THE MARYLAND-NATIONAL CAPITAL PARK & PLANNING COMMISSION

February 14, 2003

Memorandum

To: Montgomery County Planning Board

From: Transportation Planning Staff

Re: Impact of the AGP on Montgomery County Traffic Congestion

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The Annual Growth Policy (AGP) was developed to work in partnership with the Capital Improvement Program (CIP). Both the AGP and CIP are tools for implementation of the land use and facilities recommended in master plans. Specifically, the AGP was developed with two primary purposes:

- To constrain subdivision approvals to those that can be accommodated by the transportation network consisting of existing plus programmed facilities, and
- To identify the transportation system deficiencies that must be addressed by adding new transportation facilities to the CIP.

We have balanced three competing factors in seeking and achieving this policy of "transportation concurrency." The three factors are:

- Level of service
- Transportation system capacity, and
- Development.

Transportation tests are traditionally the most critical element of the AGP, so an assessment of the impact of the AGP on transportation level-of-service (LOS) is necessary to understand the effectiveness of the AGP. This task is undertaken with the knowledge that the AGP does not control all aspects of travel demand and supply. The AGP does not control growth outside of the county, and it does not control demographic changes within the community, such as household size, that can increase travel demand even when no new development occurs.

A number of questions are being asked about the effectiveness of the AGP:

- Is transportation capacity being delivered in a timely manner, i.e. keeping pace with development?
- Is traffic congestion getting worse?

- Has Montgomery County traffic congestion increased more or less than neighboring jurisdictions?
- How has the AGP affected travel patterns & roadway conditions?

This report is one of a series of studies conducted to determine the effectiveness of the adequate public facilities ordinance as part of the FY04 Policy Element. It should be noted that the analysis is primarily limited to roadway level-of-service, although there is a review of transit mode shares. To address the questions posed above, there are five sections: summary of findings, data sources, historical growth trends, regional comparison of mobility and a comparison of Montgomery and Fairfax counties.

I. Summary of Findings

The following is a summary of major findings from the study:

1) The pace of development in Montgomery County has been greater than the provision of roadway lane miles over the time period when the AGP has been in place (As shown below, the term daily vehicle miles of travel (VMT) refers to the sum of all the auto travel that takes place on the roadway network during a typical weekday):
    - From 1985 to 2000, Montgomery County's jobs have increased by 43%, population has increased by 39%, and daily VMT has increased by 45%.
    - During the same time period from 1985 to 2000, lane miles of collector, minor arterial, principal arterial, and freeway have increased by only 23% in Montgomery County. Lane miles per 1,000 persons have decreased from 3.1 to 2.7 and lane miles per 1,000 jobs have decreased from 5.1 to 4.4.

1) Travel data for the urbanized portion of the Washington region indicates that Montgomery County freeways are as congested as the rest of the region, but principal arterials are doing better than the rest of the region:
    - VMT per lane mile of freeway in Montgomery County have remained consistent with VMT per lane mile in the D.C. region and in Fairfax County, at 18,400 daily VMT.
    - VMT per lane mile of principal arterial in Montgomery County (7,300) are lower than in the D.C. region (8,300) and Fairfax County (9,900).
    - Texas Transportation Institute (TTI)'s Congestion Index (average volume-to-capacity ratio based on LOS-C capacity) in Montgomery County (1.32) is lower than the Congestion Index in the D.C. Region (1.35) and Fairfax County (1.41).
    - Annual Delay per Capita (derived from the TTI Congestion Index) in Montgomery County (43) is lower than the Annual Delay per Capita in the D.C. region (45) and Fairfax County (52).

2) A review of development patterns in Montgomery County and Fairfax County found that growth patterns are closer to Metrorail and transit use is more widespread in Montgomery County:
    - Transit mode share is 43% higher in Montgomery County than Fairfax County (13.4% versus 7.6% of work trips).
    - Montgomery County continues to approve development closer to Metro than Fairfax County.
    - Fairfax County has had double the development (land conversion) of Montgomery County from 1973 to 1996.

These findings lead us to the following conclusions:

- Montgomery County's AGP process has limited the impact of development during a period when jobs and population (and the resulting VMT) have increased at twice the rate as lane miles of new roads.
- Our emphasis on traffic mitigation and development near Metrorail has resulted in mode share (13.4%) almost double that of Fairfax County.
- VMT per lane mile on freeways has increased over the past decade, and these facilities are highly impacted by development occurring outside of Montgomery County.
- VMT per lane mile on principal arterials have decreased, and these facilities are highly affected by development occurring within Montgomery County. However, minor arterials and collectors show an increase in VMT per lane mile (see Table 1).
- Montgomery County is doing better than the D.C. region and Fairfax County on a number of congestion measures that are derived from VMT per lane mile on principal arterials and freeways, but all parts of the region are experiencing greater congestion than in 1985.

This analysis has shown the historical trend for a number of critical performance measures for transportation use in Montgomery County. But the meaning and causal factors are open to debate and have raised more questions:

1. *Does the lower VMT per lane on principal arterials really mean that Montgomery County has less congestion than the rest of the region?*

   The method used in this study makes a number of assumptions about roadway capacity that ultimately depend on the number of lane miles. A major factor that shapes perceptions of traffic congestion is delay at intersections. This analysis did not look at intersection delay because the data were not available. It is possible that intersection delay has increased faster than VMT per lane mile, leading to a perception that congestion has gotten worse.

2. *Should the AGP be held responsible for roadway traffic conditions?*

The AGP is responsible for the timing of development, not the end-state conditions when the county is built out. Rather it is the General Plan and master plans that set the direction of the county, establish goals and the criteria used to evaluate attainment of county goals. Analysis of Master Plan conditions show that there will be an increase in congestion levels from existing conditions.

The AGP should not be held responsible for any real/perceived failures to build roads and other transportation facilities, which is the responsibility of the CIP. However, if the AGP is not helping to inform where transportation improvements are needed, then the process is not working properly.

3. *What was the impact of widening I-270 in the late 1980's?* Many of the charts in this report show a change in congestion trends occurring after 1990. It appears that congestion levels improved in the early 1990's, and that there was a shift in traffic from principal arterials to freeways. The widening of I-270 would definitely have had an impact on roadways in the corridor. Outside of the I-270 corridor, the recession in the early 1990's may have played a larger role.

4. *What about differences in congestion levels at the policy area level?*

   Montgomery County places a very high priority on economic development, fiscal stability and delivery of public services. These broad goals must be linked to the goals of our transportation and land use policies. In Montgomery County, we have, as a matter of public policy, decided to accept higher levels of traffic congestion in our urban areas in exchange for denser development. As our urban areas grow, they get denser, and density translates into traffic congestion. We have provided a higher level of transit service in these areas and have not sought to increase roadway system or "network" capacity. We have chosen to encourage "smart" development in our urban areas and not increase system capacity. The result has been a more congested level of service in these areas which, by policy, we have also accepted. The AGP has been the engine that has steered, guided and controlled this high priority public policy.

5. *How much development capacity has been added in the past fifteen years given the programmed transportation facilities?*

   Appendix A presents the development capacity that was added in each year of the AGP and the associated transportation improvements. Appendix B charts the total of gross staging ceilings for the county over time.

II. Data Sources and Methodology

The approach selected to compare Montgomery County with the Washington region was to use the Texas Transportation Institute's (TTI) Mobility Study methodology. TTI conducts a national study of mobility and traffic congestion on freeways and major streets for urbanized portion of 75 regions. This study is the source of the often-quoted "2nd worse traffic congestion in the nation" ranking of the Washington region. The TTI method estimates a number of mobility measures based on VMT per lane mile on freeways and arterials.

TTI ranks metropolitan areas nationally by congestion, delay, cost of time lost stuck in traffic, etc. In order to do that comparison, TTI developed a methodology that uses data that are easily available for all metro areas. The primary inputs include:

- Population Totals
- Highway Performance Monitoring System (HPMS) database of roadways (specifically Freeways and Principal Arterials)
    - Lane Miles
    - Vehicle-Miles Traveled

The TTI methodology is applied to only the urbanized portion of each region. The urbanized portion of Montgomery County is fairly consistent with the policy areas in which the AGP transportation test is applied, i.e. the non-rural section of the county.

Fairfax County was specifically identified for comparison purposes with Montgomery County to see the real-world effects of our growth management policies. Fairfax is of a comparable size to Montgomery County, and was actually slightly less populated in 1985. Fairfax is in the same region and experiences the same economic pressures and influences as Montgomery. Most importantly, the regulatory contexts are significantly different, with Fairfax having very loose controls on the location and pace of development, and Montgomery having much tighter controls.

All roadway data in this report is presented for the years 1985 through 2000. This fifteen-year time period coincides with the time period since the AGP was adopted in it current form. Only Year 2000 data is available for Fairfax County for lane miles and VMT.

The comparison of Montgomery and Fairfax counties also includes data from the 1990 and 2000 Census. Note that transit mode shares were adjusted to remove the effect of workers that stayed at home to work.

III. Historical Growth Trends Compared with Transportation Improvements

One measure of how well the AGP/CIP partnership is working is to review the pace of delivery of transportation infrastructure and compare it to the pace of development. The AGP was created to achieve balance between transportation supply, i.e. the lane miles of roadways, and transportation demand, generated by approved development. The policy response to an area being out of balance is to either slow growth through the use of building moratoriums or increase transportation capacity by programming roadway improvements in the Capital Improvement Program.

Figure 1 shows that Montgomery County experienced significant growth in both jobs and households over the period from 1985 to 2000. Total population grew from 628,000 to 873,000, a 39% increase. Total jobs grew from 381,000 to 546,000, a 43% increase. Growth was significantly higher in the late 1980's compared with the 1990's. Between 1985 and 1990, the county experienced a 20% increase in both jobs and households. Between 1990 and 1995, population increased by 7.5%, but the number of jobs declined. Between 1995 and 2000, population growth continued at the same pace, but the job market significantly rebounded, increasing by 18%.

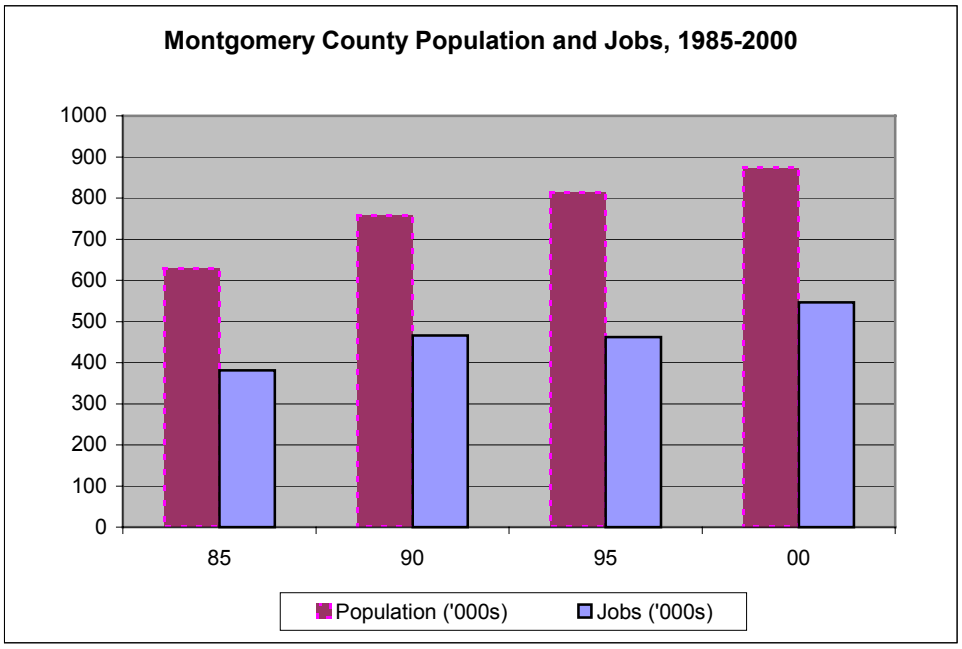


Figure 1

Data from the Highway Performance Monitoring System database have been summarized to show the amount of roadway mileage constructed over the period from 1985 to 2000, i.e since the AGP was initiated in 1986. It should be noted that the AGP looks ahead five years into the future when analyzing the impacts of future development. Only highway projects funded for construction in the five-year Capital Improvement Program are considered during the process of setting development staging ceilings. As a result of the five-year horizon of the AGP, results shown for one five year period are really the result of policy decisions made in the previous five-year period.

Figure 2 presents the number of lane miles added for three five-year periods: 1985-1990, 1990-1995, and 1995-2000. Lane miles are summarized by type of roadway based on HPMS functional classifications: freeway, principal arterial, minor arterial, and collector. Local streets have not been included in this summary because they are primarily for access purposes and are not considered in the Policy Area Transportation Review. Although local streets account for the majority of roadway miles built each year, the vehicle capacity of these streets is low compared with arterials and freeways.

More lane miles of roadway were added during the late 1980's than during all of the 1990's. From 1985 to 1990, 233 lane miles were added to the county road system, a 12% increase over the 1985 network total of 1,940 lane miles. The biggest roadway categories were principal arterial, such as the completion of Great Seneca Highway and road widenings in Germantown, and freeways, especially the widening of and construction of collector-distributor lanes on I-270. From 1990 to 1995, 113 lane miles were added (5% increase). From 1995 to 2000, 104 lane miles were added (4.5% increase).

Figure 3 shows the lane miles added per person and job added. Lane miles added between 1990 to 1995, compared with population added in the same period, were slightly higher than other periods because of slower growth. Total jobs added were about the same in the 1985-1990 period as the 1995-2000 period, but more lane miles were added from 1985 to 1990. This suggests that the county's roadway system was not expanded during the late 1990's to address rapid job growth at the same rate as in the late 1980's.

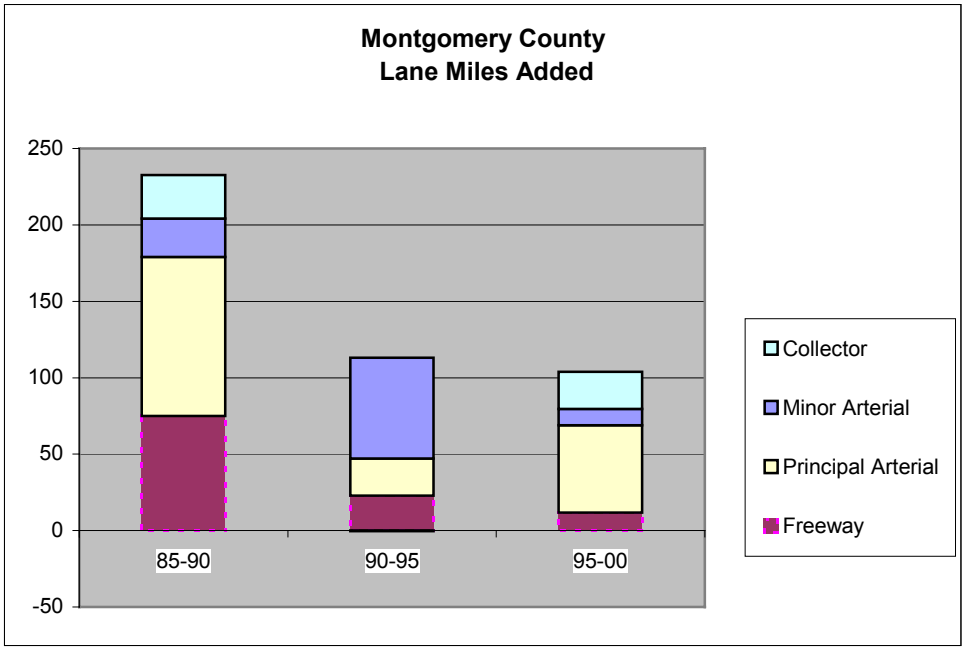


Figure 2

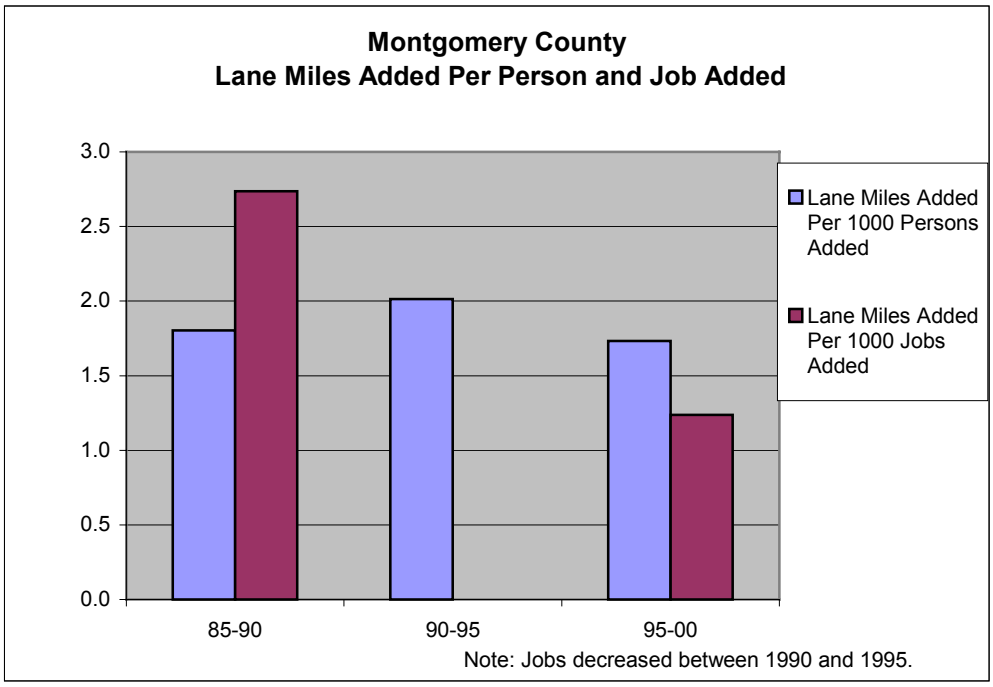


Figure 3

Figure 4 shows that the total county lane miles compared with total county population and jobs are on a downward trend. Many of the major roads planned in the county have already been built, so as the county's population grows, the same road system must serve more and more people. Specifically, total network lane miles did not increase at the same rate as population growth, so there has been a decline in the number of lane miles per capita from 3.1 in 1985 to 2.7 in 2000. The decline in the number of jobs from 1990 to 1995 caused the average lane miles per job to increase during that period, but the overall trend is also downward from 5.1 in 1985 to 4.4 in 2000.

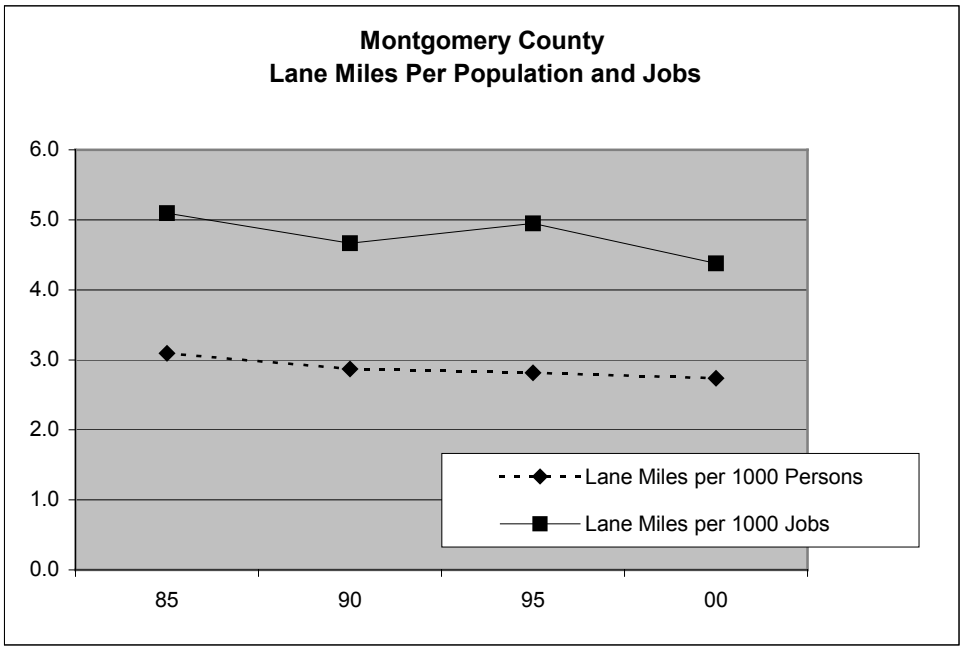


Figure 4

Vehicle Miles Traveled (VMT) is a standard measure used to describe the demand for roadway vehicular capacity. VMT for Montgomery County includes traffic that is made by residents and workers as they travel on county roadways, as well as external trips that pass through the county to travel between neighboring jurisdictions. Land use controls within Montgomery County affect county VMT only to the extent that they can reduce the amount of locally-generated traffic. Other factors that can affect VMT include the share of trips taking transit, the distance required to activities such as work and shopping, the number of passengers in each car, and the number of trips made by each household.

Figure 5 shows that daily VMT increased by 45% between 1985 and 2000. Over the same period there was a 43% increase in jobs and a 39% increase in population. The biggest increase in VMT occurred between 1985 and 1990, from 11.8 million to 14.1 million VMT daily (19% increase). VMT increased 15% between 1990 and 1995, a greater increase than land use, and 6% between 1995 and 2000, a smaller increase than land use growth over the same period.

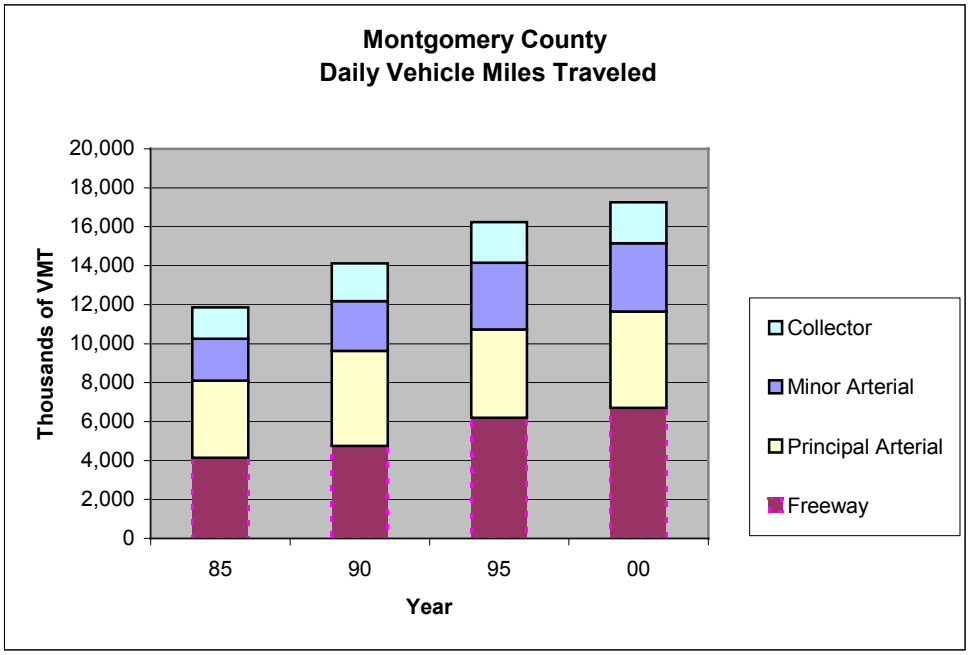


Figure 5

Figure 6 displays the average volume-to-capacity (V/C) ratio for county roadways between 1985 and 2000. The average daily V/C ratio is calculated using daily VMT from the HPMS dataset and assumed daily capacities. The countywide AGP standards are shown for reference. Freeway V/C declined in 1990 with the widening of I-270, but the overall trend has been an increase from 0.73 in 1985 to 0.86 in 2000. Non-freeway (highways and arterials) V/C increased in the late 80's, but has decreased in the '90s from 0.65 in 1990 to 0.56 in 2000.

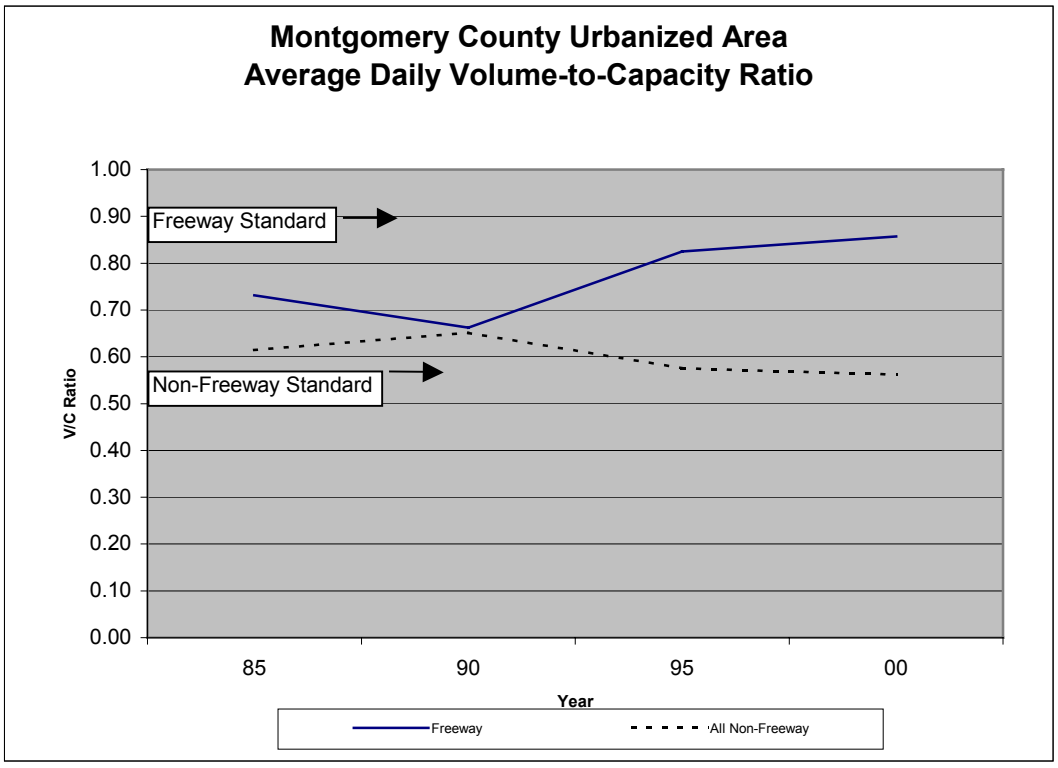


Figure 6

IV. Comparison of Regional Mobility

How does Montgomery County compare with the rest of the region? Many of the economic factors are the same for the entire Washington region, so differences in VMT and congestion for individual jurisdictions should be partly the result of local policies.

Figure 7 displays the lane miles per capita for the two classes of roadways used in the TTI study: freeways and principal arterials. Montgomery County has less Freeway lane miles per capita than Fairfax or the Washington region as a whole, but more Principal Arterial lane miles.

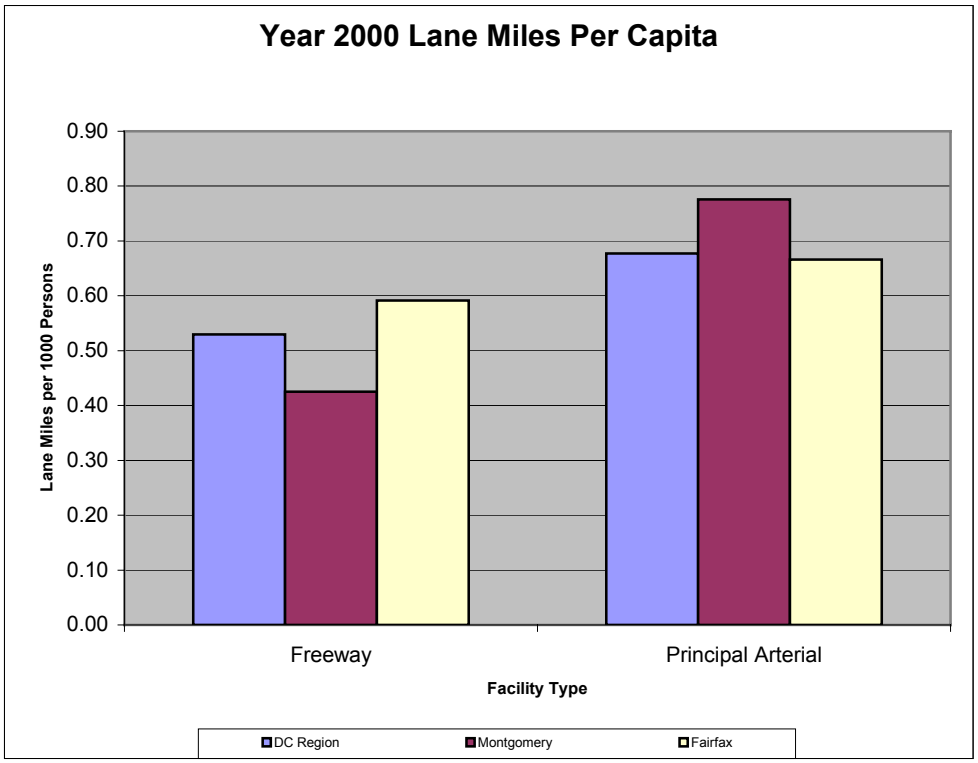


Figure 7

Figure 8 charts the lane miles added per person added between 1985 and 2000 in the urbanized portion of Montgomery County and the rest of the region. Over the past 15 years, Montgomery County has added less new freeway and principal arterial lane miles per new resident than the rest of the region.

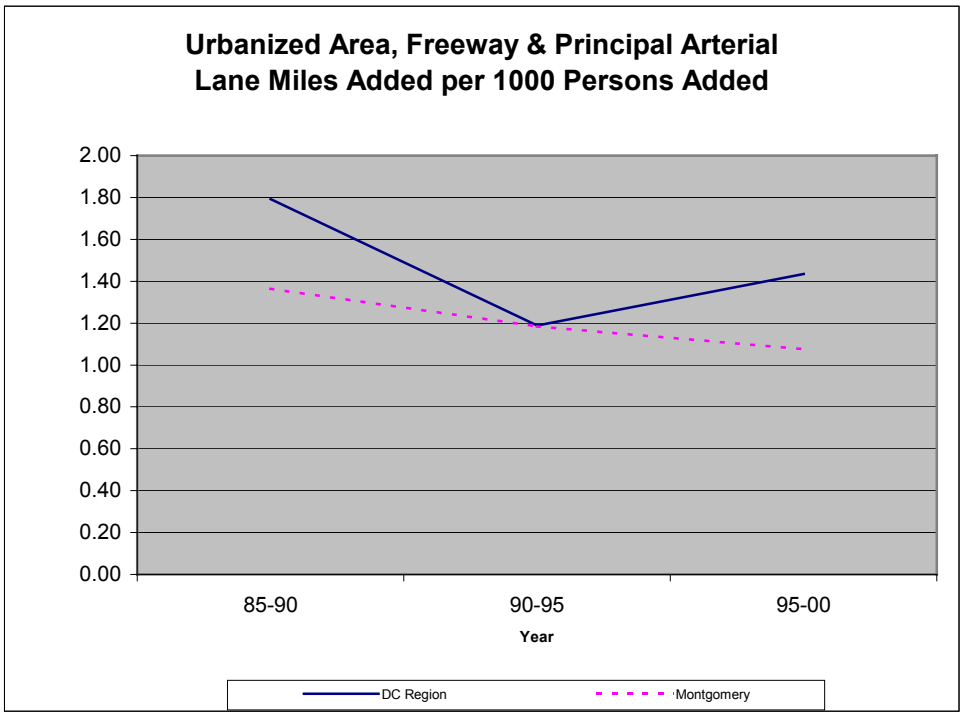


Figure 8

Figures 9 and 10 compare the VMT per lane mile for Montgomery County with the rest of the region. Note that Fairfax data is only available for year 2000.

In 1985, the freeway system in Montgomery County was carrying more VMT per lane mile than the rest of the region. A sharp drop is seen in 1990 with the widening of I-270. In 1995 and 2000, VMT per lane mile has increased so that it now matches the regional average of 18,400 daily VMT per lane mile.

In 1985, the principal arterials in Montgomery County were carrying more VMT per lane mile than the rest of the region. Between 1990 and 1995, VMT per lane mile decreased due to road widenings and traffic being diverted to the freeway system. In 2000, VMT per lane mile of 7,300 in Montgomery County is lower than the regional average, and much lower than Fairfax County's average of 9,900.

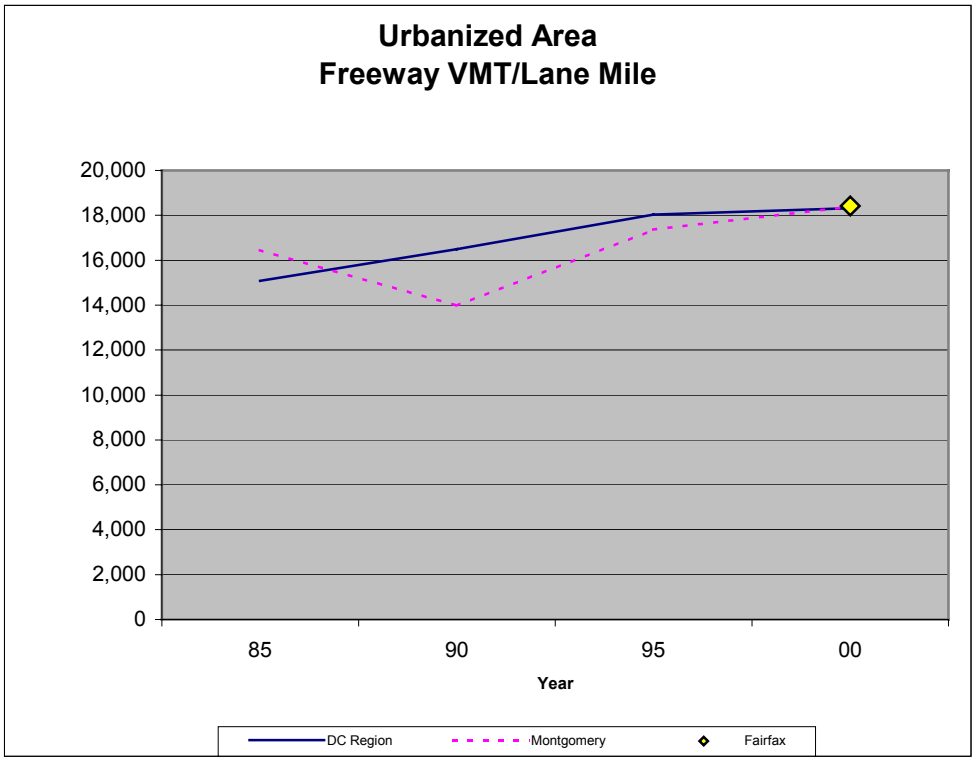


Figure 9

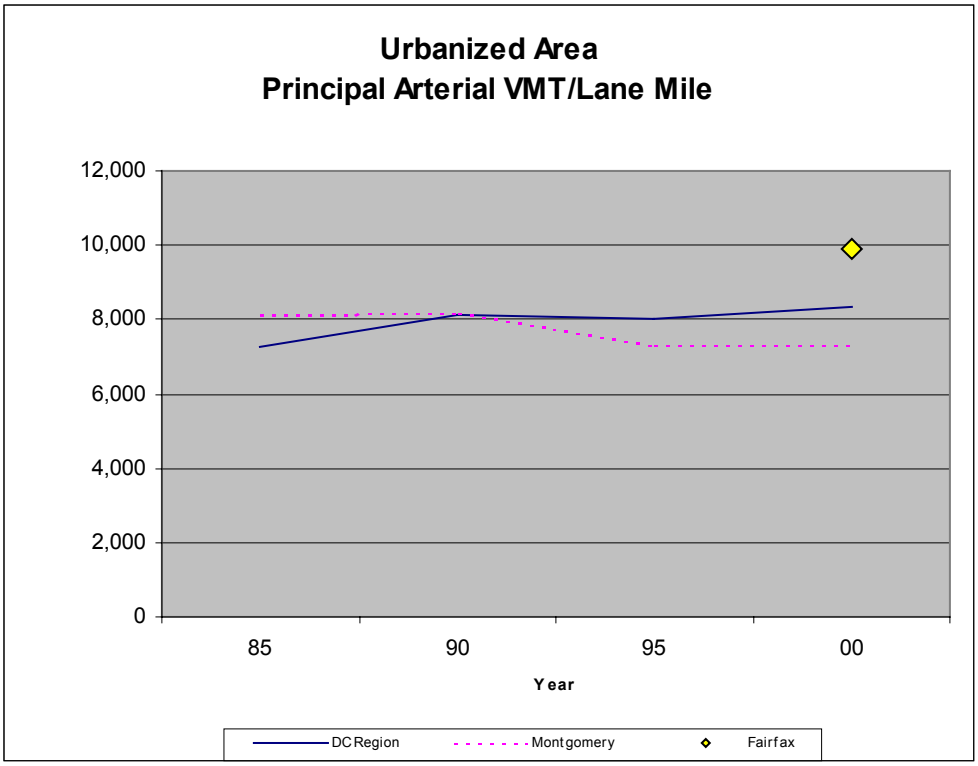


Figure 10

Figure 11 presents an estimate of congestion derived from the TTI approach. The TTI Congestion Index is an average measure of daily volume-to-capacity ratio, using LOS C capacities. Montgomery County's index was higher than the region in 1985, but consistently lower than the region since 1990.

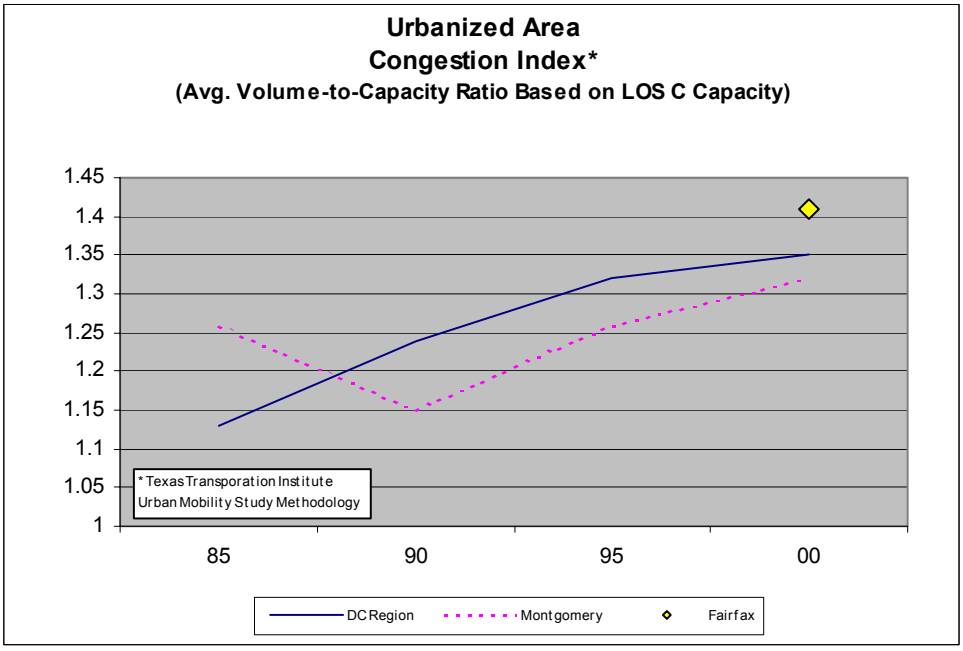


Figure 11

Figure 12 shows another TTI congestion measure. Annual delay per capita is estimated based on V/C ratio and assumptions about typical speeds. It does attempt to account for delay from incidents. Montgomery County's delay was higher than the region in 1985, but slightly lower than the region since 1990, and much lower than Fairfax County.

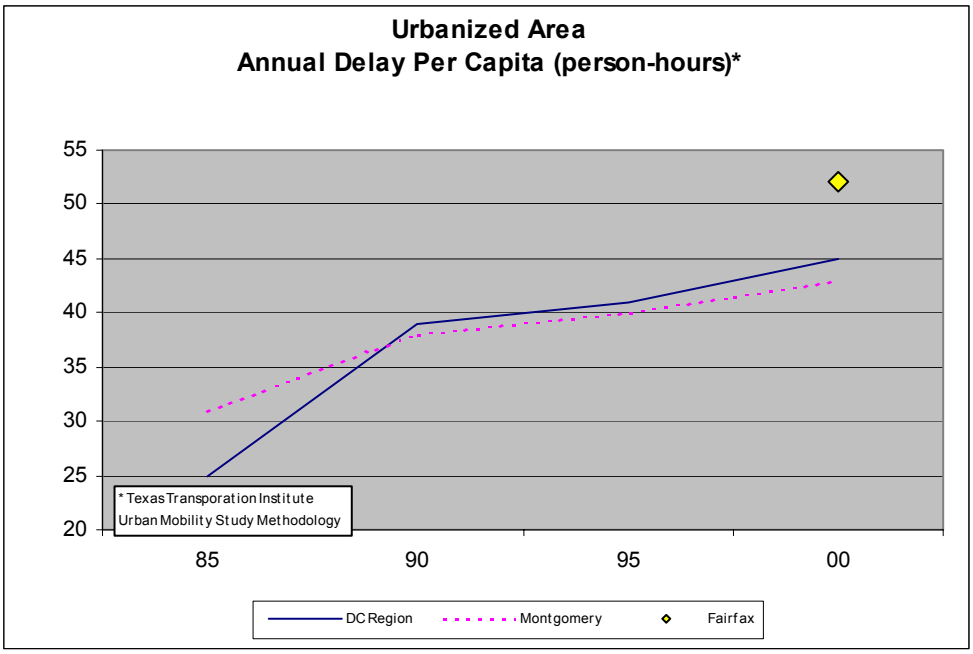

Urbanized Area
Annual Delay Per Capita (person-hours)*
55
50
45
40
35
30
25
20
85
90
95
00
* Texas Transporation Institute
Urban Mobility Study Methodology
DC Region
Montgomery
Fairfax

Figure 12

V. Comparison of Montgomery and Fairfax

The analysis presented in the previous section indicates that Montgomery County is carrying less VMT per lane mile than Fairfax County. Yet the latest 2000 Census Journey-to-Work data shows a travel trend at odds with the TTI result*: Montgomery County's average commute time to work is increasing faster than Fairfax County's.*

Between 1990 and 2000, Montgomery County's average trip time to work increased from 29.5 to 32.8 minutes, an increases of 11.1%. Fairfax County's average trip time increased from 29.6 to 30.7 minutes, an increase of 3.7%.

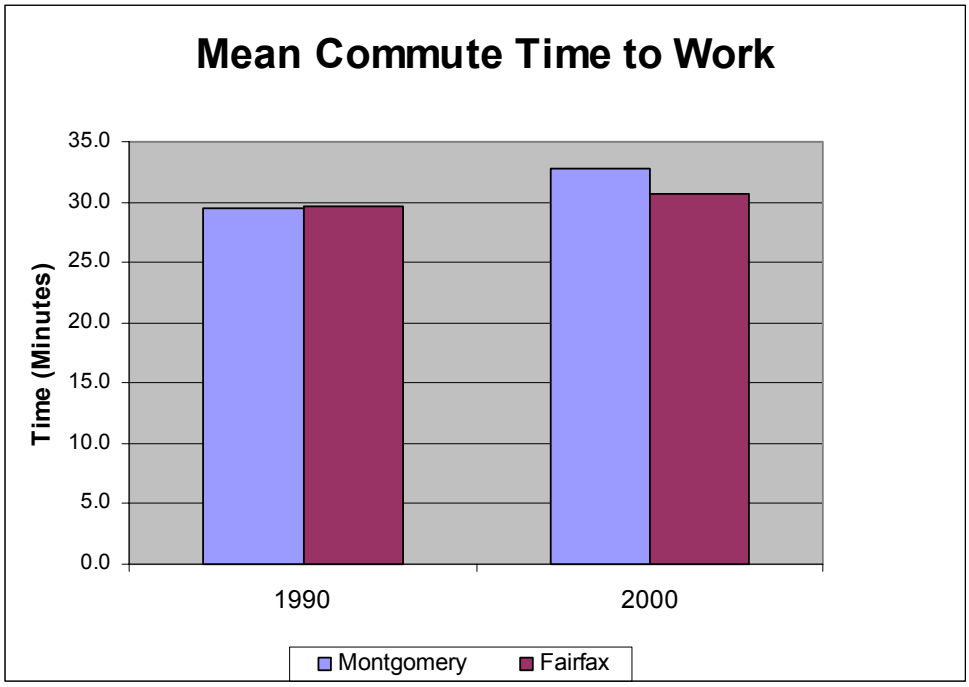


Figure 13

Why did average commute time increase more in Montgomery County? What differences in policies, demographics, and urban form contribute to travel conditions?

- **Highway network differences are very significant.**
  Table 4 of this report summarizes the route miles of roadway in Fairfax and Montgomery Counties. Montgomery County has more 6-lane principal arterials and this contributes to the better VMT per lane mile findings. But Fairfax has significantly more freeway route miles, so the average travel speeds, even under congested conditions, should tend to be higher.

- **Montgomery County has a higher transit share.**

Montgomery County has a much higher transit mode share for work trips than Fairfax, 13.4% compared with 7.6%. During the 90's, Montgomery's transit share increased slightly while Fairfax's dropped slightly.

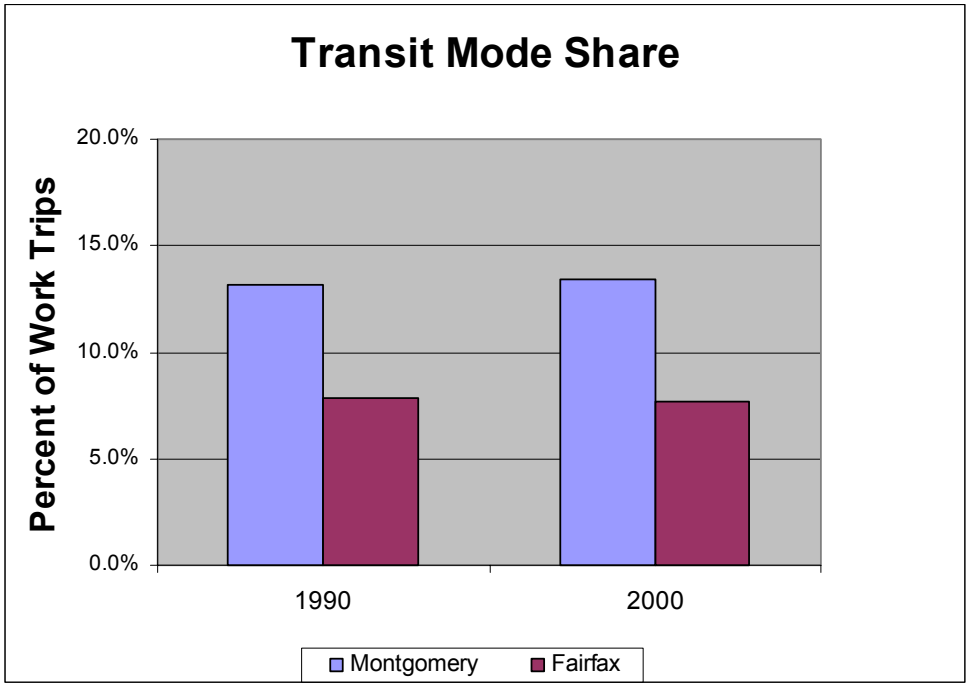


Figure 14

- **Transit trips typically have longer travel times than auto trips.**

Figures 17 and 18 show the commute time to work by mode for Montgomery County and Fairfax County residents. Nearly all transit trips made by Montgomery County residents are greater than 30 minutes; roughly one-third of the trips that are longer than 45 minutes are made on transit. Transit trips are a much smaller share in Fairfax County but they do make up 20% of the trips over 45 minutes. The percent of trips less than 30 minutes in Fairfax is 48%, compared with 45% in Montgomery.

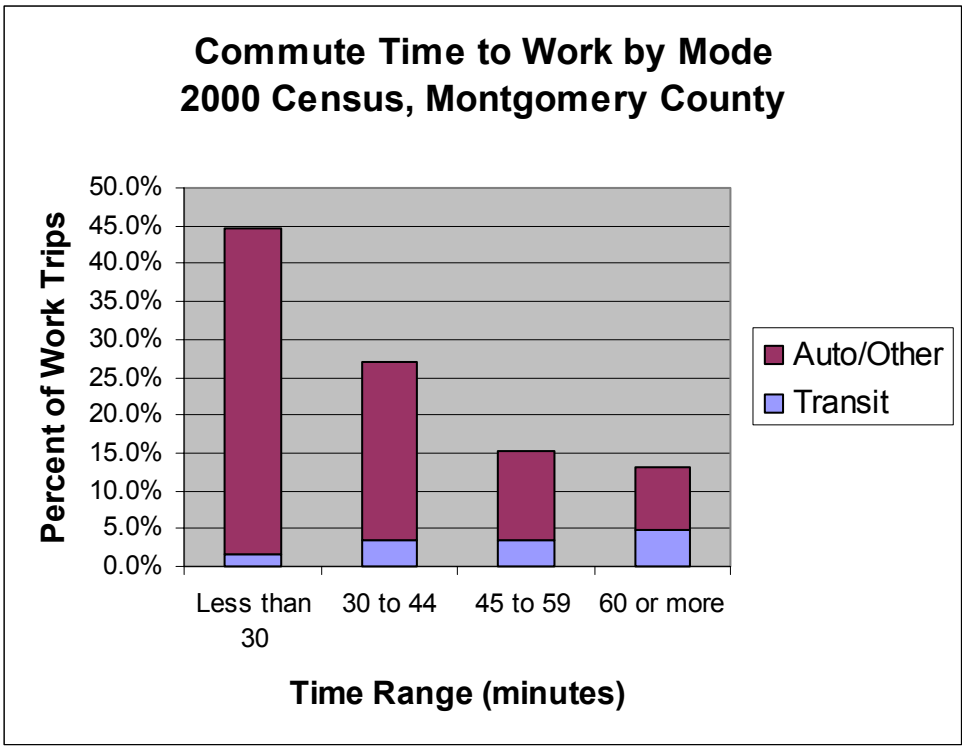


Figure 15

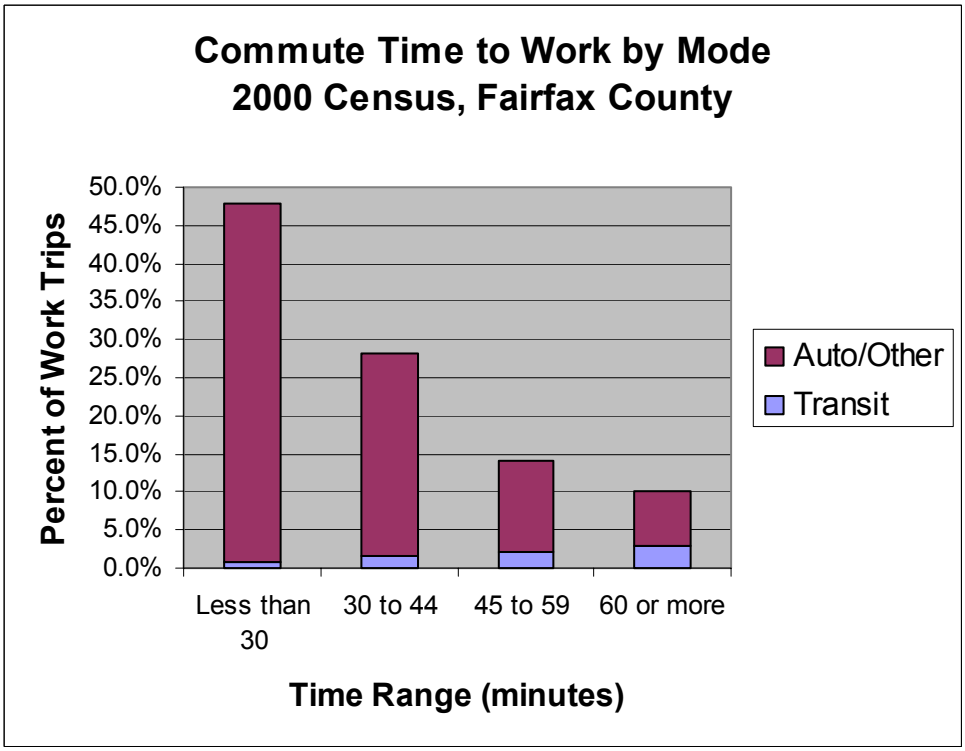


Figure 16

- **Fairfax County is improving its job-to-housing ratio.**

Figure 15 shows that Montgomery County has a higher job-to-housing (J/H) ratio than Fairfax, but in the 1990's, Fairfax has increased jobs relative to housing faster than Montgomery County. A better balance between jobs and housing usually leads to more trips staying within the county to work.

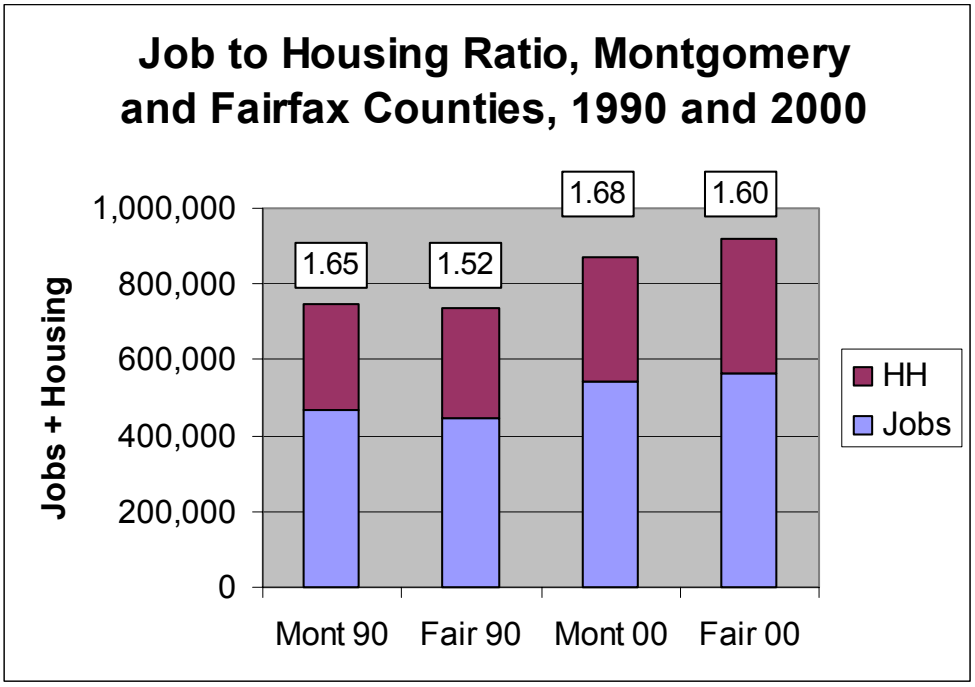


Figure 17

- **Montgomery County has a higher share of work trips that stay within county, but a higher share that work in D.C. than Fairfax County.** Commute times to the Washington CBD Core tend to be longer than to suburban work locations. This would contribute to a higher work time for Montgomery County residents. Another issue is the dispersal of work locations within county – does Fairfax County have a more dispersed pattern of job locations? Dispersed jobs would tend to be closer on average to residences, but much harder to serve with transit.

Figure 16 compares the work locations for Montgomery and Fairfax residents. The percent of county residents that work within the same county is higher in Montgomery than Fairfax, 58% vs. 51%, but Montgomery County has a higher percentage that work in D.C., 24% vs. 19%.

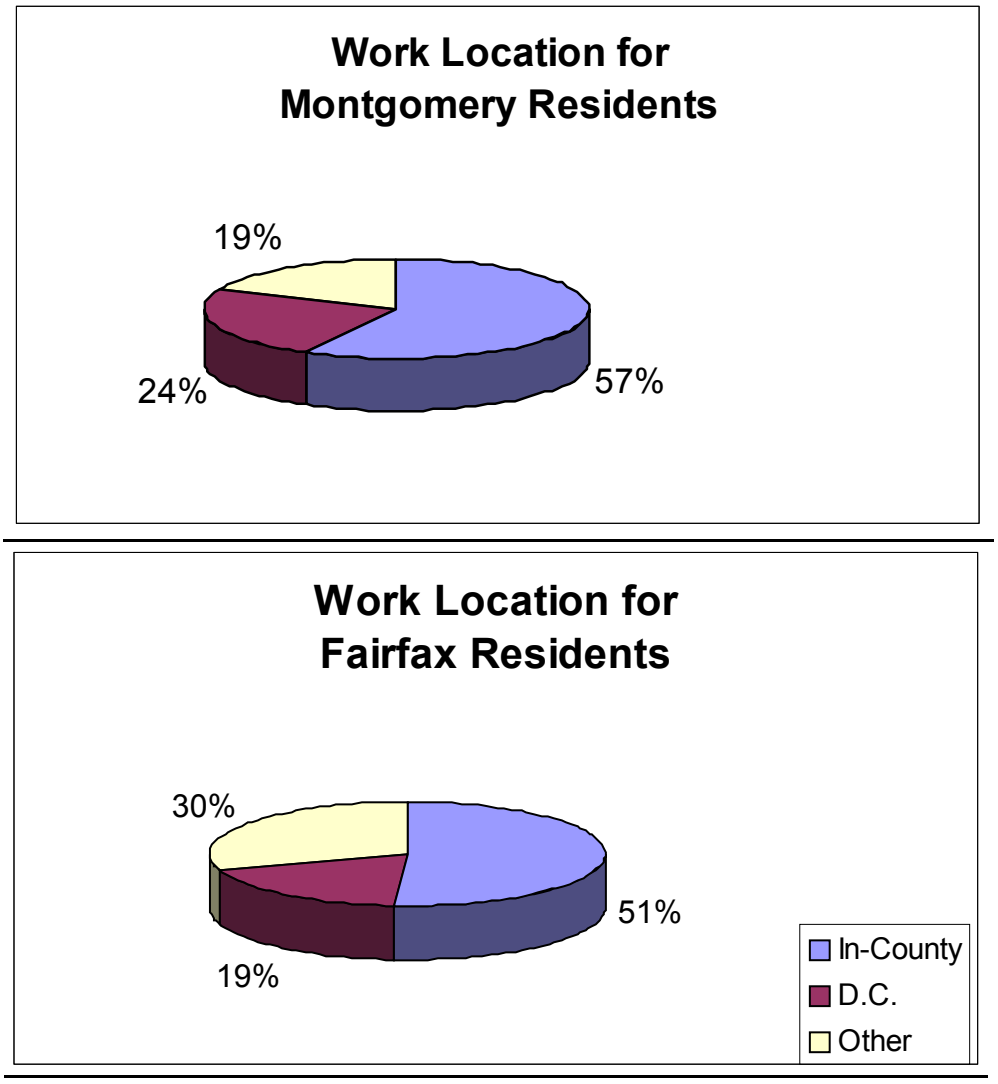


Figure 18

- **Montgomery County has focused land uses around Metrorail stations.**

A recent University of Maryland Study used satellite images to measure "sprawl" by calculating the amount of development away from Metro stations. Raw areas were normalized based on size differences between the two counties.

The study found that Montgomery County consistently developed closer to Metro than Fairfax between 1973 and 1985. That trend continued between 1985 and 1990 when Montgomery County consistently developed closer to Metro than Fairfax.

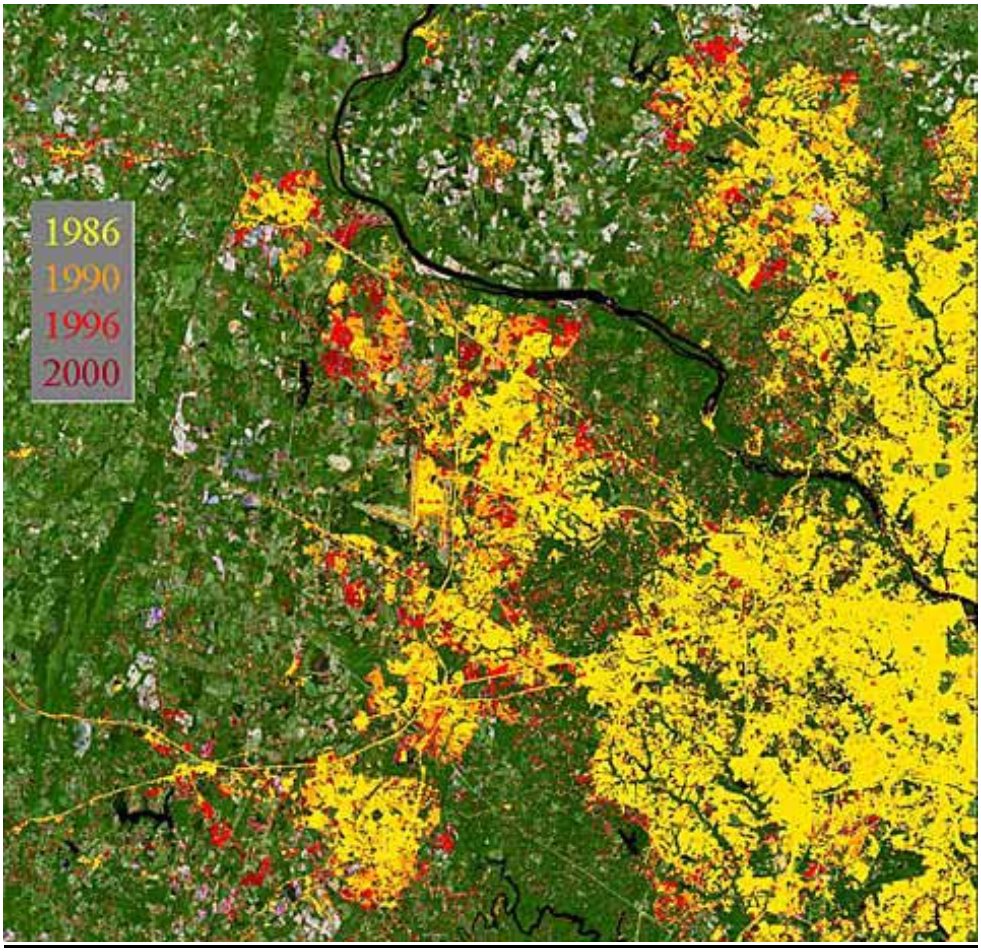


Figure 19

LANDSAT Data Showing Urban growth in the Washington D.C. region
Source: Mid-Atlantic RESAC, Department of Geography, University of Maryland, College Park

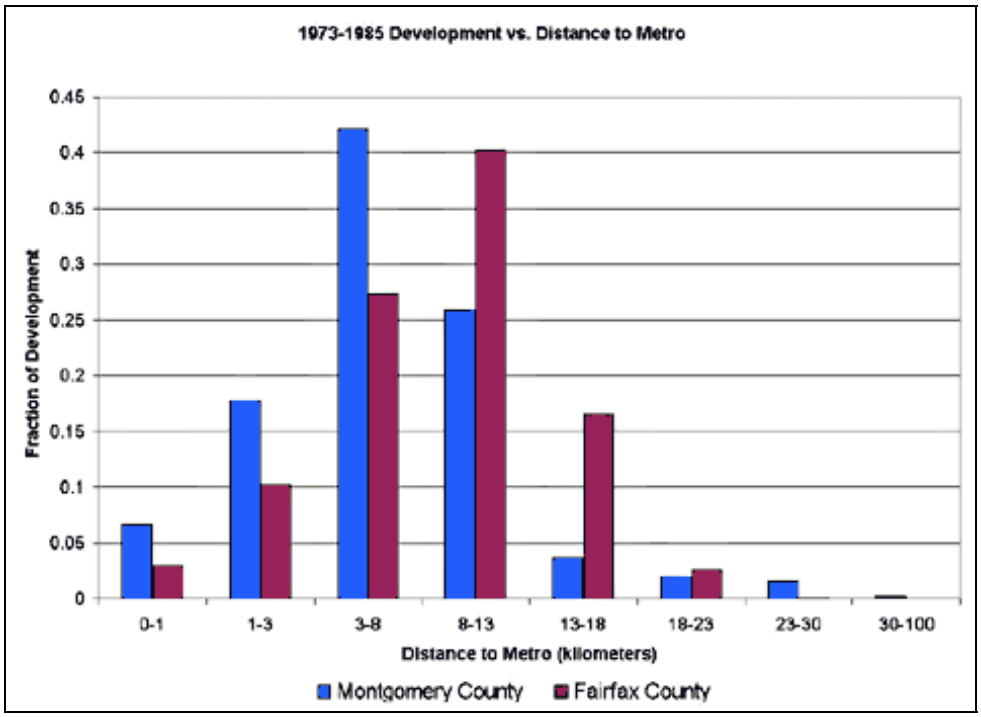


Figure 20

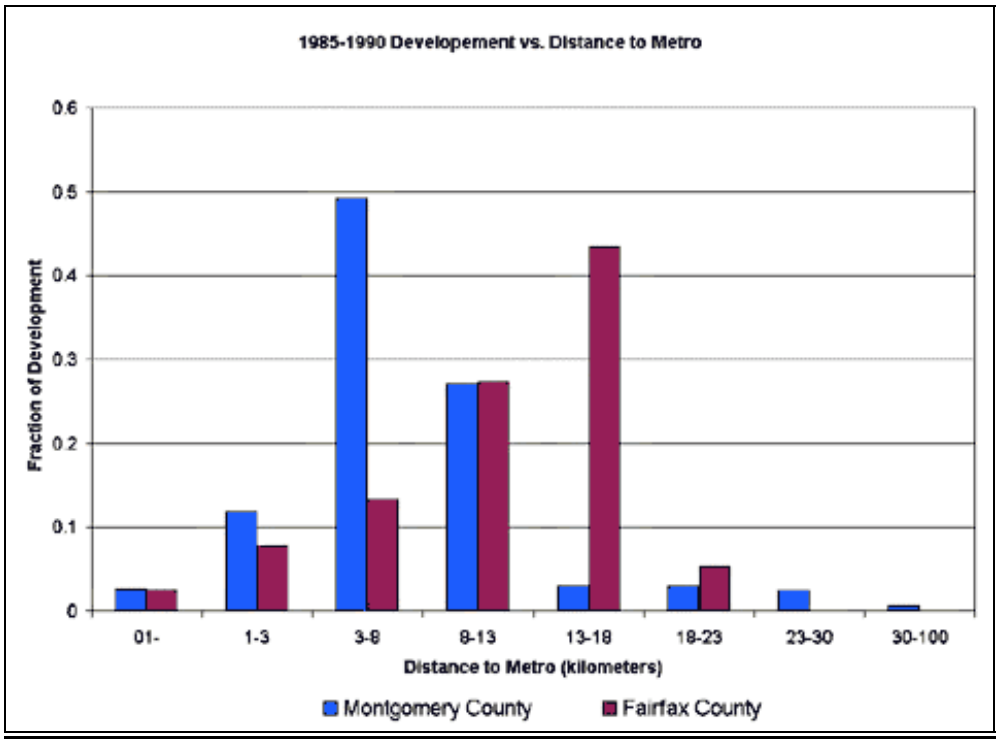


Figure 21

Source: Mid-Atlantic RESAC, Department of Geography, University of Maryland, College Park

A similar pattern is shown for development under 13km, but Montgomery County appears to be spreading out, with almost 10% of new development occurring between 23 and 30 km from Metro. Fairfax does not have any new development more than 23 km from Metro.

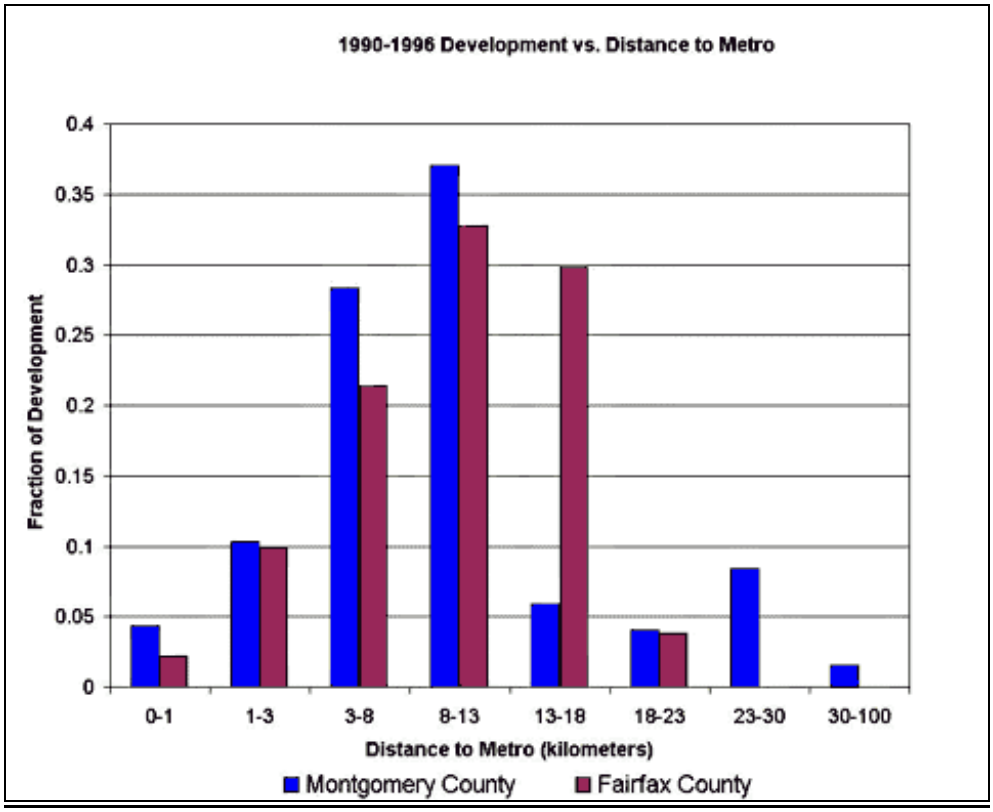


Figure 22

Rates of Land Conversion were Consistently Lower in Montgomery than in Fairfax

Square kilometers of development per year		
Time Period	**Montgomery**	**Fairfax**
1973-1985	3.5	5.7
1985-1990	4.6	10
1990-1996	2.6	4.5

Source: Mid-Atlantic RESAC, Department of Geography, University of Maryland, College Park

Table 1, Montgomery County Totals 1985-2000: VMT Per Lane Mile

Land Use Totals	1985	1990	1995	2000	% Change 85-00
Jobs ('000s)	381	466	462	546	43.3%
Population ('000s)	628	757	813	873	39.0%
Lane Miles	1985	1990	1995	2000	% Change 85-00
Freeway	262	337	360	371	41.8%
Principal Arterial	492	596	620	677	37.8%
Minor Arterial	471	496	562	573	21.6%
Collector	717	745	745	769	7.3%
TOTAL	1,941	2,174	2,287	2,391	23.1%
VMT	1985	1990	1995	2000	% Change 85-00
Freeway	4,135,316	4,747,434	6,190,650	6,702,510	62.1%
Principal Arterial	3,970,368	4,883,190	4,539,786	4,945,715	24.6%
Minor Arterial	2,141,632	2,552,171	3,420,097	3,498,581	63.4%
Collector	1,617,805	1,939,698	2,085,205	2,104,420	30.1%
TOTAL	11,865,121	14,122,493	16,235,739	17,251,227	45.4%
VMT/Lane Mile	1985	1990	1995	2000	% Change 85-00
Freeway	15,788	14,094	17,214	18,048	14.3%
Principal Arterial	8,077	8,198	7,321	7,302	-9.6%
Minor Arterial	4,544	5,141	6,081	6,105	34.3%
Collector	2,257	2,603	2,800	2,736	21.2%
TOTAL	6,111	6,496	7,100	7,216	18.1%

Table 2, Washington Region* Comparison 1985-2000: VMT Per Lane Mile

	Washington Region				Montgomery				Fairfax
	1985	1990	1995	2000	1985	1990	1995	2000	2000
Population ('000s)	2860	3100	3445	3560	565	681	732	785	965
Freeway									
Daily VMT (000)	19,460	25,080	32,460	34,535	3,843	4,310	5,830	6,313	10,515
Lane-miles	1,290	1,520	1,800	1,885	234	309	336	343	571
VMT/Lane-mile	15,085	16,500	18,033	18,321	16,449	13,968	17,357	18,391	18,415
Fwy. Lane Miles per Capita	0.45	0.49	0.52	0.53	0.41	0.45	0.46	0.44	0.59
Principal Arterial Streets									
Daily VMT (000)	14,530	17,860	18,680	20,060	3,892	4,762	4,540	4,946	6,372
Lane-miles	2,000	2,200	2,330	2,410	480	581	620	677	643
VMT/Lane-mile	7,265	8,118	8,017	8,324	8,107	8,193	7,321	7,302	9,910
P.A. Lane Miles per Capita	0.70	0.71	0.68	0.68	0.85	0.85	0.85	0.86	0.67

* All figures are for the urbanized portions of the Washington Region, Montgomery and Fairfax Counties only.

Table 3, Washington Region 1985-2000: Comparison of TTI Mobility Measures

	Washington Region				Montgomery				Fairfax
	1985	1990	1995	2000	1985	1990	1995	2000	2000
Travel Rate Index	1.22	1.35	1.37	1.4	1.24	1.33	1.35	1.4	1.41
Travel Time Index	1.41	1.63	1.63	1.68	1.44	1.6	1.61	1.68	1.71
Percent of Daily Travel in Congestion	30	38	37	39	31	37	37	39	40
Annual Hours of Delay									
Total (1000 Person-hours)	71197	121912	141739	158737	17614	26107	29022	33782	50323
Freeway									
Recurring Person-hours (000)	13534	29277	40011	46677	2789	4923	7039	8533	14502
Incident Person-hours (000)	17594	32205	36010	37342	3626	5415	6336	6826	11602
Principal Arterial Street									
Recurring Person-hours (000)	19080	28776	31294	35580	5333	7509	7451	8773	11533
Incident Person-hours (000)	20989	31654	34424	39138	5866	8260	8196	9650	12686
Annual Delay per Capita (person-hours)	25	39	41	45	31	38	40	43	52
Annual Excess Fuel Consumed									
Total (million gallons)	110	184	215	240	27	39	43	50	76
Fuel consumed per capita (gallons)	39	59	62	67	47	57	59	64	79
Annual Congestion Cost									
Total ($million)	834	1653	2215	2901	204	350	450	571	856
Cost per Capita ($)	292	533	643	815	362	514	615	727	887
Average Peak Period Travel Speed									
Freeway System (mph)	50	44	43	42	49	44	44	42	41
Prin Arterial Street System (mph)	28	27	26	26	28	27	27	26	26
Roadway Congestion Index	1.13	1.24	1.32	1.35	1.26	1.15	1.26	1.32	1.41

Table 4, Route Miles for Freeways and Arterials, Year 2000

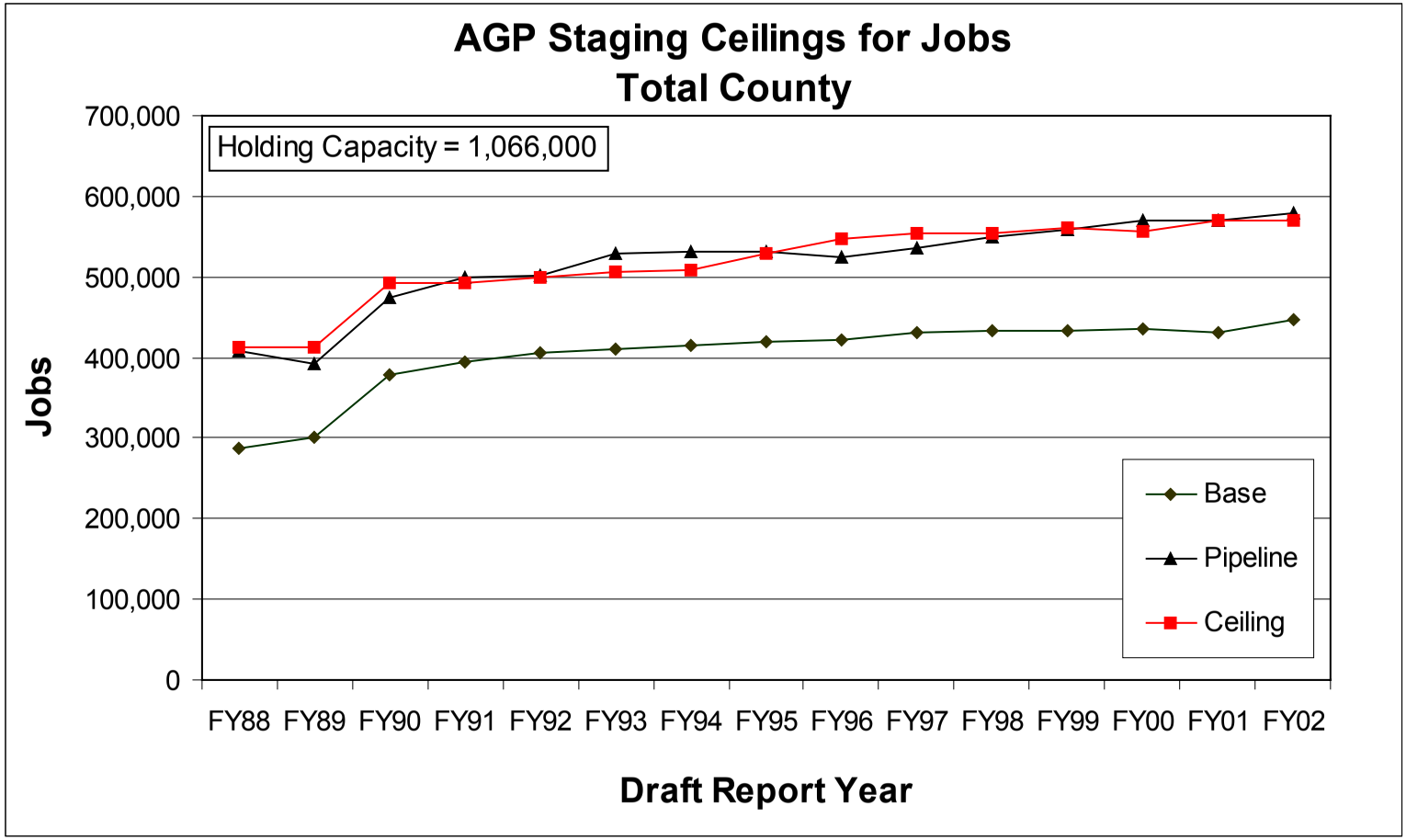
	Montgomery	Fairfax
Freeways	140	286
Principal Arterials	273	245
2-lane	103	36
4-lane	88	178
6 or more lanes	82	31
Minor Arterials	422	482
Total	835	1013

Source: COG Data Clearinghouse

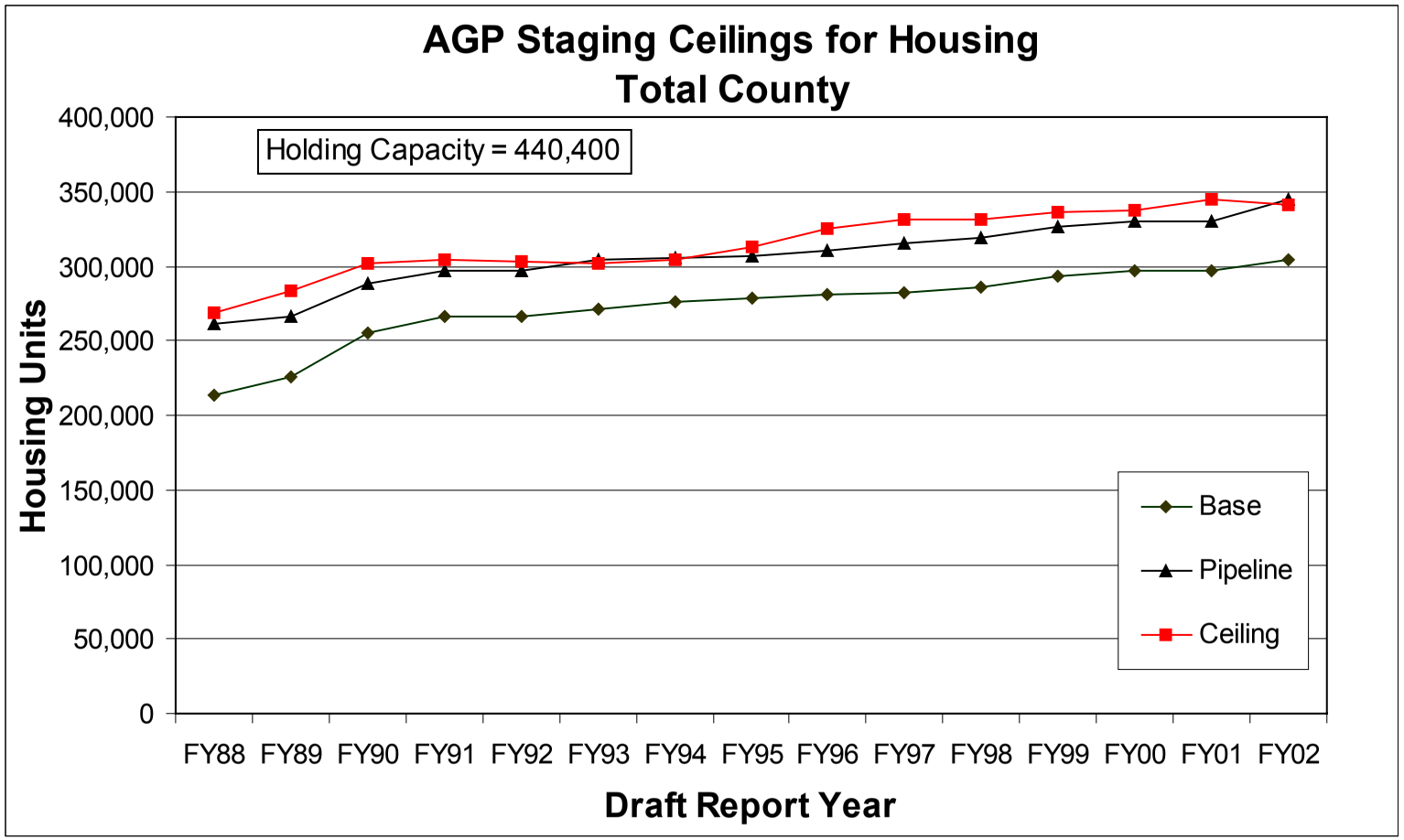
APPENDIX A
Development Capacity Due to Added Infrastructure, FY88-FY97

Fiscal Year	Transportation Improvement	Added Jobs Capacity	Added Housing Capacity
FY88	Widening of US-29 Widening of Veirs Mill Road from Randolph to Connecticut Avenue I-270 Widening North of Montgomery Village Avenue Great Seneca Highway Midcounty Highway Key West Avenue Gude Drive	12,400	5,130
FY89	I-495 Widening + 2 lanes from American Legion Bridge to River Road MD-118 Relocated MD28/198 Connector Widen MD 108 in Olney Chapman Avenue MD 355/28 Intersection New Metro Stations: Wheaton & Forest Glen	6,000	10,000
FY90	Construct Father Hurley Blvd Widen MD 108 Laytonsville Rd in Olney Widen New Hampshire Ave Phase I	1,500	2,500
FY91	Widening of Veirs Mill Rd & Twinbrook Pkwy Widening of MD 28 (Darnestown Road) Widening of East Randolph Road Widening of Watkins Mill Road Bridge	4,000	8,000
FY92	Widening of New Hampshire Avenue Widening of West Richie Parkway Construction of Chapman Avenue	5,000	3,500
FY93	Shady Grove Road from Corporate Blvd to Choke Cherry Rd I-270 Southbound from Y-Split to Old Georgetown Road I-495 Widening between N. Hampshire Ave and Rte.1	3,750	4,000
FY94	Widening of I-270 East and West Spurs Widening of Father Hurley Blvd and I-270 from FHB to MD-121 Widening New Hampshire Ave from Randolph Road to MD 198 Germantown Improvements to Support Town Center Build-out Creation of 3 North Bethesda Metro Station Areas	17,420	7,176
FY94 Amendment	Change to Countywide Freeway Test and TTLOS Methodology	11,773	12,342
FY95	Extending Key West Ave from Gude Drive to Research Blvd Widening MD28 from Research Blvd to I-270 Widening Quince Orchard from MD28 to Longdraft Rd	11,250	2,000

Fiscal Year	Transportation Improvement	Added Jobs Capacity	Added Housing Capacity
FY96	Widening MD 355 from MD 124 to Middlebrook Rd Widening MD 118 from A-254 to Clopper Rd Widening Clopper Rd from west of Schaeffer Rd to East of MD 118 Extension of MD 118 relocated south of Clopper Rd	750	2,750
FY96 Policy Element	Creation of Shady Grove Policy Area	1,000	
FY97	Norbeck Road Extended	250	2,000


AGP Staging Ceilings for Jobs
Total County
Holding Capacity = 1,066,000
Jobs
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
FY88 FY89 FY90 FY91 FY92 FY93 FY94 FY95 FY96 FY97 FY98 FY99 FY00 FY01 FY02
Draft Report Year
Base
Pipeline
Ceiling

APPENDIX B 1


AGP Staging Ceilings for Housing
Total County
Holding Capacity = 440,400
Housing Units
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
FY88 FY89 FY90 FY91 FY92 FY93 FY94 FY95 FY96 FY97 FY98 FY99 FY00 FY01 FY02
Draft Report Year
Base
Pipeline
Ceiling

APPENDIX B 2

APPENDIX C
Notable Transportation Improvements Provided by the Private Sector to Meet AGP Requirements

Germantown East Road Club

MD 27 (Ridge Road): 6.8 lane miles
6 lanes from I-270 to A-19 (Observation Drive) and 4 lanes from A-19 to Brink Road

MD 355 (Frederick Road): 9.2 lane miles
5 lanes from MD 118 to Archdale Road and 4 lanes from MD 118 to north of MD 27

A-19 (Observation Drive): 7.5 lane miles
4 lanes from MD 118 to north of Ridge Road

I-270/Father Hurley Boulevard: *Dedication of Right-of Way*

Total: 23.5 lane miles. Supported: 3,040 dwelling units and 22,100 jobs

Germantown West Road Club

A-297 (Richter Farm Road): 11.3 lane miles
4 lanes from Great Seneca Highway to MD 117 (Clopper Road)

2. MD 118 Relocated: 2.6 lane miles
2 lanes from Wisteria Drive to south of MD 117

Father Hurley Boulevard: 0.7 lane miles
2 lanes from A-254 (Dawson Farm Road) to A-80 (Hopkins Road)

4. A-254 (Dawson Farm Road): 3.4 lane miles
4 lanes from Father Hurley Boulevard to Great Seneca Highway
Total: 18.0 lane miles. Supported: 4,450 dwelling units

Clarksburg Road Club

MD 27 (Ridge Road): 2.7 lane miles
6 lanes (2 additional) from Observation Drive to A-305 (Midcounty Arterial)

A-305 (Midcounty Arterial): 10.6 lane miles
4 lanes from MD 27 to Stringtown Road

A-302 (Newcut Road): 4.4 lane miles
4 lanes from MD 355 to A-305 and 2 lanes from A-305 to MD 27

A-306 (Foreman Boulevard): 0.8 lane miles
2 lanes from current terminus at Timber Creek Lane to A-305

Stringtown Road: 0.5 lane miles
4 lanes (2 additional) from MD 355 to A-305
Total: 19.0 lane miles. Supported: 3,900 dwelling units and 270 jobs

Grand Total: 60.5 lane miles