

# APPENDIX D

## **Trip Distribution and Traffic Assignment Guidelines**

## Introduction

This document provides trip distribution guidance to be used in all traffic studies prepared for development sites in Montgomery County. Vehicle trip distribution and trip assignment are described in Sections VII-D and VII-F of the Guidelines. For most development sites, the process is a combination of trip distribution and traffic assignment.

## Definitions

Trip distribution specifies the location where trips that originate at a development site are destined to, and the origin of trips that are destined to a development site.

Traffic assignment specifies the individual local area intersections used to access (enter and leave) a development site.

## Discussion

The tables in this appendix provide generalized assumptions for trip distribution for both background development(s) and the development site. For the purpose of reviewing trip distribution, Transportation Planning staff divided the region into 16 geographic areas, called super districts. Eleven of these super districts are in Montgomery County, as shown in Figure D-1. The remaining five super districts represent neighboring jurisdictions.

The trip distribution assumptions are contained in Tables D-1 through D-11 for developments within each of the eleven super districts in Montgomery County. For each super district, the assumed distribution of trips for general office development and for residential development is listed. For instance, 18.1 percent of trips generated by a general office development in Germantown (see Table D-9) would be expected to travel to or from Frederick County. However, only two percent of trips generated by a residential development in Germantown would be expected to travel to or from Frederick County.

The trip distribution assumptions in these tables are based on 1990 census journey-to-work information, updated to reflect regional housing and employment totals as of 1998. The distribution for residential development in each super district is based on the reported workplace locations for 1990 census respondents who lived in that super district. Similarly, the distribution for office development for each super district is based on the distribution of all census households nationwide that reported a workplace in that super district. Trip distribution for other land uses will be decided based on consultation with staff and the applicant prior to submission of the traffic study.

The application of the trip distribution information in Tables D-1 through D-11 is straightforward in cases where a traffic study has a limited number of alternate routes. In other cases, judgment is required to convert the trip distribution information into traffic assignment information useful for conducting the Local Area Transportation Review.

Figure D-2 provides an example of how the trip distribution information can be converted to traffic assignment information for a hypothetical case in the Rockville/North Bethesda super district with both office and residential components.

The leftmost column of data shows the trip distribution by super-district as found in Table D-4 (used for development in the Rockville/North Bethesda super district). The information located in the center of the table (inside the boxes) describes the assumed route, or assignment, taken for trips

between the site and each super-district. *The data inside the boxes must be developed using judgment and confirmed by Transportation Planning staff.* The rightmost portion of the table multiplies the percent of trips distributed to each super-district by the percent of trips from that super-district assigned to each route to calculate the percent of total site-generated trips using each combination of distribution and assignment. The assignment data is then summed to develop an aggregate trip assignment for the trips generated by the office and residential components of the site, respectively.

Figure D-1  
Super Districts in Montgomery County

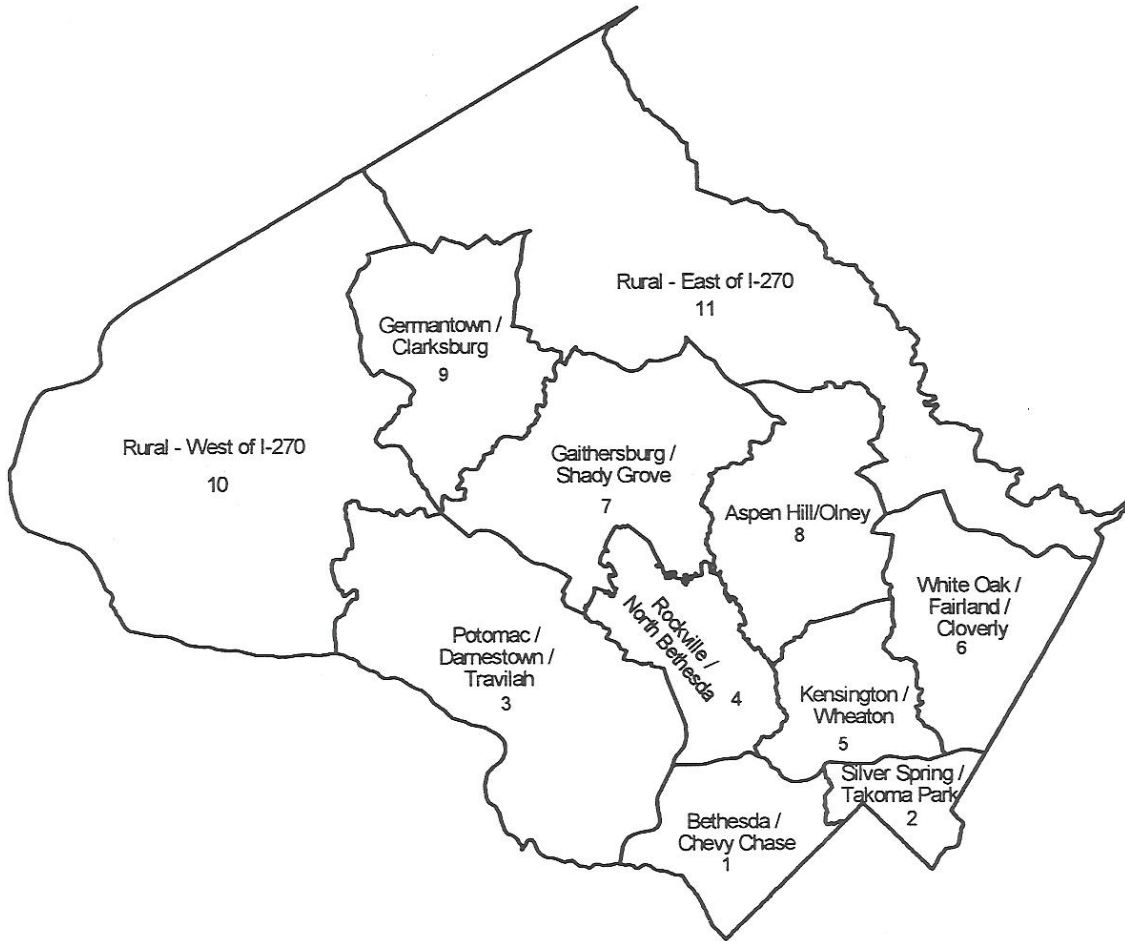


Figure D-2  
Trip Distribution Converted to Traffic Assignment

Figure 2. Trip Distribution - Assignment Matrix  
Hypothetical Case in North Bethesda with both Office and Residential Components

Trip distribution by super-district	Trip assignment for origin by super-district					Trip assignment for development case					TOTAL
	Montrose	MD 355	Randolph	MD 355	MD 187	Montrose	MD 355	Randolph	MD 355	MD 187	
Bethesda	3.5%				50%	0.0%	0.0%	0.0%	1.8%	1.8%	3.5%
Silver Spring	2.2%				100%	0.0%	0.0%	0.0%	2.2%	2.2%	2.2%
Potomac	8.0%				20%	6.4%	0.0%	0.0%	0.0%	1.6%	8.0%
Rockville	12.8%	75%	80%	20%	20%	3.2%	9.6%	0.0%	0.0%	0.0%	12.8%
Kensington	7.2%		80%	20%		0.0%	0.0%	5.8%	1.4%	0.0%	7.2%
Fairland	4.1%		80%			0.0%	0.0%	3.3%	0.8%	0.0%	4.1%
Gaithersburg	14.4%	25%	30%			10.8%	3.6%	0.0%	0.0%	0.0%	14.4%
Olney	8.5%	20%	90%			1.7%	4.3%	2.6%	0.0%	0.0%	8.5%
Germantown	6.5%	10%				5.9%	0.7%	0.0%	0.0%	0.0%	6.5%
Agricultural Area (West)	0.9%	40%	20%			1.7%	1.7%	0.8%	0.0%	0.0%	4.2%
Agricultural Area (East)	4.2%	70%		30%		2.5%	0.0%	0.0%	1.1%	0.0%	3.6%
Washington, DC	3.6%			100%		0.0%	0.0%	0.0%	0.0%	0.0%	3.6%
Prince George's County	8.8%	80%	10%		10%	6.2%	0.0%	0.8%	0.0%	0.8%	7.8%
Virginia	7.8%	100%				4.6%	0.0%	0.0%	0.0%	0.0%	4.6%
Frederick County	4.6%					0.0%	0.3%	0.3%	2.3%	0.0%	2.9%
Howard County	2.9%				80%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%
<b>TOTAL</b>	<b>100.0%</b>					<b>43.9%</b>	<b>20.1%</b>	<b>13.5%</b>	<b>18.4%</b>	<b>4.1%</b>	<b>100.0%</b>
						<b>USE ==&gt;</b>	<b>44%</b>	<b>14%</b>	<b>18%</b>	<b>4%</b>	<b>100%</b>

Trip distribution by super-district	Trip assignment for origin by super-district					Trip assignment for development case					TOTAL
	Montrose	MD 355	Randolph	MD 355	MD 187	Montrose	MD 355	Randolph	MD 355	MD 187	
Bethesda	15.6%				50%	0.0%	0.0%	0.0%	7.8%	7.8%	15.6%
Silver Spring	2.4%				100%	0.0%	0.0%	0.0%	2.4%	2.4%	2.4%
Potomac	3.3%				20%	2.6%	0.0%	0.0%	0.0%	0.7%	3.3%
Rockville	31.0%	75%	80%	20%		7.8%	23.3%	0.0%	0.0%	0.0%	31.0%
Kensington	2.6%		80%	20%		0.0%	0.0%	2.1%	0.5%	0.0%	2.6%
Fairland	0.7%		80%			0.0%	0.0%	0.6%	0.1%	0.0%	0.7%
Gaithersburg	10.6%	75%	30%			8.0%	2.7%	0.0%	0.0%	0.0%	10.6%
Olney	1.7%	20%	90%			0.3%	0.9%	0.5%	0.0%	0.0%	1.7%
Germantown	1.0%	10%				0.9%	0.1%	0.0%	0.0%	0.0%	1.0%
Agricultural Area (West)	0.0%	40%	20%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Agricultural Area (East)	0.2%	70%		30%		0.1%	0.1%	0.0%	0.0%	0.0%	0.2%
Washington, DC	13.9%			100%		9.7%	0.0%	0.0%	4.2%	0.0%	13.9%
Prince George's County	6.1%	80%	10%		10%	0.0%	0.0%	1.0%	0.0%	6.1%	6.1%
Virginia	9.7%	100%				7.8%	0.0%	0.0%	0.0%	1.0%	9.7%
Frederick County	0.5%					0.5%	0.0%	0.0%	0.0%	0.0%	0.5%
Howard County	0.7%				80%	0.0%	0.1%	0.1%	0.6%	0.0%	0.7%
<b>TOTAL</b>	<b>100.0%</b>					<b>37.7%</b>	<b>27.0%</b>	<b>4.2%</b>	<b>21.7%</b>	<b>9.4%</b>	<b>100.0%</b>
						<b>USE ==&gt;</b>	<b>38%</b>	<b>4%</b>	<b>22%</b>	<b>9%</b>	<b>100%</b>

figure2

**Table D-1**

Trip Distribution Report in Super District 1: Bethesda/Chevy Chase

Auto-Driver Trip Distribution for Development in Super District 1:  
Bethesda/Chevy Chase

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	11.7%	22.8%
2. Silver Spring/Takoma Park	3.8%	2.1%
3. Potomac/Darnestown/Travilah	7.3%	1.8%
4. Rockville/North Bethesda	9.4%	9.8%
5. Kensington/Wheaton	8.7%	1.6%
6. White Oak/Fairland/Cloverly	4.3%	0.7%
7. Gaithersburg/Shady Grove	7.5%	4.0%
8. Aspen Hill/Olney	5.1%	0.4%
9. Germantown/Clarksburg	3.3%	0.2%
10. Rural: West of I-270	0.6%	0.0%
11. Rural: East of I-270	2.0%	0.15%
12. Washington, DC	7.4%	39.5%
13. Prince George's County	12.4%	4.6%
14. Virginia	12.2%	11.7%
15. Frederick County	2.1%	0.2%
16. Howard County	2.2%	0.5%

Table D-2

Trip Distribution Report in Super District 2: Silver Spring/Takoma Park

Auto-Driver Trip Distribution for Development in Super District 2:  
Silver Spring/Takoma Park

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	2.2%	9.1%
2. Silver Spring/Takoma Park	11.5%	13.3%
3. Potomac/Darnestown/Travilah	2.2%	0.9%
4. Rockville/North Bethesda	3.0%	7.7%
5. Kensington/Wheaton	10.0%	4.6%
6. White Oak/Fairland/Cloverly	11.9%	2.7%
7. Gaithersburg/Shady Grove	3.9%	4.2%
8. Aspen Hill/Olney	6.3%	0.8%
9. Germantown/Clarksburg	1.3%	0.6%
10. Rural: West of I-270	0.1%	0.6%
11. Rural: East of I-270	2.8%	0.2%
12. Washington, DC	7.2%	32.5%
13. Prince George's County	24.5%	12.8%
14. Virginia	6.4%	8.9%
15. Frederick County	1.1%	0.2%
16. Howard County	5.6%	1.4%

Table D-3  
 Trip Distribution Report in Super District 3: Potomac/Darnestown/Travilah

Auto-Driver Trip Distribution for Development in Super District 3:  
 Potomac/Darnestown/ Travilah

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	5.7%	13.0%
2. Silver Spring/Takoma Park	2.4%	1.9%
3. Potomac/Darnestown/Travilah	21.0%	6.2%
4. Rockville/North Bethesda	12.1%	20.5%
5. Kensington/Wheaton	6.8%	1.4%
6. White Oak/Fairland/Cloverly	2.3%	0.7%
7. Gaithersburg/Shady Grove	11.1%	13.3%
8. Aspen Hill/Olney	5.1%	0.6%
9. Germantown/Clarksburg	4.5%	1.7%
10. Rural: West of I-270	1.1%	0.1%
11. Rural: East of I-270	2.2%	0.2%
12. Washington, DC	3.8%	22.1%
13. Prince George's County	7.2%	5.1%
14. Virginia	10.4%	12.4%
15. Frederick County	2.8%	0.4%
16. Howard County	1.5%	0.4%

Table D-4  
 Trip Distribution Report in Super District 4: Rockville/North Bethesda

Auto-Driver Trip Distribution for Development in Super District 4:  
 Rockville/North Bethesda

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	3.5%	15.6%
2. Silver Spring/Takoma Park	2.2%	2.4%
3. Potomac/Darnestown/Travilah	8.0%	3.3%
4. Rockville/North Bethesda	12.8%	31.0%
5. Kensington/Wheaton	7.2%	2.6%
6. White Oak/Fairland/Cloverly	4.1%	0.7%
7. Gaithersburg/Shady Grove	14.4%	10.6%
8. Aspen Hill/Olney	8.5%	1.7%
9. Germantown/Clarksburg	6.5%	1.0%
10. Rural: West of I-270	0.9%	0.0%
11. Rural: East of I-270	4.2%	0.2%
12. Washington, DC	3.6%	13.9%
13. Prince George's County	8.8%	6.1%
14. Virginia	7.8%	9.7%
15. Frederick County	4.6%	0.5%
16. Howard County	2.9%	0.7%

Table D-5  
 Trip Distribution Report in Super District 5: Kensington/Wheaton

Auto-Driver Trip Distribution for Development in Super District 5:  
 Kensington/Wheaton

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	2.7%	12.3%
2. Silver Spring/Takoma Park	6.2%	6.9%
3. Potomac/Darnestown/Travilah	2.6%	1.6%
4. Rockville/North Bethesda	5.1%	14.8%
5. Kensington/Wheaton	26.0%	11.1%
6. White Oak/Fairland/Cloverly	10.6%	2.2%
7. Gaithersburg/Shady Grove	5.5%	6.0%
8. Aspen Hill/Olney	10.3%	2.0%
9. Germantown/Clarksburg	2.1%	0.6%
10. Rural: West of I-270	0.2%	0.0%
11. Rural: East of I-270	4.3%	0.4%
12. Washington, DC	3.7%	22.6%
13. Prince George's County	11.9%	9.5%
14. Virginia	4.1%	8.2%
15. Frederick County	1.5%	0.2%
16. Howard County	3.2%	1.5%

Table D-6  
 Trip Distribution Report in Super District 6: White Oak/Fairland/Cloverly

Auto-Driver Trip Distribution for Development in Super District 6:  
 White Oak/Fairland/ Cloverly

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	1.3%	6.8%
2. Silver Spring/Takoma Park	4.5%	9.0%
3. Potomac/Darnestown/Travilah	1.7%	0.6%
4. Rockville/North Bethesda	1.7%	9.3%
5. Kensington/Wheaton	6.1%	5.0%
6. White Oak/Fairland/Cloverly	23.5%	9.3%
7. Gaithersburg/Shady Grove	3.2%	3.8%
8. Aspen Hill/Olney	6.2%	1.4%
9. Germantown/Clarksburg	0.4%	0.4%
10. Rural: West of I-270	0.1%	0.0%
11. Rural: East of I-270	2.8%	1.1%
12. Washington, DC	3.7%	23.4%
13. Prince George's County	26.4%	20.1%
14. Virginia	3.4%	7.1%
15. Frederick County	1.6%	0.0%
16. Howard County	13.4%	2.7%

Table D-7  
 Trip Distribution Report in Super District 7: Gaithersburg/Shady Grove

Auto-Driver Trip Distribution for Development in Super District 7:  
 Gaithersburg/Shady Grove

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	1.8%	8.5%
2. Silver Spring/Takoma Park	1.5%	2.2%
3. Potomac/Darnestown/Travilah	6.6%	2.1%
4. Rockville/North Bethesda	5.6%	23.7%
5. Kensington/Wheaton	3.7%	1.9%
6. White Oak/Fairland/Cloverly	2.2%	0.9%
7. Gaithersburg/Shady Grove	25.2%	32.4%
8. Aspen Hill/Olney	5.3%	1.8%
9. Germantown/Clarksburg	10.9%	3.4%
10. Rural: West of I-270	1.6%	0.1%
11. Rural: East of I-270	7.1%	0.8%
12. Washington, DC	2.5%	8.4%
13. Prince George's County	6.7%	4.0%
14. Virginia	4.6%	7.9%
15. Frederick County	12.1%	1.3%
16. Howard County	2.6%	0.6%

Table D-8  
 Trip Distribution Report in Super District 8: Aspen Hill/Olney

Auto-Driver Trip Distribution for Development in Super District 8:  
 Aspen Hill/Olney

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	1.2%	9.3%
2. Silver Spring/Takoma Park	1.9%	5.5%
3. Potomac/Darnestown/Travilah	1.9%	1.5%
4. Rockville/North Bethesda	6.1%	22.5%
5. Kensington/Wheaton	8.6%	5.7%
6. White Oak/Fairland/Cloverly	5.5%	2.8%
7. Gaithersburg/Shady Grove	9.4%	11.0%
8. Aspen Hill/Olney	26.0%	8.1%
9. Germantown/Clarksburg	3.1%	0.8%
10. Rural: West of I-270	0.1%	0.1%
11. Rural: East of I-270	14.1%	1.3%
12. Washington, DC	2.2%	15.2%
13. Prince George's County	6.4%	7.7%
14. Virginia	3.1%	6.2%
15. Frederick County	4.7%	0.4%
16. Howard County	5.7%	1.9%

Table D-9  
 Trip Distribution Report in Super District 9: Germantown/Clarksburg  
 Auto-Driver Trip Distribution for Development in Super District 9:  
 Germantown/ Clarksburg

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	0.6%	8.1%
2. Silver Spring/Takoma Park	1.4%	1.6%
3. Potomac/Darnestown/Travilah	5.5%	1.8%
4. Rockville/North Bethesda	3.5%	22.9%
5. Kensington/Wheaton	2.3%	1.6%
6. White Oak/Fairland/Cloverly	1.6%	0.2%
7. Gaithersburg/Shady Grove	17.2%	30.2%
8. Aspen Hill/Olney	2.5%	1.3%
9. Germantown/Clarksburg	25.2%	10.5%
10. Rural: West of I-270	2.6%	0.1%
11. Rural: East of I-270	8.0%	1.0%
12. Washington, DC	0.7%	7.0%
13. Prince George's County	5.8%	3.8%
14. Virginia	3.0%	7.4%
15. Frederick County	18.1%	2.0%
16. Howard County	2.1%	0.5%

Table D-10  
 Trip Distribution Report in Super District 10: Rural - West of I-270  
 Auto-Driver Trip Distribution for Development in Super District 10:  
 Rural - West of I-270

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	0.8%	9.7%
2. Silver Spring/Takoma Park	2.7%	0.7%
3. Potomac/Darnestown/Travilah	4.3%	2.9%
4. Rockville/North Bethesda	2.1%	20.1%
5. Kensington/Wheaton	0.8%	1.2%
6. White Oak/Fairland/Cloverly	0.0%	0.4%
7. Gaithersburg/Shady Grove	7.0%	30.0%
8. Aspen Hill/Olney	3.0%	0.4%
9. Germantown/Clarksburg	4.1%	7.1%
10. Rural: West of I-270	47.7%	9.1%
11. Rural: East of I-270	1.7%	0.5%
12. Washington, DC	0.0%	7.4%
13. Prince George's County	2.1%	1.7%
14. Virginia	4.8%	4.5%
15. Frederick County	18.9%	3.8%
16. Howard County	0.0%	0.5%

Table D-11  
 Trip Distribution Report in Super District 11: Rural – East of I-270

Auto-Driver Trip Distribution for Development in Super District 11:  
 Rural – East of I-270

Trip Distribution to Super District for	Office Development	Residential Development
1. Bethesda/Chevy Chase	0.4%	5.9%
2. Silver Spring/Takoma Park	0.8%	3.9%
3. Potomac/Darnestown/Travilah	1.3%	1.0%
4. Rockville/North Bethesda	1.3%	17.7%
5. Kensington/Wheaton	3.4%	3.8%
6. White Oak/Fairland/Cloverly	8.8%	2.1%
7. Gaithersburg/Shady Grove	9.0%	23.5%
8. Aspen Hill/Olney	8.8%	6.9%
9. Germantown/Clarksburg	4.9%	4.1%
10. Rural: West of I-270	0.4%	0.1%
11. Rural: East of I-270	27.5%	6.7%
12. Washington, DC	0.5%	7.3%
13. Prince George's County	9.8%	7.0%
14. Virginia	0.5%	5.2%
15. Frederick County	10.5%	2.0%
16. Howard County	12.1%	2.8%