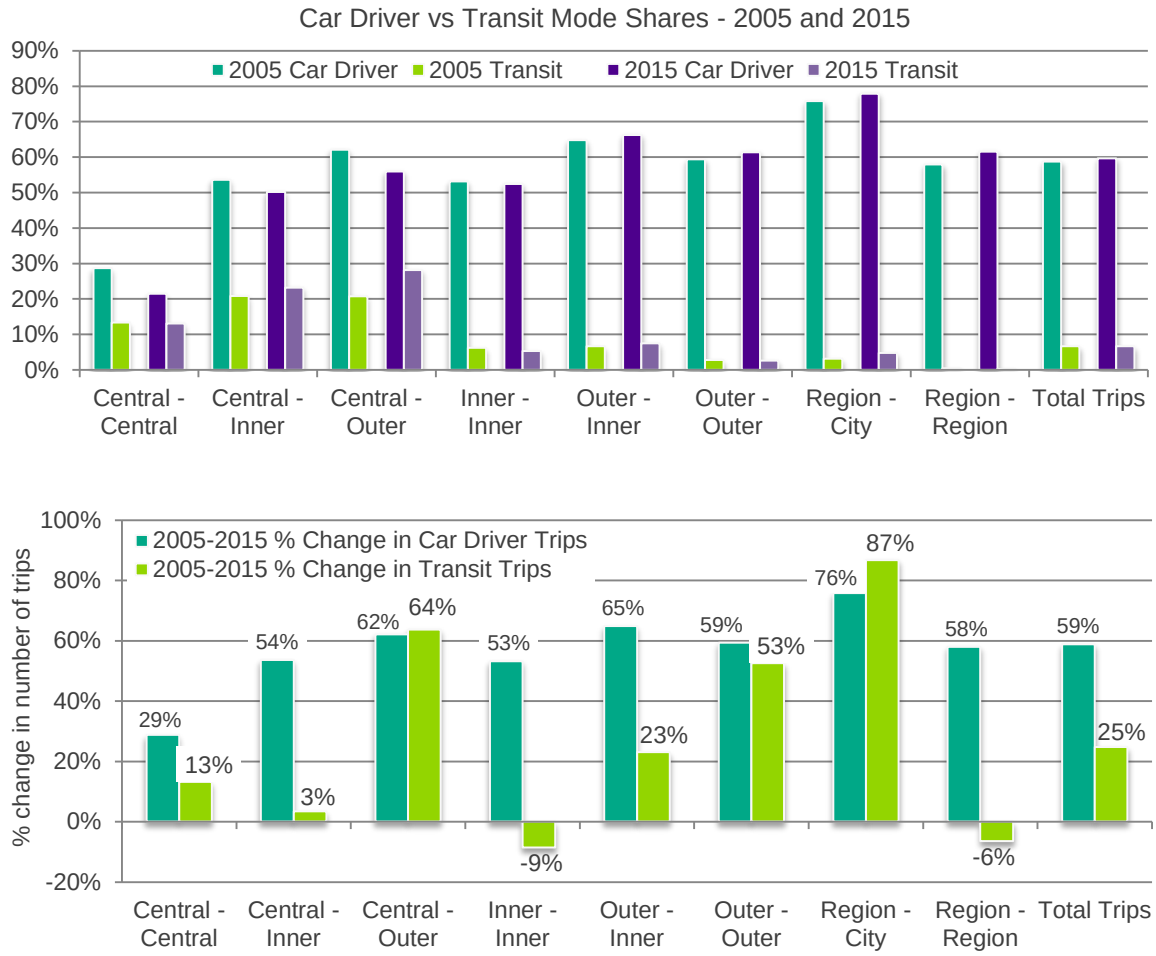


Table 4-2: Weekday Daily Car Driver and Transit Trips Between Edmonton and Major Sectors – 1994 to 2015

Intra-Regional Car Driver Trips 2005-2015

	Number of Car Driver Trips			Car Driver Mode Share		
Sector	2005	2015	% Change 2005-2015	2005	2015	%-pt Change 2005-2015
Central - Central	60,400	52,000	-14%	29%	21%	-7%
Central - Inner	156,900	136,100	-13%	54%	50%	-3%
Central - Outer	126,900	137,700	+9%	62%	56%	-6%
Inner - Inner	290,200	303,800	+5%	53%	52%	-1%
Outer - Inner	381,600	423,500	+11%	65%	66%	+1%
Outer - Outer	379,800	645,700	+70%	59%	61%	+2%
Region - City Subtotal	308,200	386,600	+25%	76%	78%	+2%
St. Albert - Edmonton	65,500	79,900	+22%	74%	76%	+2%
Sherwood Park - Edmonton	77,600	93,200	+20%	72%	79%	+6%
Reg. Other Urban - Edmonton	73,900	90,300	+22%	79%	79%	+1%
Rural Region - Edmonton*	91,200	123,200	+35%	78%	78%	0%
Region - Region Subtotal	401,300	581,200	+45%	58%	62%	+4%
St. Albert internal	69,300	95,900	+38%	56%	59%	+3%
Sherwood Park internal	83,100	111,100	+34%	57%	63%	+6%
Reg. Other Urban internal	118,600	166,600	+40%	57%	58%	0%
Rural Region internal*	36,700	76,700	+109%	49%	57%	+8%
Other flows within region	93,700	130,900	+40%	65%	73%	+7%
Total Trips	2,105,300	2,666,700	+27%	59%	60%	+1%

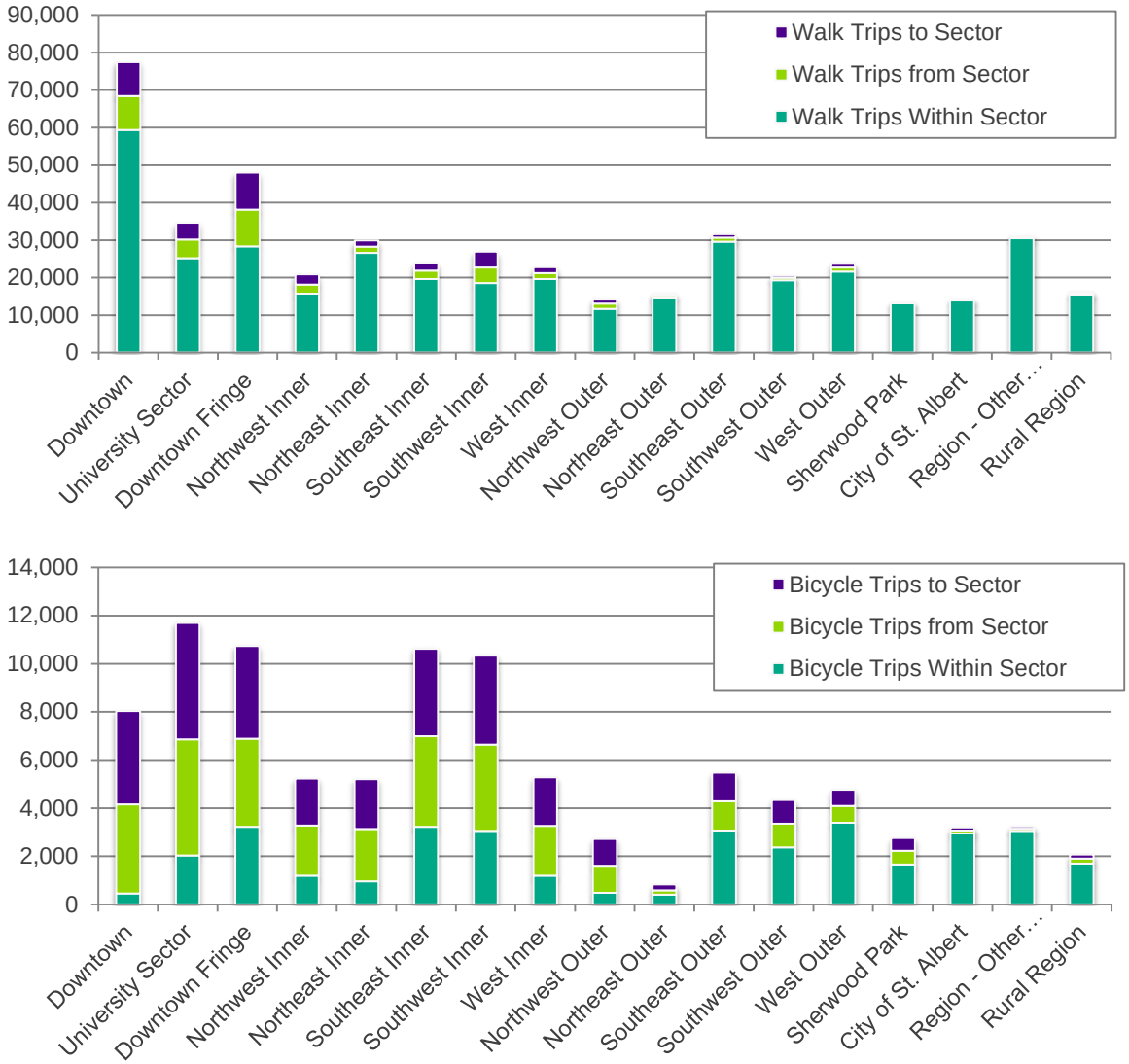
Intra-Regional Transit Trips 2005-2015

	Number of Transit Trips			Transit Mode Share		
Sector	2005	2015	% Change 2005-2015	2005	2015	%-pt Change 2005-2015
Central - Central	28,000	31,700	+13%	13%	13%	0%
Central - Inner	60,900	63,000	+3%	21%	23%	+2%
Central - Outer	42,400	69,400	+64%	21%	28%	+7%
Inner - Inner	33,800	30,900	-9%	6%	5%	-1%
Outer - Inner	39,000	48,000	+23%	7%	8%	+1%
Outer - Outer	17,900	27,300	+53%	3%	3%	0%
Region - City Subtotal	12,800	23,900	+87%	3%	5%	+2%
St. Albert - Edmonton	4,900	6,200	+27%	6%	6%	0%
Sherwood Park - Edmonton	6,700	7,900	+18%	6%	7%	0%
Reg. Other Urban - Edmonton	1,200	4,700	+292%	1%	4%	+3%
Rural Region - Edmonton*	0	5,200	n/a	0%	3%	+3%
Region - Region Subtotal	3,100	2,900	-6%	0.4%	0.3%	-0.1%
St. Albert internal	600	1,000	+67%	0%	1%	0%
Sherwood Park internal	2,300	1,400	-39%	2%	1%	-1%
Reg. Other Urban internal	200	400	+100%	0%	0%	0%
Rural Region internal*	0	100	n/a	0%	0%	0%
Other flows within region	0	0	n/a	0%	0%	0%
Total Trips	238,100	297,100	+25%	7%	7%	0%

4.2 Travel by Active Modes

This section describes the use of active transportation modes – that is, walking and bicycling. Figure 4-4 shows the origins, destinations and internalization of walking and cycling trips. Of note, the Central band has the highest number of walking trips, representing one-third of all walking trips recorded in the study area. Half of those trips (17%) are trips made to, from and within the Downtown sector. Overall, 82% of all walking trips are made entirely within the same sector. The University sector has the greatest number of bicycling trips, followed by the Southeast Inner and Southwest Inner sectors. Together, these represent one-third of the bicycling trips recorded in the study area. Overall, 36% of all bicycling trips are made entirely within the same sector. Residents who live in or closer to the Central band are more likely to walk and cycle than those who live further away.

Figure 4-4: Location of Walking and Bicycle Trips



5 Conclusions

The 2015 Household Travel Survey provided a very rich poll of data on the travel patterns of Edmonton and area residents. The information that has been collected reveals significant changes in travel patterns and behaviours that will be assessed and applied towards transportation policies and strategies for the Edmonton Capital Region over the coming years.

5.1 Growth

Part of the change in travel patterns observed can be attributed to population growth. In 2015, the City of Edmonton had a total of 894,400 residents while the Region had 385,300 residents. This represents significant population growth since the last travel survey that was carried out in 2005. The majority of growth in Edmonton and the Region has occurred outside of the Anthony Henday Drive, which is outside the areas well served by municipal transit systems.

5.2 Demographic Changes

There have been significant changes in the demographics of the Edmonton Region's population since 2005. The largest age group in Edmonton is the 25-34 group, which represents a population of younger adults and younger families. Growth rates since 2005 were highest among the 55-69 age group. In contrast, the largest age group in the Region is the 45-54 group, which reflects a population profile of mature families.

Household size, which is a key variable in the number of trips made in a day, has generally declined since 1994 except for the City between 2005 and 2015. In addition, a review of occupations and school status revealed higher levels of full time employment, and lower levels of children in grade school.

5.3 Travel Changes

The number of trips made by Edmonton residents has risen to 3.14 million trips per weekday in 2015, which is an increase of approximately 39.4% since 1994. In the Region, the total number of trips rose to 1.33 million in 2015, which is an increase of 63.5% since 1994. At a household level, the number of trips made per weekday in Edmonton dropped from 9.17 to 8.54 between 1994 and 2015. In the Region, rates dropped from 11.09 to 9.41 daily trips per household. In 2015, City residents generated 3.51 daily trips per person while Region residents generated 3.46 daily trips per person. The daily trips per person rates increased for the City and Region between 1994 and 2005, but have since dropped.

The combined car driver and passenger mode share dominated in both the City (77.6% of all daily trips) and the Region (86.8% of all daily trips) in 2015. The transit share among City residents has remained stable since the 1994 survey at 8.6%, although absolute ridership numbers have increased from 194,300 to 269,000. The transit share among Region residents has increased slightly to 2.1% in 2015. Cycling has experienced by far the greatest growth rates at 4.5 times among City residents and 14 times among Region residents since 1994. Mode share in 2015 was 1.7% in the City and 0.8% in the Region. The absolute numbers of trips have increased in most modes, which highlights the increasing demand on the transportation system.

Average trip lengths have increased in the City for virtually all trip purposes indicating that residents are travelling further to complete their daily activities and that the population is geographically more dispersed. Region trip lengths have dropped steadily, which is consistent with the expansion of the

urban areas. A high growth was observed in person-kilometres of travel, which is a measure of overall demand on the roadway network. In 2015, car driver trips accounted for 16,955,000 person-kilometres per weekday in the City, and 12,305,400 in the Region. In both cases, this has increased by nearly three-quarters from 1994. Transit trips have also increased significantly in the 21-year period, which is likely due to the extension of the Capital Line LRT and the outward growth of the City and corresponding bus network growth.

Prior to 2005, trips to and from Central Edmonton grew the fastest. Trips in the outer suburbs and the Region have grown the most after 2005, by 64% and 36% respectively. This is consistent with urban growth patterns over that time. Between 2005 and 2015, the transit mode share to and from the Central band has grown, while the car driver share has dropped. This shows that transit is a major mode for trips to and from Central Edmonton, and is used less for suburban travel. Almost half of all trips, on average, are internal to the sector of origin. The internalization rates generally increase moving outwards from the Central band, although they drop again in the Rural Region where opportunities and activities are relatively sparse.