

**NATIONAL CAPITAL REGION  
TRANSPORTATION TRENDS/ ISSUES  
STUDY  
FINAL REPORT**

Prepared for  
**TRANS**

A Joint Technical Committee on Transportation System Planning

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## EXECUTIVE SUMMARY

The National Capital Region Transportation Trends/Issues Study assessed the socio-demographic, economic and land use trends that can be expected to influence transportation in the NCR in the period to 2011. The study was based primarily on the analysis of the 1986 and 1995 TRANS National Capital Region Origin-Destination Survey data.<sup>1</sup> Given the identified trends and their causes, the study assessed future trends, documented the expected transportation implications, and identified possible policy responses.

### **Main Findings: Transportation Trends and Related Factors**

The major transportation trends observed over the 1986 to 1995 period included:

- a decline in work trip making related to declining labour force participation and the increases in part-time employment over the period;
- some increases in school trip making associated with demographic shifts (the ageing of the boomers, decline in the numbers 15-24 and the growth of the under 15 cohort associated with the echo-boom) and increased post-secondary enrolments associated with the recession.
- a substantial decline in transit market share (and ridership) that resulted in declining transit mode splits across most markets (both women and men of all ages and for trips from all origins and to most destinations). The comparison of the 1986 and 1995 O-D survey data suggest that only Hull, Gatineau and Kanata (WUC) destinations saw mode split increases between 1986 and 1995.
- changes in travel patterns related to the decentralization of population across the NCR and the decentralization in employment in the RMOC.

The relationships between the identified transportation trends and the related key factors are summarized in Exhibit A. This table, which identifies the primary factors, also comments on the influence of each factor on the related transportation trend.

It is clear that labour force and employment trends and the decentralization of population and employment have been much more important than demographic factors in explaining changing travel and transit use patterns over the 1986 to 1995 period. Ageing and reduced labour force activity (related to the recession) have reduced work trip making. Nevertheless, the most significant travel trends (the changes in travel patterns) reflect changes in the distribution and character of employment including the loss of government jobs downtown and the growth in high tech jobs in West Ottawa and the WUC (Kanata).

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<sup>1</sup> Unless otherwise specified, the data referred to herein are from the 1986 TRANS O-D Survey and/or 1995 TRANS O-D Survey.



## EXHIBIT A - TRENDS AND RELATED FACTORS

Major Trends	Key Factors*	Comment
Decline in work trip rates (per capita and per worker).	-demographic shifts  <b>-employment and labour force participation trends</b>	-ageing of boomers (35-55) -decline in 15-24 cohort -echo-boom (5-14) -decline in labour force participation -decline in full-time work and increase in part-time
Increases in per capita school trip rates.	<b>-decline in employment opportunities</b>  <b>-echo boom (increase in 5-14 Age Cohort)</b>	-declining employment encourages young people to stay in school (growth in post-secondary). -some increase in public and high school enrolment
Changes in peak period travel patterns.	<b>-decentralization of population</b> <b>-decentralization of employment</b>	-population increases primarily outside Greenbelt -decline in Federal Government jobs in inner city (after 1991) -growth in suburban "high tech" employment
Substantial shift from transit to auto (large decline in transit mode splits)	-socio-demographic factors  <b>-changing travel patterns</b>  -auto availability/access  -transit and auto service/cost factors	-ageing of population (decline in 15-24 group) -decentralization of population and employment -increase in auto availability per worker in growing suburban areas. -rising real transit fares -reduced transit service levels as recession took hold (supported by less congestion on roads in most locations).

\* Primary Factors are Bolded



The observed losses in transit market shares and ridership cannot be explained by any single factor. These modal shifts from transit to the auto are the result of a variety of socio-demographic, land use, and transit service/cost factors. As shown in Exhibit A, reduced labour force activity and increased part-time work also reduced transit ridership. However, changing travel patterns appears to be the most important single explanatory factor.

Changes in economy over the period 1986-1995 reduced labour force participation and work trip making. Therefore, 1995 is not a good base for forecasting future travel demands, given the reduced labour force activity observed for all age groups, compared to 1986, and the loss of full-time jobs and increase in part-time employment. Indeed, the economic recovery in Ontario and the National Capital Region has seen substantial increases in full time employment since 1995.

### **Travel Implications of Socio-Demographic Trends**

Socio-demographic forecasts were prepared to assess the possible travel demand implications of population growth, demographic shifts (the ageing of the population), alternative labour force scenarios and expected changes in auto availability and access. The forecasts indicate the relative importance of the identified socio-demographic factors but are not to be taken as absolute estimates of future travel demands.

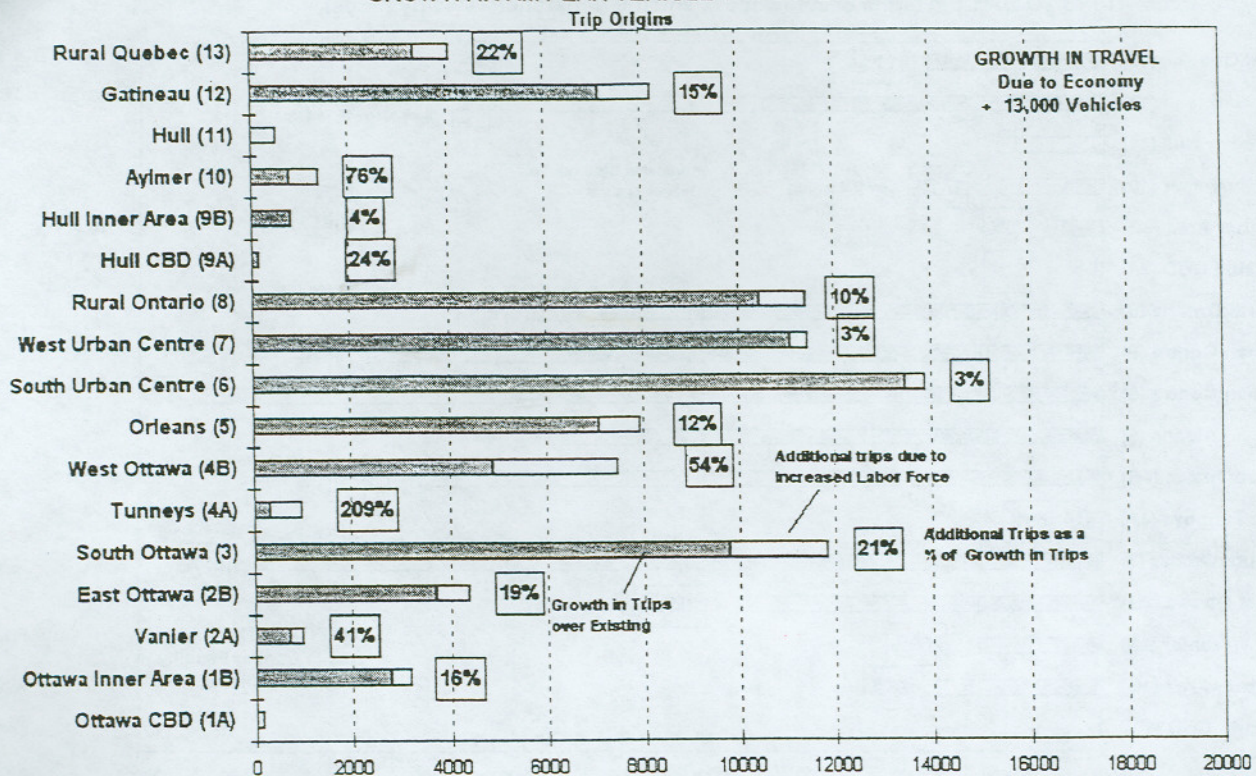
Four Socio-demographic scenarios were considered:

- Scenario 1, the base case Socio-Demographic Scenario consistent with Land Use Alternative A, illustrates the transportation implications of projected changes in the distribution of population across the NCR and the expected changes in age structure.
- Scenario 2, the 'Stronger Economy' scenario, is intended to represent a return to full time employment with related declines in the numbers of part-time workers and students. Scenario 2 is consistent with current trends, as they are understood.
- Scenario 3 uses 1995 employment status profiles (as per Scenario 1) but assumes that observed male trip rates will apply to females as autos become more widely available (and there is gender equality in terms of auto access).
- Scenario 4 is similar to Scenario 3 but uses the same "Stronger Economy" labour force participation assumptions that were assumed in Scenario 2.

Socio-demographic Scenario 1 is projected to increase total AM peak period auto vehicle (auto driver) travel by 72,000 trips between 1995 and 2011, as documented in Exhibit 33. Other AM peak travel (auto passenger, school bus, walk) would increase by 26,000 trips and AM peak transit travel would increase by 13,500 trips.



**EXHIBIT B - IMPACT OF STRONGER ECONOMY ON  
GROWTH IN AM PEAK VEHICLE TRIPS to 2011**

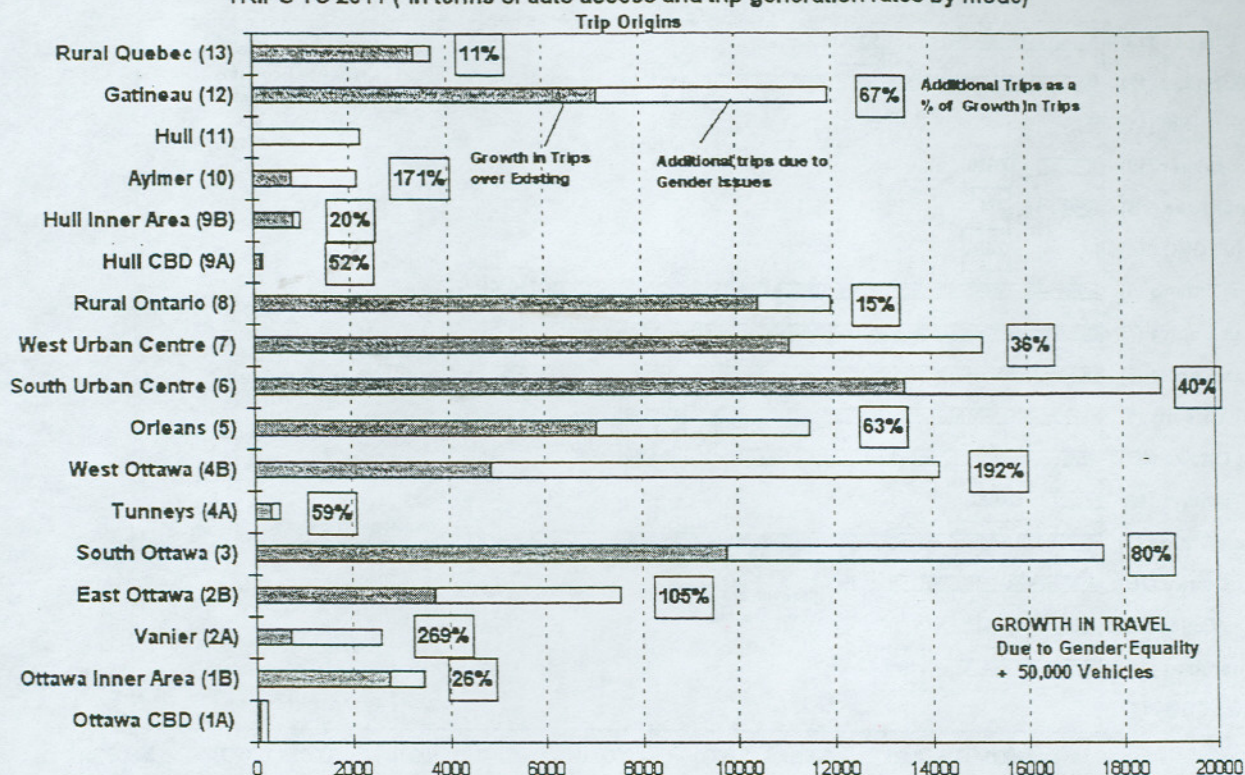


Changes in economy over the period 1986-1995 are documented in Section 3.2. It was concluded that 1995 was not a good base for forecasting future travel demands, given the reduced labour force activity observed for all age groups, compared to 1986, and the loss of full-time jobs and increase in part-time employment. Indeed, the economic recovery in Ontario and the National Capital Region has seen substantial increases in full time employment. Scenario 2 would increase auto driver trip making relative to Scenario 1.

Increased auto availability and a failure to maintain competitive transit services (through a combination of improved services and transit-supportive land use and transportation policies) could potentially lead to the large increases in auto driver travel (and related increases in road requirements) that are associated with Scenarios 3 and 4. It is important to note, however, that the projected increases in auto driver trip making would be influenced by changes in travel patterns. These increases would also be constrained for travel to some major trip destinations, such as the Ottawa and Hull CBDs and other inner city areas, where parking is limited and roadways are already congested during peak periods. Therefore, it is important to consider the independent effects of changes in land use on future travel patterns, as discussed in Section 4.2.



EXHIBIT C - IMPACT OF GENDER EQUALITY\* ON GROWTH IN AM PEAK VEHICLE  
TRIPS TO 2011 (\*In terms of auto access and trip generation rates by mode)





## Travel Implications of Land Use Trends

The Travel Pattern (or O-D) Forecasts discussed in Section 4.2 were prepared to investigate the impact of projected changes in the distribution of labour force (at place of residence) and employment opportunities (labour force at place of work) on travel patterns and transit mode splits. The analysis of land use trends focused on the possible impact of future land use changes on AM peak period work travel patterns and trip making by mode assuming 1995 modal shares for transit, auto driver, auto passenger and other modes. Three employment scenarios were tested including a base case (Land Use A), which reflects current expectations for the growth of Downtown Ottawa and Hull, and recent trends in suburban development, and two alternatives (Land Use Scenarios B and C) that assume less growth in the Ottawa CBD and more employment in suburban Ottawa.

All three land use alternatives share the same population distribution. Land Use Scenarios B and C are similar in that they both assume that there are 23,200 fewer jobs in Downtown Ottawa in 2011 and 23,200 more jobs in suburban locations. In Scenario B, the 23,200 jobs lost in the CBD are allocated to the West and South Urban Communities outside the Greenbelt and in Scenario C, some of this employment growth is allocated to West Ottawa.

Scenarios B and C result in fewer transit trips and more auto driver trips than Scenario A, due to the reduction in work travel to the transit-oriented CBD. For 2011, this implies about 2% more auto traffic but almost 10% less transit ridership (comparing Scenarios B and C to the Base Case).

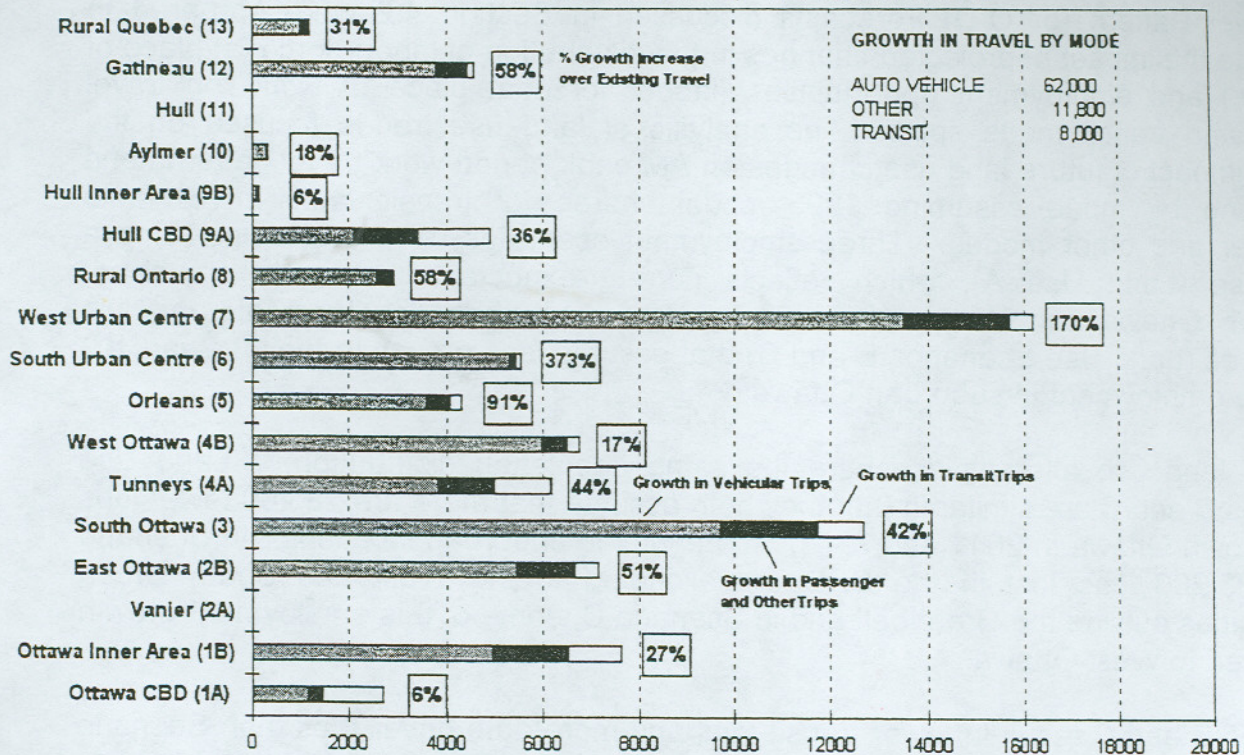
The projected changes in origin-destination travel patterns reflect the effects of changes in population and employment that are projected over the period 1995 to 2011 for the Base Case Land Use Alternative.

For all three scenarios, most of the estimated growth in peak period work trips originates in the growing suburban districts (South Urban Centre, West Urban Centre, South Ottawa, Orleans and Gatineau) and rural Ontario.

Based on projected travel patterns and current (1995) mode splits, transit will account for a significant share of estimated increases in peak period work travel for trips originating in Orleans, South Ottawa, the South Urban Centre and the West Urban Centre. Transit's role in accommodating increases in AM peak work travel originating in Rural Ontario will be insignificant, based on these estimates. *This finding points to the need for special transit strategies to be developed to support increased transit use by rural residents, such as park and ride lots for persons working in transit-oriented employment areas.*



EXHIBIT D - GROWTH IN AM PEAK WORK TRIPS  
HIGH WUC/SUC (LAND USE ALTERNATIVE B) - TRIP DESTINATIONS



The 2011 base case (Land Use Scenario A) forecast shows that auto driver travel will account for less than 50% of the estimated growth in AM peak period work travel to the Ottawa and Hull CBD's, with the growth in transit being most significant to the Ottawa CBD. Transit's share of future increases in travel demand are also significant work trips destined for the Hull CBD, Ottawa Inner Area, Tunneys and South Ottawa. However, transit use is expected to be very low for projected increases in work travel to West Ottawa, the West Urban Centre and the South Urban Centre.

Given the reduced growth in CBD oriented work travel (from 34% with Land Use Scenario A to only 6% with Scenario B) transit's growth would be lower (+8,000 with Scenario B compared to +13,200 with Scenario A) and there would be less travel by other modes (particularly less auto passenger travel) (+11,800 with Scenario B, compared to +13,400 with Scenario A). Given the assumed suburban growth, there would be more auto driver travel (+62,000 AM peak period trips with Scenario B compared to 57,100 with Scenario A) with the increases destined for Districts 6 and 7 (See Map 1). Scenario C results in similar changes in travel patterns and mode splits as is the case for Scenario B.

### Implications for Future Travel in the National Capital Region

The current study has established the relative importance of demographic, employment and locational trends for travel and transit use and documented related changes in the



trip making by mode for both men and women. While the demographic forecasts discussed in Section 4.1 suggest that demographic trends, as represented in Socio-Demographic Scenario 1, will tend to increase auto driver travel at the expense of other modes, primarily auto passengers, and transit during the peak periods, the projected effects are relatively small. The independent effects of increasing full time employment (comparing the results of Socio-Demographic Scenarios 1 and 2) appears to also be relatively small. In contrast, the continuation of the modal shift from transit to the auto by women travellers that was observed over the 1986 to 1995 period, will have greater significance, as discussed in relation to Scenarios 3 and 4 in Section 4.1. While transit use by both genders declined between 1986 and 1995 there were proportionately larger declines among women than among men. Transit mode splits by gender and age are more similar in 1995 than they were in 1986. This trend can be expected to continue in the future given expected increases in employment and the expectation that travel patterns will become even more dispersed. As discussed in Section 4.2, changes in future travel patterns associated with projected changes in population and employment will change travel patterns and result in disproportionate increases in auto vehicle travel. Nevertheless, the expected growth of Downtown Ottawa and Downtown Hull would almost maintain transit's share of total AM peak travel, compared to 1995. Where the average AM peak transit mode split for work trips was 17% in 1995, the travel forecast associated with Land Use Scenario A results in a 16% mode split. The two decentralization options imply average AM peak work transit mode splits of 15% (for Land Use Scenario's B and C).

## **Conclusions and Recommendations**

The emerging trends discussed in Section 4.3 point to the following transportation challenges for the next ten to fifteen years:

- Decentralization will result in more dispersed travel patterns focusing on the growing suburban employment areas.
- The growth in travel demands to growing suburban employment areas will be difficult to serve by either transit or other HOV options because of emerging travel patterns.
- Additional road capacity will be required to accommodate these new auto vehicle demands.
- Transit's share of travel crossing most screenlines in the RMOC and CUO, will continue to decline, given socio-demographic and locational trends, in the absence of strong transit-supportive measures.

The current trends also imply some opportunities will support a modal shift to transit and more efficient use of the Region's road network:



- The expected continued growth in Downtown Ottawa and Hull should allow transit to regain lost ridership and improve mode splits for Core oriented travel in peak periods. This will justify improved service to the NCR's Core Areas and improved transit connections between the growing suburban areas and the Ottawa and Hull CBDs.
- The growth in outbound auto travel from within the Greenbelt to new suburban job opportunities will take advantage of underused road capacity.

As observed over the 1986-95 period, changes in the future distribution of population and employment will influence both travel patterns and mode choice, as discussed in Section 4.2. Travel patterns will become even more dispersed, given current trends in the distribution of population and employment.

*The large increases in travel destined to suburban destinations will be auto oriented, by definition, given the widespread availability of free parking and the difficulties associated with using transit to commute between suburban locations. Nevertheless, it should be possible to improve transit's share of trips to the largest suburban employment areas from inner city neighbourhoods. It should also be possible to create opportunities for ride-sharing, assuming that the supportive policies included in current planning documents are pursued.*

*The expected growth of employment in Downtown Ottawa and Downtown Hull should maintain transit's share of total AM peak travel, compared to 1995, reversing the trend observed in the recent period. Whereas the average AM peak transit mode split for work trips was 17% in 1995, the travel forecast associated with Land Use Scenario A results in a 16% mode split. Given the low transit mode splits for travel from the outer suburbs to Ottawa's Central Area (CBD plus Inner Areas), it should be possible to shift some of this increase in auto driver trips to transit and/or to other high occupancy vehicles (HOVs). Reversing the recent modal shift from transit to the auto will require improved transit services that provide direct, transfer-free rides from the growing residential communities to inner city employment concentrations.*

### **Transportation Planning and Policy Implications of the Identified Trends**

As outlined in Section 5.1, the continued decentralization of the Region's population and employment will make it more difficult to achieve the various target modal shares particularly those related to increasing transit's share of total travel at various screenlines.

Given the expectation of employment growth in Downtown Ottawa and Hull, one can reasonably expect increases in transit mode splits to the two CBD's assuming that transit service improvements are introduced along with TDM measures to improve the competitive position of transit. Continued residential development in the inner city will support increased self-containment in the inner city and greater pedestrian activity.



In general, however, the socio-demographic and economic trends will reduce transit mode splits and other non-auto modal shares, as measured at the various suburban screenlines, and increase the auto driver mode shares.

The continued decentralization of job opportunities will encourage increased single occupant vehicle (SOV) travel and reduced HOV, transit, walk and bike use, unless NCR planning agencies are successful in concentrating new suburban employment activity in locations that are accessible by modes other than the automobile. Therefore, the innovative land use planning measures proposed for the RMOC and CUO must be supported with improved transit services and transit and/or HOV supportive policies.

The current RMOC and CUO transportation plans and policies provide a wide range of tools to encourage a modal shift from single occupant vehicles (SOVs) to high occupancy vehicles (HOVs). Nevertheless, NCR planners have little control of the land use and socio-economic factors which have given rise to the problematic travel trends. Furthermore, it is very difficult to relate modal shares, measured at screenlines, to specific land use or transportation planning initiatives.

It is recommended that NCR transportation planners focus on major travel destinations where transit and other modes can be competitive in planning transportation supply and demand modification initiatives. This will allow planners to more effectively monitor change and make the ongoing adjustments to transit service and TDM policies that will be required to stay on target.



## SOMMAIRE

Dans le cadre de l'enquête sur les enjeux et les tendances en matière de transport dans la région de la capitale nationale (RCN), on a évalué les tendances socio-démographiques et économiques ainsi que les tendances liées à l'utilisation des terrains, qui sont susceptibles d'avoir des répercussions sur le transport dans la RCN d'ici 2011. Cette enquête se fondait principalement sur l'analyse des données de l'Étude origine-destination dans la région de la capitale nationale, réalisée par le groupe TRANS. Compte tenu des tendances relevées et de leurs causes, l'enquête a permis de déterminer les futures tendances, de documenter les répercussions prévues dans le domaine du transport et de recommander des mesures de planification appropriées.

### Observations et constatations de l'Étude origine-destination (ÉOD) de 1995

Les principales tendances observées dans le domaine du transport pour la période de 1986 à 1995 sont les suivantes :

- une réduction du nombre de déplacements liés au travail, associée à une baisse de la participation de la main-d'oeuvre et à une augmentation du travail à temps partiel au cours de cette période;
- une certaine augmentation du nombre de déplacements liés aux études, parallèlement à l'évolution démographique (le vieillissement de la génération du baby-boom, la baisse du nombre de personnes âgées de 15 à 24 ans et l'accroissement de la cohorte des jeunes de moins de 15 ans, associé à la deuxième génération du baby-boom), ainsi que la hausse du nombre d'inscriptions au niveau post-secondaire par suite de la récession;
- une baisse sensible de la part du marché du transport en commun (et de l'achalandage), qui a donné lieu à une réduction des déplacements en autobus par rapport à l'ensemble des déplacements, sur la plupart des marchés (tant les femmes que les hommes de tout âge, pour les déplacements de toute origine et pour la plupart des destinations). La comparaison des données des études origine-destination de 1986 et 1995 laisse entendre que la part du marché du transport en commun n'a augmenté que pour Hull, Gatineau et Kanata (centre urbain de l'ouest) de 1986 à 1995;
- la modification des tendances en matière de déplacements, qui va de pair avec la décentralisation de la population dans la RCN et la décentralisation de l'emploi à la MROC.

Les liens entre les tendances relevées dans le domaine du transport et les facteurs clés connexes sont résumés au tableau A. Ce tableau, qui expose les principaux facteurs, fait également état de l'influence de chaque facteur sur la tendance connexe en matière de transport.



TABLEAU A - TENDANCES ET FACTEURS CONNEXES

Principales tendances	Facteurs clés*	Commentaire
Baisse du taux de déplacements liés au travail (par personne et par travailleur)	<ul style="list-style-type: none"> <li>- évolution démographique</li> <li>- <b>tendances au niveau de l'emploi et de la participation de la main-d'oeuvre</b></li> </ul>	<ul style="list-style-type: none"> <li>- vieillissement de la génération du baby-boom (35 à 55 ans)</li> <li>- réduction du nombre de jeunes de 15 à 24 ans</li> <li>- deuxième génération du baby-boom (5 à 14 ans)</li> <li>- baisse de la participation de la main-d'oeuvre</li> <li>- réduction du travail à plein temps et accroissement du travail à temps partiel</li> </ul>
Augmentation du taux, par personne, de déplacements liés aux études	<ul style="list-style-type: none"> <li>- <b>baisse des possibilités d'emploi</b></li> <li>- <b>deuxième génération du baby-boom (augmentation de la cohorte des jeunes de 5 à 14 ans)</b></li> </ul>	<ul style="list-style-type: none"> <li>- la baisse du nombre d'emplois encourage les jeunes à poursuivre leurs études (augmentation du nombre d'étudiants au niveau post-secondaire)</li> <li>- une certaine augmentation du nombre d'inscriptions dans les écoles secondaires et les écoles publiques</li> </ul>
Modification des tendances en matière de déplacement durant les périodes de pointe	<ul style="list-style-type: none"> <li>- <b>décentralisation de la population</b></li> <li>- <b>décentralisation de l'emploi à la MROC</b></li> </ul>	<ul style="list-style-type: none"> <li>- accroissement de la population, principalement à l'extérieur de la Ceinture de verdure</li> <li>- réduction du nombre d'emplois au sein du gouvernement fédéral dans le noyau central de la ville (après 1991)</li> <li>- croissance de l'emploi dans les banlieues, dans le domaine de la haute technologie</li> </ul>
Abandon de plus en plus marqué du transport en commun au profit de la voiture (baisse considérable de la part du marché du transport en commun, surtout chez les femmes)	<ul style="list-style-type: none"> <li>- facteurs socio-démographiques</li> <li>- <b>modification des tendances en matière de déplacement</b></li> <li>- disponibilité / accès à la voiture</li> <li>- facteur de coût / service - transport en commun et automobile</li> </ul>	<ul style="list-style-type: none"> <li>- vieillissement de la population (baisse du nombre de jeunes de 15 à 24 ans)</li> <li>- décentralisation de la population et de l'emploi</li> <li>- accroissement de la disponibilité des voitures par travailleur dans les régions suburbaines en pleine croissance</li> <li>- augmentation des tarifs réels du transport en commun</li> <li>- réduction des niveaux de service du transport en commun durant la période de récession (parallèlement à une réduction des bouchons de circulation dans la plupart des secteurs)</li> </ul>

\* Les principaux facteurs figurent en caractères gras.



L'ÉOD de 1995 a été réalisée durant la période de récession économique dans la RCN, ce qui explique la baisse de la participation au marché du travail et du nombre de déplacements liés au travail et en partie, l'accroissement du nombre d'inscriptions dans les écoles et du nombre de déplacements effectués à des fins d'études. De 1991 à 1996, environ 10 000 emplois à plein temps ont été supprimés au centre-ville d'Ottawa par suite des compressions du gouvernement fédéral. En conséquence, il faut faire preuve de prudence en fondant les estimations des besoins futurs en déplacement sur les résultats de l'enquête de 1995, compte tenu de la baisse de la participation de la main-d'oeuvre en 1995 comparativement à 1996 et de la perte d'emplois à plein temps. En fait, la reprise économique en Ontario et dans la région de la capitale nationale (RCN) a donné lieu à une augmentation importante du nombre d'emplois à plein temps depuis 1995. La planification du transport pour la prochaine décennie doit tenir compte des répercussions de la reprise économique au niveau de la circulation et du transport en commun.

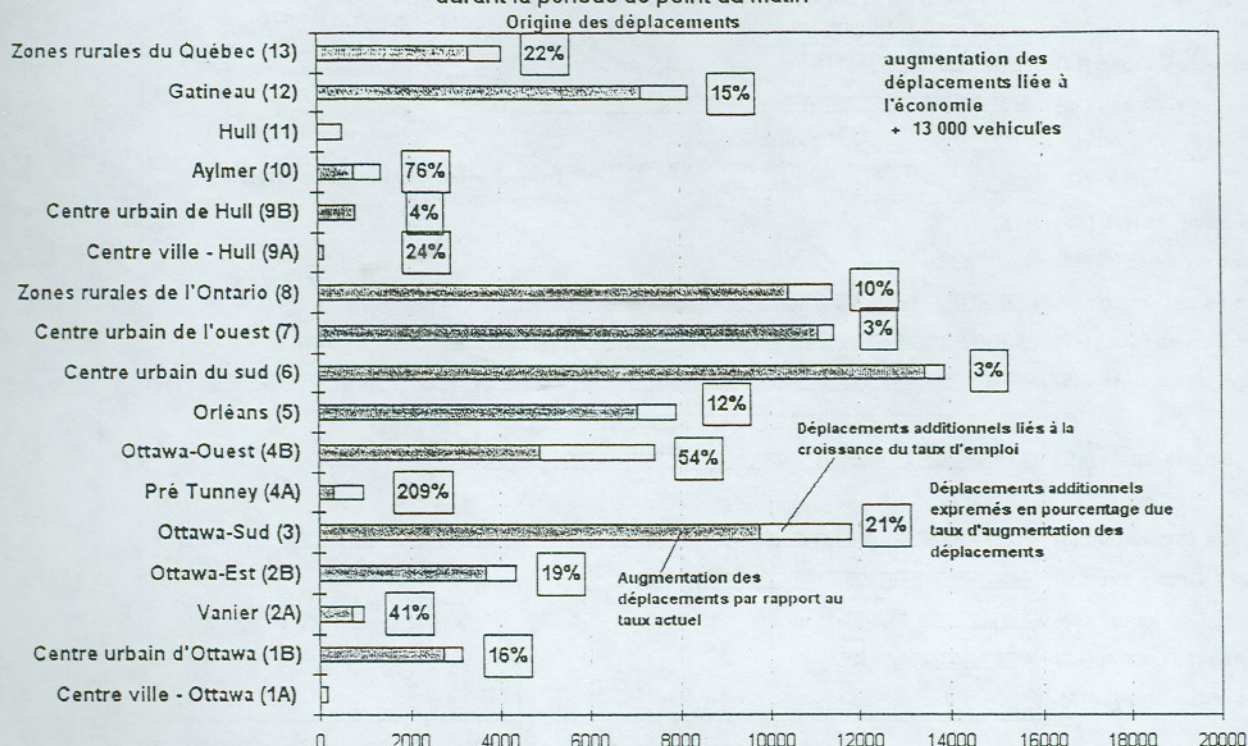
Durant la période de 1986 à 1995, l'utilisation du transport en commun a continué d'accuser une baisse par rapport à celle de la voiture, surtout chez les femmes qui avaient toujours été les meilleures clientes. Ce changement au niveau du mode de transport utilisé ainsi que la perte d'emplois au centre-ville d'Ottawa ont été à l'origine de la réduction sensible de la part du marché du transport en commun durant la dernière décennie. En l'absence de politiques rigoureuses favorables au transport collectif, on peut s'attendre à une utilisation encore plus grande de la voiture en tant que mode de transport.

### **Reprise économique**

Ce projet traite des répercussions probables sur le transport du plein emploi en mettant à l'essai un scénario socio-démographique qui suppose un accroissement de la participation au marché du travail. Le scénario 2, qui repose sur une « économie plus vigoureuse », est conforme aux tendances actuelles, telles qu'elles sont perçues. L'augmentation du nombre de déplacements en voiture durant les périodes de pointe, qui est associée au scénario 2, est résumée au tableau B. Les tendances actuelles laissent entendre que la reprise économique débouchera sur 13 000 déplacements additionnels en voiture pendant les périodes de pointe du matin sur les routes de la région de la capitale nationale en 2011, sans compter le niveau de circulation associé à l'accroissement prévu de la population et de l'emploi. On peut s'attendre à ce que la reprise économique engendre une hausse considérable de la circulation provenant de l'ouest et du sud d'Ottawa et de Gatineau, comme l'indique le tableau. Cependant, on prévoit que l'augmentation la plus marquée de la circulation surviendra dans l'ouest d'Ottawa, qui a connu la baisse la plus importante de la participation au marché du travail durant la période de 1986 à 1995.



Tableau B - IMPACT DE LA CROISSANCE ÉCONOMIQUE  
SUR LES DÉPLACEMENT EN VOITURE, D'ICI 2011  
durant la période de point du matin



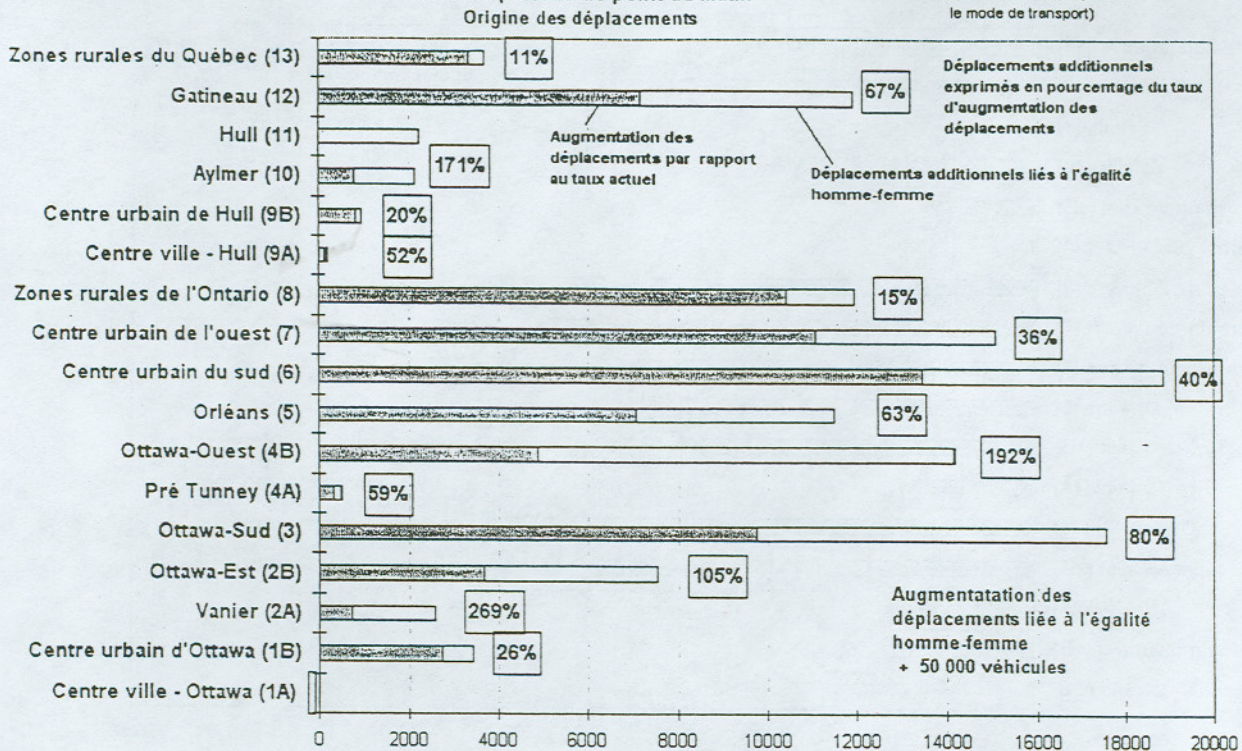
## Égalité homme-femme

On s'est également penché sur un autre scénario socio-démographique qui présume que, d'ici 2011, le même taux de déplacement et la même part du marché du transport en commun s'appliqueront aux femmes, dont les habitudes en matière de déplacement continuent au fil du temps de se rapprocher de celles des hommes. Comme l'indique le tableau C, l'égalité homme-femme débouchera sur 50 000 autres déplacements en voiture durant les périodes de pointe du matin sur le réseau routier de la RCN. L'augmentation de la circulation automobile la plus marquée proviendra surtout de l'ouest, du sud et de l'est d'Ottawa ainsi que de Vanier, secteurs où, en 1995, le transport en commun continuait de représenter une part relativement élevée du marché du transport. On peut également prévoir un accroissement sensible de la circulation automobile à Gatineau, Hull et Aylmer si la tendance à délaisser le transport en commun au profit de l'automobile se poursuit chez les femmes habitant ces secteurs.



Tableau C - IMPACT DE L'ÉGALITÉ HOMME-FEMME SUR L'AUGMENTATION  
DES DÉPLACEMENTS EN VOITURE D'ICI 2011  
durant la période de point du matin

(en fonction de l'accès aux véhicules et du taux  
de déplacements requis, selon  
le mode de transport)



## Répercussions sur les déplacements des tendances en matière d'utilisation des terrains

Bien que le taux d'emploi au centre-ville d'Ottawa ait baissé de 1986 à 1995-1996, le nombre d'emplois dans le domaine de la « haute technologie » dans les régions suburbaines a continué de croître, surtout dans l'ouest d'Ottawa et dans le secteur de Kanata (centre urbain de l'ouest). Les tendances actuelles semblent indiquer une faible croissance au centre-ville d'Ottawa et au centre-ville de Hull, mais une croissance élevée qui se poursuit dans certains centres suburbains. Puisque la distribution future de la croissance de l'emploi est incertaine, l'étude a évalué les conséquences de diverses distributions de l'emploi.

Trois scénarios d'emploi ont été mis à l'essai, notamment un scénario de référence (scénario d'utilisation des terrains A) qui reflète les attentes actuelles liées à la croissance du centre-ville d'Ottawa et de Hull et les récentes tendances en matière d'aménagement suburbain, et deux autres scénarios de rechange (scénarios d'utilisation des terrains B et C), qui présument une croissance plus réduite pour le centre-ville d'Ottawa et une croissance de l'emploi dans les régions suburbaines.

Les trois scénarios d'utilisation des terrains ont en commun la même répartition de la population et par conséquent, la même distribution des déplacements requis (par secteur d'origine). Les scénarios B et C sont semblables car tous deux présument qu'en 2011, le centre-ville d'Ottawa perdra 23 200 emplois au profit des zones



suburbaines.

Comme l'indique le tableau D, les scénarios B et C débouchent sur une réduction du nombre de déplacements en autobus et sur une hausse du nombre de déplacements en voiture par rapport au scénario A, en raison de la baisse du nombre de déplacements des travailleurs en direction du centre-ville desservi par le transport en commun. Tandis que le scénario de référence donne lieu à une utilisation, en moyenne, de 16,5 pour cent du transport en commun durant les périodes de pointe du matin, soit à peu près le même pourcentage que pour la RCN en 1995, la décentralisation engendrerait une réduction de la part du marché du transport collectif. Pour 2011, les options liées à la décentralisation supposent une augmentation d'environ 2 pour cent du nombre de déplacements en voiture et une baisse de près de 10 pour cent du nombre d'usagers du transport en commun (en comparant les scénarios B et C au scénario de référence).

TABLEAU D  
ANALYSE DES DÉPLACEMENTS FUTURS LIÉS AU TRAVAIL  
POUR LA PÉRIODE DE CONGESTION DE TRAFIC DU MATIN,  
ET DES ALTERNATIVES D'UTILISATION DE TERRAINS EN L'AN 2011.

	Total	Transport en commun	Voiture	Transport en commun (Moyenne/ pourcentage)
Scénario 1- Scénario de référence	328307	54185	213607	16.5%
Scénario 2 - décroissance de déplacements au centre ville d'Ottawa, et croissance dans les centres urbains de l'ouest et du sud d'Ottawa.	326290	48998	218431	15.0%
Scénario 3 - décroissance de déplacements au centre ville d'Ottawa, et croissance dans l'Ouest d'Ottawa et dans les centres urbains de l'ouest et du sud d'Ottawa.	326585	49075	218565	15.0%

Source: Scénarios d'utilisation de terrains en l'an 2011. Ces scénarios ont été développés par le comité TRANS à l'effet de ce rapport.

## Conclusions et recommandations

Les tendances nouvelles font ressortir les défis suivants au niveau du transport au cours des dix à quinze prochaines années :

- La décentralisation engendrera des déplacements plus éparpillés, surtout vers les zones d'emploi en pleine croissance dans les régions suburbaines.
- Il sera difficile de répondre aux besoins en transport vers les zones d'emploi en pleine croissance des régions suburbaines, au moyen du transport en commun ou d'autres options liées aux véhicules à plusieurs occupants, en raison de l'orientation vers des déplacements de plus en plus diversifiés.
- La capacité routière devra être augmentée pour satisfaire à l'augmentation prévue des besoins de déplacement en véhicule vers les zones d'emploi dans les régions suburbaines.
- En l'absence de mesures vigoureuses favorables au transport en commun, la part des déplacements en autobus franchissant la plupart des cordons de



comptage de la MROC et de la Communauté urbaine de l'Outaouais (CUO) continuera de baisser, compte tenu de l'évolution socio-démographique et des tendances liées aux déplacements vers les banlieues.

Les tendances actuelles semblent également indiquer que certaines possibilités s'offrent à nous pour appuyer une transition vers le transport en commun et une utilisation plus efficace du réseau routier de la région :

- La croissance continue qui est prévue au centre-ville d'Ottawa et de Hull devrait nous permettre de recouvrer le nombre d'usagers perdus et d'accroître la part du marché du transport en commun, en ce qui concerne les déplacements au coeur de la ville pendant les périodes de pointe. Cela justifiera l'amélioration du service dans les secteurs centraux de la RCN ainsi que l'amélioration des correspondances entre les zones suburbaines en pleine croissance et le centre-ville d'Ottawa et de Hull.
- L'augmentation des déplacements en voiture en provenance de la Ceinture de verdure et à destination des zones suburbaines offrant de nouvelles possibilités d'emploi tirera parti d'une capacité routière insuffisamment utilisée.

Les politiques et les plans de transport existants de la MROC et de la CUO prévoient toute une gamme d'outils afin d'encourager les personnes à délaisser leur véhicule à passager unique au profit d'un véhicule à plusieurs occupants.

Les planificateurs de la RCN n'exercent qu'une influence limitée sur les types d'utilisation des terrains, qui sont surtout à l'origine des tendances observées en matière de déplacement, ainsi que sur les parts du marché du transport en commun et de l'automobile qui en résultent. L'industrie de l'aménagement, oeuvrant dans le contexte des politiques du plan directeur et du règlement de zonage, répond aux facteurs du marché. Ainsi, la croissance continue de l'emploi dans le domaine de la « haute technologie » dans les zones suburbaines reflète les réalités économiques et géographiques actuelles. Ces tendances au niveau de l'aménagement n'appuient pas les politiques relatives à la planification de l'utilisation des terrains qui sont axées sur le transport en commun, lesquelles figurent dans le Plan directeur des transports de la MROC ou le plan intégré des réseaux routiers et du transport en commun de la CUO. De plus, il est très difficile d'associer les parts du marché du transport, mesurés aux cordons de comptage, à des initiatives particulières de planification du transport ou de l'utilisation des terrains. Ainsi, les politiques touchant à la gestion des besoins en transport s'appliquent surtout à des aires géographiques limitées, et le contrôle continu du succès de ces politiques ne peut être assuré qu'à l'échelle locale. Les cordons entourant le centre-ville ou d'autres « principales destinations du transport en commun » peuvent servir à la collecte des données sur la circulation et le transport en commun, qui sont nécessaires pour évaluer les tendances au chapitre des déplacements ainsi que les résultats des initiatives de politiques et d'approvisionnement dans le domaine du transport.



Compte tenu des tendances actuelles en matière de planification et de transport, on recommande que :

1. les planificateurs en transport de la RCN concentrent leur attention sur un nombre limité de zones où le taux d'emploi est élevé, lesquels pourraient tirer avantage d'une augmentation du service de transport en commun et / ou du soutien de modes de transport de rechange. Ces zones pourraient être désignées sous le nom de principales destinations. La détermination de ces destinations aiderait à mieux orienter les initiatives de modification de l'offre et de la demande de transport, lesquelles figurent dans les politiques existantes de planification du transport, pour préciser les emplacements où les résultats seraient plus susceptibles d'être atteints;
2. les politiques actuelles de planification de la MROC et de la CUO soient examinées, afin de déterminer l'utilisation qu'il convient de faire des terrains, les stratégies du service de transport en commun et les initiatives pour chaque principale destination, et que les politiques pertinentes soient énoncées en détail pour chacune de ces destinations;
3. des objectifs réalistes soient établis relativement à l'utilisation du transport en commun, de la marche et du vélo pour se rendre à chaque principale destination et que ces objectifs complètent les objectifs existants de la MROC et de la CUO touchant aux cordons de comptage, lorsque cela est possible;
4. les organismes du groupe TRANS songent à établir un programme de surveillance à long terme afin de suivre de près les changements touchant à l'utilisation des terrains et aux besoins en déplacement, par mode de transport, pour chaque principale destination. Un tel programme permettrait aux planificateurs de surveiller l'efficacité des politiques relatives à la planification du transport.



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## 1.0 Introduction

The intent of the National Capital Region Transportation Trends/Issues Study is to identify, describe and explain those socio-demographic, economic and land use trends that can be expected to influence transportation in the NCR in the period to 2011. The study was based primarily on the analysis of the 1986 and 1995 TRANS National Capital Region Origin-Destination Survey data.<sup>1</sup> Given the identified trends and their causes, the study assessed future trends, documented the expected transportation implications, and recommended appropriate planning responses.

## 2.0 Study Process

The study was carried out in 3 phases or major tasks:

- Strategic Overview,
- Detailed Investigation, and
- Reporting.

The study process was designed to maximise the use of available data and research and to facilitate TRANS team inputs to the study process at critical decision points.

Phase 1, the Strategic Overview, documented the findings/conclusions of available research into socio-demographic and land use trends and transportation including recent NCR reports. This phase was designed to identify potential factors and trends and assess the general implications of these trends/factors for transportation demand over the period 1986 to 1995. The results of Phase 1 are presented in Section 3.1.

Phase 2, Detailed Investigation, assessed the identified key factors and trends, based on 1986-1995 TRANS data and related land use, economic and socio-demographic information, as well as auto availability and transportation level of service and cost factors, as documented in Sections 3.2 to 3.5.

During phase 2, the study team prepared "Trend" projections for the key socio-demographic and locational trends in order to assess the probable implications of these trends for transportation demand for 2011, as documented in Section 4. Section 4 also discusses the implications of other trends, including recent shifts in modal shares in assessing the validity of the base-case or trend projections and the possible implications of other factors. The final stage of the analysis was the identification of policy opportunities for TRANS agencies to influence the identified trends and ameliorate any problems associated with the projections prepared as part of Phase 2. Policy issues are addressed in Section 5 which also presents conclusions and recommendations.

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<sup>1</sup> Unless otherwise specified, the data referred to herein are from the 1986 TRANS O-D Survey and/or 1995 TRANS O-D Survey.



Phase 3, Documentation, was an ongoing task that included the preparation of four Working Papers as components of the individual Phase 1 and 2 tasks to facilitate ongoing communication and the preparation of the final report. This included the preparation of this Final Report which documents the study process, findings, conclusions and recommendations. The working papers are listed in Appendix A.

### 3.0 Study Analysis

This section reviews the technical analyses undertaken during the course of this study. It documents the identified travel habits changes or trend over the 1986-95 period, based primarily on the 1986 and 1995 TRANS O-D surveys, and discusses the identified explanatory factors and related trends. Section 3.1 documents Phase 1 of the study process while the following sections review the analysis and findings associated with the detailed analysis carried out during Phase 2.

#### 3.1 Review of Travel Trends

As part of Phase 1, differences in crude trip rates (trips/population 10+ years of age) between the most recent TRANS O-D Surveys were reviewed in order to identify trends in trip making between 1986 and 1995. This review, which built on modelling work carried out by RMOC staff, identified large and unexpected changes in trip making between the two surveys and raised some concerns about the comparability of the survey data, particularly for "non-home based" and "home based other" trip making.

Exhibits 1A and 1B summarize estimated 1986 and 1995 trip rates (for daily and PM peak period trips, respectively) by selected trip purposes and geographic area (RMOC, CUO and total NCR) for auto, transit (excluding school bus), total travel (sum of all modes including walk and bike) and vehicular travel (auto and transit).

Exhibit 1A- 1986 and 1995 Daily Trip Rates\*

Time Period	Trip Purpose	Area	Auto			Transit			Sum, All Modes			Sum, Auto & Transit		
			1986	1995	%Change	1986	1995	%Change	1986	1995	%Change	1986	1995	%Change
Weekday 24 Hour	Non-Home Based	RMOC	0.69	0.52	-24%	0.09	0.04	-58%	0.87	0.65	-26%	0.78	0.56	-28%
		CUO	0.61	0.50	-18%	0.04	0.02	-54%	0.71	0.58	-18%	0.65	0.52	-20%
		NCR	0.67	0.52	-23%	0.08	0.03	-58%	0.83	0.63	-24%	0.75	0.55	-27%
	Other Home Based	RMOC	0.54	0.56	3%	0.07	0.04	-48%	0.66	0.68	3%	0.61	0.59	-3%
		CUO	0.40	0.55	38%	0.03	0.01	-60%	0.45	0.62	38%	0.43	0.56	30%
		NCR	0.50	0.55	10%	0.06	0.03	-50%	0.61	0.67	9%	0.57	0.69	3%
	Home Based School	RMOC	0.08	0.08	2%	0.11	0.10	-9%	0.32	0.37	14%	0.19	0.19	-4%
		CUO	0.08	0.10	31%	0.06	0.05	-20%	0.30	0.38	24%	0.14	0.15	8%
		NCR	0.08	0.09	9%	0.10	0.09	-12%	0.32	0.37	16%	0.18	0.18	-2%
	Home Based Work	RMOC	0.50	0.54	8%	0.24	0.15	-37%	0.82	0.77	-5%	0.74	0.69	-7%
		CUO	0.56	0.67	19%	0.11	0.08	-29%	0.70	0.79	13%	0.67	0.75	11%
		NCR	0.52	0.57	11%	0.21	0.13	-37%	0.79	0.78	-2%	0.72	0.70	-3%
	Total	NCR	2.27	2.25	-1%	0.51	0.32	-38%	3.15	3.08	-3%	2.79	2.57	-8%

\*Trip rates calculated based on reported trips divided by population for persons aged 10 and over.

Source: Development of the 1995 TRANS Model, RMOC, August 1999, Exhibit 7.3 - 1986 and 1995 Trip Rates by Time Periods

While there was little change in the reported total trip rates between 1986 and 1995 surveys, there were major differences in the estimated trip rates by trip purpose, mode of travel and between Ontario and Quebec.



As shown in Exhibit 1A, weekday daily total trip rates (sum of all modes) for the NCR declined by 3% between 1986 and 1995, while vehicular trip rates (sum, auto & transit) declined by 8%. However, these data suggest large declines in total trip making by all modes for "non-home based" travel for the RMOC and CUO, and significant increases in "other home based" and "home based school" travel, particularly for the CUO. Total daily "home-based work" travel declined overall by 2% but appears to have increased by 13% in the CUO.

While total auto trip rates for the NCR were stable, declining by an estimated 1% between 1986 and 1995, total transit trip making declined by an estimated 38%. While transit trip making declined across all purposes and across the NCR, the estimated auto person trip rates increased for "home based work", "home based school" and "other home based" purposes, they declined for "non-home based" trip purposes.

The changes in PM Peak trip rates by purpose and mode summarized in Exhibit 1B are generally similar to the changes in Daily Trip rates shown in Exhibit 1A. There are, however, some significant differences. For example, whereas there are overall declines in NCR non-home based and "other home based" trip rates for the PM peak, these are smaller than estimated for daily auto trip rates, and the CUO PM peak trip rate for "other home based" trips increases by 238%.

Exhibit 1B - 1986 and 1995 PM Peak Trip Rates\*

Time Period	Trip Purpose	Area	Auto			Transit			Sum, All Modes			Sum, Auto & Transit		
			1986	1995	%Change	1986	1995	%Change	1986	1995	%Change	1986	1995	%Change
PM Peak Period	Non-Home Based	RMOC	0.16	0.13	-17%	0.03	0.01	-58%	0.20	0.16	-21%	0.19	0.14	-23%
		CUO	0.15	0.14	-5%	0.01	0.01	-49%	0.18	0.16	-9%	0.16	0.15	-8%
		NCR	0.15	0.13	-14%	0.03	0.01	-57%	0.20	0.16	-18%	0.18	0.14	-20%
	Other Home Based	RMOC	0.14	0.12	-14%	0.03	0.01	-63%	0.19	0.16	-16%	0.11	0.10	-9%
		CUO	0.04	0.14	238%	0.01	0.00	-65%	0.13	0.16	23%	0.10	0.10	3%
		NCR	0.14	0.13	-5%	0.02	0.01	-63%	0.17	0.16	-9%	0.11	0.10	-7%
	Home Based School	RMOC	0.01	0.01	10%	0.02	0.02	-19%	0.06	0.07	9%	0.04	0.03	-10%
		CUO	0.01	0.02	97%	0.01	0.01	1%	0.06	0.09	60%	0.03	0.04	43%
		NCR	0.01	0.01	32%	0.02	0.02	-16%	0.06	0.07	22%	0.03	0.03	0%
	Home Based Work	RMOC	0.13	0.14	5%	0.08	0.05	-38%	0.24	0.21	-11%	0.22	0.19	-12%
		CUO	0.15	0.18	17%	0.04	0.03	-19%	0.20	0.22	12%	0.19	0.21	10%
		NCR	0.14	0.15	8%	0.07	0.05	-36%	0.23	0.22	-6%	0.21	0.20	-7%
	Total	NCR	0.51	0.50	-2%	0.15	0.09	-41%	0.74	0.70	-6%	0.61	0.55	-9%

\*trip rates calculated based on reported trips divided by population for persons aged 10 and over.

Source: Development of the 1995 TRANS Model, RMOC, August 1999, Exhibit 7.3 - 1986 and 1995 Trip Rates by Time Periods

The data presented in Exhibit 1A and 1B suggest that daily and PM peak school travel increased across the NCR, with the largest increases in the CUO. Both areas experienced large declines in "non-home based" trip making and substantial increases in "other home-based" trip making, based on the comparison of the two surveys. This result was unexpected, given documented changes in travel behaviour in the Toronto area over a similar ten year period, where non-home based and other home based trip making has generally been stable.<sup>2</sup> This finding raised

<sup>2</sup> The major shift identified for travel in the GTA over a ten year period was the proportionate decline in work trip making, associated with the 1990 recession, and proportionate increase in home based school, home-based other and non-home based trip making. The 1996, 1991 & 1986 Travel Survey Summaries for the Greater Toronto Area, The Transportation Tomorrow Survey, Data Management Group, University of Toronto, Joint Program in Transportation, November 1997.



concerns about the comparability of the two TRANS O-D surveys, which employed different data collection methods, as discussed below.

### 3.1.1 Comparability of TRANS O-D Surveys

Whereas the 1986 TRANS O-D survey employed a mail-back trip diary format, the 1995 survey employed the telephone interview technique. Therefore, each survey would be expected to yield somewhat different results. For example, whereas school and work trip making should be equally well reported in both telephone and mail-back "trip diary" type surveys, the mail-back format is likely to report more "other" and "non-home based" trips than the telephone format.<sup>3</sup> The trip diary format might also be expected to report more walk and bike trips than the telephone method. When respondents can ponder their trip making, as is the case when filling out a diary, they would be expected to remember more discretionary trips than when responding to a telephone interview.

Given the differences between the two surveys, the analysis focused on the AM peak period, which is dominated by work and school trips, rather the PM peak, which includes a high proportion of "non-home based" and "Other" trips. The comparisons of AM peak estimates were expected to yield reliable information given the types of trips that are represented and the fact that these trips are equally well-reported by both survey methods.

### 3.1.2 Transit Trip Making

While total vehicular travel (daily) fell by an estimated eight percent (8%), trip rates per capita for transit declined by 38 percent, a dramatic decline that was generally consistent with the ridership figures provided by NCR transit operators.

Reported O-C Transpo ridership fell from approximately 80 million rides per year in 1986 to approximately 72 million rides by 1995, but per capita ridership fell by 22% from 146 rides per capita per annum in 1986 to 113 in 1995.<sup>4</sup> Reported STO ridership declined from 11.9 million rides per year in 1986 to 10.8 million by 1995. STO rides per capita per annum declined by 28% from 66 in 1986 to 47.5 in 1995. While the ridership statistics did not decline as much as implied by the O-D survey results, they do support the conclusion that there was a substantial decline in transit trip making between 1986 and 1995.

The comparison of the 1986 and 1995 survey results suggests that the observed declines in transit use occurred across all age groups, both genders, and for all trip

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<sup>3</sup> Whereas the Transportation Tomorrow Survey Trip Diary Survey Analysis (Tranplan Associates, 1989) concluded that HBW and HBS trip rate estimates were within 1% (for mailback and telephone methods), the TDS method resulted in 9% higher estimates of HBO trips and 87% higher estimates of NHB travel compared to telephone survey results for the same households.

<sup>4</sup> Rides per capita as reported by RMOC and STO based on the population of the urban transit service areas for both transit companies.



origin districts. Exhibits 2A, 2B, 2C show daily mode splits by age and gender for 1986 and 1995. Over this period, the average transit mode split fell by one third from 18 percent in 1986 to 12 percent by 1995. On average, the reported daily transit mode split for males fell by 27 percent (from 15% to 11%) between 1986 and 1995, while it fell by 36 percent for women (from 22% to 15%).

The largest declines in transit use were among men and women over 54 years of age. While persons aged 16-24 of both genders continued to be the heaviest transit users in 1995, the traditional gap between men and women declined over the period. Whereas women aged 16-24 had an average mode split that was 37 percent higher than the transit mode split for men the same age in 1986 (37% versus 27%), by 1995 the comparable female transit mode split was 22 percent higher (28% versus 23%). The gender gap also narrowed for the other age groups.

EXHIBIT 2A - 1986 AND 1995 NCR DAILY TRANSIT MODE SPLITS BY AGE GROUP

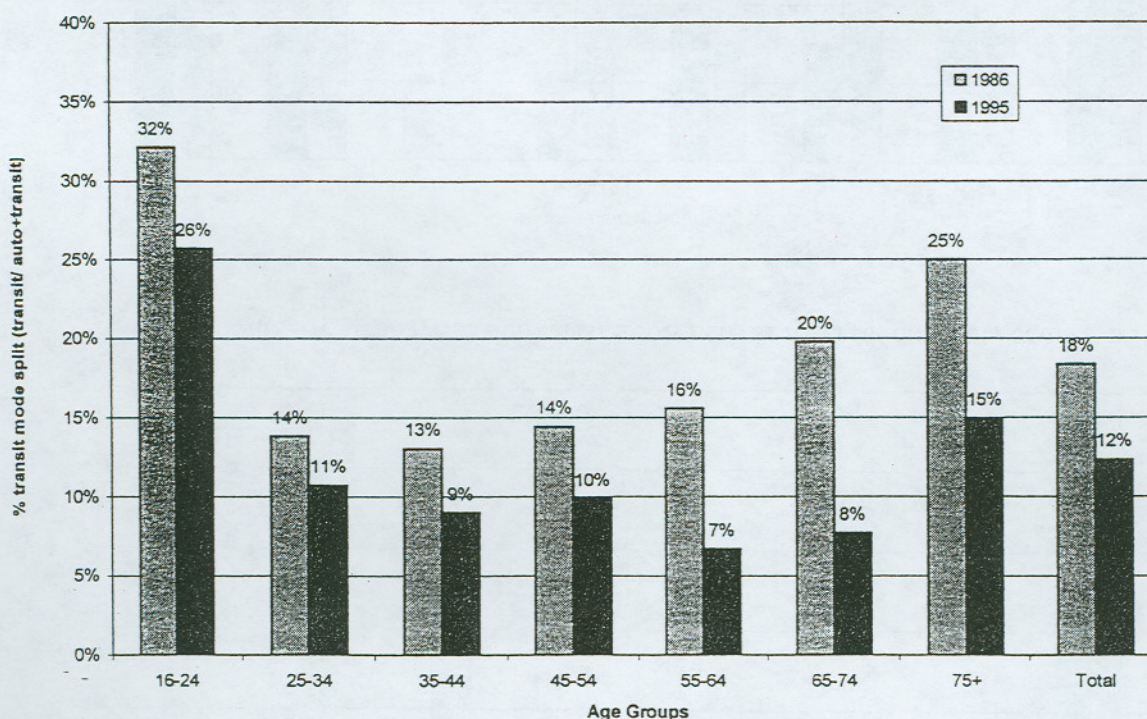




EXHIBIT 2B - 1986 AND 1995 NCR TRANSIT MODE SPLITS FOR MALES BY AGE GROUP

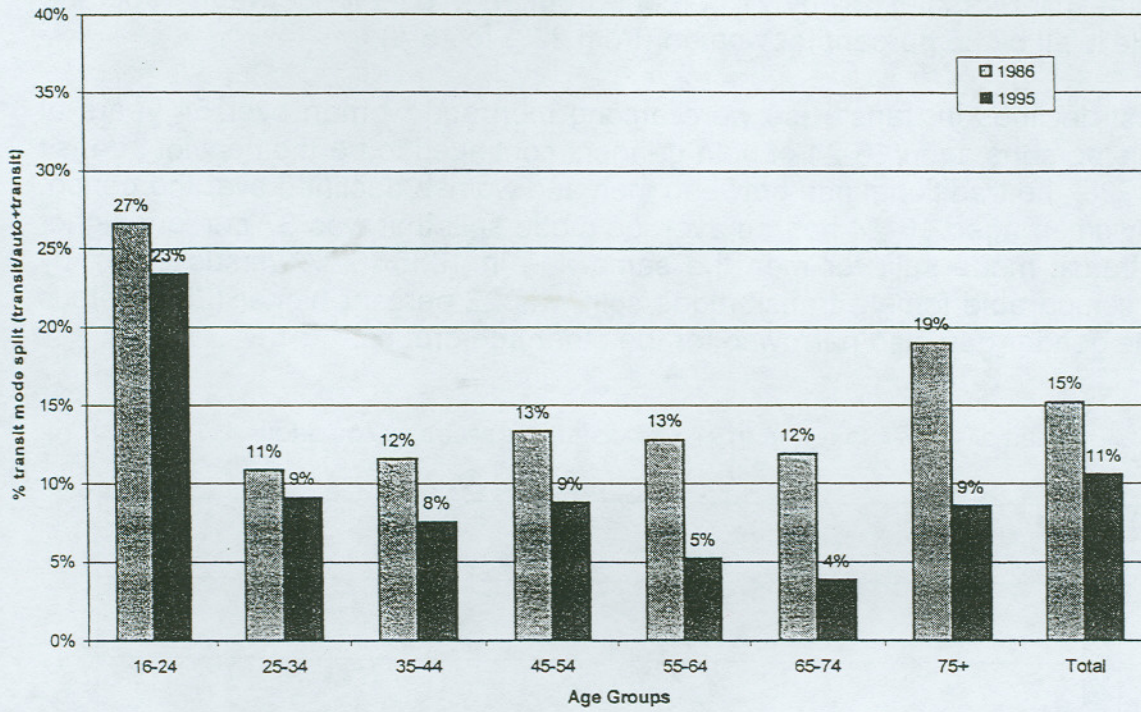
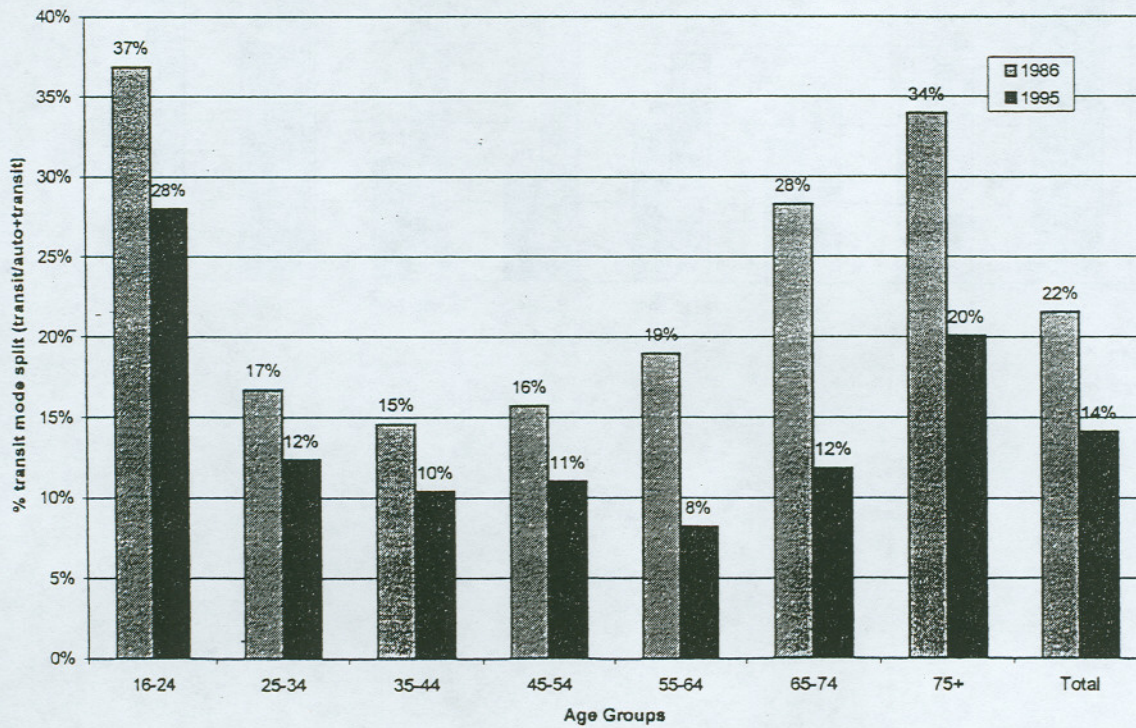


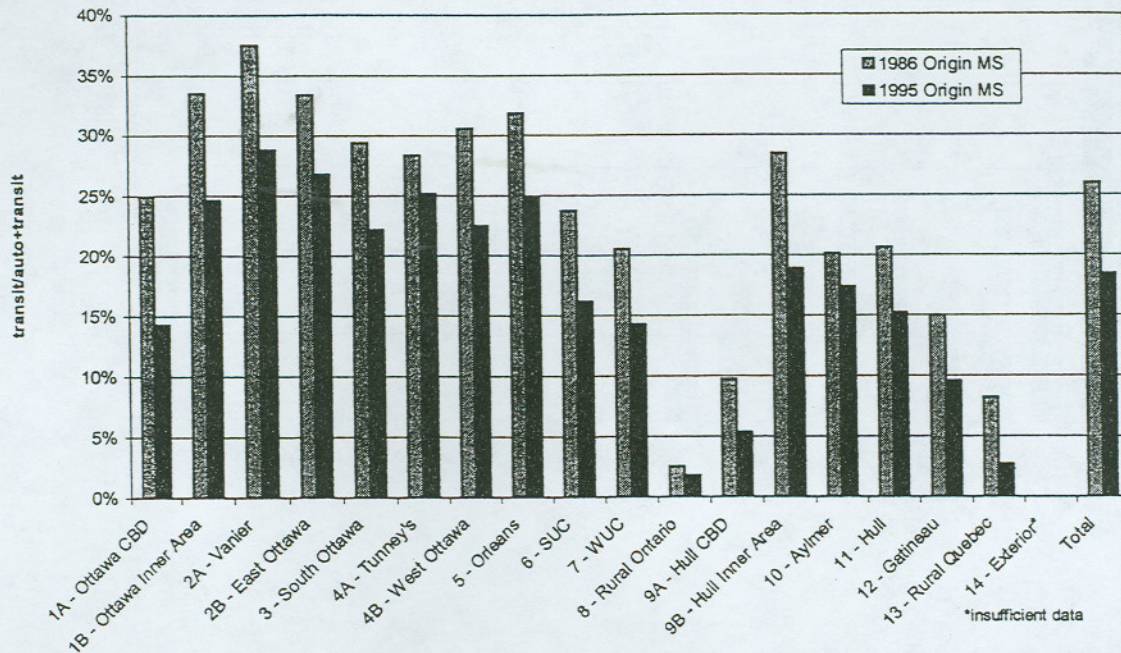
EXHIBIT 2C - 1986 AND 1995 NCR TRANSIT MODE SPLITS FOR FEMALES BY AGE GROUP





Exhibits 3A and 3B summarize changes in AM peak period mode splits by origin and destination district. The survey results suggest that all origin districts experienced substantial declines in transit mode splits, as shown in Exhibit 3A.

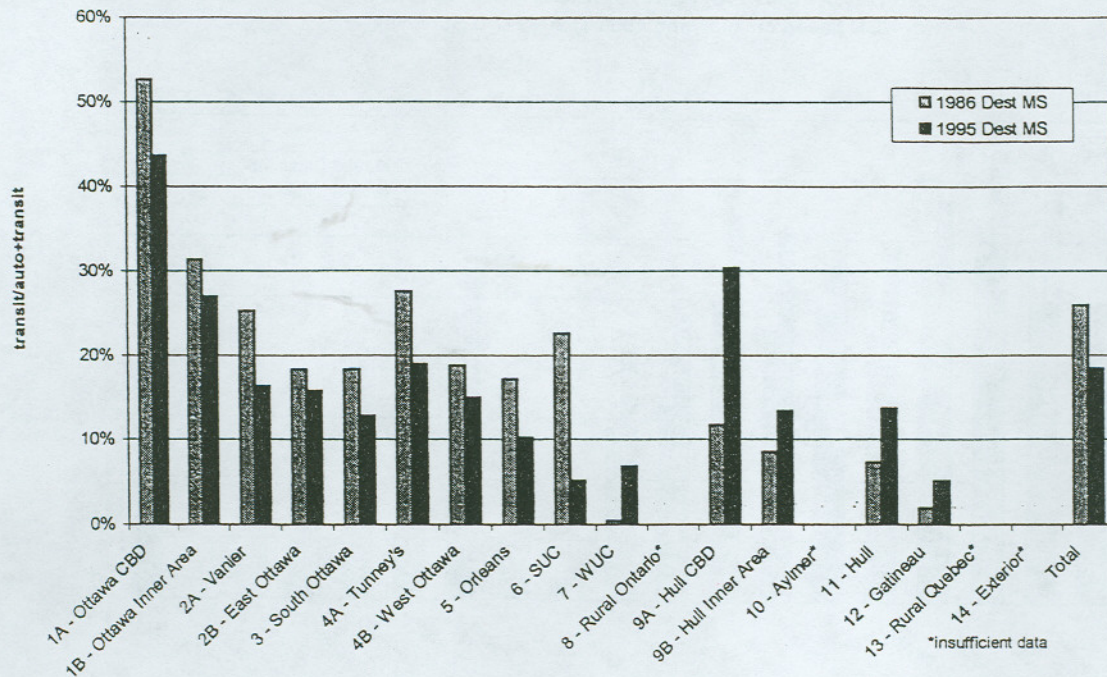
EXHIBIT 3A - AM PEAK PERIOD ORIGIN MODE SPLITS  
(for NCR based on 1986 and 1995 TRANS O-D Surveys)



As shown in Exhibit 3B, five destination districts saw increases in mode splits. These include the West Urban Community (WUC) including Kanata, Hull's CBD and Inner Area, as well as Hull and Gatineau. All other districts saw substantial declines in AM peak period destination transit mode splits, including the Ottawa CBD, the transit heart of the National Capital Region.



EXHIBIT 3B - AM PEAK PERIOD DESTINATION MODE SPLITS  
(for NCR based on 1986 and 1995 TRANS O-D Surveys)



### 3.1.3 Possible Explanatory Factors

NCR demographic data, shown in Exhibit 4, provides only a partial explanation for the changes in travel behaviour reported above and documented in Exhibits 1A to 3B. Whereas the reported total population of the National Capital Region grew by 19 percent between 1986 and 1995, the population aged 5-14 increased by 28 percent, reflecting the so-called "baby-boom echo" while the 15-24 cohort declined by 10 percent, reflecting the "baby bust".<sup>5</sup> In contrast, total employment grew by only 11% and gross leasable floor area increased by only 9%.

The high growth of the 5-14 age group and of school enrolment (+26% for primary and secondary) is consistent with the reported increase in school travel. The estimated 50% increase in post secondary enrolment is inconsistent with the reported 10% decline in the size of the 15-24 cohort, however. Reduced employment opportunities associated with the failure of employment growth to keep up with population growth explains why post-secondary school enrolment increased between 1986 and 1995.

<sup>5</sup> David Foot describes the "baby-boom echo" as the 1980-95 period when the children of the 'baby boom' born in the 1947 to 1966 period created a mini baby boom. The echo boom was preceded by the "baby bust" when the birth rate declined due to the aging of the boomers and increases in female labour force participation. *Boom Bust & Echo*, (1996) by David K. Foot, Macfarlane Walter & Ross, Toronto, pp 18-25.



As documented in Exhibits 2A to 2C, the peak transit ridership years are ages 16-24<sup>6</sup>, teenagers and young adults. If one uses the standard Statistics Canada age breaks used in Exhibit 4, the peak transit ridership cohort is 15-24. On average, the 15-24 cohort has a mode split that is more than twice as large as the average for all age groups and this generalization applies to both genders.

An absolute decline in the number of NCR residents aged 15-24 of 10% translates into a proportionate decline in the size of this cohort. While 15-24 year olds accounted for about 17% of the total NCR population in 1986, they accounted for only 13 percent of the NCR population by 1995. Such a decline in the size of this "transit-oriented" age cohort would have reduced the overall transit mode share for the NCR, even if average transit mode splits for this group had not declined as documented in Exhibits 2A-2C. The increase in the size of the 5-14 age group and decline in the size of 15-24 age cohort is consistent with reduced work trip making per capita and increased school travel.

While the demographic shift (changing age profile) associated with the "baby boom bulge" was expected, as noted in the 1995 RMOC study "The Transportation Implications of Demographic Trends in Ottawa-Carleton", the extent of the observed decline in transit trip rates and mode shares across all age groups was unexpected.

**Exhibit 4 - 1986 and 1995 NCR Demographics**

Variable	1986	1995	% Change
Total Population	806,600	960,400	19%
Popul. aged 5-14	105,300	134,400	28%
Popul. aged 15-24	139,800	126,500	-10%
Popul. aged 25-44	284,800	344,700	21%
Popul. aged 45-64	151,500	195,100	29%
Popul. aged 65 and over	70,700	85,000	20%
Dwelling units	298,300	374,400	26%
Total Employment	409,300	454,900	11%
School Enrollment			
Primary & Secondary	93,000	117,100	26%
Post Secondary*	30,000	45,000	50%
GLA (gross leasible floor area in 1000 sq ft.)	12,060	13,150	9%

Source: Development of the 1995 TRANS Model, RMOC, August 1999, page 19 Exhibit 3.2 - Demographics, 1986 and 1995

\* Original 1999 estimate for 1995 revised by RMOC staff.

The current study went beyond the analysis of demographic trends in attempting to explain the observed changes in travel behaviour. Given a general understanding of recent trends in the NCR and the need to identify and assess the transportation

<sup>6</sup> The 16-24 cohort was used in extracting the data for Exhibits 2A to 2C to account for the fact that persons age 15 cannot legally drive an automobile.



implications of a variety of relevant trends a long list of factors were identified that could potentially account for observed changes in travel behaviour. The list shown in Exhibit 5 was developed based on an extensive literature review (see Working Paper 1).

Based on the review of the twelve factors and related data, it was agreed that the consultant team would focus on the following four groups of related factors in Phase 2, in order to identify the key trends that could be expected to influence transportation in the National Capital Region in the coming years:

- employment-related trends including changes in employment status (factor 2), labour force participation (factor 3) and changes in employment characteristics such as the growth in part-time work (factor 10)
- locational and land use trends including factor 4 (the location of resident labour force and employment activities),
- auto availability and access (factor 6),
- auto and transit levels of service and costs (factors 7 and 8).

The findings with respect to each of the factors are discussed below with reference to selected data and analysis in sections 3.2, 3.3, 3.4 and 3.5.



## Exhibit 5 - TRANSPORTATION RELATED FACTORS / TRENDS (long list)

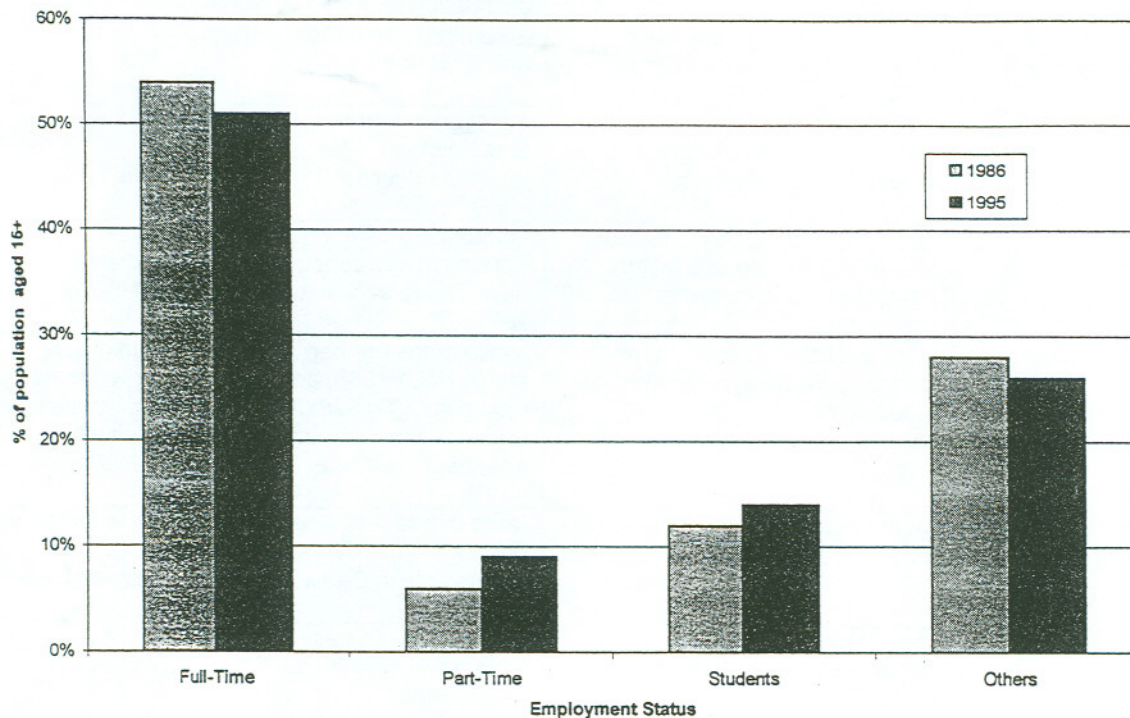
FACTOR	DESCRIPTION	RELATED TRENDS / ISSUES
1. Demographics including population level, and distribution by age and gender	-travel behaviour varies by age and gender, -total trip making is proportionate to population	-changing age structure and shifts in location (relative concentration in inner city, mature suburbs and developing suburbs (within/outside Greenbelt)
2. Employment Status including employed full time and part-time, student or other.	-travel behaviour differs for workers (full/part-time), students, and others	-declining labour force participation (1986-95) meant fewer workers relative to population (more part-time), -differential impact on men and women -increased student population, -increasing numbers of retired persons.
3. Labour force participation/activity	-changing employment totals influence work and other trip making	-declining labour force participation and activity (fewer work trips)
4. Location of Residents, resident labour force, and Employment Activities.	-travel behaviour varies by residential and employment location.	-most growth in suburbs and outside the Greenbelt. -absolute declines in CBD and inner city jobs.
5. Land Use (form, density, arrangement of uses)	-trip rates and mode shares vary depending on land use factors (and influence auto ownership and use)	-suburban growth means more people living and working in low density, auto oriented areas, -fewer have access to high levels of transit service.
6. Auto availability and licensing	-auto availability/access appears to largely determine trip rates and mode splits -relates to income/age	-while autos per person and household were stable since 1986, autos per worker will have increased. This would tend to reduce transit use. -reduced licensing among teenagers was observed in Greater Toronto Area (may apply to NCR).
7. Auto Costs	-auto costs (capital and operating) influence auto availability and use	-auto capital and operating costs have increased but not as quickly as transit fares (See "The Automobile in Ottawa-Carleton" Richard Lake, 1995).
8. Transit Costs	-transit fares (relative to out-of-pocket auto costs) influence mode splits	-transit fare increases since 1990, (with the withdrawal of MTO subsidies) have been substantial. -peak fare differential may have had impact on transit use in O-C.
9. Household Size/Composition	-average trip rates vary by household size and composition (single person, family, non-family)	-historical declines in HH size ended in the early 1990s due to recession (based on Toronto data). -more one-person and non-family hh in inner city (suggests lower incomes)
10. Employment Characteristics: (number, location, industry, occupation, hours of work, work at home etc.)	-work travel behaviour (mode choice, trip rates, timing, etc) varies depending on employment characteristics	-increasing part-time employment (more travel in off-peak hours) -increasing self-employed and work at home (more auto oriented/less likely to ride transit) -reduced opportunities for unskilled workers -more "knowledge workers" in suburban locations.
11. Travel Habits Characteristics (trip rates, o-d's, mode splits)	-travel habits by cohort/location are changing over time due in part to socio-demographic trends	-declining transit use/increasing auto use by seniors and especially women. -land use patterns are changing travel patterns (O-Ds).
12. Attitudes, Values and Expectations	-changing travel habits reflect changing attitudes, values and expectations	-the boomers have distinct attitudes and expectations which will influence future travel behaviour. [CUTA "Demographic Trends" study, 1991]



### 3.2 Employment-Related Factors and Trends

Major changes in employment and related factors were observed over the 1986 to 1995-96 period that would influence trip making, as revealed in the following exhibits, which were developed using the TRANS O-D Survey data. This period saw a shift in employment status as shown in Exhibit 6A with relatively fewer full time workers and non-workers (others) and more part-time

EXHIBIT 6A - NCR EMPLOYMENT STATUS 1986 AND 1995



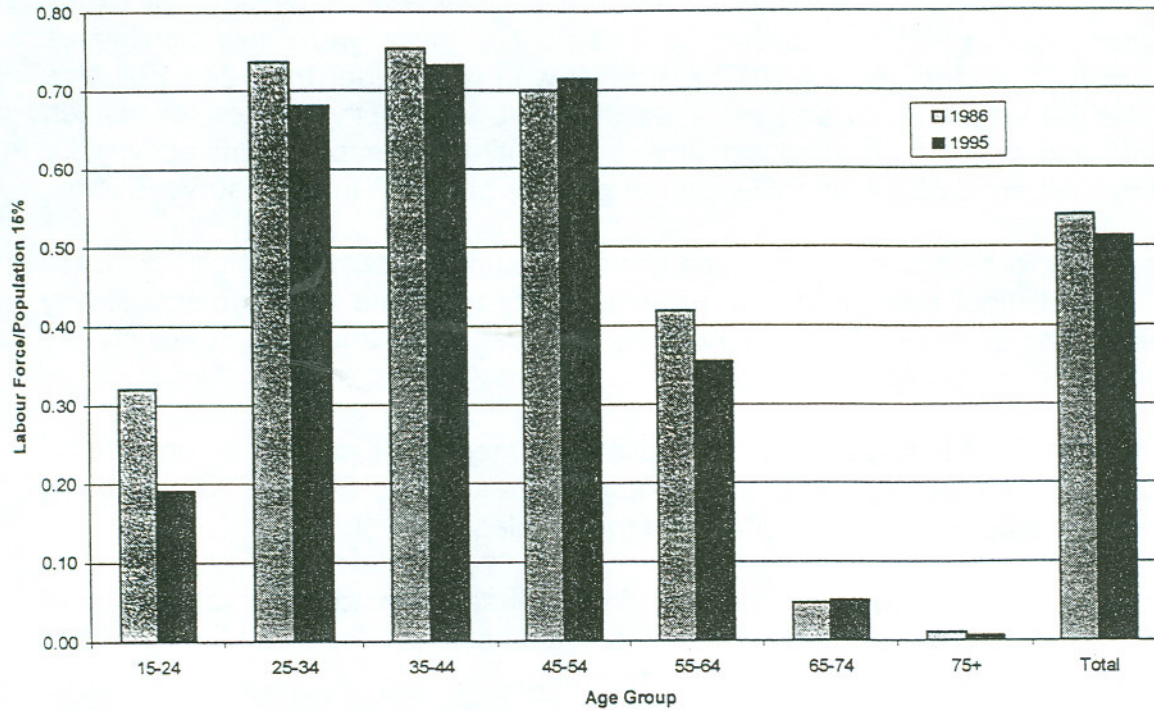
workers and students. These shifts in employment status were associated with the recession which appears to have affected the Ottawa area after 1991 and would have reduced work travel, especially during peak periods, and increased student travel.

As shown in Exhibit 6B, full-time employment activity rates (full time employed labour force/ population 15+) declined substantially for the 15-24, 25-34 and 55-64 age groups while increasing marginally for the 45-54 age cohort. The largest drop in full time employment was among persons in the 15-24 age group, those with the least experience. The second largest drop in full time employment was among persons 55-64. There has been a long term trend to reduce labour force participation among males aged 55-64<sup>7</sup> but the extent of the decline in participation appears to reflect the recession rather than normal increases in early retirement.

<sup>7</sup> This trend was documented in the CUTA Strategic Transit Research Program Report #1-1 The Implications of Demographic and Sociodemographic Trends for Urban Transit in Canada: Phase 1 Trends and Implications (December 1991), pp 25-29.

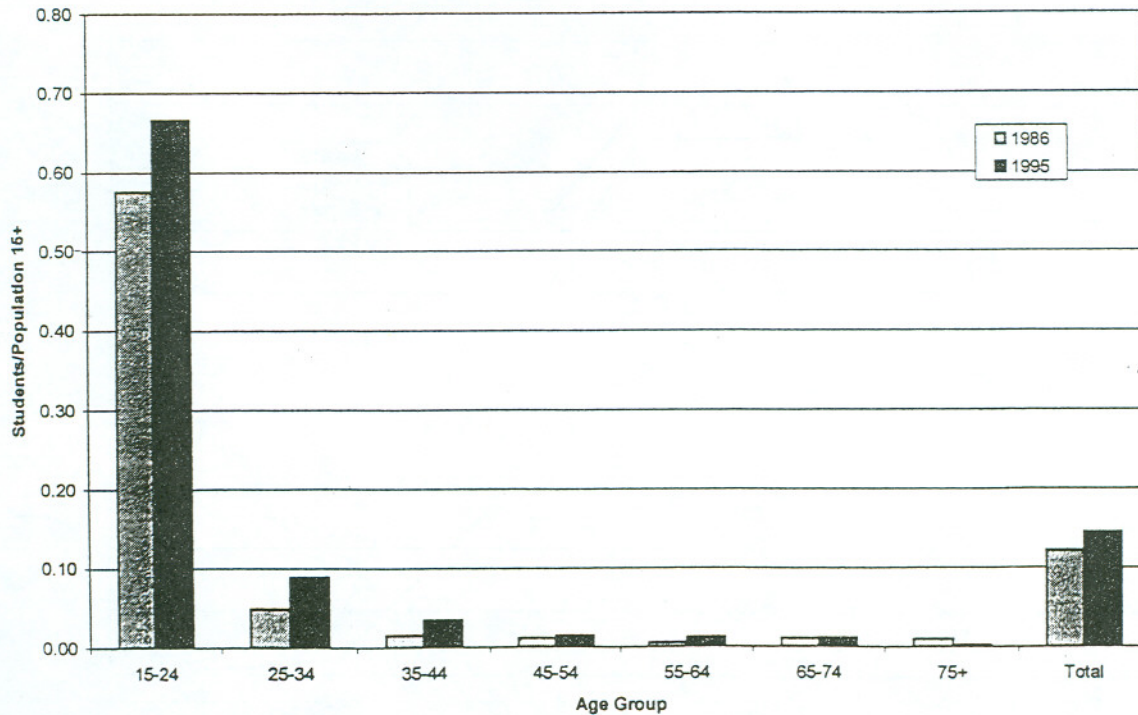


EXHIBIT 6B- FULL TIME LABOUR FORCE ACTIVITY BY AGE GROUP



While the proportion of the population in the 15-24 and 25-34 age groups who were employed full time declined, the student populations in both these groups increased substantially, as illustrated in Exhibit 6C.

EXHIBIT 6C - STUDENT ACTIVITY BY AGE GROUP





Shifts in employment status varied by age and gender, as shown in Exhibits 7A to 7C. Whereas the decline in full time labour force activity was consistent for males and females aged 15-24, as shown in Exhibit 7A, there were few similarities between the two genders among NCR residents who were older than 24. Full time activity rates fell for men between the ages of 25-64 while activity rates for women aged 35-44 and 45-54 increased significantly. Full-time employment activity for men and women aged 65-74 and 75+ did not change between the two surveys.

Part-time labour force activity by age and gender is summarized in Exhibit 7B. Each gender has a distinct age profile with much higher part-time employment activity among women or all ages. The observed shifts in part-time labour force activity are also distinct for each gender.

There was a general increase in part-time employment (per capita) among males aged 15-64 with part-time employment among males aged 15-24 in 1995 exceeding the level of part-time employment observed for females in 1986.

Part-time employment activity among women increased substantially for the 15-24 and 25-34 age groups while there were only small differences between the 1986 and 1995 part-time activity rates for the other age groups.

EXHIBIT 7A - FULL TIME LABOUR FORCE ACTIVITY BY AGE AND GENDER

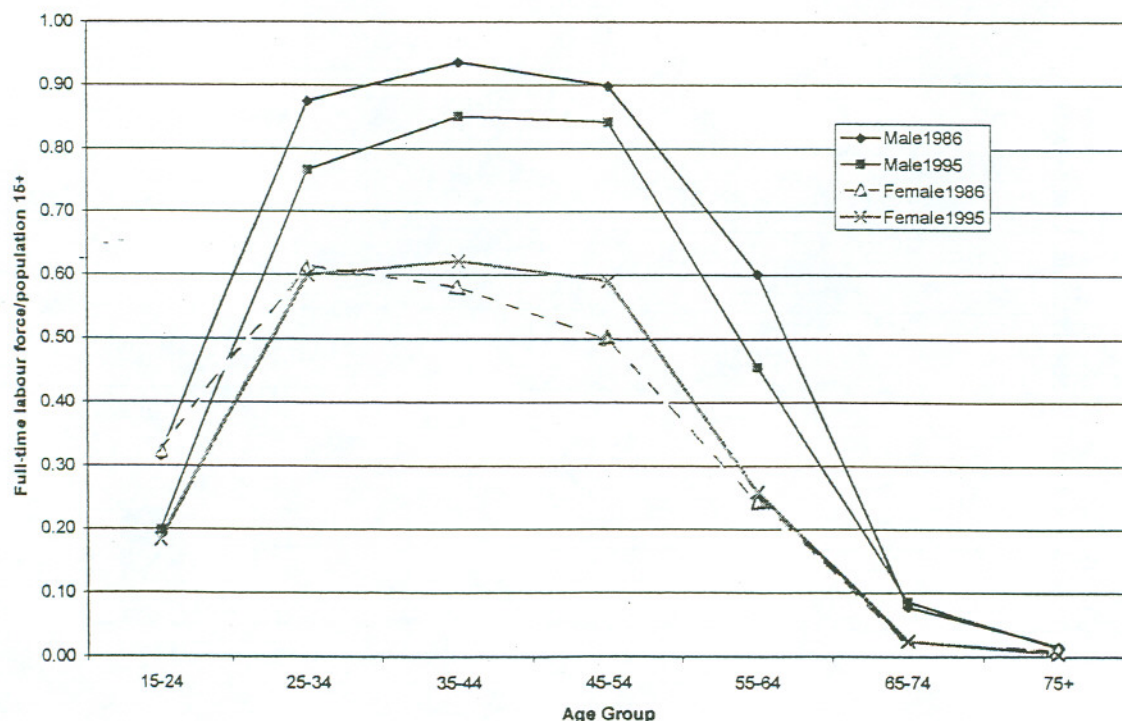
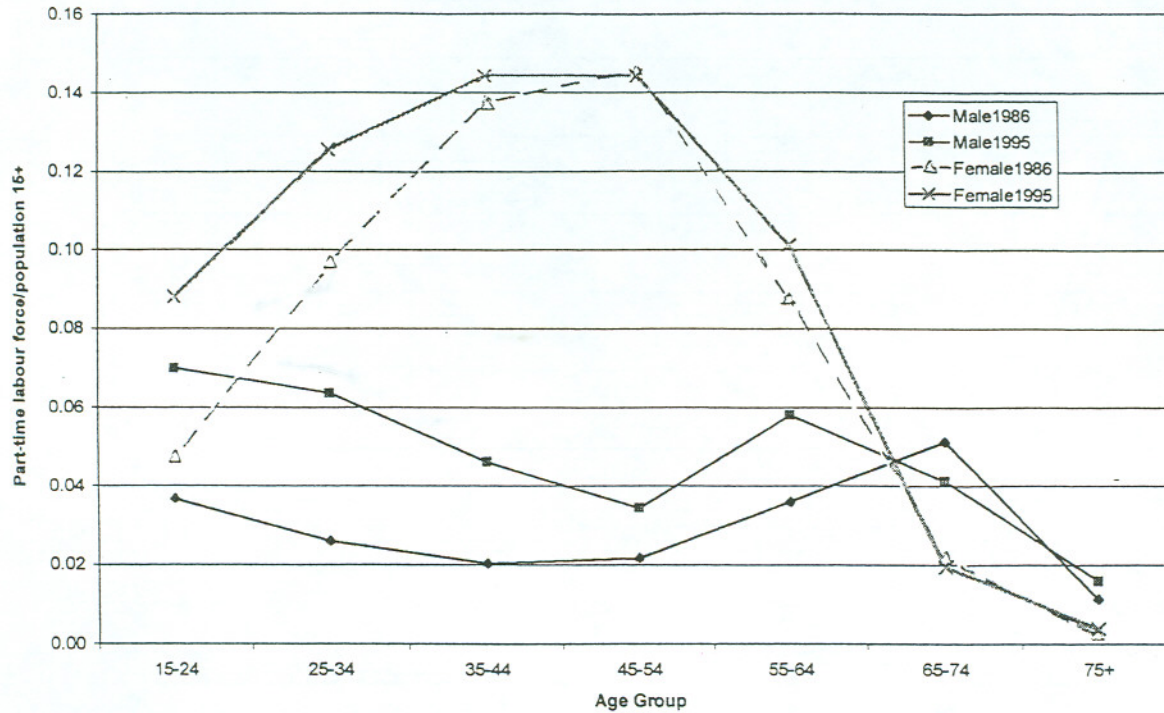




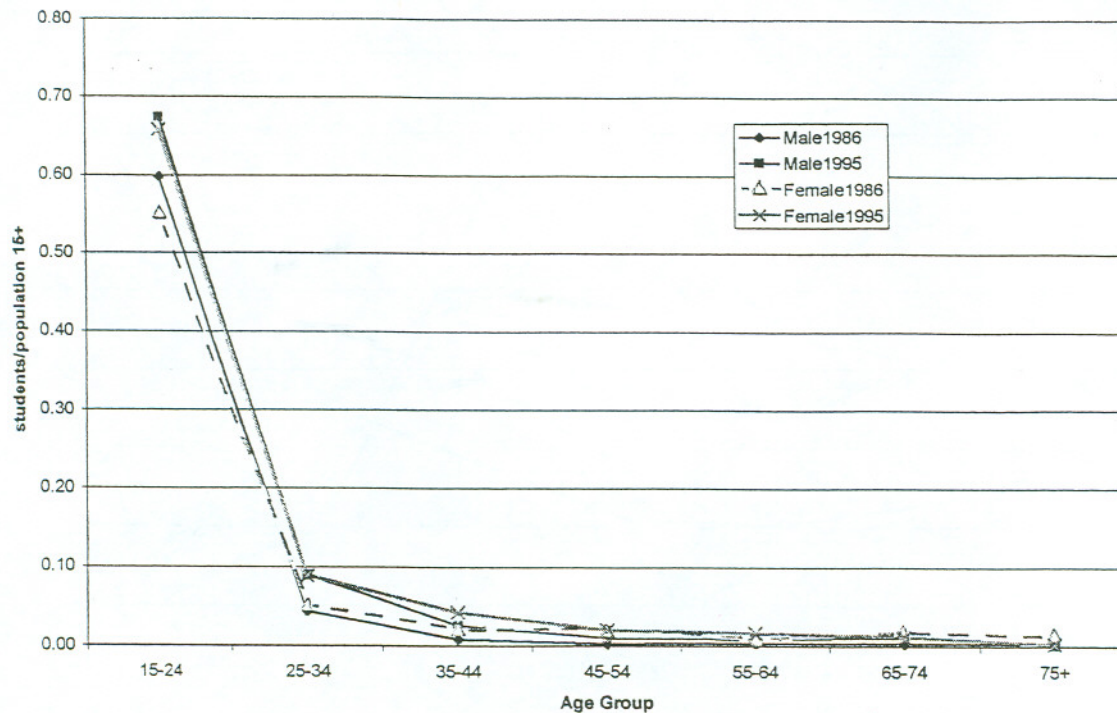
EXHIBIT 7B - PART-TIME LABOUR FORCE ACTIVITY BY AGE AND GENDER



Student activity rates by gender shifted as shown in Exhibit 7C. As full-time employment opportunities contracted there were consistent increases in the proportions of men and women aged 15-24, 25-34 and 35-44 who attending school, with a doubling of the student activity rate (students/population) among persons of both genders aged 25-34.



EXHIBIT 7C - STUDENT ACTIVITY BY AGE AND GENDER



### 3.2.1 Part-Time Employment and Peak Period Travel Demands

Employment status is a major factor in explaining the peak period travel demands that influence road capacity requirements and transit service requirements. While lower full-time employment has reduced both daily and peak travel demands, the growth in part-time employment has shifted demand from peak to off-peak periods. As shown in Exhibit 8A, while the average full-time worker makes approximately .8 trips to work per day, the average part-time worker makes about .6 trips to work each day. The actual numbers vary by gender and age. The differences are much more dramatic during the AM peak period, however, as shown in Exhibit 8B. The data suggest that the part-time worker makes less than half as many trips to work in the AM peak compared to his or her full-time counterpart. This conclusion is applicable to both genders and all age groups and reflects differences in the types of work that are dominated by part-time employment including retail and service businesses which start later in the day than office and industrial employment.



EXHIBIT 8A - DAILY 1ST WORK DESTINATIONS PER EMPLOYED PERSON BY  
AGE GROUP AND GENDER - 1995 TRANS O-D Survey

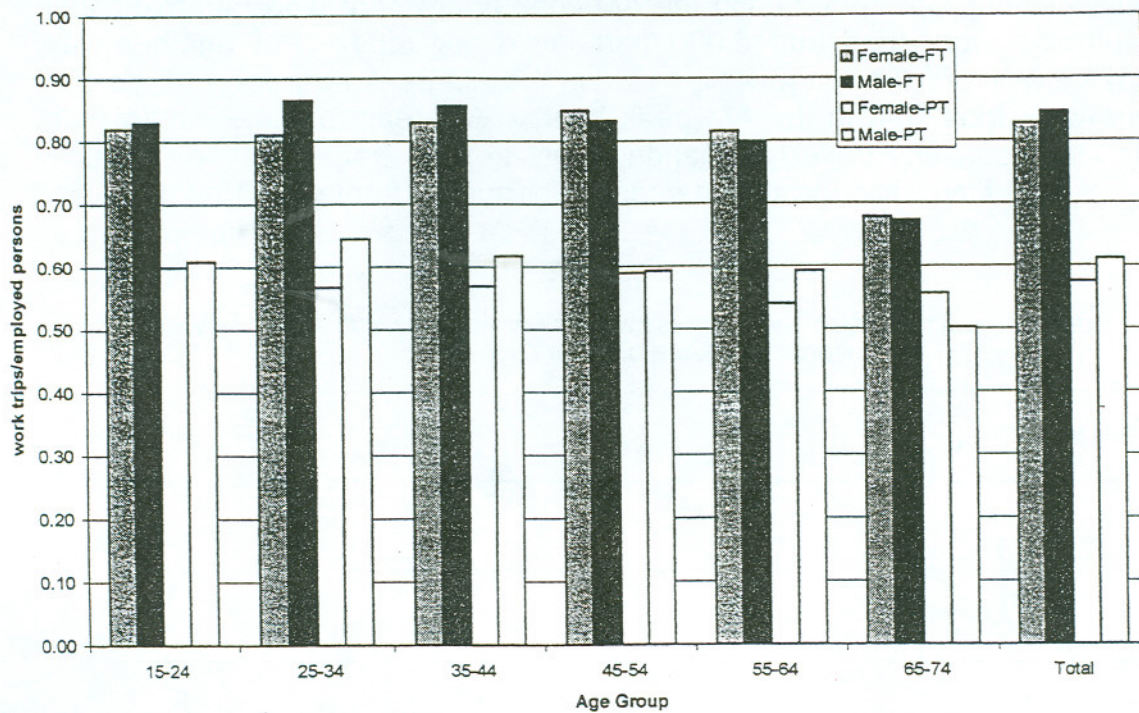


EXHIBIT 8B - A.M. PEAK PERIOD 1ST WORK DESTINATIONS PER EMPLOYED PERSON  
BY GENDER AND AGE GROUP - 1995 TRANS O-D Survey

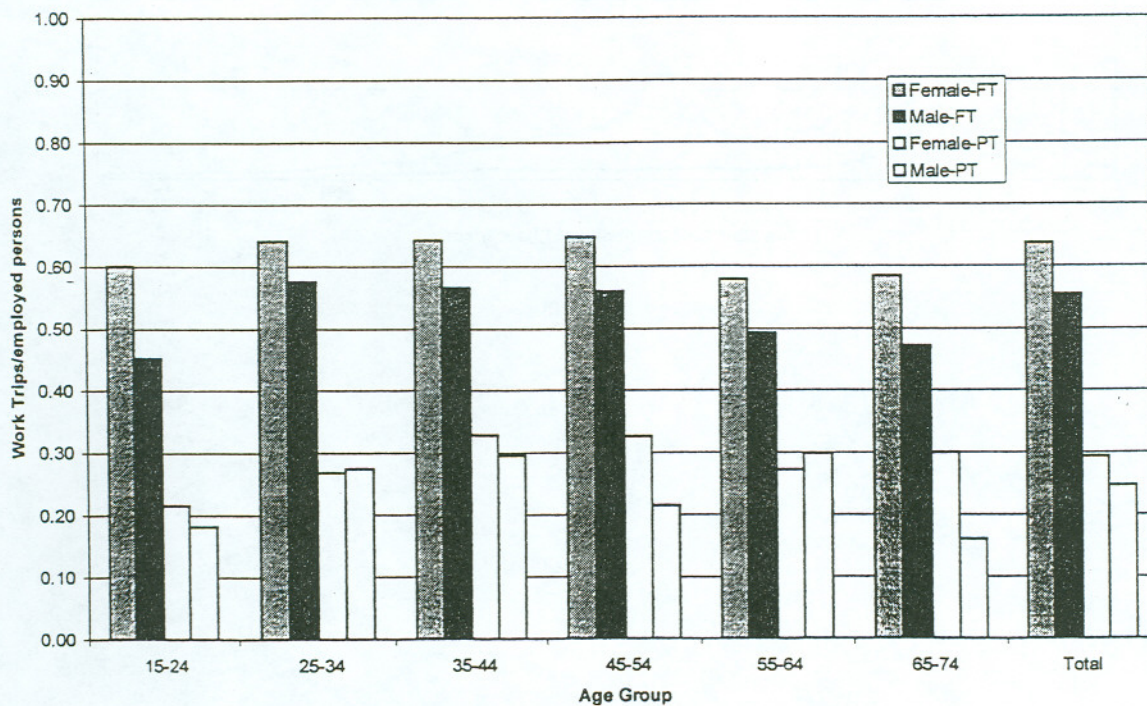
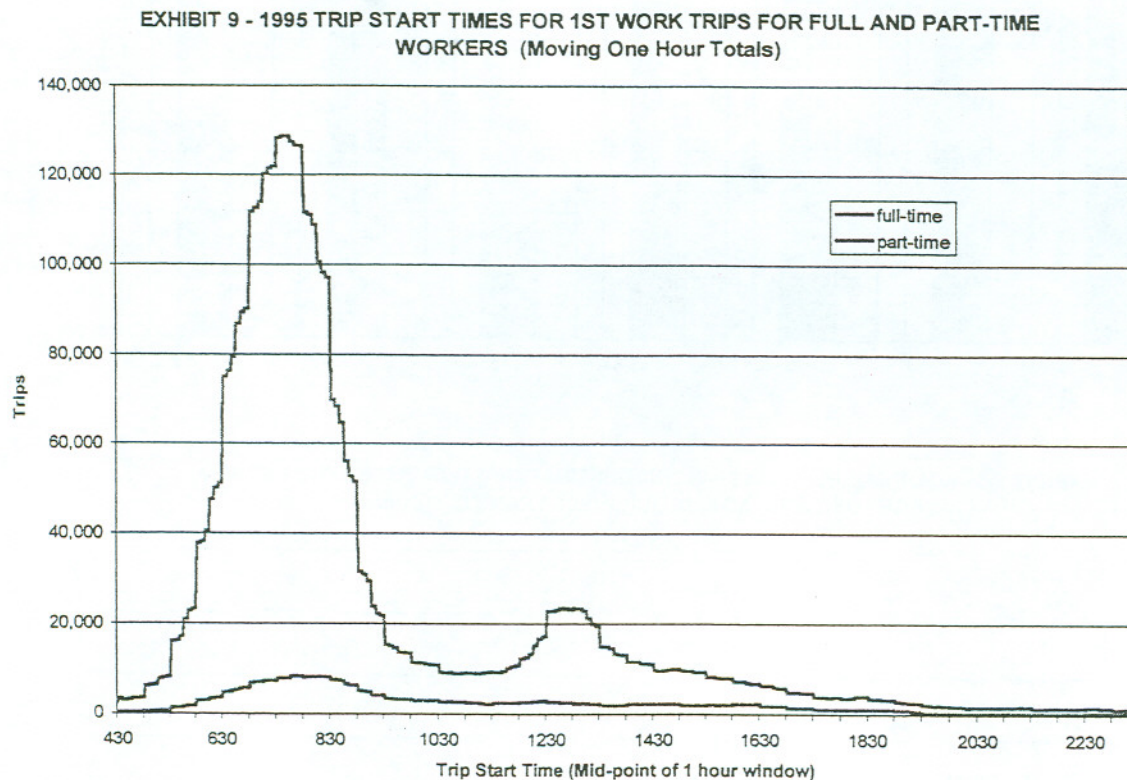




Exhibit 9 helps to put part-time employment into perspective. While there was large increase in part-time employment between 1986 and 1995, the associated peak hour travel demands in 1995 are still small, relative to the demand associated with full-time employment. In 1995, during the AM peak hour, there were approximately 130,000 full time work trips and 8,000 part-time work trips. Put another way, whereas 32 percent of full-time work trips start in the AM peak hour, only 18 percent of part-time work trips start in the AM peak hour. Whereas full-time employment results in the peaked travel demands that define transportation capacity requirements, part-time transportation demands are spread throughout the day.



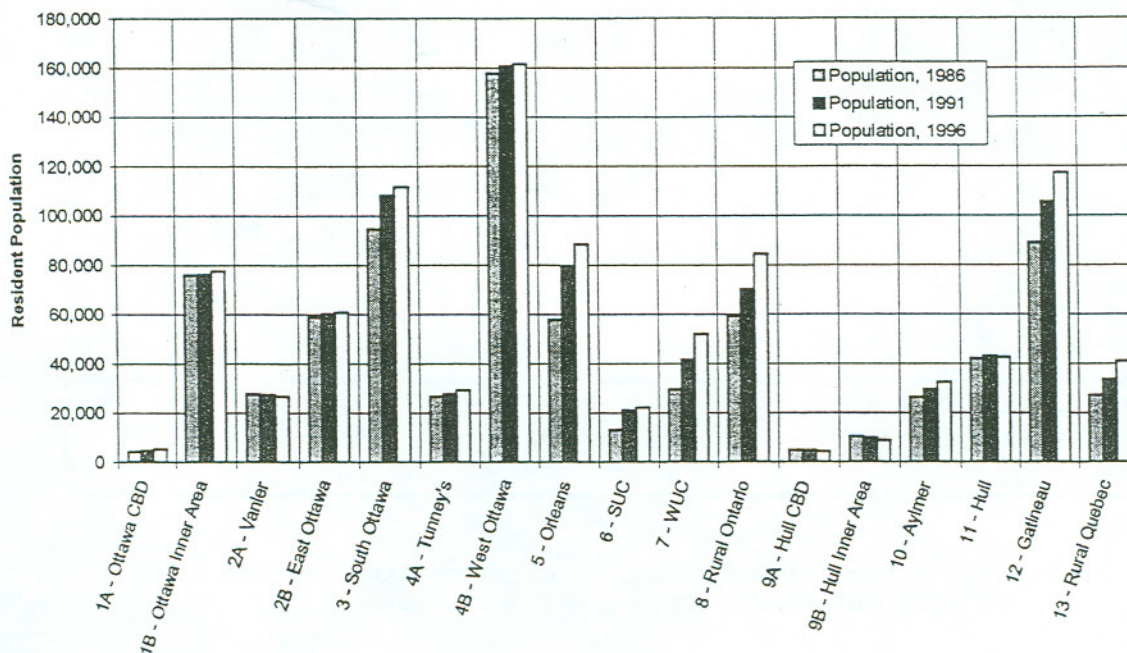


### 3.3 Location and Land Use Factors

#### 3.3.1 Land Use Trends

Transportation follows land use. Therefore, changes in the residential location, and the location of employment and other activities have a strong influence on travel demand patterns. Population continued to decentralize between 1986 and 1995 as illustrated in Exhibit 10.

EXHIBIT 10 - NCR POPULATION BY DISTRICT - 1986, 1991, 1996  
(Statistics Canada Census Figures)

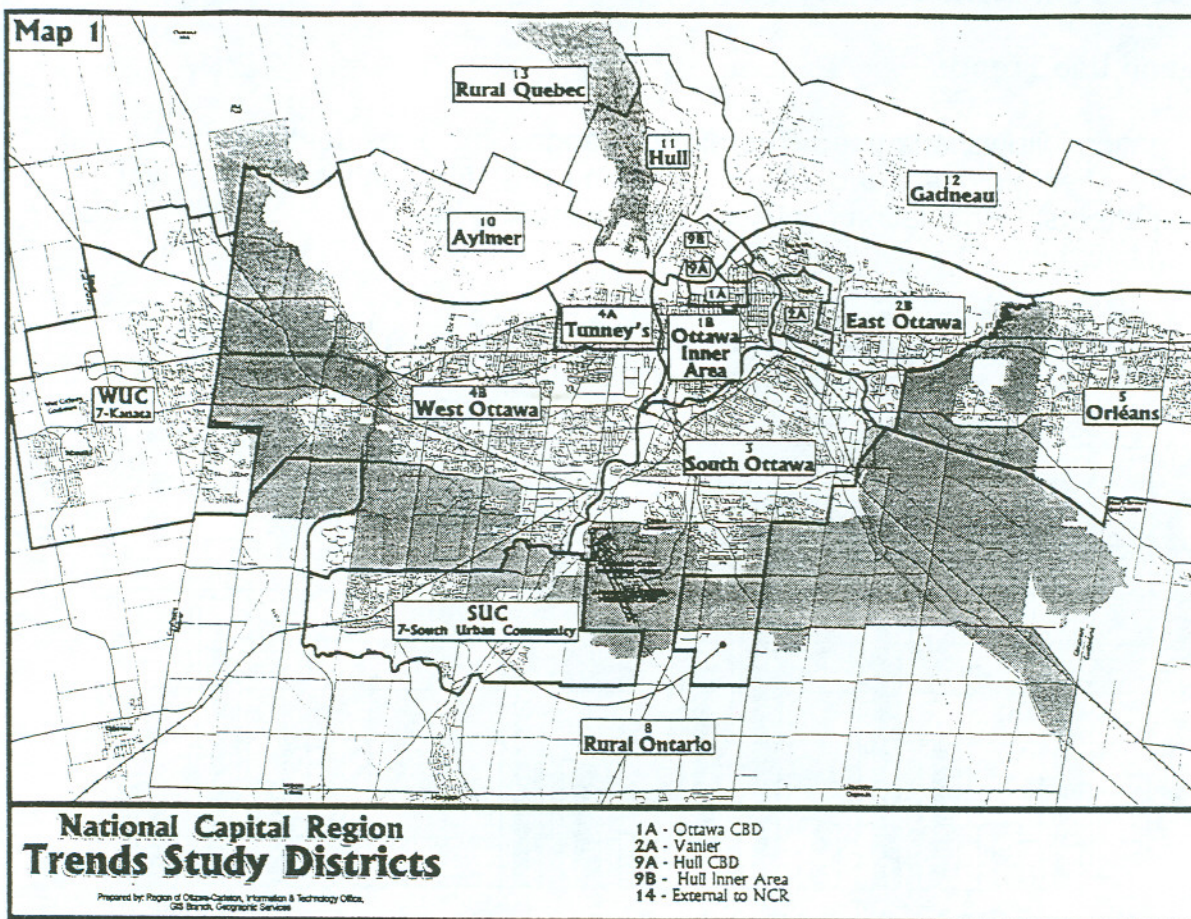


Population growth in the 1986 to 1996 period was concentrated in the newer suburban districts of South Ottawa, Orleans, SUC, WUC, Gatineau and Rural Ontario and Quebec. The location and extent of each area is shown on Map 1.

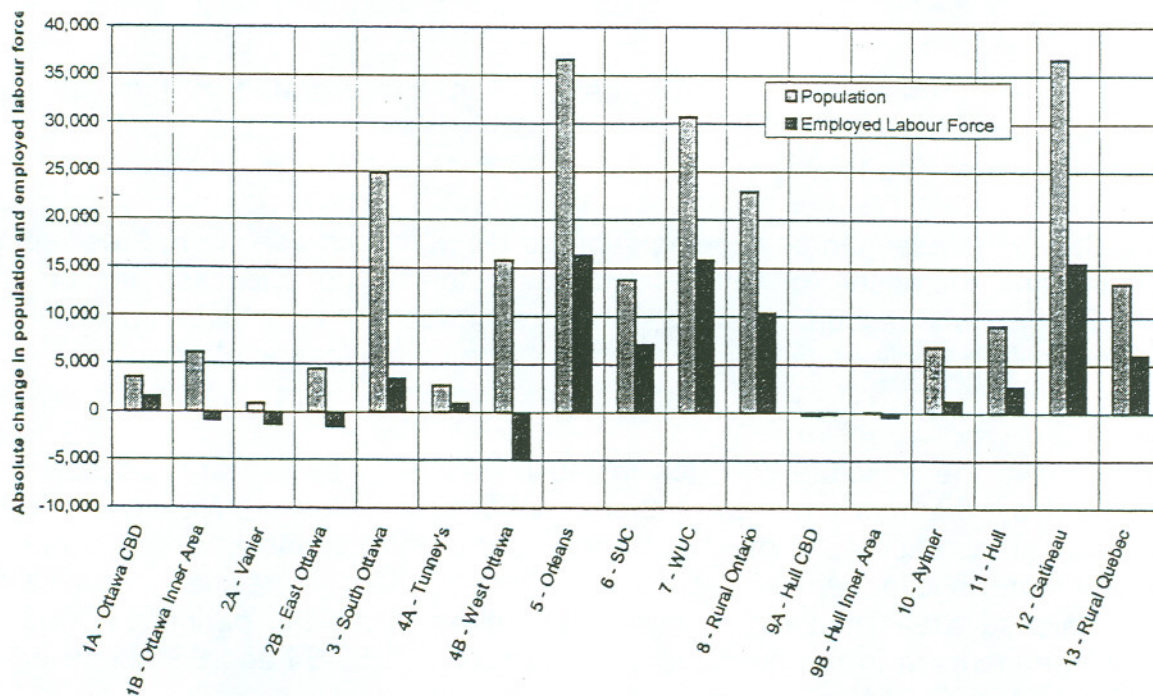
While population increases in developing suburbs result in increases in the resident labour force, and increases in work-related travel, this is not the case in some established urban and suburban areas, where socio-economic and demographic factors can result in declines in resident workers, even when the total population is increasing.

Exhibit 11 shows the absolute changes in the numbers of people and employed residents (employed labour force) by district of residence. Despite increases in the populations of areas such as Vanier, East Ottawa and, most notably, West Ottawa, these mature areas experienced reductions in the number of resident workers. These established areas had high numbers of retirees over the period 1986-95, because of the increase in the numbers of residents aged 55-64 and 65+ between





**EXHIBIT 11 - 1986-1995 CHANGE IN POPULATION AND EMPLOYED LABOUR FORCE  
BY DISTRICT OF RESIDENCE (based on TRANS O-D surveys)**

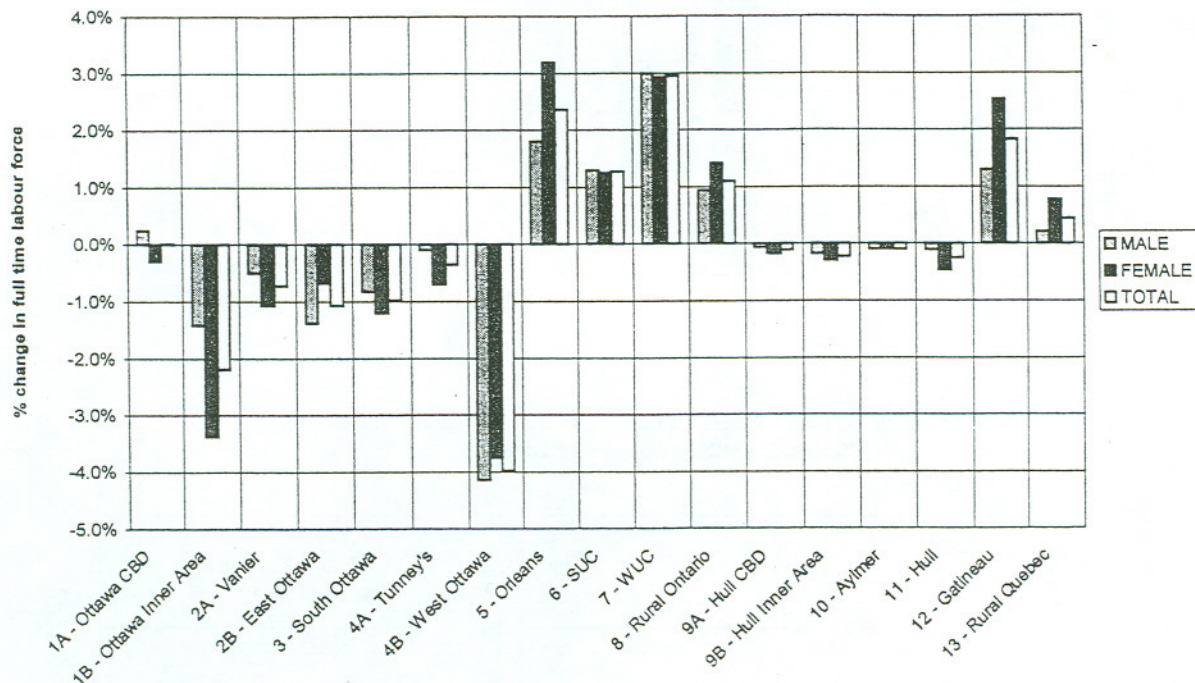




1986-1995 and job losses resulting from Federal government downsizing in the 1994-95 period. The 1986 TRANS O-D Survey shows that many of the residents of these mature suburban areas had worked in Downtown Ottawa and in other areas that experienced job losses prior to 1995.

Exhibit 12 shows related percentage changes in the numbers of full time workers living in each district. Over the period 1986 to 1995, the survey data show that the number of full time labour force at place of residence fell in Ottawa districts within the Greenbelt and in all of Hull and Aylmer, and increased in the outer suburbs of the RMOC and in Gatineau.

EXHIBIT 12 - 1986-1995 CHANGE IN FULL-TIME LABOUR FORCE BY DISTRICT OF RESIDENCE AND GENDER (Percent Change by District based on TRANS O-D Surveys)



Employment opportunities also decentralized between 1986 and 1995 as government employment declined in the inner cities, but continued to increase in West Ottawa and the Kanata area (WUC), with the growth of high-tech industries. Exhibit 13A shows changes in full-time employment (at place of work) over the 1986 to 1996 period for the RMOC. Similar employment survey data were not available for the CUO, unfortunately.

The employment survey data for 1986, 1991 and 1996 shows the impact of the job losses experienced primarily as a result of Federal Government cutbacks that took place in the NCR starting in 1994. While employment continued to grow in developing suburban areas such as West Ottawa, Orleans and Kanata (WUC) over the entire period (see Ex. 13A, for districts 5, 6 and 7), the Ottawa CBD, Ottawa Inner Area and the Tunney's Pasture area all saw employment declines after 1991 (districts 1A, 1B and 4A). The largest decline was in the Ottawa CBD, which saw employment fall below 1986 levels.



EXHIBIT13A - RMOC FULL-TIME EMPLOYMENT BY DISTRICT 1986-91-96  
(Source: RMOC Employment Surveys)

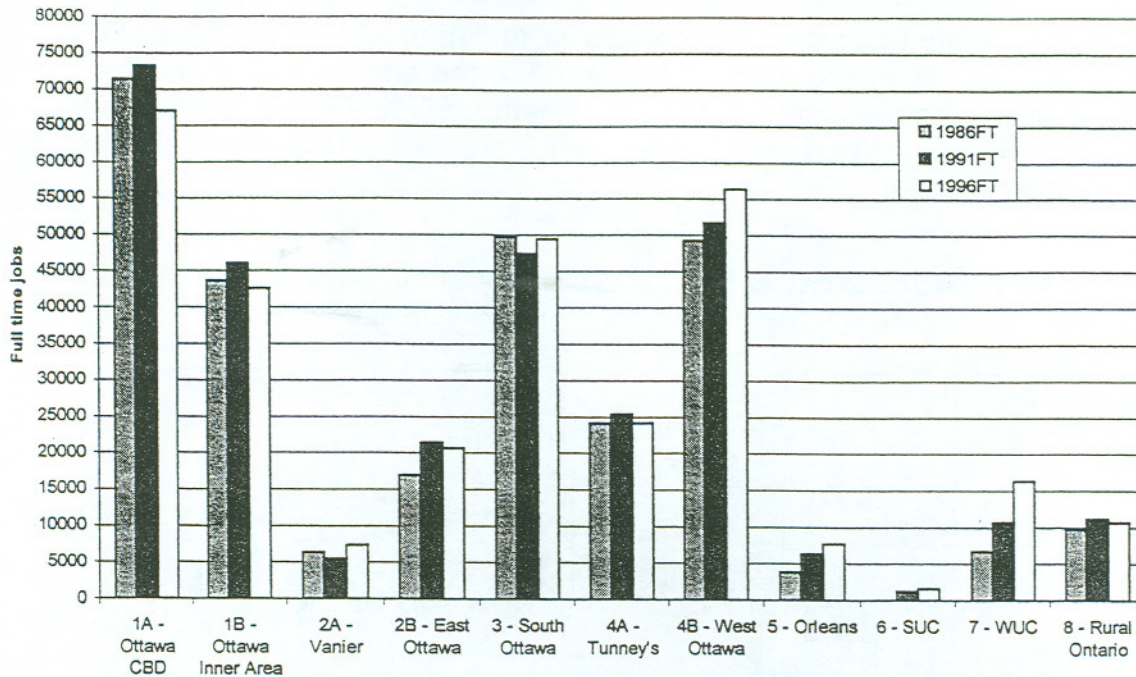


Exhibit 13B RMOC PART TIME EMPLOYMENT BY DISTRICT 1986-91-96  
(Source: RMOC Employment Surveys)

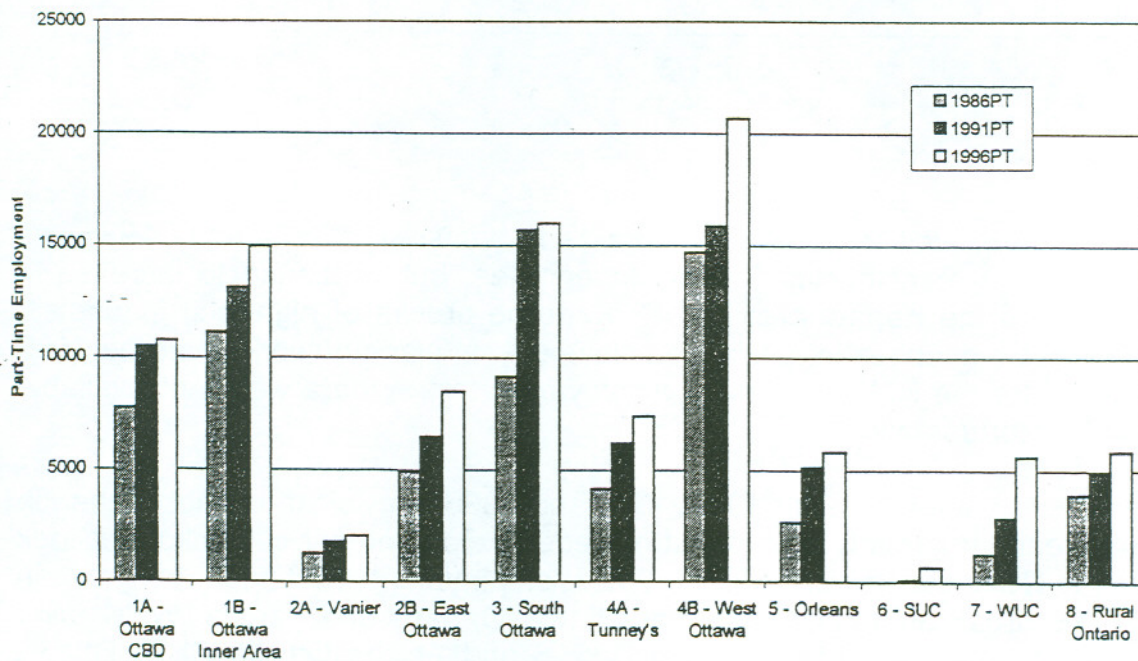


Exhibit 13B shows the growth in part-time employment. While full time employment generally declined in the inner city districts, part-time employment increased. At the



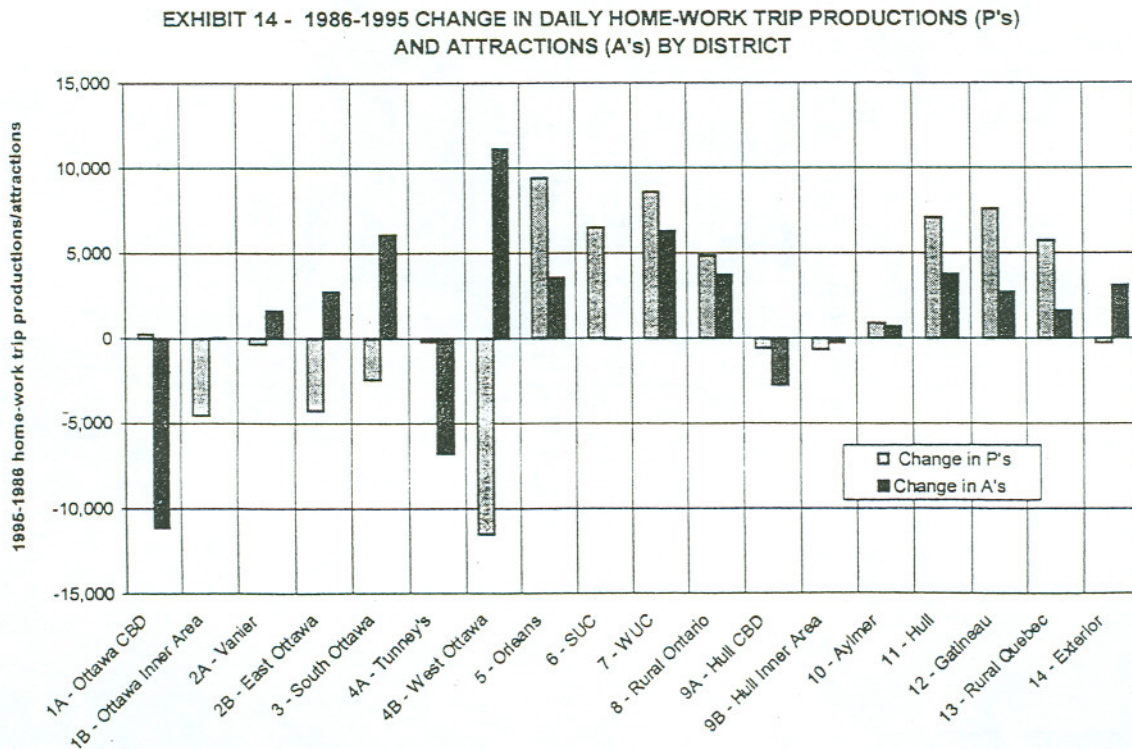
same time, significant part-time employment growth was experienced in suburban districts. For example, District 4B, West Ottawa, saw as many part-time jobs created between 1991 and 1996, as full-time jobs.

### 3.3.2 Related Changes in Trip Making and Travel Patterns

The changes in population, labour force and employment documented in Exhibits 10 to 13B had a direct impact on trip generation and travel patterns as illustrated in Exhibits 14-21.

#### Work Trip Productions

In general, the patterns of change for trip productions shown in Exhibit 14 are consistent with the changes in the resident labour force shown in Exhibit 11, with some notable exceptions. For example, the labour force and trip production data for West Ottawa and Gatineau are not consistent in terms of magnitude. Whereas the estimated West Ottawa employed labour force fell by about 5000, as shown in Exhibit 11, the home-work trip productions fell by almost 12,000, as shown in Exhibit 14. In the Gatineau case a 15,000 increase in employed labour force resulted in a 7,000 increase in work trip productions. This result suggests that West Ottawa lost a high proportion of full-time jobs while a large proportion of the employed labour force increase in Gatineau was employed in part-time jobs.

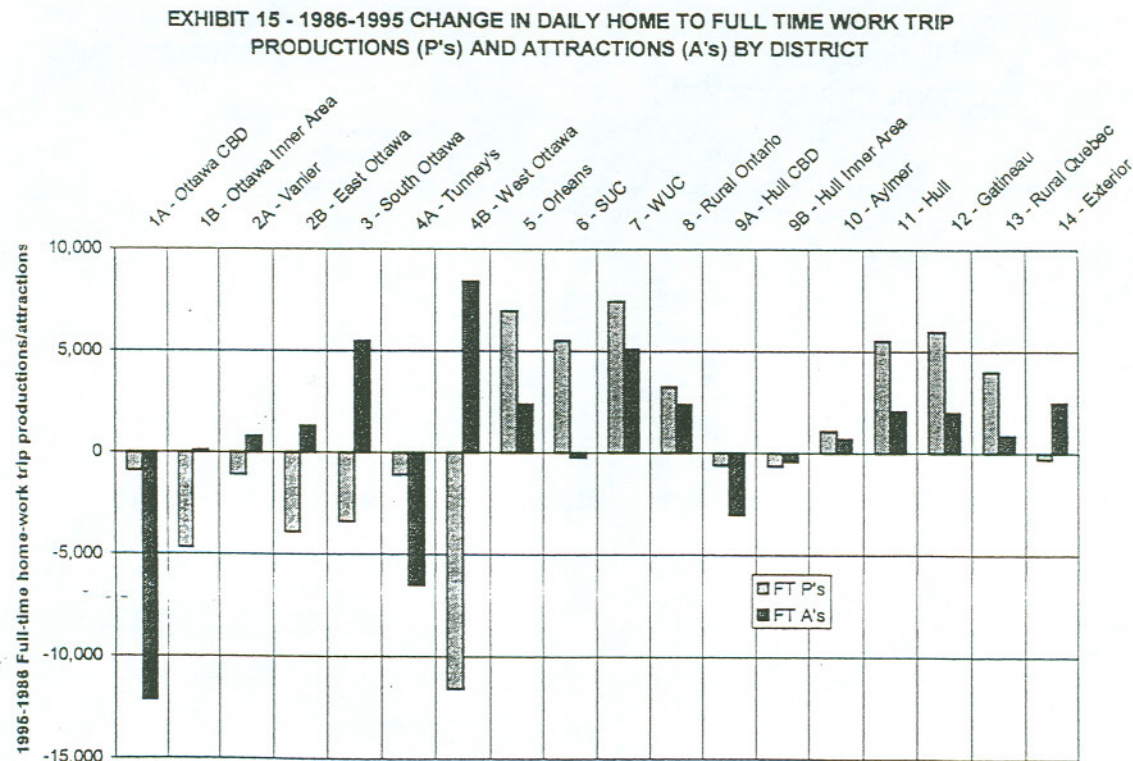




## Work Trip Attractions

Focusing on the trip attraction data shown on Exhibit 14, there were large declines in the number of trips destined for the Ottawa CBD, Tunney's Pasture and the Hull CBD. At the same time, there were large increases in the number of trips destined for South Ottawa, West Ottawa, the WUC and Rural Ontario, areas that experienced employment increases. While the O-D survey results for daily home to work trip attractions are generally consistent with the available employment survey data (for RMOC), the relative magnitudes of the changes in travel differ somewhat from what would be expected based on the employment surveys. For example, while the decline in CBD work trips is consistent with the available employment data (Exhibit 13A), this is not the case for Tunney's Pasture where the decline in work trip attractions was not consistent with the employment data, which shows that full-time employment did not decline and part-time employment increased.<sup>8</sup>

Exhibit 15 shows the magnitude of the changes in work trip productions and attractions for full-time workers by district. Despite the growth in part-time



<sup>8</sup> Such discrepancies are to be expected, given that the O-D surveys sampled approximately 5 percent of urban households whereas the RMOC employment survey data are based on surveys that included all of the Region's known businesses. Therefore, the O-D surveys are subject to sampling variability that will result in some inconsistencies with employment survey information for individual districts.



employment between 1986-1996, work travel patterns continue to be dominated by full-time workers, as demonstrated by comparing Exhibits 14 and 15, and full time work trips define peak period travel requirements , as shown in Exhibit 9,

### **Changes in Travel Patterns**

The estimated changes in trip productions and attractions and the related changes in the distribution of population, labour force and employment resulted in substantial changes to travel patterns across the NCR. Exhibits 16 to 19 show the changes in daily full-time work trips to the Ottawa CBD, West Ottawa, WUC (Kanata) and Hull CBD by origin district.

The Ottawa CBD experienced a 12,000, or 20%, decline in FT work trips attracted between 1986 and 1995. The largest declines in work travel to the Ottawa CBD were from West Ottawa (-5000), South Ottawa (-2300) and East Ottawa (-2200), as shown in Exhibit 15. During the same period there were small increase in work travel to the Ottawa CBD from suburban areas outside the Greenbelt and from the suburban areas of the CUO.

West Ottawa, an employment area with as many jobs as the CBD in 1995, experienced an 8,400 or 23% increase in work trips. This area attracted the largest increases in full time work travel from RMOC residential areas outside the Greenbelt, including Orleans, SUC and from the WUC (Kanata), as shown in Exhibit 16. Despite the growth in local employment opportunities, the number of local residents working in West Ottawa declined as the size of the local labour force declined.

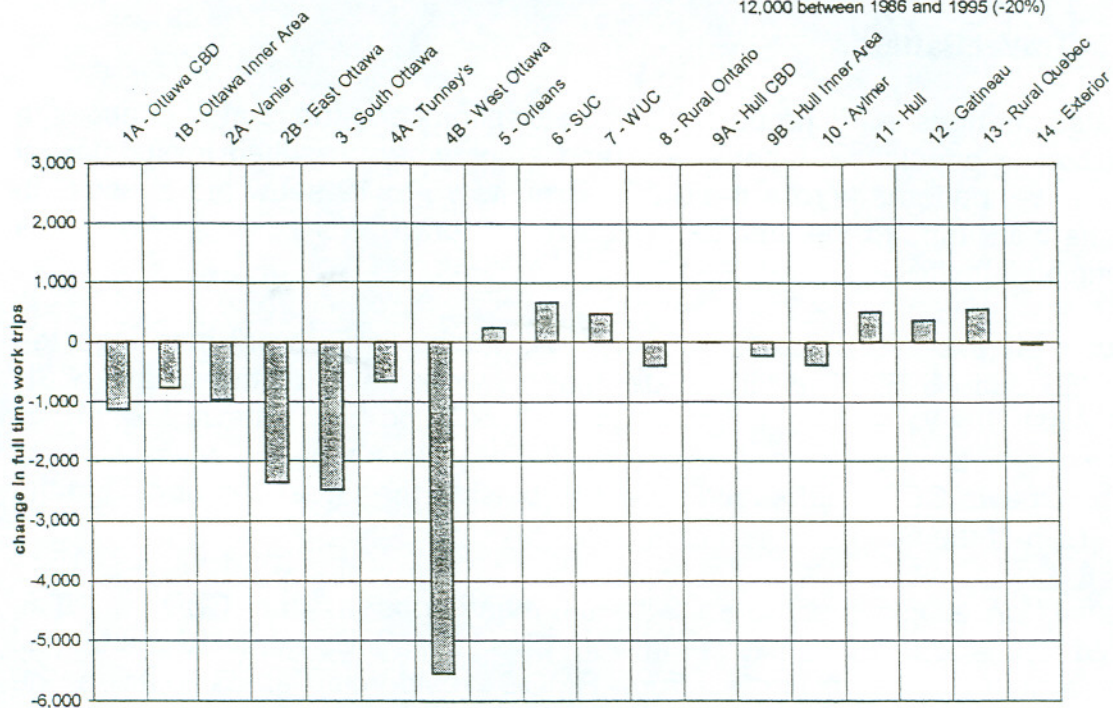
The WUC experienced a 95% increase in work trips attracted between 1986 and 1995, an increase of 5000 work trips attracted to Kanata. The largest increases in work travel to the WUC originated in the Kanata area, with most of the remaining work trips coming from West Ottawa and Rural Ontario, as shown in Exhibit 18.

The Hull CBD, which like the Ottawa CBD experienced job losses related to Federal Government cutbacks, saw a decline of 3,000 work trips attracted (18% of the 1986 value). Despite this decline, the Hull CBD experienced small increases in work travel from Gatineau and Rural Quebec, but large declines in travel from Inner Ottawa, East Ottawa, West Ottawa and from the Hull CBD, as shown in Exhibit 19.



**EXHIBIT 16 - CHANGES IN DAILY FULL-TIME WORK TRIPS TO OTTAWA CBD  
BY ORIGIN DISTRICT**

FT work trips to Ottawa CBD declined by 12,000 between 1986 and 1995 (-20%)



**EXHIBIT 17 - CHANGES IN DAILY FT WORK TRIPS TO  
WEST OTTAWA BY ORIGIN DISTRICT**

FT Work trips to West Ottawa increased by 8,400 or 23% between 1986 and 1995

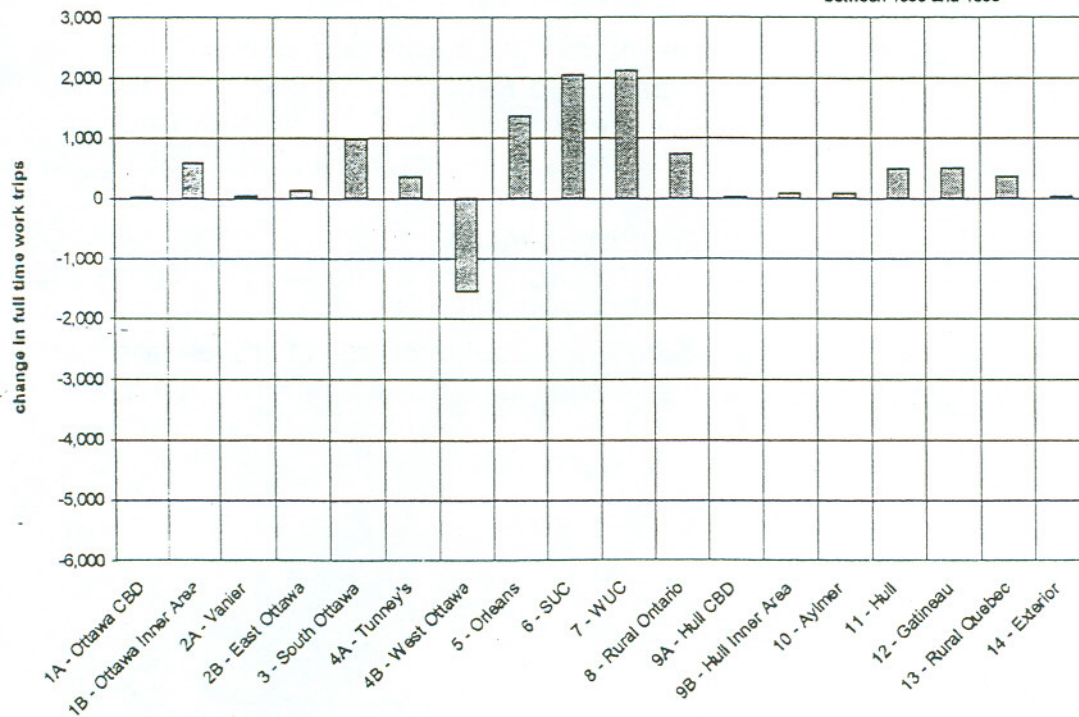




Exhibit 18 - CHANGE IN DAILY FT WORK TRIPS TO WUC (KANATA) BY ORIGIN DISTRICT

FT Work trips to WUC increased by 5,000 or 95% between 1986 and 1995

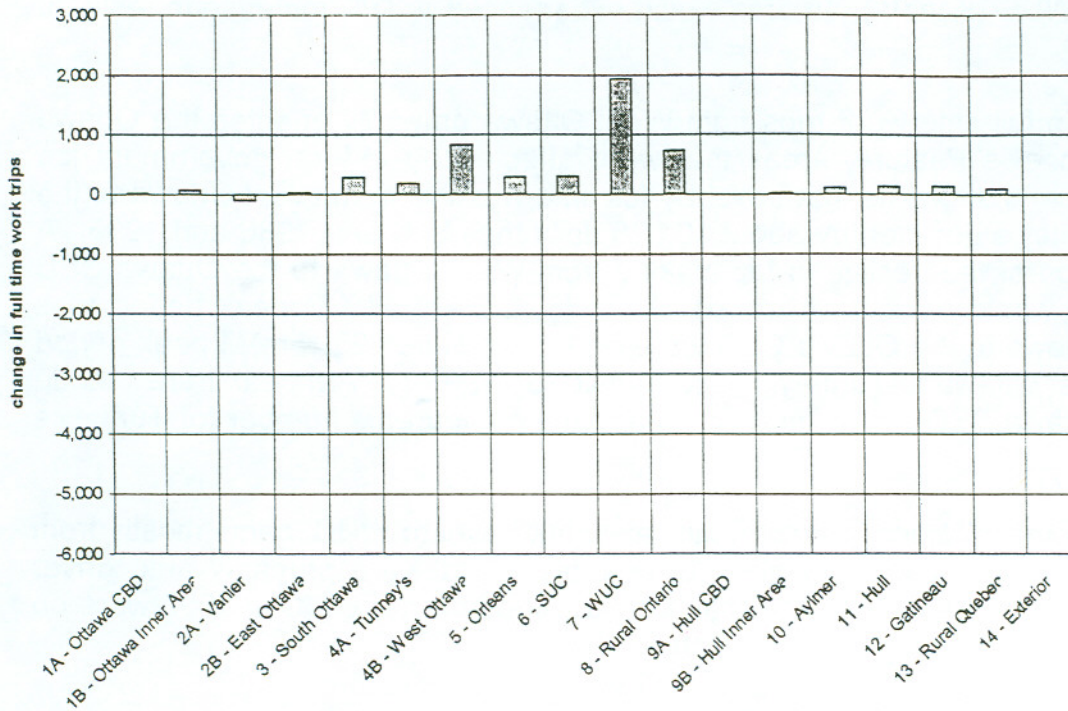


EXHIBIT 19- CHANGES IN DAILY FT WORK TRIPS TO HULL CBD BY ORIGIN DISTRICT

FT Work Trips to Hull CBD declined by 3,000 or 18% between 1986 and 1995

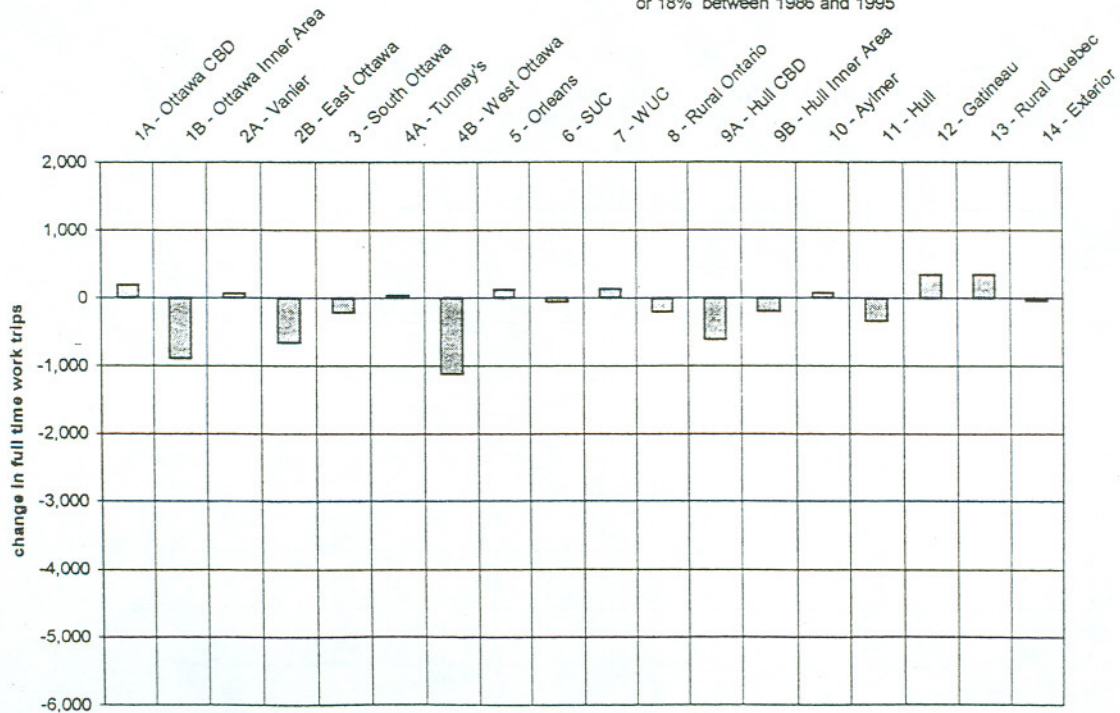
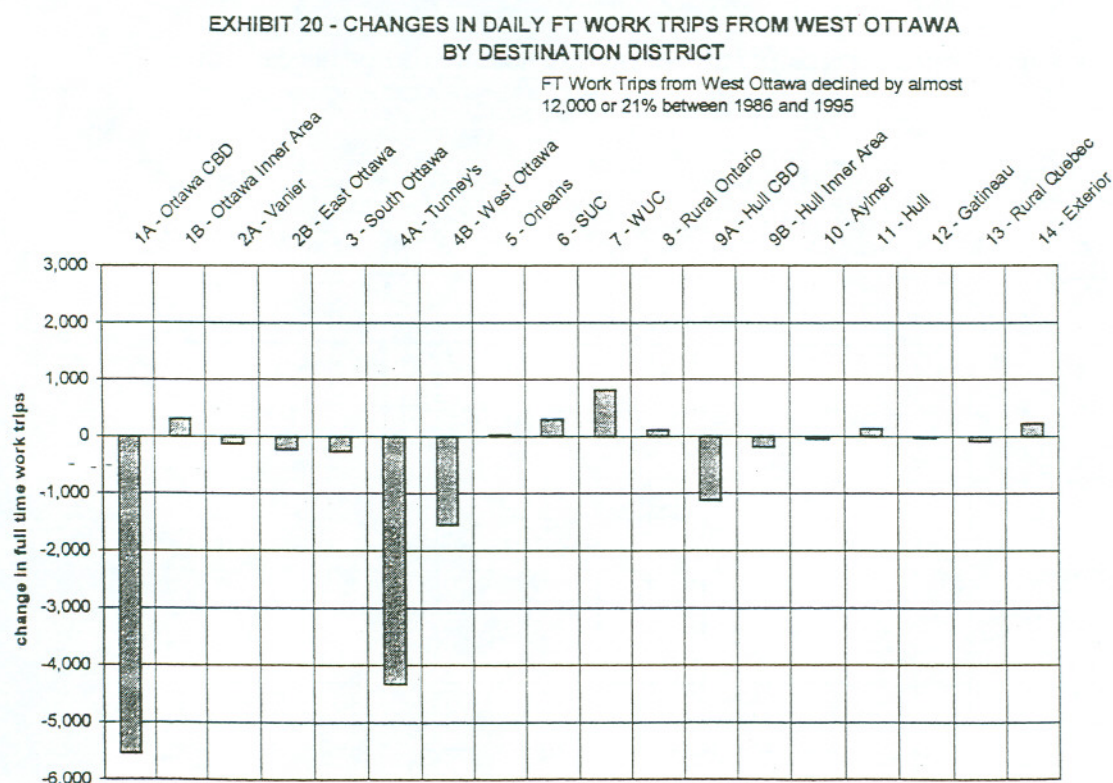




Exhibit 20 and 21 illustrate the changes in full-time work trips to all destinations from West Ottawa, a large area<sup>9</sup> that experienced a 21% decline in resident full time workers, and WUC (Kanata), an area which experienced a 67% increase in resident labour force.

The declines in full time work trips from West Ottawa primarily effected the Ottawa CBD and Tunney's Pasture, areas that were affected by federal government job losses. Exhibit 20 suggests that travel by full time workers from West Ottawa to the CBD and Tunney's declined by about 10,000 daily trips between 1986 and 1995. A large proportion of the decline in trip making from West Ottawa to the Ottawa CBD and Tunney's would have used transit. In 1986, 67% of all AM peak period trips from West Ottawa to the Ottawa CBD were on transit while 32% of AM peak period trips from West Ottawa to Tunney's used transit. By 1995 the AM peak transit mode split to the Ottawa CBD had fallen to 52% and the comparable number for Tunney's was 22%.

As shown in Exhibit 21, the growth of full time work travel to WUC, came mostly from the Kanata area, West Ottawa and South Ottawa and were primarily auto driver trips. Less than 10 percent of AM peak trips destined for the WUC in 1995 were on transit.



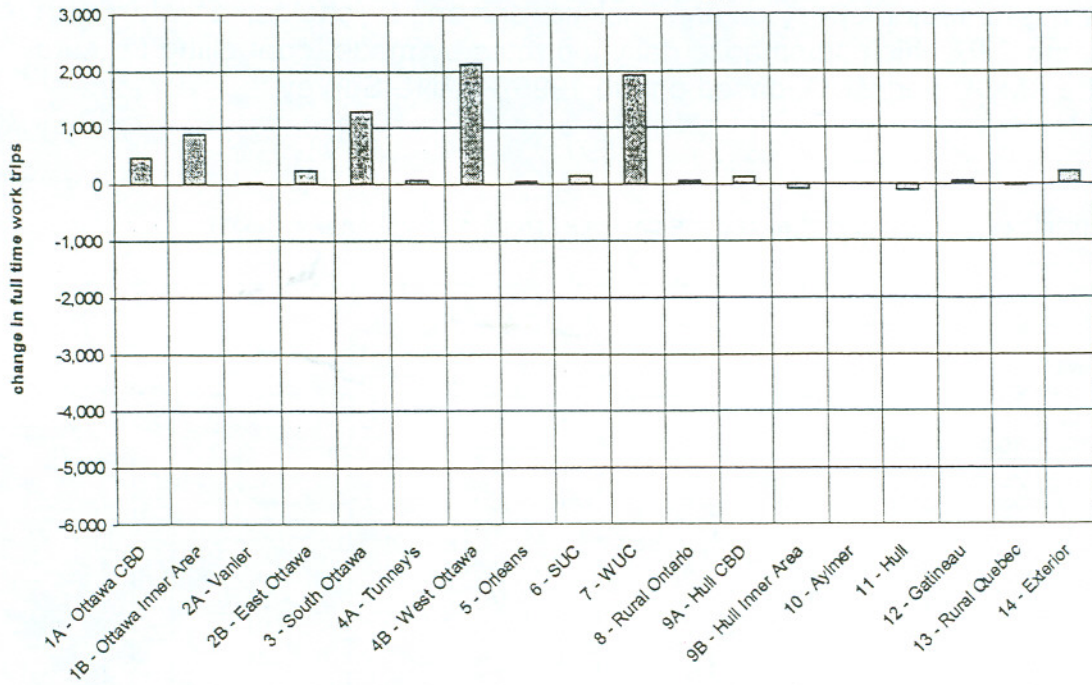
<sup>9</sup> Note that West Ottawa is the largest single residential district in the NCR accounting for 17% of the NCR population in 1995.



# EXHIBIT 21 - CHANGES IN DAILY FT WORK TRIPS FROM WUC (KANATA)

## BY DESTINATION DISTRICT

FT Work Trips from WUC increased by 7,500 or 67%

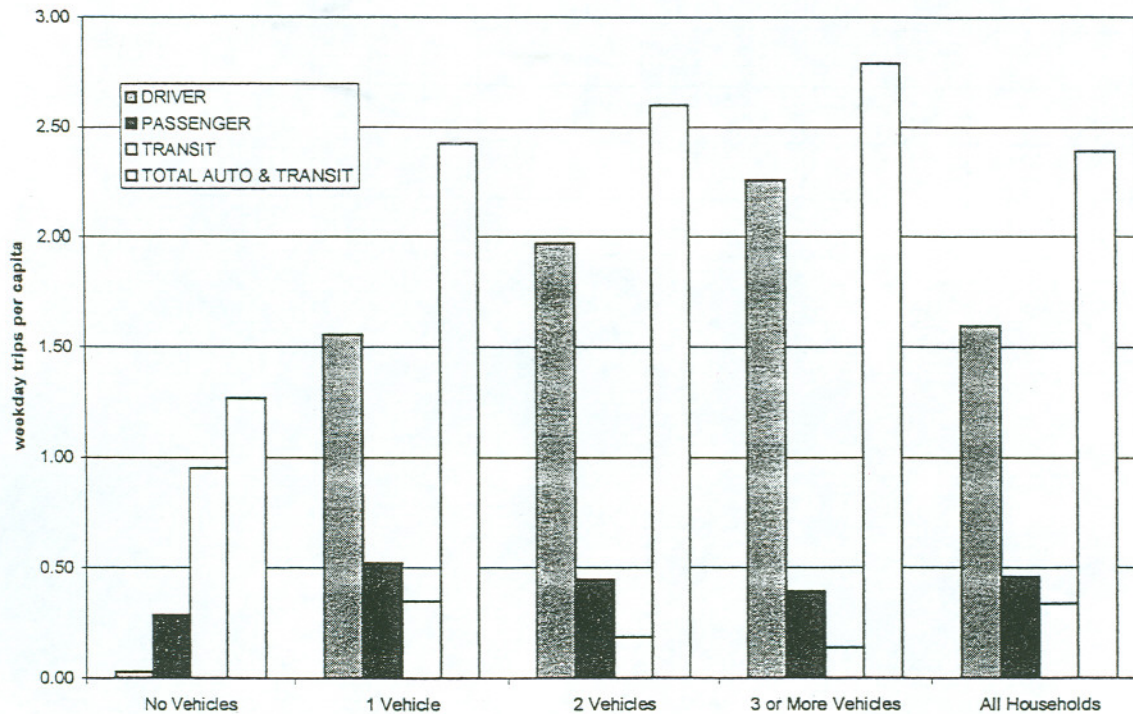




### 3.4 Auto Availability and Access

Auto access has a major effect on trip making and mode choice, as shown in Exhibits 22A and 22B which summarize daily trip rates by mode, controlling for auto access, for the RMO and CUO, based on the 1995 TRANS Survey.

EXHIBIT 22A - 1995 RMO TRIP RATES PER CAPITA BY MODE AND AUTO AVAILABILITY



Despite the socio-economic differences between Ontario and Quebec parts of the NCR, both exhibits show similar patterns of variation with total trip rates being lowest and transit use being highest for zero car households. In contrast, 3 car households have the highest mobility and the lowest transit use. As of 1995, 11 percent of the RMO population lived in households without a car (or personal use vehicle), 45 percent had access to one car, 36 percent had access to two cars and 8 percent had access to 3 or more vehicles. For the CUO, the comparable percentages are 9%, 49%, 36% and 7%. The average cars per household reported in the 1986 and 1995 TRANS O-D Surveys was about 0.45 for the NCR, but there is some indication that auto availability did change over the nine years between the survey. As shown in



EXHIBIT 22B - 1995 CUO TRIP RATES PER CAPITA BY MODE AND AUTO AVAILABILITY

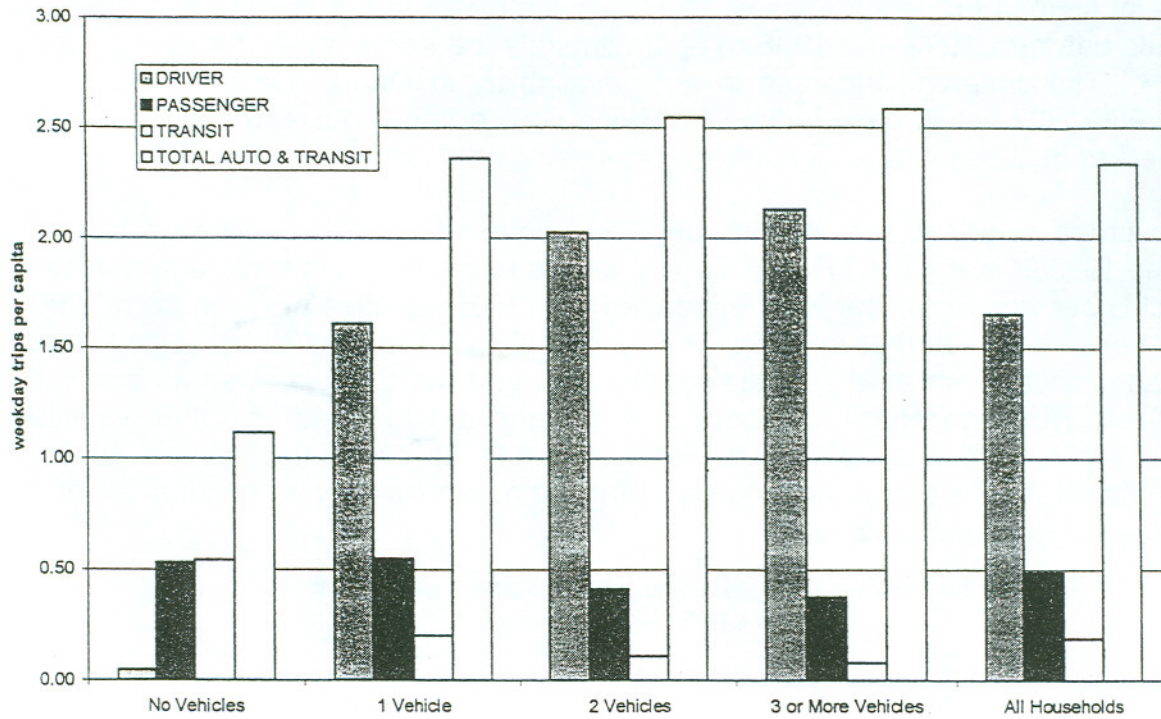


EXHIBIT 23 - PASSENGER VEHICLES PER CAPITA  
(Regional Municipality of Ottawa-Carleton)

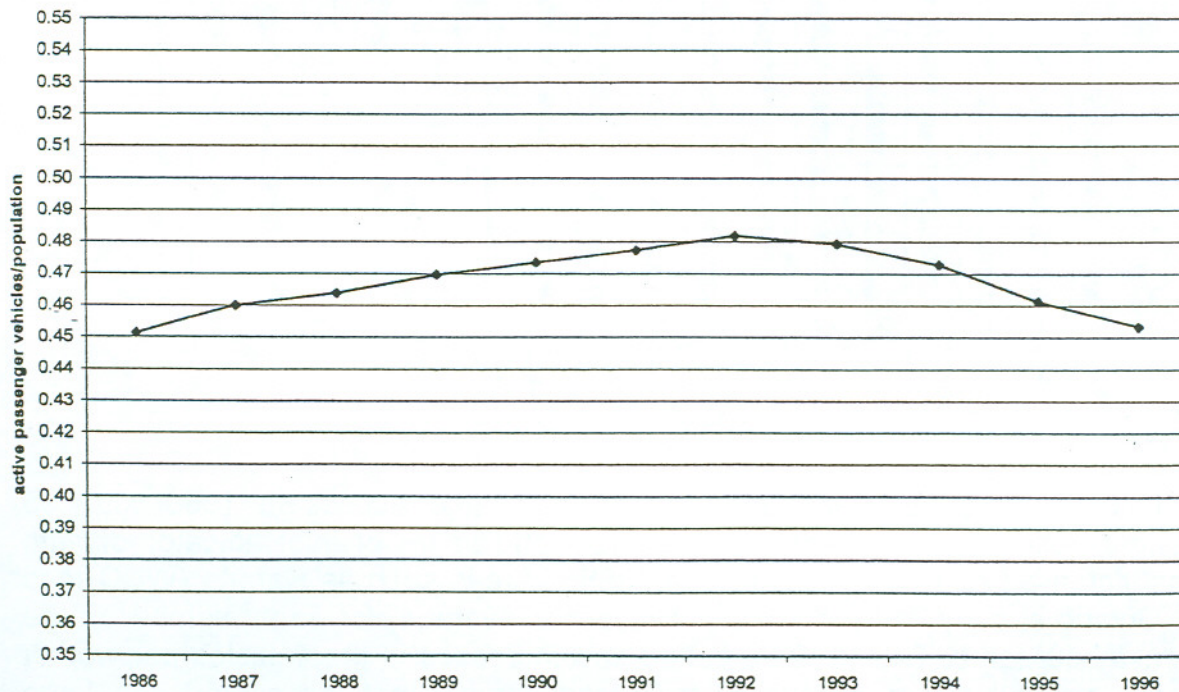
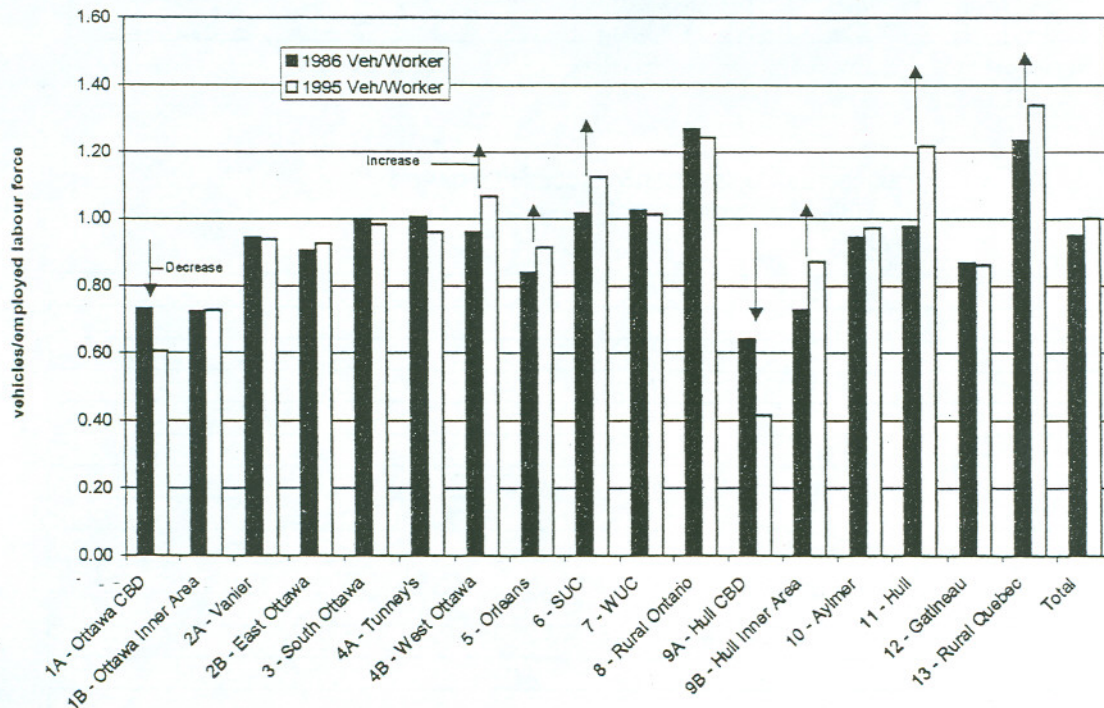




Exhibit 23, passenger vehicles per capita increased in the RMOC between 1986 1992 from .45 to .48 (and increase of 7%) followed by a drop in passenger vehicles per capita between 1992 and 1996 to approximately the same level of was reported for 1986. The observed increase in auto availability in Ottawa-Carleton over the period 1986-1992 would have influenced mode choice behaviour and contributed to the observed decline in transit's market share.

While average personal use vehicles per household did not change, based on the 1986 and 1995/96 data, the TRANS Survey results suggest that the average number of vehicles per worker for the NCR increased from 0.95 vehicles per worker in 1986 to 1.00 vehicles per worker in 1995. The TRANS O-D survey data indicate that suburban districts such as West Ottawa, Orleans, and the SUC, as well as the Hull Inner Area, Hull and Rural Quebec all experienced increases in other vehicle availability per worker, as shown in Exhibit 24. Inner city districts such as the Ottawa and Hull CBDs experienced declining auto availability per resident worker during the same period, as shown.

EXHIBIT 24 - 1986 AND 1995 VEHICLES PER WORKER BY DISTRICT  
(1986 and 1995 TRANS O-D Survey)



The National Capital Region had relatively high auto access in 1986 with .95 passenger vehicles per worker, on average. The value of this indicator of auto access increased to 1 car per worker in 1995. Areas such as Kanata (WUC) and Rural Ontario already had more than one car, on average, for each member of the resident labour force. The 1986-95 period saw increases in the vehicles per worker indicator, particularly in suburban residential areas that accounted for large increases in travel demand, such as Orleans and the South Urban Centre, or large declines in transit riding, such as West Ottawa.



While significant, changes in vehicle access are not as important in explaining observed changes in travel behaviour as Employment-Related Factors and Trends (Section 3.2) or Location and Land Use Factors (Section 3.3).

### **3.5 Auto and Transit Service and Cost Factors**

A variety of transit and auto cost and level of service factors were considered, as outlined in Sections 3.5.1 and 3.5.2. The depth of this review was limited by the available data.

#### **3.5.1 Transit Costs and Levels of Service**

This section discusses the influence of transit cost and service changes on the observed declines in transit ridership and mode split. This analysis was limited by the available data on transit service changes. Neither O-C Transpo nor the STO were able to provide specific information on service changes over the period. Therefore, the analysis of transit service was based on urban bus km operated, a crude measure of level of service. Exhibits 25 and 26 summarize data by year for the period 1986 to 1998 related to annual ridership and fare revenue and urban bus km for O-C Transpo and the STO.

O-C Transpo ridership fell by 10 percent between 1986 and 1995, from more than 80 million rides per annum to approximately 72 million. Ottawa area ridership only showed signs of recovery after 1996.<sup>10</sup>

O-C Transpo Ridership started to decline in absolute terms after 1990, despite increases in the number of service kilometres operated over the period 1986 to 1992. This suggests that non-service factors reduced ridership after 1990, necessitating reductions in service levels.

STO ridership started to decline in 1989 but this decline was reversed after 1993. By 1998 reported annual ridership for the CUO exceeded the levels achieved in the 1986-1988 period. Despite the growth in the CUO, STO urban bus kilometres generally declined over the period 1986 to 1997. However, once again, the decline in ridership appears to have preceded (and exceeded) the reduction in service km, suggesting that non-service factors acted to reduce ridership and revenues, necessitating service reductions.

In order to better understand changes in O-C Transpo and STO ridership over the 1986-1998 period, Exhibits 27A and 27B summarize changes in annual rides per capita per annum, a standard Transit industry measure of market penetration, for each agency.

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<sup>10</sup> The low 1996 annual ridership figure of 65 million was the result of a 24 day strike, and should not be considered as part of the underlying ridership trend for O-C Transpo.



## O-C Transpo Ridership

O-C Transpo ridership per capita fell continuously over the period 1987 to 1995, as shown in Exhibit 27A. The change in O-C Transpo fare policy, in 1987, and the introduction of higher peak fares, was identified by staff as a possible factor in explaining the ridership losses observed over the 1987-95 period. The impact of fare increases on the observed declines in ridership in the RMOC was assessed by comparing trends in per capita ridership (Exhibit 27A) with trends in average fares

EXHIBIT 25 - TRENDS IN O-C TRANSPOR RIDERSHIP, REVENUE AND SERVICE KM

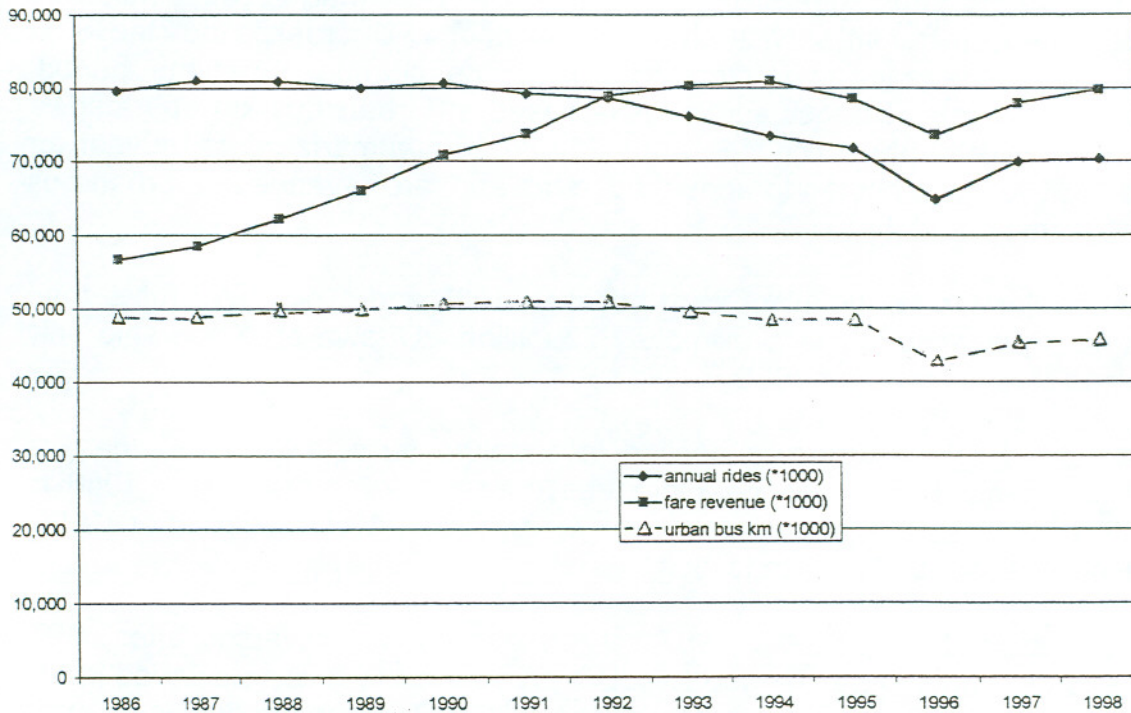




EXHIBIT 26 - TRENDS IN STO RIDERSHIP, REVENUE AND SERVICE KM

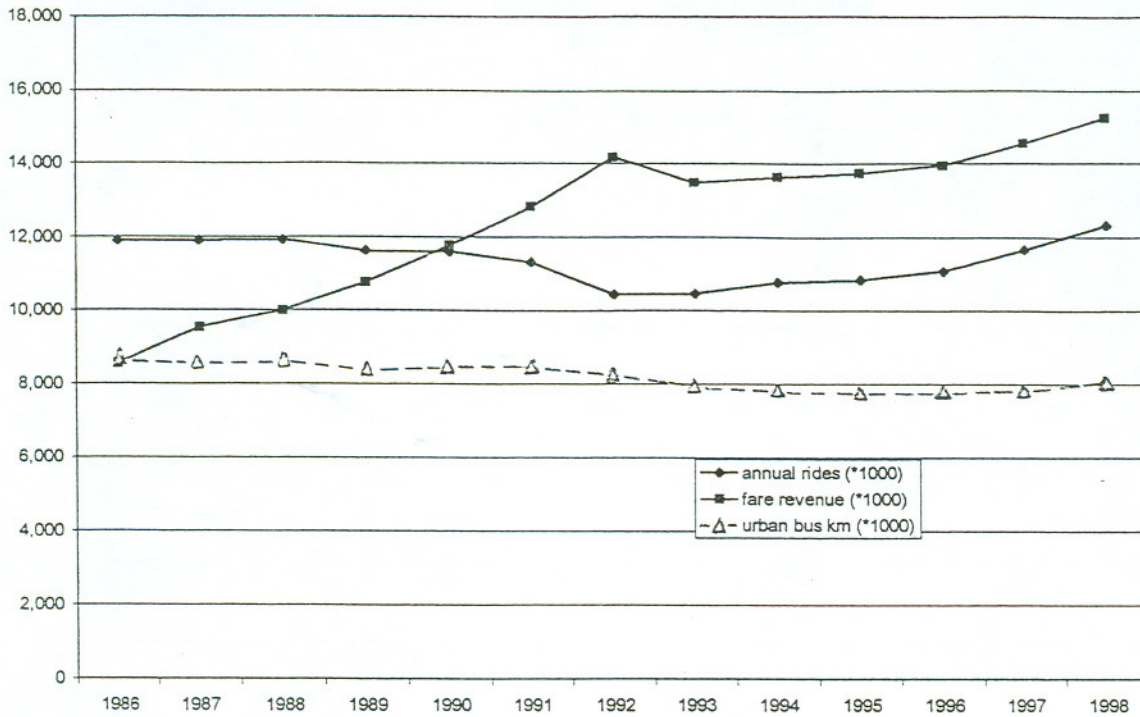


EXHIBIT 27A - O-C TRANSPOR RIDERSHIP TRENDS  
(annual rides per capita)

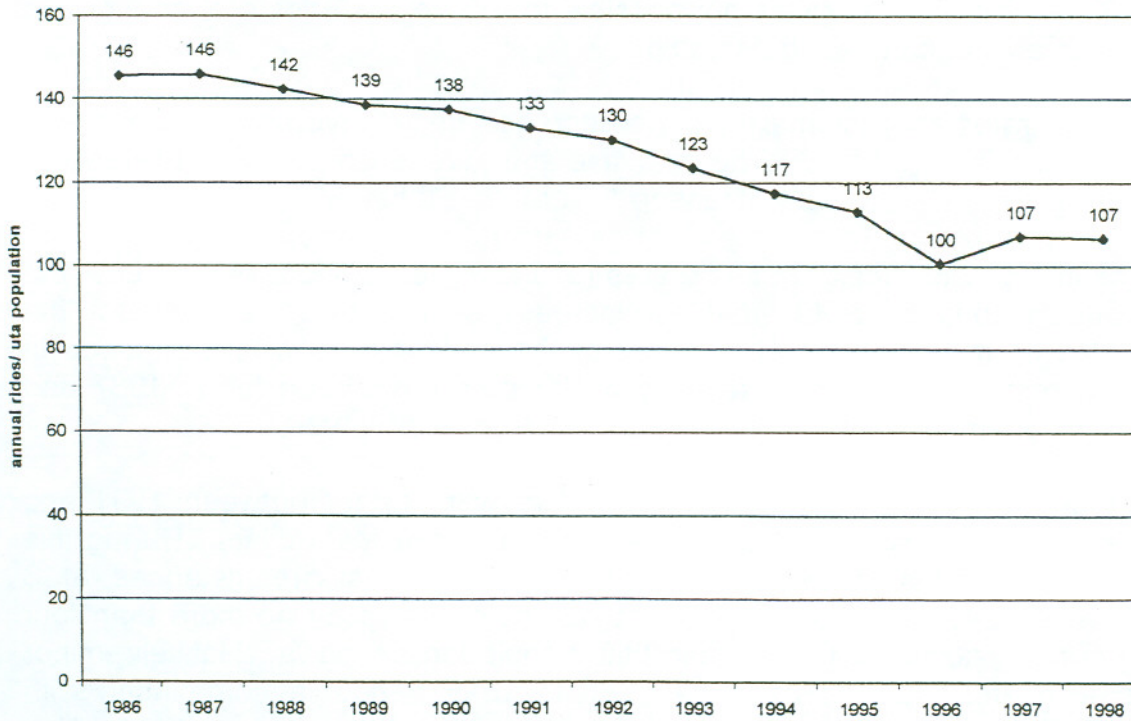
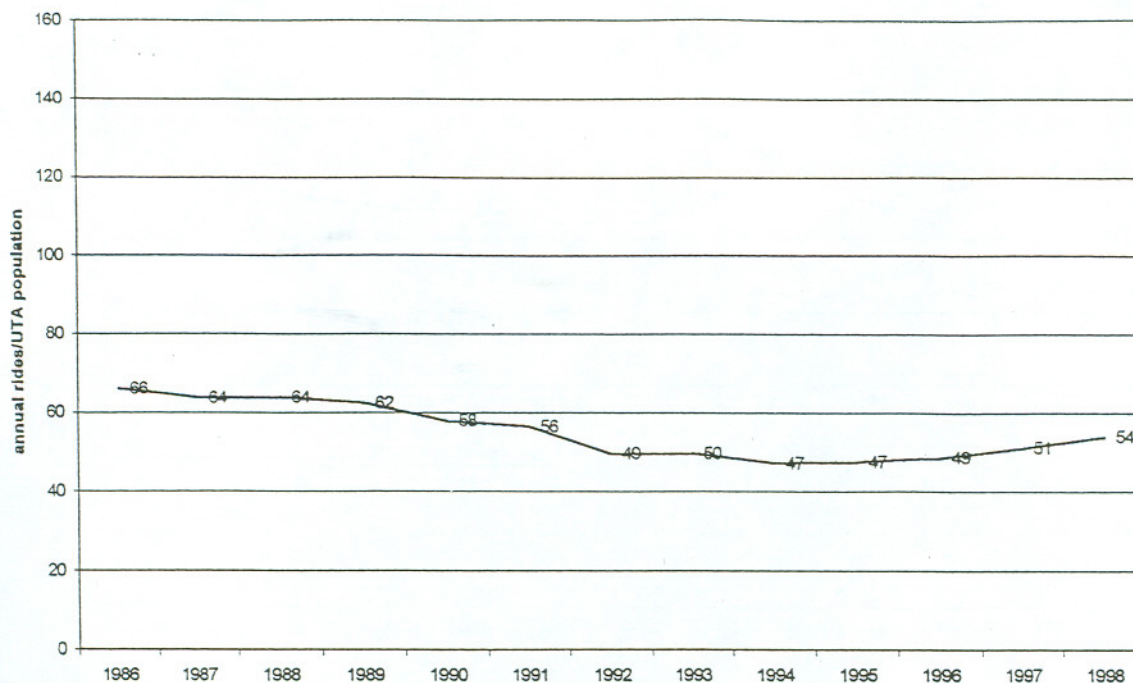




Exhibit 27B - STO RIDERSHIP TRENDS  
(annual rides per capita)



(Exhibit 28). Unfortunately, it was not possible to isolate the effects of changes in peak period fares on peak period ridership.

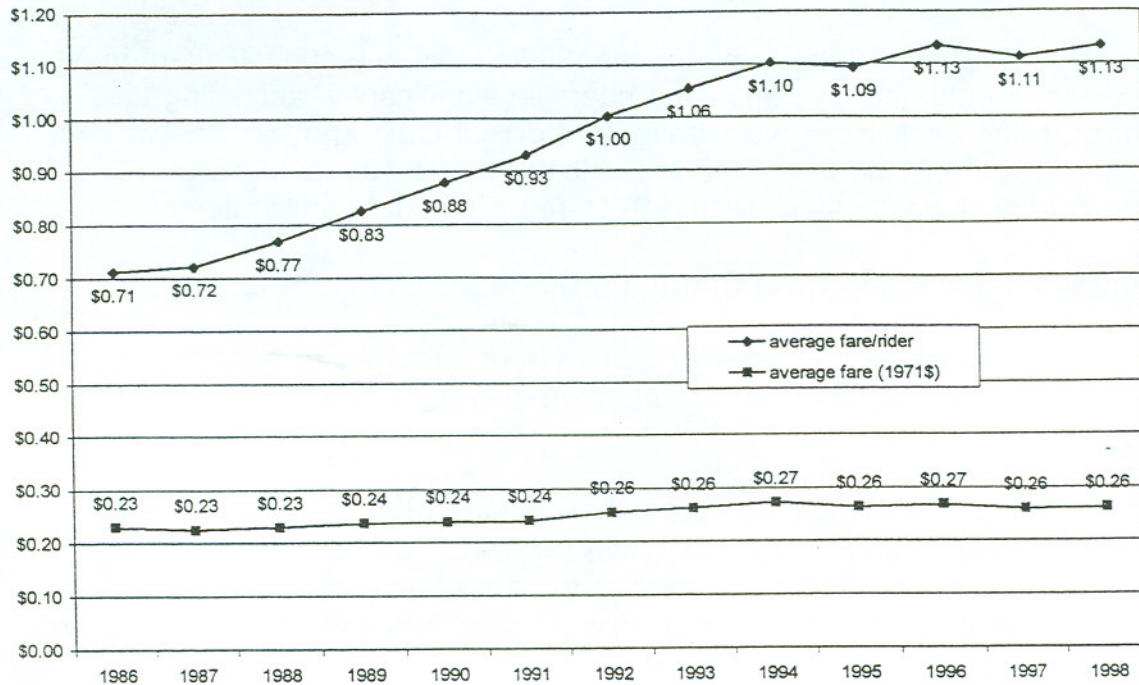
Exhibit 28 illustrates the nominal and real increase in the average O-C Transpo transit fare over this period. The real average fare estimate is expressed in 1971 dollars as per published O-C Transpo "Operating Statistics".

Despite the introduction of higher peak fares (and lower off-peak fares) in 1987, the average fare in constant dollars did not increase sufficiently to account for the observed decline in ridership. The impact of the new fare policies introduced in 1987 on the cost of peak period travel to work would have been felt in 1987 and 1988, before the largest declines in transit ridership were observed.

Real increases in the O-C Transpo average fare were larger between 1991 and 1994, when they increased by approximately 13 percent in real dollars. During this time period annual rideship fell by 12 percent. Under normal circumstances, a 13 percent fare increase would be expected to reduce ridership by no more than four percent. The available data suggest that transit fares had a relatively minor influence on ridership trends over the 1986 to 1995 period in comparison with Employment-Related Factors and Trends (Section 3.2), and Location and Land Use Factors (Section 3.3).



EXHIBIT 28 - O-C TRANSP0 AVERAGE FARE PER RIDE 1986 to 1998  
(in Nominal and 1971 Dollars)  
Source: O-C Transpo Operating Statistics



The decline in O-C Transpo ridership observed over the 1990-1995 period, reflects the recession and the previously discussed job losses in the CBD and Inner City and related travel pattern changes, rather than the effects of service cuts, per se. The reductions in service kilometres after 1992, followed the decline in ridership which started in 1991<sup>11</sup> and there is no direct evidence that the introduction of higher peak fares in 1987 had a significant independent influence on annual ridership figures.

### STO Ridership

STO (formerly CTCRO) services were restructured after 1988, to improve peak period services to key transit destinations and reduce service in low ridership periods. The service changes included the introduction of new express routes to Downtown Hull and Downtown Ottawa. As discussed in Section 3.1.2, Transit Trip Making; AM Peak transit mode splits increased for travel to the Hull CBD, Hull Inner Area, Hull and Gatineau between 1986 and 1995 (see Exhibit 3B). This suggests that the revised services were effective in attracting a higher proportion of peak travel. Despite this apparent success, total STO ridership in 1995 was lower than in

<sup>11</sup> This is not to say that O-C Transpo was able to maintain transit service levels in the developing suburban areas during the 1986-91 period. Failure to extend routes and improve services to growing areas would have limited potential ridership increases in these markets.



1986 because of the decline in total work-related travel destined for the Hull CBD and the Ottawa CBD.

The reductions in STO service kilometres after 1988 shown in Exhibit 26 were in off-peak periods and would not have impacted ridership significantly, according to STO staff. However, the declines in work travel to the Hull CBD and the Ottawa CBD discussed in Section 3.3 and illustrated in Exhibits 16 and 19 would have reduced travel to the key transit destinations for the STO, reducing total transit ridership.

### **3.5.2 Traffic Conditions, and Auto Operating Costs**

Three factors were considered in assessing the role of auto related service and cost factors on explaining the identified changes in travel behaviour (including the observed modal shift from transit to auto):

- changes in traffic conditions over the period 1986 to 1995, based on published data on traffic at various RMOC and CUO cordons,
- changes in auto operating costs, relative to transit fares, and
- parking-related costs, again based on published information, most of which applied to the RMOC only.

The analysis of these factors was limited by the extent and quality of the data provided by the participating agencies.

#### **Traffic Conditions**

Traffic conditions as measured at RMOC cordons, appear to mirror the observed economic trends. PM peak hour outbound autos peaked in 1992 at the Inner Area and Greenbelt cordons before declining. Therefore, there was generally less traffic in 1995 than in 1992 and 1992 was higher than 1986. This would have improved the competitive position of the auto, relative to transit after 1992, which would tend to increase the auto share of total trips at least in the RMOC. The exception to this generalization is at the inter-provincial cordon where traffic conditions appear to have worsened over the entire period of the reported counts (1989 to 1995).<sup>12</sup>

Available CUO counts for the Riviere Outaouais cordon also show increases in traffic between 1986, 1991 and 1996, as well as at some other cordon lines. In some cases, such as at the Chemin de la Montagne and the Riviere Gatineau cordons, traffic counts suggest levels at or near the available capacity by 1996. The traffic count data suggest some increases in traffic congestion in some areas within the CUO but it is unclear how the observed increases in traffic would have influenced mode choice. To the extent that increased congestion reduced transit operating speeds and service reliability it would have reduced transit's competitive position and increased auto use. However, the Boulevard Maisonneuve and Boulevard Alexandre-Tache HOV lanes in Hull, which were introduced in 1991 and

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<sup>12</sup> Source: Travel Demand Forecasting, Working Paper prepared by M.M. Dillon for RMOC, June 1996, pages 8 to 10 and Exhibits 4 and 5.



1994 respectively, may have reduced the impact of this congestion on transit service, helping to account for the improvements in mode splits observed to destinations in Hull (as documented in Exhibit 3B).

Transit person trips crossing the various RMOC cordons also declined after 1992, consistent with TRANS O-D survey results and O-C Transpo ridership counts. The transit decline is also evident at the Interprovincial cordon, despite the growth in auto traffic, supporting the view that traffic congestion reduces transit's competitive position. Transit priority measures at this cordon, including HOV lanes at Pont Portage and Boulevard Fournier, were not introduced until after the 1995 survey.

### **Auto Operating Costs**

Auto related costs include a range of capital and operating costs including out of pocket costs such as parking fees, where these are applicable, mostly in Downtown Ottawa and Hull. A study prepared for the RMOC in 1995 (The Automobile in Ottawa-Carleton), looked the cost of purchasing a car and driving that car in relation to the cost of taking transit. This study concluded that while the average fare for Canadian urban transit had increased,

“...the costs of ownership and operation of an automobile have fallen dramatically. Even the cost (price) of gasoline, including taxes, has risen less than transit fares (over the whole period [to 1993] and especially since 1981) and this does not consider the improvement in automobile fuel economy.”<sup>13</sup>

Therefore, for the period 1986 to 1995, the report's findings suggest that auto operating cost trends would have favoured the auto over transit and supported a modal shift from transit to the auto.

### **Parking**

The 1995 “Automobile in Ottawa-Carleton” study also concluded while parking is not a substantial part of owning and operating an automobile it can be a major factor in the mode choice decision for certain trips (those destined for the downtown areas, where parking charges apply). While parking costs are substantial in downtown Ottawa and Hull, there was no evidence found that would suggest that these costs changed substantially over the period. Reduced demands, associated with the recession, would be expected to reduce parking prices at private and public lots, based on the experience in Toronto after 1990 when parking prices fell and the auto share of peak period travel increased. No evidence was found in the NCR to confirm this expectation.

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<sup>13</sup> The Automobile in Ottawa-Carleton, May 1995, page 11.



## Conclusions and Implications

The review of the limited traffic, cost and parking data available supports the view that reduced traffic and parking demands associated with the recession, would have made transit less competitive with the auto, even if there was no change in parking charges, especially in the RMOC. While these factors would have supported increased auto use and discouraged transit use, they are definitely secondary factors, compared to the impact of economic, land use and travel pattern changes on transportation demands by mode.

### 3.6 Main Findings: Transportation Trends And Related Factors

Based on the Phase 2 analysis documented in Sections 3.2-3.5, the major transportation trends observed over the 1986 to 1995 period included the following:

- a decline in work trip making related to declining labour force participation and the increases in part-time employment over the period;
- some increases in school trip making associated with demographic shifts (the ageing of the boomers, decline in the numbers 15-24 and the growth of the under 15 cohort associated with the echo-boom) and increased post-secondary enrolments associated with the recession;
- a substantial decline in transit market share (and ridership) that resulted in declining transit mode splits across most markets (both women and men of all ages and for trips from all origins and to most destinations). The comparison of the 1986 and 1995 O-D survey data suggest that only Hull, Gatineau and Kanata (WUC) destinations experienced transit mode split increases between 1986 and 1995;
- changes in travel patterns related to the decentralization of population across the NCR and employment within the RMOC.

The relationships between the identified transportation trends and the related key factors are summarized in Exhibit 29. This table also comments on the influence of each factor on the related transportation trend.

### Discussion

Considering the trends and factors identified in Exhibit 29, it is clear that labour force and employment trends and the decentralization of population and employment have been much more important than demographic factors in explaining changing travel and transit use patterns over the 1986 to 1995 period. Aging and reduced labour force activity (related to the recession) have reduced work trip making but the most significant travel trends (the changes in travel patterns) reflect changes in the distribution and character of employment including the loss of government jobs downtown and the growth in high tech jobs in Ottawa West and the WUC (Kanata).



The observed losses in transit market shares and ridership cannot be explained by any single factor. These modal shifts from transit to the auto are the result of a variety of socio-demographic, land use, and transit service/cost factors as described below.

The changing age structure resulted in an absolute decline in the number of persons aged 15-24 over the period 1986-96 (as documented in the RMOC Regional Profile, March 1998, and the comparison of the 1986 and 1995 TRANS O-D survey results). Given that the 15-24 cohort has the highest transit trip rates of all age groups, any decline in the size of this population would tend to reduce ridership whereas increases in the proportion of the population over 24 tends to increase auto use. However, this factor<sup>14</sup> cannot explain the size of the losses experienced by O-C-Transpo and the STO.

As shown in Exhibit 29, reduced labour force activity and increased part-time work also reduced transit ridership. However, changing travel patterns appear to be the most important single explanatory factor. Changing travel patterns resulted from the decentralization of both population and employment, as discussed in Section 3.3. The documented declines in employment in the Ottawa CBD had a disproportionate impact on transit use. For example, the loss of 5,000 full time jobs in the Ottawa CBD would reduce transit ridership by about 4000 trips per day (or more than 1 million trips per year)<sup>15</sup>. This estimate is based on the average 1995 AM peak period mode split for first work trips to the Ottawa CBD (42 percent). Actual ridership losses were greater because the actual CBD job loss was about 6200 jobs after 1991 and the average AM peak period mode split to the Ottawa CBD declined from 53 percent in 1986 to 42 percent in 1995.

It must be noted that the transit mode split to the Hull CBD, Inner Area and the remainder of Hull increased between 1986 and 1995, based on the comparison of the two O-D surveys. This increase in transit use is consistent with improved peak period services including express routes taking advantage of HOV lanes, but there was insufficient data available to assess the role of these factors in accounting for the reported modal shift from auto to transit.

The auto availability indicators presented in Section 3.4 suggest that suburban increases in auto's per worker and per licensed driver in some rapidly growing suburban areas contributed to the decline in transit trip making. Comparative auto and transit cost and service factors reviewed in Section 3.5 would have supported the general modal shift from transit to auto but were secondary factors.

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<sup>14</sup> The role of demographic trends (shifts in age structure) has been discussed in previous reports (STRP Report #1-1 The Implications of Demographic and Socio-Demographic Trends for Urban Transit in Canada: Phase 1 Trends and Implications, December 1991 and Transportation Implications of Demographic Trends in Ottawa-Carleton, 1995).

<sup>15</sup> This estimate assumes that each full time job would generate 1.9 home-based work trips per day, 42% of commuters would have used transit and there are 252 regular weekdays in the typical year.



## EXHIBIT 29 - TRENDS AND RELATED FACTORS

Major Trends	Key Factors*	Comment
Decline in work trip rates (per capita and per worker).	<ul style="list-style-type: none"> <li>-demographic shifts</li> <li><b>-employment and labour force participation trends</b></li> </ul>	<ul style="list-style-type: none"> <li>-aging of boomers (35-55)</li> <li>-decline in 15-24 cohort</li> <li>-echo-boom (5-14)</li> <li>-decline in labour force participation</li> <li>-decline in full-time work and increase in part-time</li> </ul>
Increases in per capita school trip rates.	<ul style="list-style-type: none"> <li><b>-decline in employment opportunities</b></li> <li><b>-echo boom (increase in 5-14 Age Cohort)</b></li> </ul>	<ul style="list-style-type: none"> <li>-declining employment encourages young people to stay in school (growth in post-secondary).</li> <li>-some increase in public and high school enrolment</li> </ul>
Changes in peak period travel patterns.	<ul style="list-style-type: none"> <li><b>-decentralization of population</b></li> <li><b>-decentralization of RMO employment</b></li> </ul>	<ul style="list-style-type: none"> <li>-population increases primarily outside Greenbelt</li> <li>-decline in Federal Government jobs in inner city (after 1991)</li> <li>-growth in suburban "high tech" employment</li> </ul>
Substantial shift from transit to auto (large decline in transit mode splits especially among women)	<ul style="list-style-type: none"> <li>-socio-demographic factors</li> <li><b>-changing travel patterns</b></li> <li>-auto availability/access</li> <li>-transit and auto service/cost factors</li> </ul>	<ul style="list-style-type: none"> <li>-aging of population (decline in 15-24 group)</li> <li>-decentralization of population and employment</li> <li>-increase in auto availability per worker in growing suburban areas.</li> <li>-rising real transit fares</li> <li>-reduced transit service levels as recession took hold (supported by less congestion on roads in most locations).</li> </ul>

\* Primary Factors are Bolded



#### 4.0 Looking Toward The Future

In considering future transportation requirements for the NCR over the next 10 to 15 years the analysis presented in Section 3 indicates that the following socio-demographic and land use changes will be significant:

- The population of the NCR will age, as the baby boom generation moves into retirement and the smaller echo boom cohort moves on to post-secondary education and the workforce.
- Changes in current (1995) NCR employment status profiles can be expected, given the ongoing economic recovery, with more full-time workers, fewer part-time workers and fewer students (due to increased labour force participation, especially among people aged 15 to 24 and 25-34).
- The suburbanization of population and labour force will continue with most growth being outside the Greenbelt in the RMOC and in Gatineau.
- CBD and inner city employment should continue to recover and increase beyond 1991 levels given greater stability in government employment and continued private sector growth.
- Employment is expected to continue to suburbanize, despite the recovery of the inner city employment, given the rapid growth in private sector jobs in suburban locations both within and outside the Greenbelt for the RMOC and in Gatineau for the CUO.

The aging of the boomers can be expected to further reduce the employed labour force living in mature suburban areas such as Ottawa West. Increasing numbers of retirees will reduce the number of work trips originating in established areas within the Greenbelt in the RMOC and in suburban Hull and other established communities in the CUO.

The echo-boom generation, who were under 15 in 1995/96, will be concentrated in the 15-24 age group in the 1996-2006 period. The growth of this cohort should benefit transit in the short-term, given the above average transit use of the age group, assuming that relevant transit services are available in the inner city and suburban areas where this cohort is over-represented.

The current economic recovery is expected to reverse the employment status shifts that occurred between 1986 and 1995, increasing the full-time participation of persons of all ages, but particularly for the 15-24 cohort.

The continued suburbanization of the NCR labour force and job opportunities will result in further changes in travel patterns with more suburb to suburb trips, which will be difficult to serve by transit, and longer trips from the outer suburbs to the Ottawa and Hull CBDs.



In order to better understand the possible implications of the identified trends and possible variations in these trends, two sets of demand forecasts have been prepared as part of Phase 2: Socio-Demographic Forecasts, and Travel Pattern (or O-D) Forecasts, as documented in Sections 4.1 and 4.2.

Two spreadsheet based forecasting models were developed as part of this project, one to explore future trends in demographic and socio-economic factors and a second model to assess the transportation implications of trends in the location of residential and employment activity and related changes in origin-destination travel patterns .

The "socio-demographic trends" model was designed to calculate the travel demand implications of projected changes in population by age and residential location (district), making use of specific assumptions about trip generation rates (by age, gender, mode and location) and labour force activity profiles by age, gender and location. Two versions of this spreadsheet-based model were provided to the TRANS Group: one to project AM peak travel demands associated with different socio-demographic assumptions and a second to estimate the daily travel.

The "locational trends" model was designed to assess the AM peak period travel demand implications of projected changes in the distribution of population and employment across the NCR. The second model employs the Fratar "growth factor" technique to project future O-D travel patterns associated with changes in the distribution of population and employment.

Exhibit 30 summarizes base case population projections by age for 2011, in relation to the 1995 base figures for the NCR. This projection, detailed for the 18 Districts illustrated in Map 1 (page 23), were used to assess the implications of projected demographic trends (expected changes in the level, location and age of the NCR population) and possible changes in labour force participation and trip generation for future travel by mode.

**Exhibit 30 - National Capital Region Population Projections (Scenario A)**

District	Population by Age Group		Percent of Total Pop	
	1995	2011	1995	2011
0-4	67,665	62,700	7.1%	5.3%
5-9	69,835	63,000	7.3%	5.3%
10-14	63,767	68,400	6.7%	5.7%
15-24	126,496	150,300	13.3%	12.6%
25-34	168,978	168,200	17.7%	14.1%
35-44	175,650	175,900	18.4%	14.8%
45-54	124,480	199,000	13.1%	16.7%
55-64	70,505	150,900	7.4%	12.7%
65+	85,133	152,200	8.9%	12.8%
Total pop.	952,510	1,190,600	100.0%	100.0%

Source: Developed by the TRANS Group for this project



Given the aging of the NCR population, the under 25 age groups decline in percentage terms over the entire period to 2021, while the groups aged 55 plus grow as a percentage of the total population over the entire period. Based on the demographic projections provided by the TRANS Group, the effects of the echo boom will be short-lived. By 2011, the projections indicate that the size of the 15-24 cohort will have declined in percentage terms relative to 1995.

Exhibit 31 documents the 2011 NCR population and employment projections by District for the "Base Scenario" (Land Use alternative A).

**EXHIBIT 31 - NATIONAL CAPITAL REGION POPULATION/EMPLOYMENT ESTIMATES  
1995 AND 2011 for BASE SCENARIO (Land Use Alternative A)**

Districts (See Map 1)	Population		Employment	
	1995	2011	1995	2011
1A - Ottawa CBD	9,117	7,300	76,191	108,200
1B - Ottawa Inner A	72,594	80,200	51,519	68,900
2A - Vanier	25,953	28,800	9,623	9,300
2B - East Ottawa	56,787	69,000	26,359	42,100
3 - South Ottawa	105,587	135,200	61,030	91,500
4A - Tunneys	28,485	31,100	23,448	35,700
4B - West Ottawa	160,774	170,700	75,715	93,500
5 - Orleans	87,495	112,000	13,008	26,200
6 - SUC	34,594	75,900	4,726	15,500
7 - WUC	58,095	92,300	17,542	34,900
8 - Rural Ontario	69,781	102,000	13,870	23,200
9A - Hull CBD	813	2,100	19,949	28,600
9B - Hull Inner Are	9,803	12,900	4,998	5,600
10 - Aylmer	30,628	31,600	4,659	5,800
11 - Hull	64,948	55,100	24,951	23,600
12 - Gatineau	90,925	116,600	17,972	30,000
13 - Rural Quebec	54,034	67,600	9,373	13,000
<b>Total NCR</b>	<b>960,413</b>	<b>1,190,400</b>	<b>454,933</b>	<b>655,600</b>

Source: Developed by the Trans Group based on review of recent development trends

Exhibit 32A shows the absolute and percentage increase in population by district between 1995 and 2011 with reference to the 1995 population of each district. For example, West Ottawa, the largest single district, accounted for 17% of the NCR population in 1995 and is projected to account for 4% of the Region's growth in the 1995 to 2011 period. Population growth over the 1995-2011 period will be concentrated in the South Urban Centre (18% of the total increase in the NCR population), West Urban Centre (15%), Rural Ontario (14%), South Ottawa (13%) and Gatineau (11%).



EXHIBIT 32A - NCR POPULATION BY DISTRICT  
1995 Base to 2011

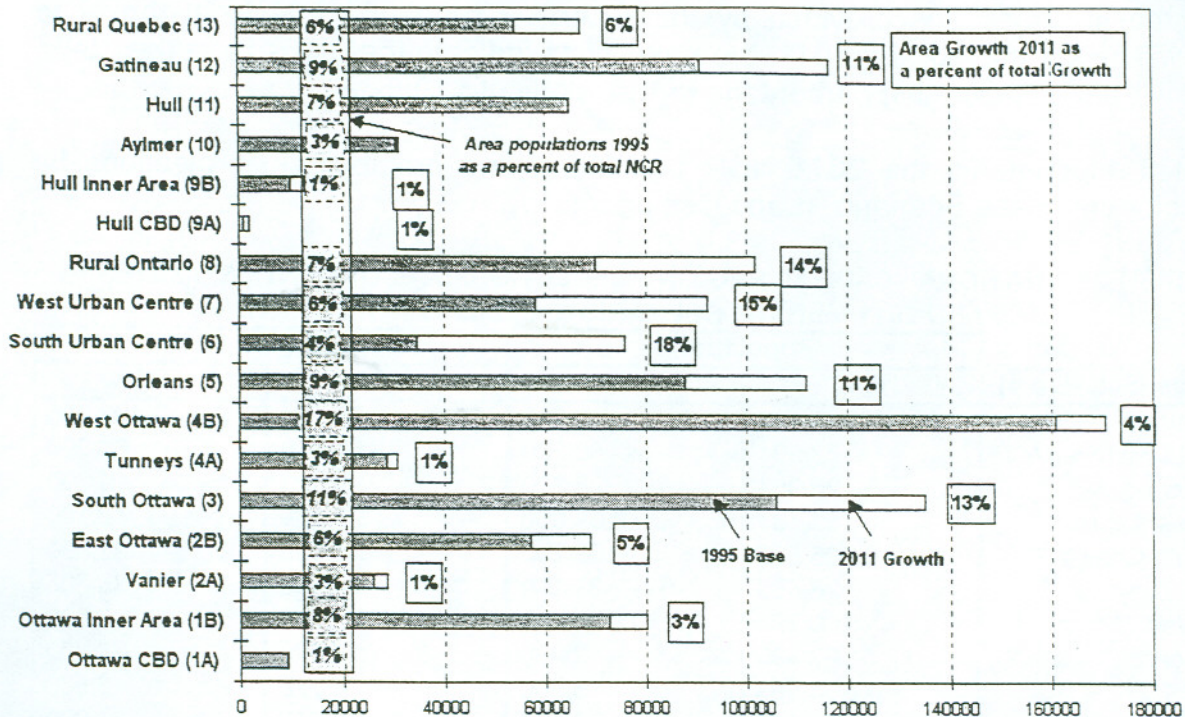
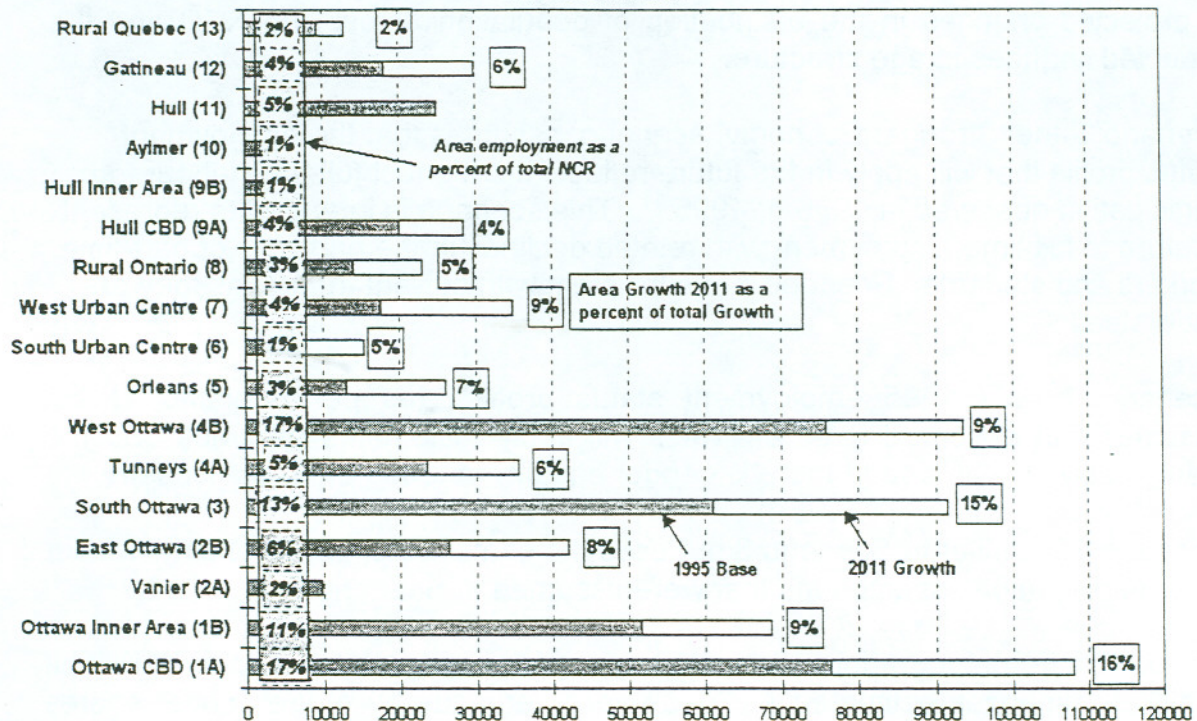


Exhibit 32B shows the absolute and percentage increase in employment by district between 1995 and 2011 for Scenario A, the base case, with reference to the 1995 employment of each district (absolute) and as a percentage of the total employment growth projected for the NCR between 1995 and 2011. Employment growth over the period 1995 to 2011 is expected to be concentrated in the Ottawa CBD and South Ottawa. Whereas the Ottawa CBD accounts for 17% of total 1995 employment, it is expected to account for 16% of the growth in NCR employment in the period to 2011. West Ottawa, which accounted for 13% of the NCR employment in 1995, is expected to receive about 15% of the total increase in employment for the NCR.

Two alternative employment distribution options were used to assess the implications of locational trends and possible changes in employment distribution for peak period travel demands. Land Use Alternatives B and C are intended to illustrate the implications of reduced CBD growth, relative to the base case, and the reallocation of that growth to the West Urban Centre and South Urban Centre, in the case of Land Use B, and to the West Urban Centre, South Urban Centre and West Ottawa, in the case of Land Use C. In both options 23,200 jobs were reallocated from District 1A to Districts 6 and 7 in Land Use B and to Districts 4B, 6 and 7 in Land Use C.



EXHIBIT 32B - NCR EMPLOYMENT BY DISTRICT  
1995 Base to 2011



#### 4.1 Travel Implications of Socio-Demographic Trends

Socio-demographic forecasts were prepared to assess the possible travel demand implications of population growth, demographic shifts (the aging of the population), alternative labour force scenarios and expected changes in auto availability and access. These projections were produced using base year trip rates (by district of residence and mode) and population forecasts by age, gender and district of residence to estimate future changes in trip making by mode to 2011.

The socio-demographic forecasts implicitly assume that there will be no major changes in the distribution of job opportunities or travel patterns over the forecast period. As will be discussed in Section 4.2, changes in travel patterns are expected and these will also influence travel behaviour. The socio-demographic forecasts are intended to assess the travel demand implications of demographic trends, and to investigate the possible implications of specific labour force and travel behaviour shifts. The forecasts indicate the relative importance of the identified socio-demographic factors but are not to be taken as absolute estimates of future travel demands.

Four Socio-demographic scenarios were considered as follows:

- Scenario 1 is the base case Socio-Demographic Scenario consistent with Land Use Alternative A. This scenario assumes that the 1995 observed employment



status profile by age group will apply to the future and uses 1995 trip rates by age, gender and mode. This scenario illustrates the transportation implications of projected changes in the distribution of population across the NCR and the expected changes in age structure.

- Scenario 2, the 'Stronger Economy' scenario, assumes that the employment status profile that will apply in the future reflects the highest full-time labour force participation observed in 1986 or 1995.<sup>16</sup> This scenario is intended to represent a return to full time employment with related declines in the numbers of part-time workers and students. Scenario 2 is consistent with current trends, as they are understood.
- Scenario 3 uses 1995 employment status profiles (as per Scenario 1) but assumes that observed male trip rates will apply to females as autos become more widely available (and there is gender equality in terms of auto access).
- Scenario 4 is similar to Scenario 3 but uses the same "Stronger Economy" labour force participation assumptions that were assumed in Scenario 2.

The results of the demographic forecasts are summarized in tabular form in Exhibit 33, which summarizes estimated AM peak hour demands by mode, modal shares and auto occupancy. Exhibit 33 shows the increases in total travel and by selected modes associated with the 2011 Base Case Scenario. Exhibits 34, 35 and 36 illustrate the additional increases in auto driver trip making that are associated with Scenarios 2, 3 and 4.

As shown in Exhibit 33, the Base Case Scenario (1) implies significant increases in total travel and travel by each mode, relative to 1995. It also suggests a small increase in the share of total travel by the auto driver mode and a related decline in the transit and other (school bus, walk) modes.

Each socio-demographic scenario is discussed below, in turn, with reference to the relevant exhibits.

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<sup>16</sup> By taking the greater of the 1986 or 1995 labour force activity rates the estimated future average proportion of the total population working would increase to .505, compared to .487 in 1986 and .466 in 1995.



**Exhibit 33**  
**NATIONAL CAPITAL REGION AM PEAK TRAVEL DEMAND ESTIMATES**

	Auto Driver	Auto Pass.	Transit	School Bus	Other	Total
1995 TRANS	271,444	62,887	75,344	36,465	67,827	513,967
2011 Scenario 1	343,431	76,046	88,743	43,231	74,694	626,145
2011 Scenario 2	345,678	73,947	86,274	41,655	74,116	621,670
2011 Scenario 3	391,668	50,087	75,756	42,473	76,174	636,158
2011 Scenario 4	392,810	49,134	73,360	40,940	75,511	631,755

**MODAL SHARES AND AUTO OCCUPANCY**

	Transit%	Auto Dr.%	Auto Pass.%	Other%	Auto occupancy
1995 TRANS	15%	53%	12%	13%	1.2
2011 Scenario 1	14%	55%	12%	12%	1.2
2011 Scenario 2	14%	56%	12%	12%	1.2
2011 Scenario 3	12%	62%	8%	12%	1.1
2011 Scenario 4	12%	62%	8%	12%	1.1

**Notes**

1995 Trans = Reference Case  
 Scen 1 =Base Case Scenario - 1995 ELF  
 Scen 2 =Stronger Economy - Maximum ELF (1986 or 1995)  
 Scen 3 =Gender Equality and 1995 ELF  
 Scen 4 =Stronger Economy/ Gender Equality

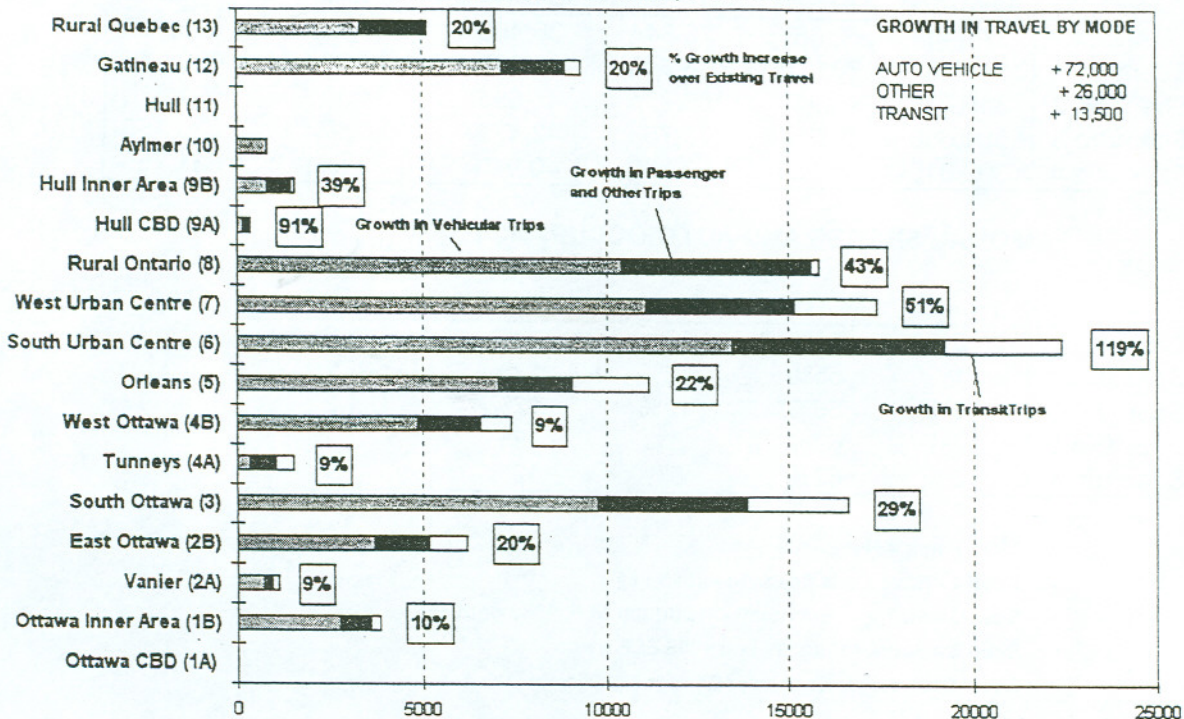
#### **4.1.1 Scenario 1 – Base Case Socio-Demographic Scenario**

Exhibit 34 illustrates the travel demand implications of the base case population forecast, assuming no changes in labour force activity or trip generation rates by age or gender between 1995 and 2011. This scenario is intended to illustrate the growth in travel demand by mode for each residential district, given recent trends in population growth (which is not necessarily consistent with Official Plans) and projected changes in age structure (See Exhibit 30).

As shown in Exhibit 34, given the base case socio-demographic scenario, total AM peak period auto vehicle (auto driver) travel would increase by 72,000 trips between 1995 and 2011. Other AM peak travel (auto passenger, school bus, walk/bike) would increase by 26,000 trips and AM peak transit travel would increase by 13,500 trips.



EXHIBIT 34- GROWTH IN AM PEAK TRIPS to 2011  
Trip Origins by Mode- All Trip Purposes



The largest increases in total travel demand, relative to 1995, are expected for the South Urban Centre (District 6 on Map 1), where travel demand would more than double by 2011, increasing by 119% compared to 1995, in line with the expected growth in this areas residential population.

Other areas within the RMOC that are expected to experience large increases in peak period travel include:

- West Urban (District 7 on Map 1 Centre where traffic can be expected to grow by 51% compared to 1995),
- South-Ottawa (District 3), where traffic is projected to increase by 29%,
- Rural Ontario (District 8), where traffic is projected to increase by 43%, and
- Orleans (District 5), where traffic is projected to increase by 22%.

For the Quebec part of the NCR, the largest growth is projected from Gatineau (District 12) and Rural Quebec (District 13), with both areas expected to see 20% growth in total AM peak travel between 1995 and 2011.

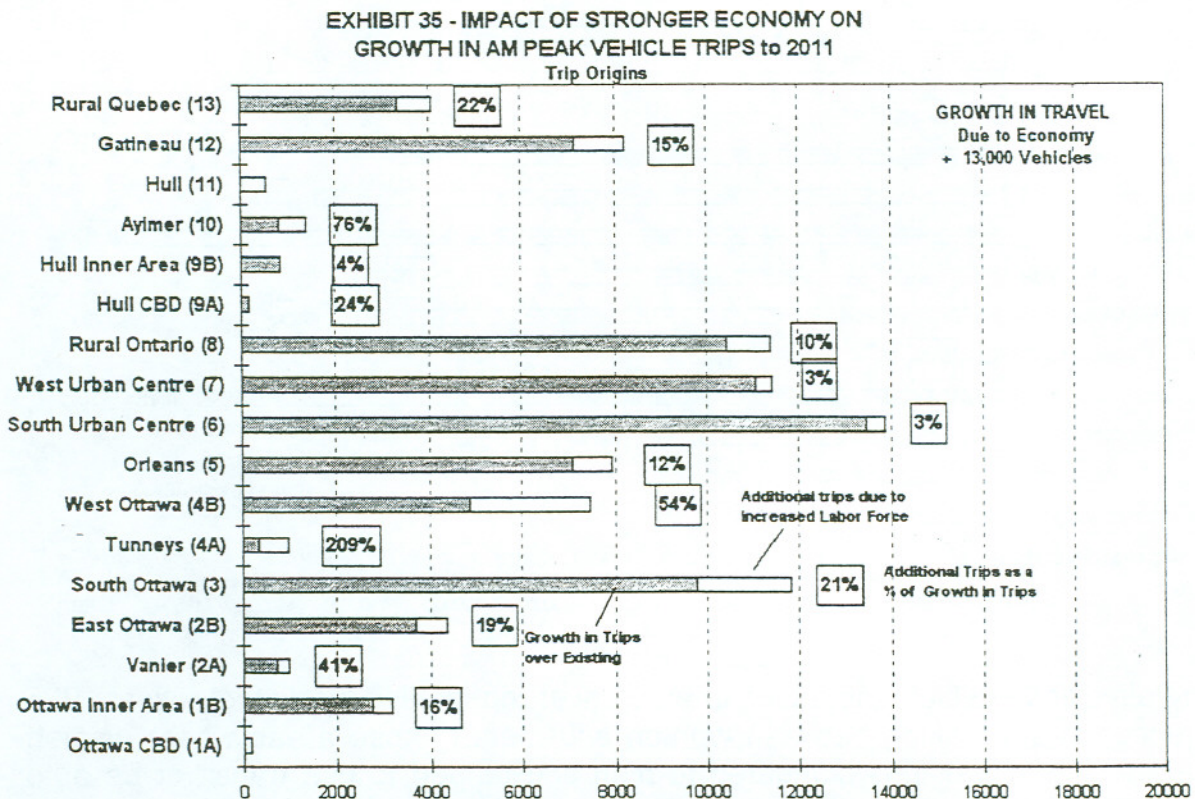
Based on current transit trip generation rates by age and gender for each district, the Scenario 1 Demographic projection suggests the largest increases in AM peak period transit trip making would be from the South Urban Centre, South Ottawa,, West Urban Centre and Orleans, as illustrated in Exhibit 34.



#### 4.1.2 Scenario 2 – Stronger Economy

Changes in economy over the period 1986-1995 are documented in Section 3.2. It was concluded that 1995 was not a good base for forecasting future travel demands, given the reduced labour force activity observed for all age groups, compared to 1986, and the loss of full-time jobs and increase in part-time employment. Indeed, the economic recovery in Ontario and the National Capital Region has seen substantial increases in full time jobs.

Exhibit 35 summarizes the impact of a stronger economy on auto driver trip making across the NCR in terms of the absolute and percentage increase in auto driver trips originating in each district, compared to the Base Case Scenario (Scenario 1) assuming that full time labour force activity were to increase to the maximum levels observed over the 1986-95 period. This scenario is consistent with increased auto driver trip making, adding 13,000 more auto vehicle trips in the AM peak period compared to Scenario 1. As shown in Exhibit 35, the largest effects of such an increase in labour force activity would be in West and South Ottawa, areas where labour force participation declined substantially between 1986 and 1995.

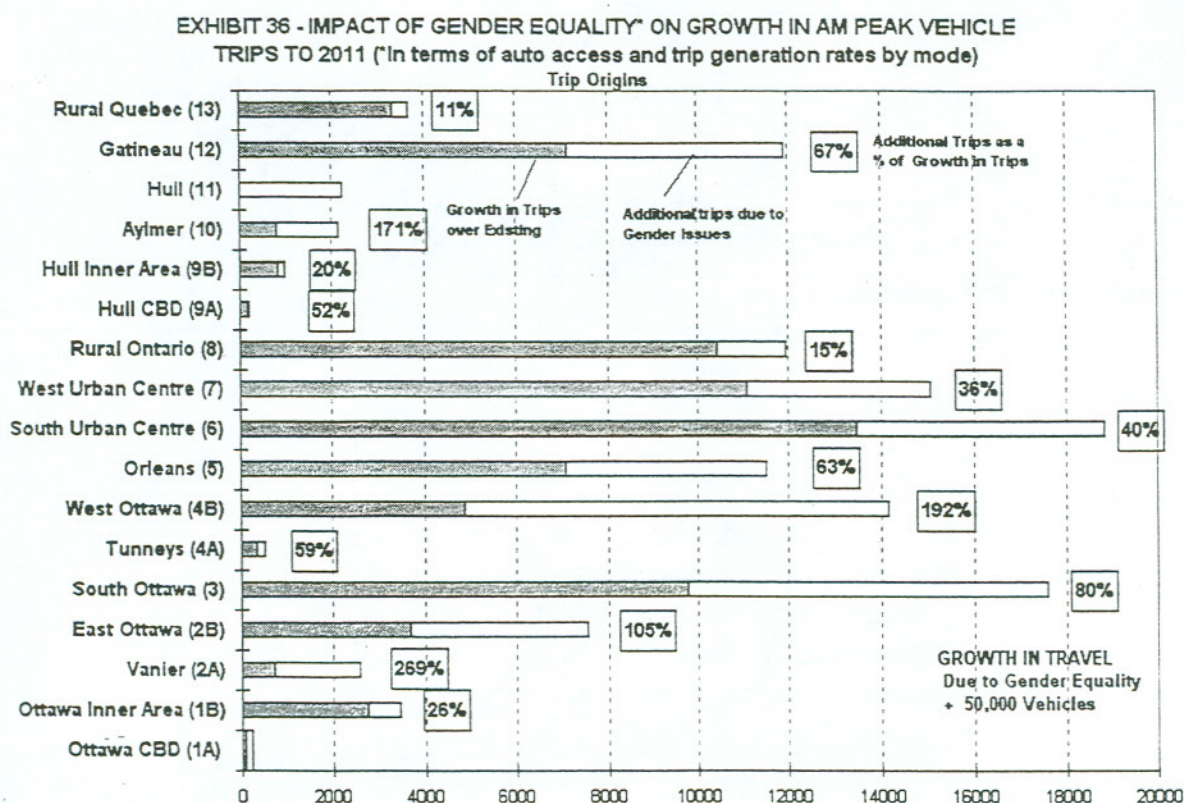




### 4.1.3 Scenario 3 - Gender Equality

In both 1986 and 1995, there were clear differences between the trip making patterns of men and women. Despite the observed declines in transit trip making and some increases in auto trip making, women living in the national capital region were more likely to use transit than men and generally had lower trip generation rates because they had less access to automobiles.

Exhibit 36 illustrates the increases in auto driver trip making that would emerge if women have the same access to autos as males currently have and exhibited the same mode specific trip rates as males. Scenario 3, which implies a large modal shift from transit to auto, results in 50,000 more peak period vehicle trips for the NCR compared to the base case for 2011.



The relative and absolute increases in auto driver trip making by district reflect 1995 differences in trip making between women and men. Those areas where women made few auto driver trips compared to men and tended to use transit or be auto passengers, show the largest increases in auto driver trip making. Areas such as Vanier, East Ottawa and West Ottawa, have high AM peak period origin transit mode splits, as documented in Exhibit 3A (page 7).

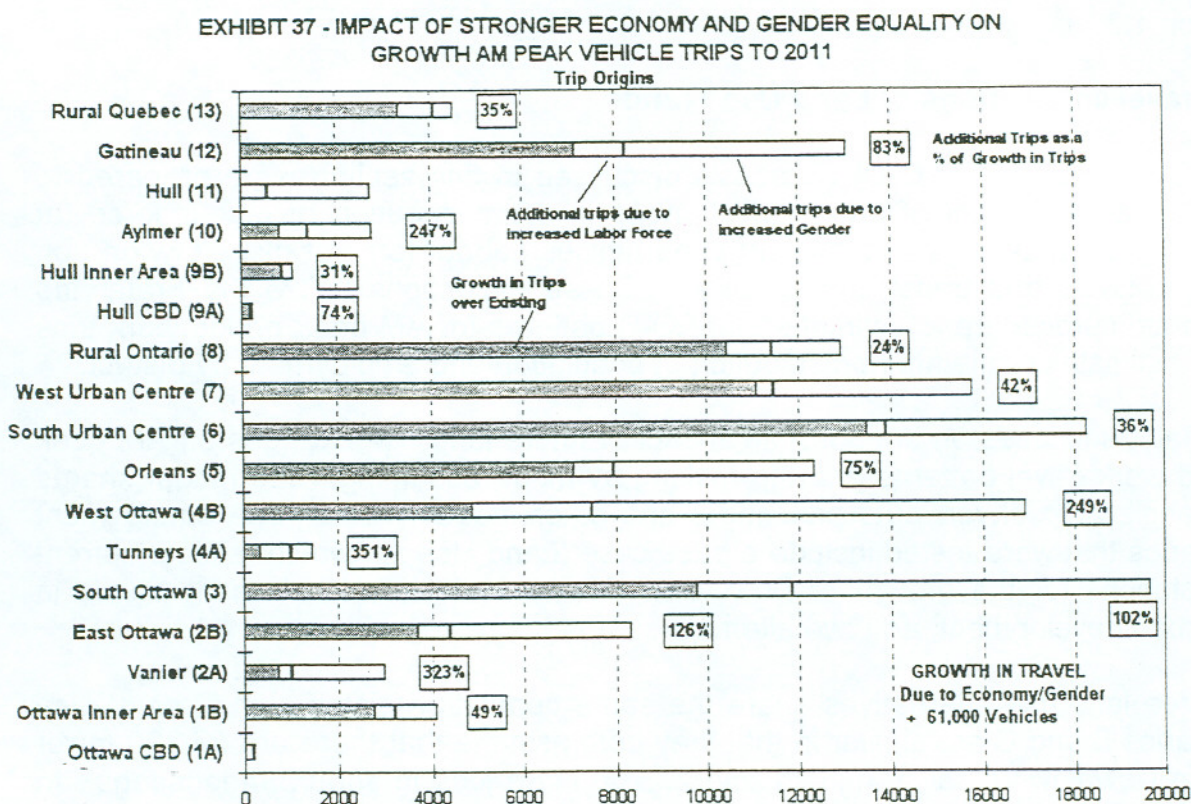
The largest absolute increases to auto driver trips are projected to originate in West and South Ottawa (192% and 80% increases respectively), the South Urban Centre



(+40%) and Gatineau (+67%). Proportionately large increases are also projected for East Ottawa (105%), Vanier (269%) and Aylmer (171%).

#### 4.1.4 Scenario 4 – Stronger Economy and Gender Equality

Exhibit 37 combines the effects of both the stronger economy and gender equality in considering the possible implications for AM peak auto driver trip making. The contribution of possible increases in labour force participation and increases in auto driver trip making related to “gender equality” are shown separately. The total result for the NCR is not the sum of the totals for Scenario's 2 and 3. Whereas Scenario 2 resulted in 13,000 additional auto driver trips and Scenario 3 resulted in 50,000 additional auto driver trips (compared to the base case Scenario 1), Scenario 4 results in an estimated 61,000 additional auto driver trips.



This scenario implies proportionately large increases in auto driver travel for all districts but the Ottawa CBD. The largest absolute increases in auto driver trip making that could occur, if there were continued increases in labour force participation and auto access improved to the point where women had the same trip generation and mode choice characteristics as men, are for West and South Ottawa, the West and South Urban Centres, in the RMOC, and in Gatineau. In percentage terms, the largest potential increases in auto driver trip making would be from Tunney's Pasture (+351% compared to Scenario 1), Vanier (+323%), and West Ottawa (+249%).



The potential increases in auto driver trip making estimated based on Socio-Demographic Scenarios 3 and 4 indicate the potential implications of a continued modal shift from transit to the auto and reduced auto occupancy. Increased auto availability and a failure to maintain competitive transit services (through a combination of improved services and transit-supportive land use and transportation policies) would lead to the large increases in auto driver travel (and related increases in road requirements) that would be associated with Scenarios 3 and 4. It is important to note, however, that the projected increases in auto driver trip making would be influenced by changes in travel patterns. These increases would also be constrained for travel to some major trip destinations, such as the Ottawa and Hull CBDs and other inner city areas, where parking is limited and roadways are already congested during peak periods. Therefore, it is important to consider the independent effects of changes in land use on future travel patterns, as discussed in Section 4.2.

#### **4.2 Travel Implications of Land Use Trends**

The Travel Pattern (or O-D) Forecasts discussed in this section were prepared to investigate the impact of projected changes in the distribution of labour force (at place of residence) and employment opportunities (labour force at place of work) on travel patterns and transit mode splits. These projections utilize the Fratar trip distribution procedure to estimate future O-D patterns for AM peak period work trips given estimates of the future distribution of population and employment by district.

Th analysis focuses on the possible impact of future land use changes on AM peak period work travel patterns and trip making by mode assuming 1995 modal shares for transit, auto driver, auto passenger and other modes. The three employment scenarios that were tested include a base case (Land Use A), which reflects current expectations for the growth of Downtown Ottawa and Hull, and recent trends in suburban development, and two alternatives.

All three land use alternatives share the same population distribution. Land Use Scenarios B and C are similar in that they both assume that there are 23,200 fewer jobs in Downtown Ottawa in 2011 and 23,200 more jobs in suburban locations. In Scenario B, the 23,200 jobs lost in the CBD are allocated to the West and South Urban Communities outside the Greenbelt and in Scenario C, some of this employment growth is allocated to West Ottawa.

Exhibit 38 provides a summary of the results for 2011. Scenarios B and C result in fewer transit trips and more auto driver trips than Scenario A, due to the reduction in work travel to the transit-oriented CBD. For 2011, this implies about 2% more auto traffic but almost 10% less transit ridership, (comparing both Scenarios B and C to the Base Case).



Exhibit 38  
ANALYSIS OF FUTURE AM PEAK WORK TRAVEL AND 2011 LAND USE ALTERNATIVES  
2011

	Total	Transit	Auto Driver	Transit MS
Scenario 1 - Base	328,307	54,185	213,607	16.5%
Scenario 2 - Low CBD, High WUC/SUC	326,290	48,998	218,431	15.0%
Scenario 3 - Low CBD, High WUC/SUC/West Ottawa	326,585	49,075	218,565	15.0%

#### 4.2.1 Base Case Land Use Scenario

The travel demand implications of the projected changes in the distribution of population and employment are summarized in Exhibits 39A and 39B.

Exhibit 39A illustrates the projected growth in AM peak period work travel relative to existing (1995) travel demand by auto driver, transit and other modes (auto passenger, school bus, walk) for each origin district.

The increases in AM peak work trips shown in Exhibit 39A are closely associated with the distribution of population growth, shown in Exhibit 32A, although there are variations in the total work trips generated that reflect district variations in labour force activity the percentage of the population assumed to be employed, as per Land Use Scenario A (and Socio-Demographic Scenario 1).

Most of the estimated growth in peak period work trips originates in the growing suburban districts (South Urban Centre, West Urban Centre, South Ottawa, Orleans and Gatineau) and rural Ontario. Based on projected travel patterns and current (1995) mode splits, transit will account for a significant share of estimated increases in peak period work travel for trips originating in Orleans, South Ottawa, the South Urban Centre and the West Urban Centre. Transit's role in accommodating increases in AM peak work travel originating in Rural Ontario will be insignificant, based on these estimates. This finding points to the need for special transit strategies to be developed to support increased transit use by rural residents, such as park and ride lots for persons working in transit-oriented employment areas.



EXHIBIT 39A - GROWTH IN AM PEAK WORK TRIPS  
TREND LAND USE (LAND USE ALTERNATIVE A) - TRIP ORIGINS

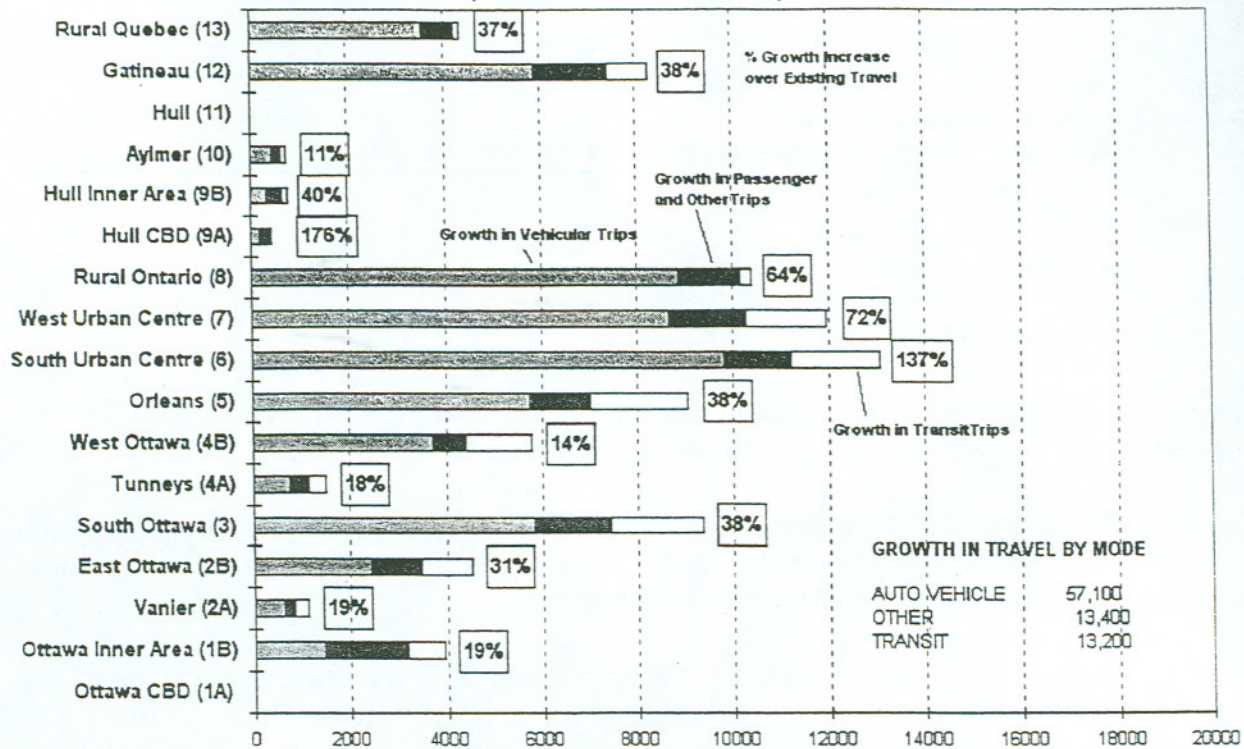


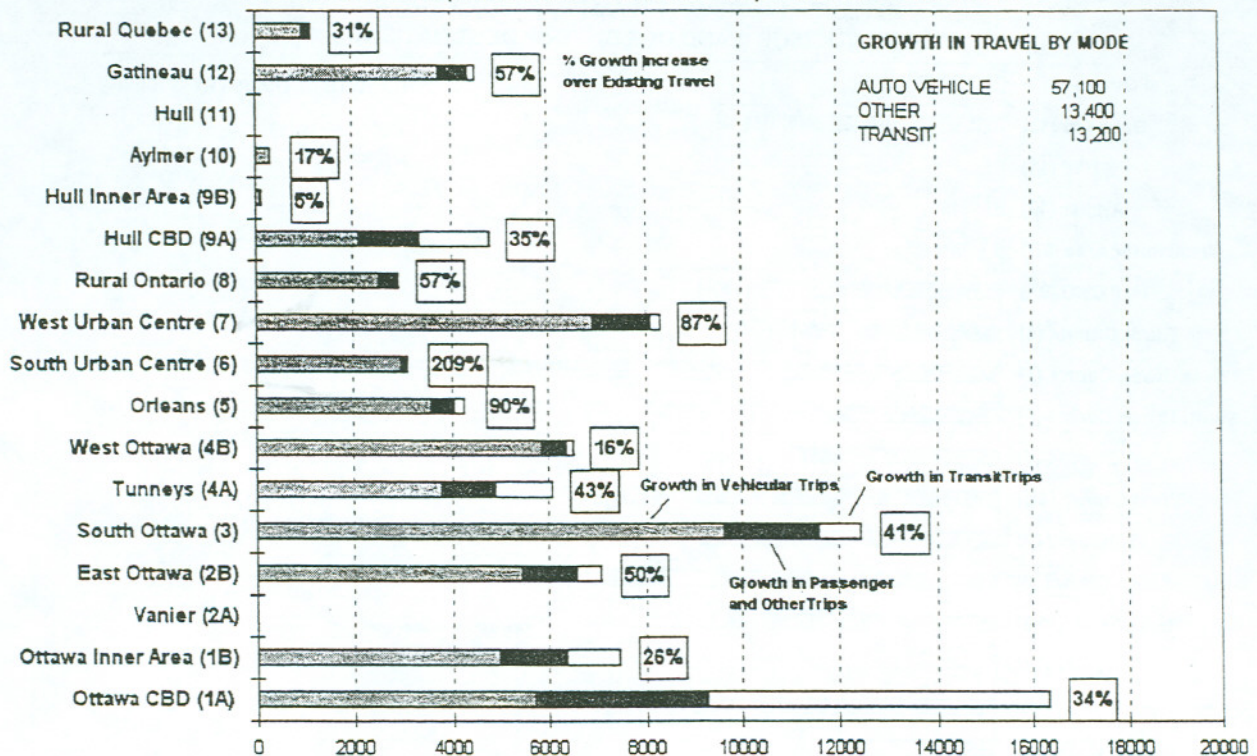
Exhibit 39B illustrates the projected growth in AM peak period travel relative to existing (1995) travel demand by auto driver, transit and other modes (auto passenger, school bus, walk) for each destination district.

The 2011 forecast shows that auto driver travel will account for less than 50% of the estimated growth in AM peak period work travel to the Ottawa and Hull CBD's, with the growth in transit being most significant to the Ottawa CBD.

Transit's share of future increases in travel demand are also significant work trips destined for the Hull CBD, Ottawa Inner Area, Tunneys and South Ottawa. However, transit use is very low for projected increases in work travel to West Ottawa, the West Urban Centre and the South Urban Centre.



EXHIBIT 39B - GROWTH IN AM PEAK WORK TRIPS  
TREND LAND USE (LAND USE ALTERNATIVE A) - TRIP DESTINATIONS



Exhibits 40 and 41 illustrate the travel demand implications of the two decentralized employment distributions that were considered: Land Use Scenarios B and C.

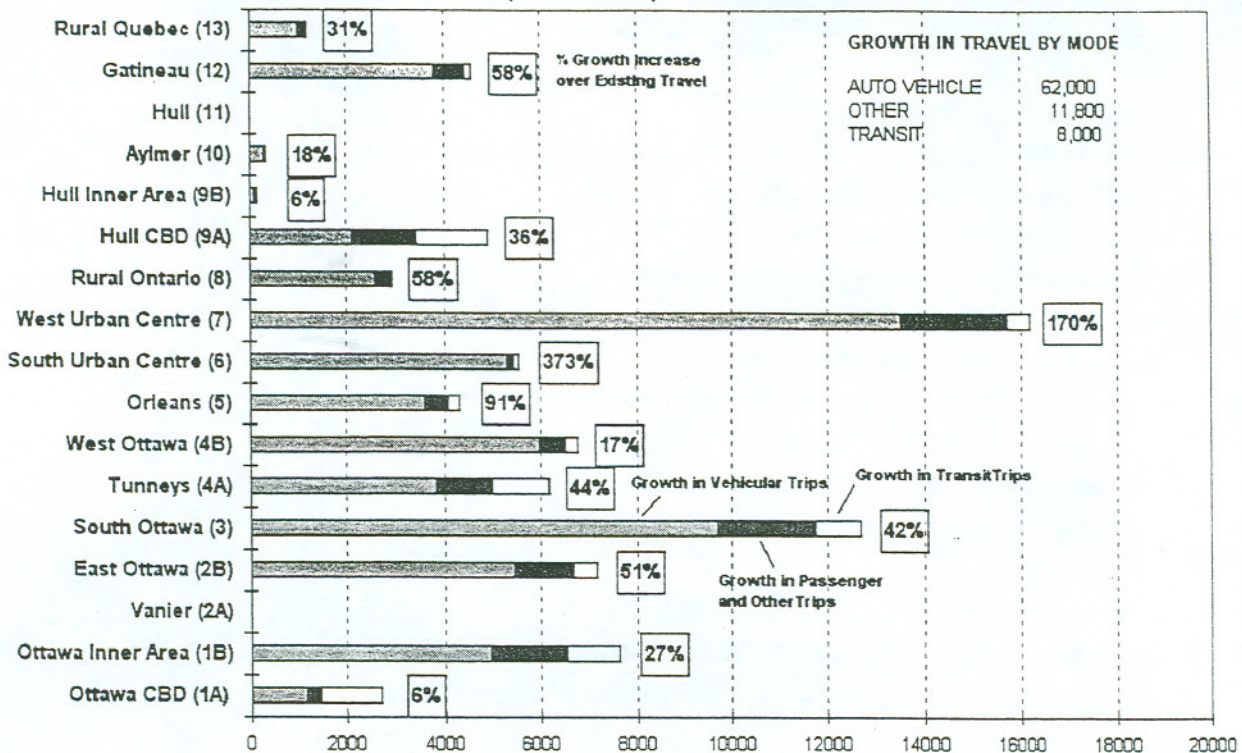
#### 4.2.2 Land Use Scenario B - High WUC/SUC

The reallocation of employment growth from the Ottawa CBD to the West and South Urban Centres would have a substantial impact on travel patterns and the growth in auto and transit travel during peak periods, as shown in Exhibit 40.

Given the reduced growth in CBD oriented work travel (from 34% with Land Use Scenario A to only 6% with Scenario B) transit's growth would be lower (+8,000 with Scenario B compared to +13,200 with Scenario A) and there would be less travel by other modes (particularly less auto passenger travel) (+11,800 with Scenario B, compared to +13,400 with Scenario A). Given the assumed suburban growth, there would be more auto driver travel (+62,000 with Scenario B compared to 57,100 with Scenario A) with the increases destined for the South and West Urban Centres (Districts 6 and 7 as shown on Map 1).



EXHIBIT 40 - GROWTH IN AM PEAK WORK TRIPS  
HIGH WUC/SUC (LAND USE B) - TRIP DESTINATIONS



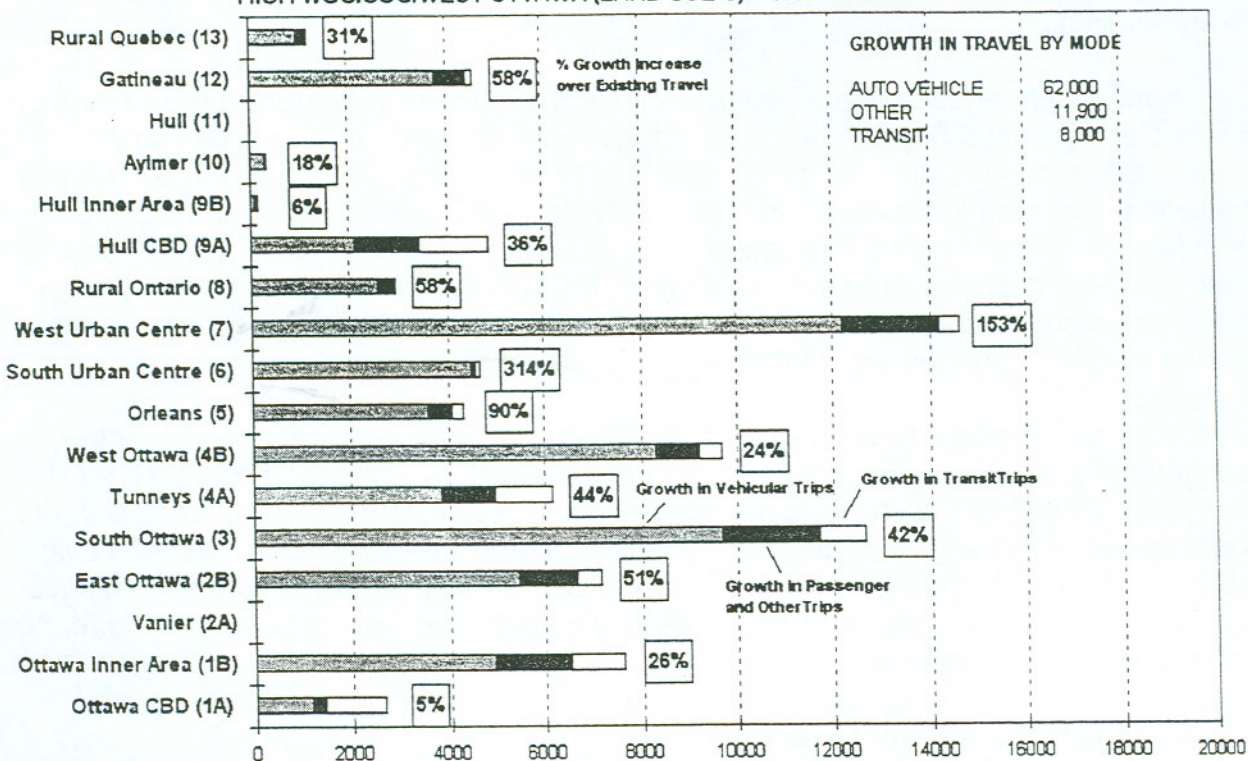
#### 4.2.3 Land Use Scenario C - High WUC/SUC/ West Ottawa

The reallocation of employment growth from the Ottawa CBD to the West and South Urban Centres and West Ottawa, as per Scenario C, is similar to Scenario B, in terms of changes in travel patterns and the growth in auto and transit travel during peak periods. In terms of total travel by mode the differences are insignificant.

As shown in Exhibit 41, with Scenario C the growth in travel by destination is distributed among the three growth areas in stead of two, with a marginal increase in travel to West Ottawa (from 17% under Scenario B to 24% with Scenario C) and less growth in the West and South Urban Centres.



EXHIBIT 41 - GROWTH IN AM PEAK WORK TRIPS  
HIGH WUC/SUC/WEST OTTAWA (LAND USE C) - TRIP DESTINATIONS



## 4.3 Implications for Future Travel in the National Capital Region

### 4.3.1 Socio-Demographic and Economic Trends

The 1995 report for the RMOC entitled Transportation Implications of Demographic Trends in Ottawa Carleton focused on demographic trends but suggested that other factors could well be more important (including employment and locational factors) and that travel habits could be expected to change over time, particularly for women. For example, one of the scenarios that was tested in 1995 assumed that women would, over time, take on the same trip generation and mode choice characteristics that men displayed in 1986. In other words, the high transit trip rates, and mode shares that have made women transit's best customers, would decline and their auto use would increase, as more became licensed to drive and auto availability increased.

The current study for the National Capital Region has confirmed the relative importance of demographic, employment and locational trends for travel and transit use and documented related changes in the trip making by mode for both men and women. While the demographic forecasts discussed in Section 4.1 suggest that demographic trends, as represented in Socio-Demographic Scenario 1, will tend to increase auto driver travel at the expense of other modes, including auto



passengers, transit and walking during the peak periods, the projected effects are relatively small.

The independent effects of increasing full time employment (comparing the results of Socio-Demographic Scenarios 1 and 2) appears to also be relatively small. In contrast, the continuation of the modal shift from transit to the auto by women travellers that was observed over the 1986 to 1995 period, would have greater significance, as discussed in relation to Scenarios 3 and 4. While transit use by both genders declined between 1986 and 1995 there were proportionately larger declines among women than among men. Transit mode splits by gender were more similar in 1995 than they were in 1986.

*The observed trend toward reduced transit use by women can be expected to continue in the future with more women driving and having access to personal use vehicles. Therefore, disproportionate increases in auto traffic can be expected in the coming decade due to reduced auto occupancy and more single occupant vehicle (SOV) use. Public transit services in the RMOC and CUO will have fewer "captive" riders in the next decade and will have to compete for "choice" riders by offering more competitive services.*

#### **4.3.2 Land Use/Locational Trends**

As observed over the 1986-95 period, changes in the future distribution of population and employment will influence both travel patterns and mode choice, as discussed in Section 4.2. Travel patterns will become even more dispersed, given current trends in the distribution of population and employment. The effects of land use distribution changes are independent of the effects of socio-demographic and employment trends and the observed modal shift from transit to auto for individual travel destinations.

*The large increases in travel destined to suburban destinations will be auto oriented, by definition, given the widespread availability of free parking and the difficulties associated with using transit to commute between suburban locations.*

*The expected growth of employment in Downtown Ottawa and Downtown Hull should maintain transit's share of total AM peak work travel, compared to 1995, potentially ending the decline in transit's market share that was observed in the 1986-95 period. Whereas the average NCR AM peak transit mode split for work trips was 17% in 1995, the travel forecast associated with Land Use Scenario A suggests that the average home to work mode split for the NCR in 2011 will be 16.5%.*

*Should less growth occur in the CBD and more in the suburbs, transit's share of total peak period travel would decline, as illustrated with respect to Land Use Scenarios B and C.*



## 5.0 Transportation Policy Implications

Section 5.1 reviews the policies that currently guide transportation planning in the NCR. The transportation policy implications of the trends discussed in Section 4 can be seen in terms of a number of challenges and opportunities, as outlined in Section 5.2. Section 5.3 discusses the policy implications of the challenges and opportunities and presents related conclusions and recommendations.

### 5.1 Current Transportation Policies

The current policies that guide transportation planning in the NCR are described in two documents: the Transportation Master Plan for Regional Municipality of Ottawa Carleton (Approved by Regional Council 9 July 1997) and the Transit and Road Systems Integrated Plan for the Outaouais Urban Community (Final Report, November 1994).

The RMOCT Transportation Master Plan (TMP) includes measures to satisfy the needs of a growing community by adding necessary road and transit facilities/services while controlling future peak hour demand levels through Transportation Demand Management (TDM), Transportation Systems Management (TSM) and related policies.

The Master Plan sets out target average PM peak hour modal share objectives by mode and for transit at 12 screenlines. The overall modal share objectives specify that auto use will decrease (from 73.5% in 1995 to "no greater than 67% by 2021) and that walk, bike and transit shares will increase. Transit's share is to increase from 15.2% in 1995 to "at least 20%" by 2021. Cycling's share is to almost double (from 1.7% to at least 3%) while walking is assumed to increase from 9.6% to 10% (or stay at about the same level). Large increases in transit ridership are assumed at all screenlines.

Various measures are proposed to support increases in non-auto modal shares including the construction of new transit facilities in the period 1997-2006, (i.e., West Transitway Phase 1, Southwest Transitway extension, new Transitway stations at Mackenzie King Bridge and Le Breton, and a Pilot rail rapid transit project), various "transit priority" measures (including those which will require road widenings), walking and cycling facility improvements, and various TDM and TSM initiatives and related policies (e.g., parking supply/pricing policies).

The TMP also proposes transit-oriented land use planning measures including:

- encouraging intensive development near Transitway stations,
- supporting the development of Town Centres and Primary Employment Areas that will support increased transit service levels (and encourage increased ridership),



- encouraging land use measures that will reduce the need to travel by auto (mixed use within neighbourhoods, pedestrian-, bicycle- and transit-friendly urban design and removing barriers to home-based business).

The CUO Transit and Roads Systems Integrated Plan (TRSIP) sets out the transportation component of the CUO's revised Official Plan. It recommends five types of intervention related to land use; public transit; road system; non-motorized modes and TDM.

The proposed urban land use philosophy for the CUO includes the following:

- concentration of employment and economic activities in the downtown core and in district centres (supported by "bonuses" and "development quotas");
- support for mixed land uses (to promote non-motorized travel);
- support for increased employment and residential densities in district centres and corridors;
- transit-oriented urban design standards (consistent with neo-traditional urban design concepts).

The proposed planning concepts and related policies, if implemented, would support higher levels of transit service, encourage walking and cycling, and reduce automobile travel.

The TRSIP recommended public transit mode split objectives for 3 screenlines: Ottawa River -- from the then current 20% to 30% in the medium term and 40% in the long term; Gatineau River -- from 14% to 25% in the medium term and 45% in the long term; Chemin de la Montagne -- from 26% to 30% in the medium term and 45% in the long term.

Short-term public transit interventions consist of reserved lanes for high occupancy vehicles and related park-n-ride projects (initiated by the STO). This document proposes a longer term rapid transit appraisal, Inter-provincial public transit harmonization and Interprovincial reserved lane studies.

Road system interventions include a number of road widenings in support of HOV lanes including on the Champlain Bridge, Alonzo-Wright Bridge, Highway 148 (between Chemin Rivermead and the Champlain Bridge), and sections of Boulevard La Verendrye.

Non-motorized interventions include the provision for public transit, pedestrians and cyclists when any new road infrastructure is introduced as well the proposal that "a utilitarian network of bicycle paths" be developed with supporting intersection modifications and support programs.



TDM interventions are recommended which will modify travel behaviour so as to reduce SOV use and road congestion during peak hours. Specific mention is made of ridesharing initiatives, HOV initiatives, public transit incentives (including Federal/Provincial Tax changes), transit priority measures (traffic signal priorities/queue jump lanes); parking management programmes; telecommuting, variable work hours, and intelligent vehicle highway systems (IVHS) measures, in the longer term.

A road pricing demonstration project is recommended for consideration in the medium term, prior to any wider consideration of road pricing as a strategy to reduce auto use and encourage a modal shift to transit.

Medium term public transit interventions include a proposed interprovincial rapid transit system and an expanded network of reserved lanes of HOV's.

Long term transit initiatives include a dedicated rapid transit system between Gatineau and Downtown Hull/Ottawa in conjunction with HOV lanes in Hull and Aylmer.

## **5.2 Challenges and Opportunities**

The emerging trends discussed in Section 4.3 point to the following transportation policy challenges for the next ten to fifteen years:

- Decentralization will result in increasingly dispersed travel patterns focusing on the growing suburban employment areas.
- The growth in travel demands to growing suburban employment areas will be difficult to serve by either transit or other HOV options.
- Additional road capacity will be required to accommodate these new demands because of increased SOV travel to the growing suburban employment areas.
- Transit's share of travel crossing most screenlines in the RMOC and CUO, will continue to decline, despite current NCR transit and other mode split targets and related policies, given other socio-demographic and locational trends, in the absence of strong transit supportive land use and TDM measures.

The current trends also imply some opportunities will support a modal shift to transit and more efficient use of the Region's road network:

- The expected continued growth in Downtown Ottawa and Hull should allow transit to regain lost ridership and improve mode splits for Core oriented travel in peak periods. This will justify improved service to the NCR's Core Areas and improved transit connections between the growing suburban areas and the Ottawa and Hull CBDs.



- The growth in outbound auto travel from within the Greenbelt to new suburban job opportunities will take advantage of underused road capacity.

### 5.3 Transportation Planning and Policy Implications of the Identified Trends

In general, the observed socio-demographic and economic trends will reduce transit mode splits and other non-auto modal shares, as measured at the various screenlines, and increase the auto driver mode shares. As discussed in Section 4.2, the continued decentralization of the Region's population and employment will result in increasingly dispersed travel patterns. The continued decentralization of job opportunities will encourage increased single occupant vehicle (SOV) travel and reduced HOV, transit, walk and bike use, unless NCR planning agencies are successful in concentrating new suburban employment activity in locations that are accessible by modes other than the automobile.

Land use and travel pattern trends and the documented modal shift from transit to auto will make it more difficult to achieve the various target modal shares particularly those related to increasing transit's share of total travel crossing suburban RMOC and CUO screenlines. Nevertheless, it should be possible to improve transit's share of trips to the largest suburban employment areas from inner city neighbourhoods, given improved transit services and supportive policies. It should also be possible to create opportunities for ride-sharing, assuming that the supportive policies, such as Transportation Demand Management (TDM) measures included in current NCR planning documents, are pursued.

Given the expectation of employment growth in Downtown Ottawa and Hull, one can reasonably expect increases in transit mode splits to the two CBD's assuming that transit service improvements are introduced along with appropriate TDM measures to improve the competitive position of transit. Continued residential development in the inner city will support increased self-containment in the inner city and greater pedestrian activity.

Given the low transit mode splits for travel from the outer suburbs to Ottawa's central area (CBD plus Inner Areas), it should be possible to shift some of the increase in auto driver trips destined for the central area to transit and/or to other high occupancy vehicles (HOVs). Reversing the recent modal shift from transit to the auto will require improved transit services that provide direct, transfer-free rides from the growing residential communities to inner city employment concentrations (CBDs and Tunney's Pasture).

The current RMOC and CUO transportation plans and policies provide a wide range of tools to encourage a modal shift from single occupant vehicles (SOVs) to high occupancy vehicles (HOVs). However, NCR planners have only limited control of the land use and socio-economic factors that have given rise to the problematic travel trends. For example, the continued development of "high tech" employment in suburban locations is strongly supported by both the private sector and elected decision-makers despite the fact that such development does not support the transit



supportive planning policies included in the RMOCT Transportation Master Plan. Furthermore, it is very difficult to relate modal shares, measured at screenlines, to specific land use or transportation planning initiatives. TDM policies, for example, are best applied to limited geographic areas and the ongoing monitoring of the success of such policies can only be assessed at the local level. Cordons enclosing the CBD or other "primary transit destinations" can provide the framework for the collection of the traffic and transit count data required to assess trends in travel and the results of transportation supply and policy initiatives.

#### **5.4 Recommendations**

Given current planning and transportation trends, it is recommended that:

1. NCR transportation planners focus on a limited number of high employment areas that could benefit from increased public transit service and/or the support of alternative transportation modes. These can be designated as Primary Travel Destinations or PTDs. The identification of PTDs would help to focus transportation supply and demand modification initiatives identified in current transportation planning policies into locations where they would be more likely to achieve results.
2. Current RMOCT and CUO planning policies be reviewed to identify appropriate land use, TDM and transit service strategies and initiatives for each Primary Travel Destination (PTD) and that the relevant policies be detailed for each PTD.
3. Realistic modal split targets be established for transit, walk and bike modes for each Primary Travel Destination, and that these targets supplement the current RMOCT and CUO screenline targets, where this is feasible.
4. The TRANS Group agencies consider establishing a long term monitoring program to track land use and travel demand changes by mode for each PTD. Such a program would allow planners to monitor the effectiveness of transportation planning policies.

Major activity centres such as the Ottawa and Hull CBD's have much greater transit and HOV potential than suburban employment concentrations in West Ottawa and the West Urban Centre or elsewhere in the RMOCT and the CUO. Traditionally, transit services have been planned to serve the two CBD's and market factors, combined with planning policies, have limited the supply of parking and made paid parking a factor in mode choice decisions. Future increases in transit mode split to the Ottawa and Hull CBDs will require the introduction of new services and supportive policies focusing on the needs of downtown commuters and post secondary students.

Success in increasing walk and transit mode splits to other NCR destinations will depend on the development of competitive conditions including relevant housing opportunities (which allow people to live and work in the same area, if possible) and



improved transit services supported by TDM policies, where such policies are appropriate. Therefore, it is recommended that the NCR planning agencies identify those employment concentrations in the existing suburban communities that can be provided with high levels of accessible transit service and where transit/HOV supportive policies can be justified. By focusing on the Primary Travel Destinations planners will be able to effectively monitor change and make the ongoing adjustments to planning and TDM policies and transit service that will be required to stay on target.

Given a limited number of transit-oriented destinations, planners should focus on measures that will enhance the competitive position of transit and other HOV options including parking supply/pricing initiatives and improved transit services. Such services would provide direct connections between growing suburban areas and the transit-oriented destinations (where places of employment are accessible to transit). Where it is not possible to provide suburban collection/distribution services that are accessible to places of residence, as is the case in rural areas and low density residential areas, part and ride access should be considered.



## APPENDIX A - LIST IS WORKING PAPERS

- Transportation Trends/Issues Review - Working Paper 1, August 31, 1999.
- NCR Transportation Trends/Issues Strategic Overview – Working Paper 2, October 31, 1999.
- NCR Transportation Trends/Issues – Detailed Investigation of Trends/Factors – Working Paper 3, December 9, 1999.
- Review of Current Planning Policies – TRANS-NCR Transportation Trends/Issues Study – Working Paper 4. December 9, 1999.