

**TECHNICAL DATA
PHASING ANALYSIS**

**MAGNOLIA GREEN
CHESTERFIELD COUNTY, VIRGINIA**

OCTOBER 14, 2001



MEMBER SINCE 1902

PHASING ANALYSIS

MAGNOLIA GREEN
Chesterfield County, Virginia

This document is a supplement to the August 1991 Magnolia Green Traffic Impact Study. The purpose of this analysis is to determine the roadway improvements, if any, required to accommodate the projected traffic anticipated to be generated by Magnolia Green during its first several phases of development. The key issue is the roadway requirements during Phase I. After construction of Phase I, additional traffic data will then be available to verify the validity of traffic assumptions utilized in these analyses.

This document provides a brief summary and working papers on the traffic assumptions, methodology, and findings of the phasing analysis. Wilbur Smith Associates (WSA) has been working concurrently with the staff at Chesterfield County Transportation Department to derive the findings stated in this document.

Traffic Assumptions

The basis for traffic data utilized in this phasing analysis is the August 1991 Magnolia Green Traffic Impact Study and its supplements. Traffic projections stated in the Traffic Impact Study are based on ultimate roadway improvements including the extension of Powhite Parkway in the vicinity of the project site. For the phasing analysis, it is assumed that Powhite Parkway Extension has not yet occurred, which requires reassignment of traffic, both site and background, anticipated to be on Powhite Parkway Extension. These traffic reassignments are shown on Figures P1 and P2 for year 2010 background traffic assignment without the extension of Powhite Parkway through the site. Figure P3 summarizes the projected site traffic distribution without the Powhite Parkway Extension.

Background Traffic Growth - The projected growth for background traffic is the difference between the existing and projected background traffic. It is assumed that the background traffic will grow at the same rate as the site traffic during the 20-year project life. For example, if it is anticipated that Phase I will generate approximately 25% of the ultimate site traffic, the background traffic will be 25% of its 20-year projected growth.

Site Traffic Growth - Site traffic is based on Table 3-1 of the August study (See Appendix P1). The phasing analysis evaluates two alternatives of development. One alternative is to develop the project during its first phases as all residential land uses. The other alternative is to develop the project as a mixture of residential and commercial land uses. To provide some simplicity in the phasing analysis, it is assumed that under the mixed land use alternative, both residential and commercial uses will be developed at a proportional rate based on ultimate land uses stated in Table 3-1. Under the all residential alternative of development, traffic utilized in the analysis will not be reduced to reflect the capture phenomenon. For the mixed land use alternative, the adjusted traffic of Table 3-1 will be used to provide the reduction in traffic due to captured trips.

Phasing Methodology - It is determined by both Chesterfield County and WSA that the simplest methodology for conducting the phasing analysis is a "backward" approach to determine the trigger points of the roadway improvement. A "backward" approach is to determine the existing capacity of the adjacent roadway network and then add a portion of the projected background and site traffic until capacity is reached. These site traffic volumes at capacity are then converted back into units of residential or commercial land uses. This approach provides a ceiling on the amount of development by Magnolia Green and other projects before the next phase of roadway improvements will be required. Again, it should be noted that both site and background traffic are assumed to grow at the same rate.

Roadway Improvement Assumptions

The following are roadway improvement assumptions for the first phases of Magnolia Green:

Phase I

- o No Powhite Parkway Extension;
- o Site Access(s) on Route 360;
- o Site Access on Woolridge Road;
- o Traffic signalization and turn lane improvements on Woolridge Road Access;
- o Traffic signalization and turn lane improvements on Route 360 Access; and,
- o Existing conditions on Route 360, Woolridge, Duval, and Otterdale Roads.

Phase II

- o No Powhite Parkway Extension;
- o Additional improvements:
 - Upgrade Route 360 to 6 lanes;
 - Upgrade Woolridge Road to 12-foot lane and 6-foot shoulder; and,
 - Additional turn lanes at signalized intersections.

Phase III

- o No Powhite Parkway Extension;
- o Additional improvements:
 - Upgrade Otterdale Road to 12-foot lane and 6-foot shoulder; and,
 - Additional traffic signalization and turn lanes on Otterdale Road.

Findings

Based on the assumptions stated above, it is determined that under Alternative 1 of Phase I, approximately 2,300 residential units can be developed by Magnolia Green during Phase I prior to requiring off-site roadway improvements (Table 1). Under Alternative 2, mixed land uses, approximately 1,160 residential units and 235,000 SF of commercial land uses can be developed with the improvements depicted on Figure P4. This amount of development is possible due to the minimal background growth (25%) in the area during the first phase of Magnolia Green.

Table 1 summarizes the estimated developments possible under the first phases of Magnolia Green. As mentioned previously, Phase I development will be the critical phase since more accurate projections of traffic can be determined after this phase, based on actual field data. Potential development under Phase II and Phase III are possible if the background growth rate is consistent with the site growth rate. Under Phase II, approximately 34% of site and background traffic is estimated to be generated. Phase III projects approximately 45% of the total traffic that will be on the adjacent roadway network. If the assumptions stated in this document are valid, Magnolia Green can develop approximately 45% of its ultimate land uses prior to the requirement of Powhite Parkway Extension or additional lanes on ~~Route 366~~, Woolridge, and Otterdale Roads. Background traffic data for these are included in the Appendix of this report.

PHASE 1 ANALYSIS

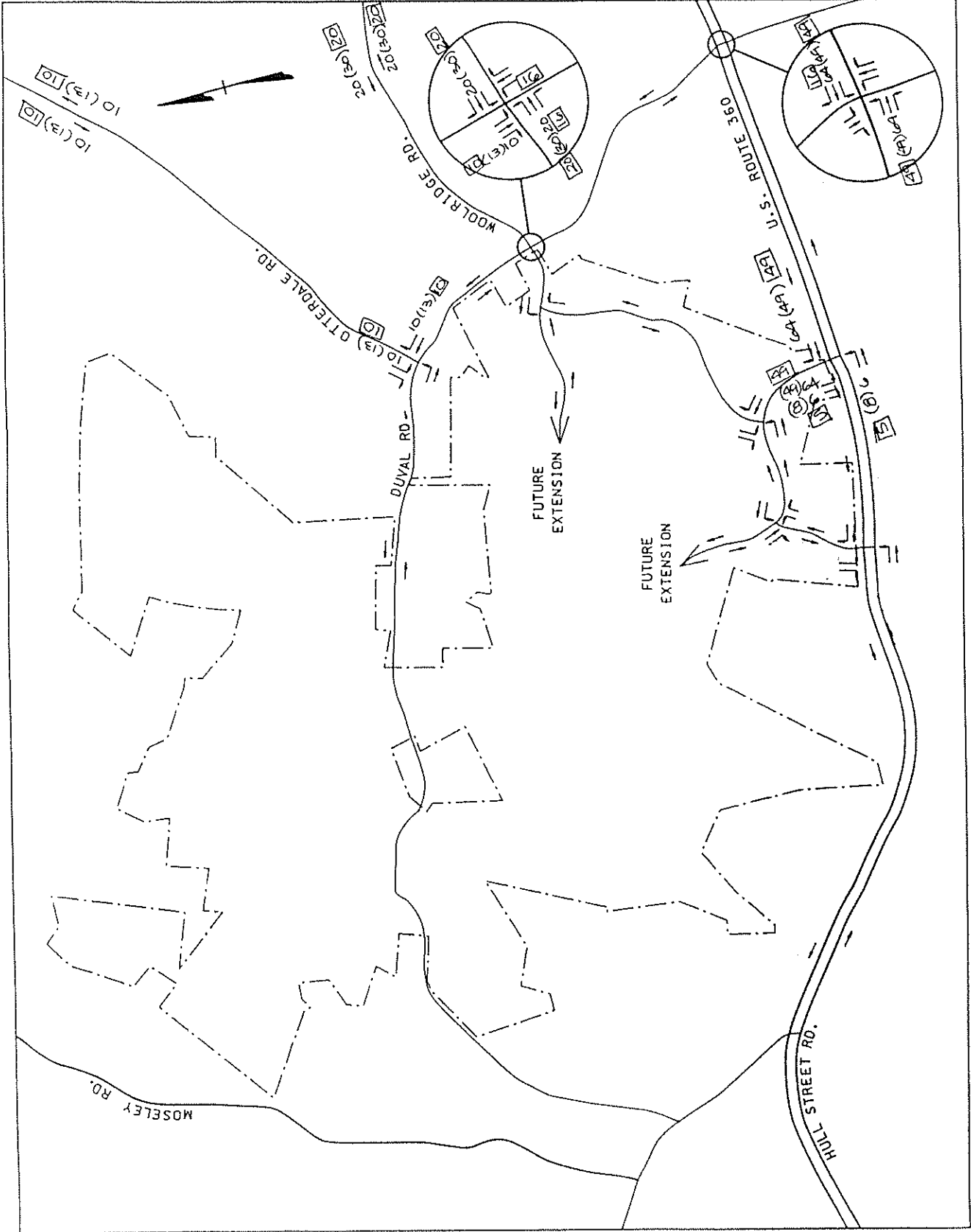
MAGNOLIA GREEN
CHESTERFIELD CO.
VIRGINIA

SITE TRAFFIC
DISTRIBUTION

- LEGEND
OO OFFICE
(OO) RETAIL
[OO] RESIDENTIAL



FIGURE # P3



PHASE 1 ANALYSIS

MAGNOLIA GREEN
CHESTERFIELD CO.
VIRGINIA

RECOMMENDED PHASE I
ROADWAY IMPROVEMENTS

LEGEND
TRAFFIC SIGNALIZATION



WSA

WILBUR SMITH ASSOCIATES

FIGURE # P4

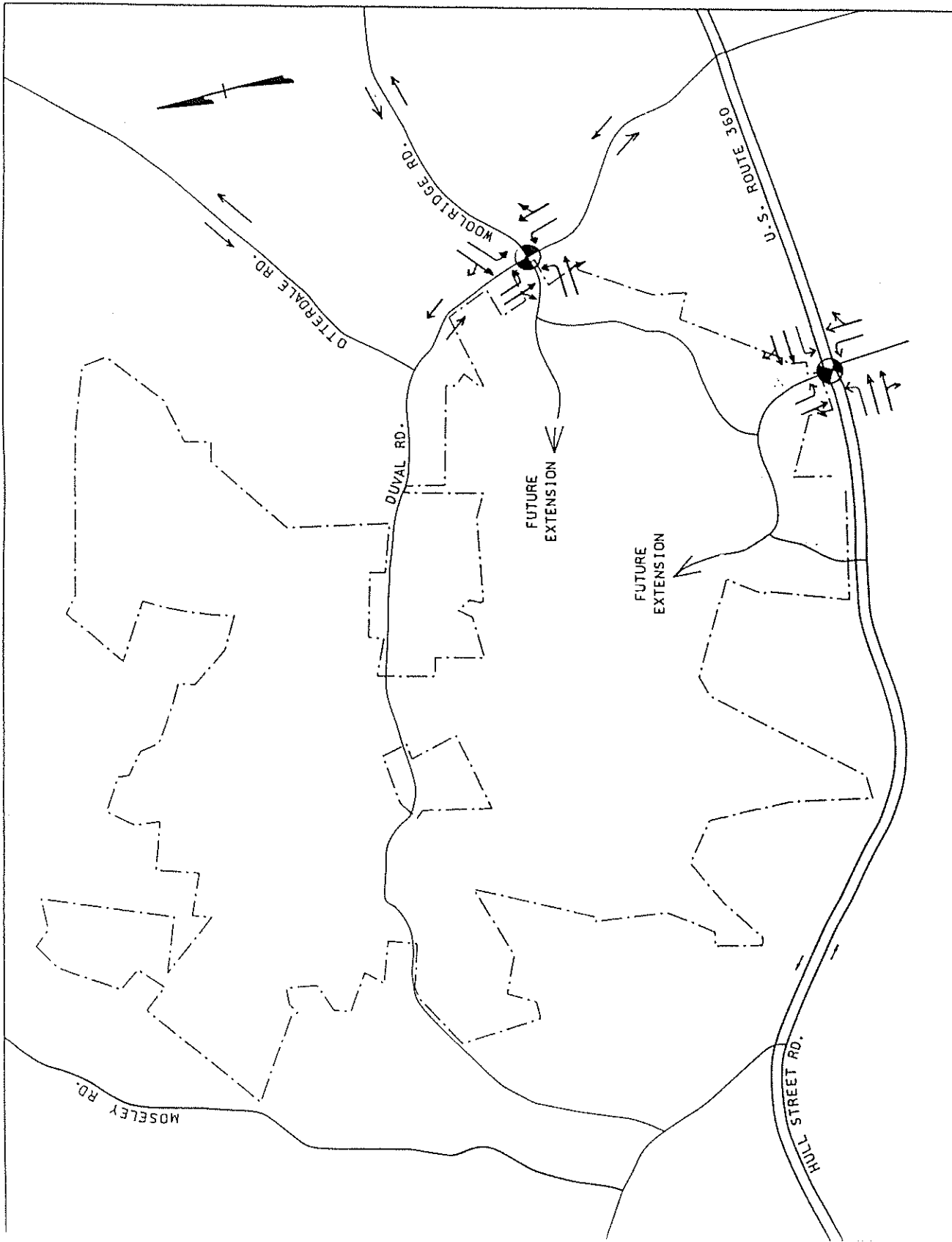


Table 1

PHASING ANALYSIS SUMMARY

Magnolia Green

<u>ROADWAY IMPROVEMENT DESCRIPTION</u>	<u>ALTERNATIVE 1 -- ALL RESIDENTIAL</u> <u>Land Uses</u> <u>Unit of Measurement</u>	<u>ALTERNATIVE 2 -- MIX LAND USES</u> <u>Land Uses</u> <u>Unit of Measurement</u>
<p>Phase I</p> <ul style="list-style-type: none"> o No Powhite Parkway o Access on Route 360 o Access on Woolridge Road o All existing off-site roadway conditions. No off-site roadway link improvements o Traffic signalization and turn lanes on Route 360, Woolridge Road 	<p>25% of Total Site Traffic 66% of Area 1 Site Traffic</p> <p><i>Total Cumulative Development:</i> Single Family 1,789 Units Multi Family 520 Units</p> <hr/> <p>2,309 Units</p>	<p>23% of Total Site Traffic 44% of Area 1 Site Traffic</p> <p><i>Total Cumulative Development:</i> Single Family 901 Units Multi Family 262 Units</p> <hr/> <p>1,163 Units</p>
<p>Phase II</p> <ul style="list-style-type: none"> o No Powhite Parkway o Additional improvements: o Upgrade Route 360 to 6 lanes o Upgrade Woolridge to 12' lane and 6' shoulder o Additional traffic signalization and turn lanes on Route 360, Woolridge Road 	<p>30% of Total Site Traffic 63% of Area 1 Site Traffic</p> <p><i>Total Cumulative Development:</i> Single Family 2,197 Units Multi Family 639 Units</p> <hr/> <p>2,836 Units</p>	<p>34% of Total Site Traffic 63% of Area 1 Site Traffic</p> <p><i>Total Cumulative Development:</i> Single Family 1,409 Units Multi Family 410 Units</p> <hr/> <p>1,819 Units</p>
<p>Phase III</p> <ul style="list-style-type: none"> o No Powhite Parkway o Additional improvements: o Upgrade Otterdale to 12' lane and 6' shoulder o Additional traffic signalization and turn lanes on Otterdale Road 	<p>45% of Total Site Traffic</p> <p><i>Total Cumulative Development:</i> Single Family 3,447 Units Multi Family 880 Units</p> <hr/> <p>4,327 Units</p>	<p>42% of Total Site Traffic</p> <p><i>Total Cumulative Development:</i> Single Family 1,831 Units Multi Family 532 Units</p> <hr/> <p>2,363 Units</p>
	<p>Office 153,000 SF Retail 84,000 SF</p>	<p>Office 239,000 SF Retail 131,000 SF</p>
	<p>Office 310,000 SF Retail 170,000 SF</p>	<p>Office 310,000 SF Retail 170,000 SF</p>

NOTE: Phasing analysis assumes that Powhite Parkway will not be extended during first three phases of Magnolia Green. Background traffic is assumed to increase at the same percentage as site traffic during the 20-year period of project life.

PHASE I WORKSHEETS

ESTIMATED TRIP GENERATION
 Chesterfield County Transportation Department
 Chesterfield, Virginia

Phase I
 Alternative 1

Project: Magnolia Green Phase I with Woolridge Access
 Date: 10/9/91 64%

Source: ITE Trip Generation, 5th Edition

ITE Code #	Description	Size	A.M. Peak Hour			P.M. Peak Hour			Average Weekday
			Enter	Exit	Total	Enter	Exit	Total	
110	Light Industrial		0	0	0	0	0	0	0
150	Warehouse		0	0	0	0	0	0	0
210	Single-family detached	1,789	256	728	984	946	510	1,456	14,701
220	Apartments	520	62	197	259	189	106	295	3,341
230	Townhouses	0	0	0	0	0	0	0	0
310	Hotel		0	0	0	0	0	0	0
710	General Office		0	0	0	0	0	0	0
750	Office Park		0	0	0	0	0	0	0
820	Shopping Center								
	(< 570,000 s.f.)		0	0	0	0	0	0	0
	(570 - 600,000 s.f.)		0	0	0	0	0	0	0
	(> 600,000 s.f.)		0	0	0	0	0	0	0

Totals for the Development

A.M. Peak Hour			P.M. Peak Hour			Average Weekday
Enter	Exit	Total	Enter	Exit	Total	
318	925	1,242	1,135	616	1,750	18,042

Source: Chesterfield Co.

Phase 1
Alternative 1

Magnolia Green - Phase 1 with Woolridge Access (MG_PM_2)
Traffic Volume Computation Checksheet
Afternoon Peak Hour

25.0% of Ultimate Total Site
66.3% Percentage of Area #1
6,988 Ultimate Site Traffic

Intersection/Segment	Area #1 Trip Generation				Area #2 Trip Generation				Total	Phased Local	Phased Total	Split	Link Volume	Link Capacity
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit						
Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Res.	1,135	617	1,752	0	0	0	0	0	0	0	0	0	0	0

Intersection/Segment	Area #1				Area #2				Total	Phased Local	Phased Total	Split	Link Volume	Link Capacity
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit						
Route 360 - #1 to #2	0	302	302	0	0	0	0	0	302	664	1,185	44%	2,508	2,510
Route 360 - #2 to #3	57	0	57	0	0	0	0	0	57	664	1,430	56%	1,794	2,510
Ottendale Rd - #1 to #4	0	99	99	0	0	0	0	0	99	53	390	44%	533	625
Ottendale Rd - #4 to #5	0	62	62	0	0	0	0	0	62	28	450	42%	463	645
Ottendale - north of #5	0	62	62	0	0	0	0	0	62	24	395	39%	461	625
Woolridge Road	0	123	123	0	0	0	0	0	123	16	305	38%	561	575

Intersection/Segment	Area #1				Area #2				Total	Phased Local	Phased Total	Split	Link Volume	Link Capacity
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit						
Route 360 at Site Road	57	0	57	0	0	0	0	0	57	0	50	13	70	70
	0	0	0	0	0	0	0	0	0	664	1,110	44%	776	776
	0	0	0	0	0	0	0	0	0	0	55	14	14	14
	0	0	0	0	0	0	0	0	0	0	70	18	18	18
	0	0	0	0	0	0	0	0	0	664	1,360	69%	838	838
	556	0	556	0	0	0	0	0	556	0	0	0	556	556
	0	0	0	0	0	0	0	0	0	0	14	14	14	14
	0	0	0	0	0	0	0	0	0	0	90	23	23	23
	0	0	0	0	0	0	0	0	0	0	75	19	19	19
	0	302	302	0	0	0	0	0	302	0	0	0	302	302
	0	0	0	0	0	0	0	0	0	0	145	36	36	36
	0	31	31	0	0	0	0	0	31	0	210	53	210	84

Intersection/Segment	Area #1				Area #2				Total	Phased Local	Phased Total	Split	Link Volume	Link Capacity
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit						
Woolridge/Site Road	0	62	62	0	0	0	0	0	62	0	45	11	73	73
	0	123	123	0	0	0	0	0	123	0	95	24	147	147
	0	99	99	0	0	0	0	0	99	0	0	0	99	99
	227	0	227	0	0	0	0	0	227	19	65	31	31	31
	0	0	0	0	0	0	0	0	0	280	280	70	297	297
	0	0	0	0	0	0	0	0	0	12	70	27	27	27
	182	0	182	0	0	0	0	0	182	0	0	0	182	182
	0	0	0	0	0	0	0	0	0	18	335	96	96	96
	0	0	0	0	0	0	0	0	0	25	55	40	25	25
	0	0	0	0	0	0	0	0	0	10	155	46	46	46
	0	0	0	0	0	0	0	0	0	34	300	101	101	101
	114	0	114	0	0	0	0	0	114	0	75	19	133	133

Source: Chesterfield Co.

Phase I
Alternative 2

ESTIMATED TRIP GENERATION
Chesterfield County Transportation Department
Chesterfield, Virginia

Project: Magnolia Green Phase I with Woolridge Access (MAGMIX4)
Date: 10/9/91 32%

Source: ITE Trip Generation, 5th Edition

ITE Code #	Description	Size	A.M. Peak Hour			P.M. Peak Hour			Average Weekday
			Enter	Exit	Total	Enter	Exit	Total	
110	Light Industrial		0	0	0	0	0	0	0
150	Warehouse		0	0	0	0	0	0	0
210	Single-family detached	901	141	402	543	510	275	785	7,820
220	Apartments	262	32	100	132	100	56	156	1,656
230	Townhouses		0	0	0	0	0	0	0
310	Hotel		0	0	0	0	0	0	0
710	General Office	152,960	236	29	266	43	211	254	1,935
750	Office Park		0	0	0	0	0	0	0
820	Shopping Center								
	(<570,000 s.f.)	3,840	15	9	24	41	41	82	921
	(<570,000 s.f.)	80,000	90	53	142	285	285	569	6,147
	(>600,000 s.f.)		0	0	0	0	0	0	0

Totals for the Development

A.M. Peak Hour			P.M. Peak Hour			Average Weekday		
Enter	Exit	Total	Enter	Exit	Total			
463	534	996	881	781	1,662	16,632		

Source: Chesterfield Co.

Magnolia Green - Phase I with Woolridge Access (MG_PM_4)
 Traffic Volume Computation Checksheet
 Afterschool Peak Hour

23.8% of Ultimate Total Site
 44.0% Percentage of Area #1
 6,998 Ultimate Site Traffic

Area #1 Trip Generation	Area #2 Trip Generation			Total
	In	Out	Total	
Office	40	194	233	
Rebal	192	365	365	
Res.	678	368	1,046	
Total			1,664	

Magnolia Green Trip Generation

Intersection/Segment	Area #1			Area #2			Total Trips	Existing Volumes	Ultimate Local Volumes	Diff.	Phased Local	Total Volumes	Split	Link Volume	Link Capacity
	Enter	Exit	Total	Enter	Exit	Total									
Route 360 - #1 to #2	0	398	398	0	0	0	398	664	1,185	521	788	1,186	48%	2,483	2,510
	451	0	451	0	0	0	451	664	1,430	766	646	1,297	52%		
Route 360 - #2 to #3	51	0	51	0	0	0	51	664	1,215	551	795	846	47%	1,784	2,510
	0	45	45	0	0	0	45	664	1,625	961	893	938	53%		
Otterdale Rd - #1 to #4	0	59	59	0	0	0	59	53	390	337	133	192	47%	411	625
	108	0	108	0	0	0	108	31	365	334	110	218	53%		
Otterdale Rd - #4 to #5	0	81	81	0	0	0	81	28	450	422	128	209	46%	454	645
	87	0	87	0	0	0	87	28	530	502	147	244	54%		
Otterdale - north of #5	0	81	81	0	0	0	81	24	395	371	112	193	43%	451	625
	97	0	97	0	0	0	97	35	565	530	161	258	57%		
Woolridge Road	0	171	171	0	0	0	171	16	305	289	85	256	44%	575	575
	202	0	202	0	0	0	202	25	415	390	118	320	56%		
Route 360 at Site Road	51	0	51	0	0	0	51	0	50	50	12	63			
	0	0	0	0	0	0	0	664	1,110	448	770	770			
	0	0	0	0	0	0	0	0	55	55	13	13			
	0	0	0	0	0	0	0	0	70	70	17	17			
	451	0	451	0	0	0	451	664	1,300	696	830	830			
	0	0	0	0	0	0	0	0	55	55	13	13			
	0	0	0	0	0	0	0	0	90	90	21	21			
	0	0	0	0	0	0	0	0	75	75	18	18			
	398	0	398	0	0	0	398	0	0	0	0	0			
	0	0	0	0	0	0	0	0	145	145	34	34			
	0	45	45	0	0	0	45	0	210	210	50	95			

MG_PM_4

Intersection/Segment	Area #1			Area #2			Total Trips	Existing Volumes	Ultimate Local Volumes	Diff.	Phased Local	Total Volumes	Split	Link Volume	Link Capacity
	Enter	Exit	Total	Enter	Exit	Total									
Woolridge/Site Road	0	81	81	0	0	0	81	0	45	45	11	92			
	0	171	171	0	0	0	171	0	95	95	23	104			
	0	59	59	0	0	0	59	0	0	0	0	59			
	202	0	202	0	0	0	202	19	85	46	30	30			
	0	0	0	0	0	0	0	0	280	280	67	269			
	108	0	108	0	0	0	108	12	70	58	26	28			
	0	0	0	0	0	0	0	0	0	0	0	0			
	0	0	0	0	0	0	0	16	335	319	92	92			
	0	0	0	0	0	0	0	15	55	40	25	25			
	0	0	0	0	0	0	0	10	155	145	44	44			
	0	0	0	0	0	0	0	34	300	266	87	97			
	97	0	97	0	0	0	97	0	75	75	18	115			

Source: Chesterfield Co.

PHASE II WORKSHEETS

ESTIMATED TRIP GENERATION
 Chesterfield County Transportation Department
 Chesterfield, Virginia

Phase II
 Alternative 1

Project: Magnolia Green Phase I with Woolridge Access (MAGRES5)
 Date: 10/9/91 78%

Source: ITE Trip Generation, 5th Edition

ITE Code #	Description	Size	A.M. Peak Hour			P.M. Peak Hour			Average Weekday
			Enter	Exit	Total	Enter	Exit	Total	
110	Light Industrial		0	0	0	0	0	0	0
150	Warehouse		0	0	0	0	0	0	0
210	Single-family detached	2,197	306	870	1,176	1,139	613	1,753	17,766
220	Apartments	639	76	241	317	228	128	357	4,124
230	Townhouses	0	0	0	0	0	0	0	0
310	Hotel		0	0	0	0	0	0	0
710	General Office		0	0	0	0	0	0	0
750	Office Park		0	0	0	0	0	0	0
820	Shopping Center								
	(<570,000 s.f.)		0	0	0	0	0	0	0
	(570-600,000 s.f.)		0	0	0	0	0	0	0
	(>600,000 s.f.)		0	0	0	0	0	0	0

Totals for the Development

A.M. Peak Hour			P.M. Peak Hour			Average	
Enter	Exit	Total	Enter	Exit	Total	Weekday	
*****	*****	*****	*****	*****	*****	*****	
382	1,111	1,493	1,367	742	2,109	21,891	

Source: Chesterfield Co.

1 lane all

Alternative 1

Magnolia Green - Phase 1 with Woolridge Access (MG_PM_5T) Roadway improvements: 360 = 6 lanes; Woolridge lane width = 12'; Shoulder = 6'
 Traffic Volume Computation Checksheet
 Afternoon Peak Hour
 30.2% of Ultimate Total Site
 80.0% Percentage of Area #1
 6,898 Ultimate Site Traffic

Intersection/Segment	Area #1 Trip Generation						Area #2 Trip Generation						Phased Local	Phased Total	Split	Link Volume	Link Capacity					
	Movement Number	Area #1		Area #2		Total	Enter	Exit	Total	Enter	Exit	Total						Local	Volumes	Diff.	Ultimate Local	Ultimate Total
		In	Out	In	Out																	
Route 360 - #1 to #2	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	1,370	744	2,114	0	0	0	0	0	0	0	0	0	0	0	0	0					
Magnolia Green Trip Generation																						
Route 360 - #2 to #3	Office	68	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	37	37	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Otterdale Rd - #1 to #4	Office	0	119	119	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	219	0	219	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Otterdale Rd - #4 to #5	Office	0	74	74	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	137	0	137	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Otterdale - north of #5	Office	0	74	74	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	137	0	137	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Woolridge Road	Office	0	149	149	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	274	0	274	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Route 360 at Site Road	Office	68	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

Intersection/Segment	Area #1 Trip Generation						Area #2 Trip Generation						Phased Local	Phased Total	Split	Link Volume	Link Capacity					
	Movement Number	Area #1		Area #2		Total	Enter	Exit	Total	Enter	Exit	Total						Local	Volumes	Diff.	Ultimate Local	Ultimate Total
		In	Out	In	Out																	
Woolridge/Site Road	Office	0	74	74	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	149	149	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	119	119	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	274	0	274	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	219	0	219	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Res.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

Source: Chesterfield Co.

ESTIMATED TRIP GENERATION
 Chesterfield County Transportation Department
 Chesterfield, Virginia

Phase II
Alternative 2

Project: Magnolia Green Phase I with Woolridge Access (MAGMIX5)
 Date: 10/9/91 50%

Source: ITE Trip Generation, 5th Edition

ITE Code # *****	Description *****	Size *****	A.M. Peak Hour *****			P.M. Peak Hour *****			Average Weekday *****
			Enter *****	Exit *****	Total *****	Enter *****	Exit *****	Total *****	
110	Light Industrial		0	0	0	0	0	0	0
150	Warehouse		0	0	0	0	0	0	0
210	Single-family detached	1,409	208	592	800	763	411	1,174	11,796
220	Apartments	410	49	155	204	151	85	236	2,616
230	Townhouses		0	0	0	0	0	0	0
310	Hotel		0	0	0	0	0	0	0
710	General Office	239,000	335	41	376	60	293	353	2,711
750	Office Park		0	0	0	0	0	0	0
820	Shopping Center								
	(< 570,000 s.f.)	6,000	20	11	31	55	55	109	1,218
	(< 570,000 s.f.)	125,000	117	69	185	378	378	756	8,125
	(> 600,000 s.f.)		0	0	0	0	0	0	0

Totals for the Development

A.M. Peak Hour *****			P.M. Peak Hour *****			Average Weekday *****	
Enter *****	Exit *****	Total *****	Enter *****	Exit *****	Total *****		
655	782	1,436	1,266	1,100	2,366	23,819	

Source: Chesterfield Co

Phase II
Alternative 2

Magnolia Green - Phase I with Woolridge Access (MG_PM_5) Roadway improvements: 360 = 6 lanes; Woolridge, = 12', Shoulder = 6'
 Traffic Volume Computation Checksheet
 Afternoon Peak Hour
 34.0% of Ultimate Total Site
 63.0% Percentage of Area #1
 6,998 Ultimate Site Traffic

Area #1 Trip Generation				Area #2 Trip Generation			
	In	Out	Total	In	Out	Total	
Office	57	277	334	Office	0	0	0
Retail	275	275	551	Retail	0	0	0
Res.	871	527	1,498	Res.	0	0	0
Total			2,383				

Magnolia Green Trip Generation

Intersection/Segment	Area #1			Area #2			Total Trips	Existing Volumes	Ultimate Local Volumes	Diff.	Phased Local	Total Volumes	Split	Link Volume	Link Capacity
	Enter	Exit	Total	Enter	Exit	Total									
Route 360 - #1 to #2	0	647	647	0	0	0	570	664	1,185	521	841	1,411	47%	2,983	3,785
Route 360 - #2 to #3	74	0	74	0	0	0	74	664	1,430	551	852	928	47%	1,982	3,785
Otterdale Rd - #1 to #4	0	64	64	0	0	0	84	53	380	337	168	252	46%	551	825
Otterdale Rd - #4 to #5	139	0	139	0	0	0	139	28	450	422	172	289	46%	627	645
Otterdale - north of #5	139	0	139	0	0	0	139	24	395	371	150	267	43%	622	625
Woolridge Road	288	0	288	0	0	0	243	16	305	289	114	357	44%	803	992
Route 360 at Site Road	74	0	74	0	0	0	74	0	50	50	17	91			
	0	0	0	0	0	0	0	664	1,110	446	816	816			
	0	0	0	0	0	0	0	0	55	55	19	19			
	0	0	0	0	0	0	0	0	70	70	24	24			
	647	0	647	0	0	0	647	664	1,360	696	901	901			
	0	0	0	0	0	0	0	0	55	55	19	19			
	0	0	0	0	0	0	0	0	90	90	31	31			
	0	0	0	0	0	0	0	0	75	75	26	26			
	0	570	570	0	0	0	570	0	0	0	0	570			
	0	65	65	0	0	0	65	0	145	145	49	49			
	0	0	0	0	0	0	0	0	210	210	72	137			

Magnolia Green Trip Generation

Intersection/Segment	Area #1			Area #2			Total Trips	Existing Volumes	Ultimate Local Volumes	Diff.	Phased Local	Total Volumes	Split	Link Volume	Link Capacity
	Enter	Exit	Total	Enter	Exit	Total									
Woolridge/Site Road	0	117	117	0	0	0	117	0	45	45	15	132			
	0	243	243	0	0	0	243	0	95	95	32	275			
	0	84	84	0	0	0	84	0	0	0	0	84			
	288	0	288	0	0	0	288	19	65	46	35	35			
	0	0	0	0	0	0	0	0	280	280	95	363			
	155	0	155	0	0	0	155	12	70	58	32	32			
	0	0	0	0	0	0	0	0	0	0	0	155			
	0	0	0	0	0	0	0	16	335	319	125	125			
	0	0	0	0	0	0	0	0	55	40	29	29			
	0	0	0	0	0	0	0	10	155	145	58	59			
	139	0	139	0	0	0	139	34	300	268	125	125			
	0	0	0	0	0	0	0	0	75	75	26	165			

Source: Chesterfield Co.

MG_PM_4

PHASE III WORKSHEETS

ESTIMATED TRIP GENERATION
 Chesterfield County Transportation Department
 Chesterfield, Virginia

Phase III
 Alternative 1

Project: Magnolia Green Phase I with Woolridge Access (MAGRES6)
 Date: 10/9/91 85%

Source: ITE Trip Generation, 5th Edition

ITE Code #	Description	Size	A.M. Peak Hour			P.M. Peak Hour			Average Weekday
			Enter	Exit	Total	Enter	Exit	Total	
110	Light Industrial		0	0	0	0	0	0	0
150	Warehouse		0	0	0	0	0	0	0
210	Single-family detached	3,447	452	1,285	1,737	1,710	921	2,631	26,896
220	Apartments	880	104	331	435	307	173	480	5,724
230	Townhouses	0	0	0	0	0	0	0	0
310	Hotel		0	0	0	0	0	0	0
710	General Office		0	0	0	0	0	0	0
750	Office Park		0	0	0	0	0	0	0
820	Shopping Center								
	(< 570,000 s.f.)		0	0	0	0	0	0	0
	(570-600,000 s.f.)		0	0	0	0	0	0	0
	(> 600,000 s.f.)		0	0	0	0	0	0	0

Totals for the Development

A.M. Peak Hour			P.M. Peak Hour			Average Weekday		
Enter	Exit	Total	Enter	Exit	Total			
556	1,616	2,172	2,017	1,093	3,110	32,619		

Source: Chesterfield Co.

Phase III
 Alternative 2

ESTIMATED TRIP GENERATION
 Chesterfield County Transportation Department
 Chesterfield, Virginia

Project: Magnolia Green Phase I with Woolridge Access (MAGMIX6)
 Date: 10/9/91 65%

Source: ITE Trip Generation, 5th Edition

ITE Code # *****	Description *****	Size *****	A.M. Peak Hour *****			P.M. Peak Hour *****			Average Weekday *****
			Enter *****	Exit *****	Total *****	Enter *****	Exit *****	Total *****	
110	Light Industrial		0	0	0	0	0	0	0
150	Warehouse		0	0	0	0	0	0	0
210	Single-family detached	1,831	261	743	1,004	966	520	1,487	15,020
220	Apartments	532	64	201	265	193	108	301	3,422
230	Townhouses		0	0	0	0	0	0	0
310	Hotel		0	0	0	0	0	0	0
710	General Office	310,700	410	51	461	73	356	429	3,306
750	Office Park		0	0	0	0	0	0	0
820	Shopping Center								
	(< 570,000 s.f.)	7,800	23	13	36	65	65	129	1,435
	(< 570,000 s.f.)	162,500	136	80	216	447	447	894	9,573
	(> 600,000 s.f.)		0	0	0	0	0	0	0

Totals for the Development

A.M. Peak Hour *****			P.M. Peak Hour *****			Average Weekday *****		
Enter *****	Exit *****	Total *****	Enter *****	Exit *****	Total *****			
804	979	1,784	1,569	1,347	2,916	29,480		

Source: Chesterfield Co.

THAX III
Alternative 2

Magnolia Green - Phase I with Woolridge Access (MG_PM_6M) Roadway improvements: 360 = 6 lanes; Woolridge, Otterdale lane widths = 12', Shoulder = 6'
Traffic Volume Computation Checksheet
Afternoon Peak Hour

42.4% of Ultimate Total Site
78.5% Percentage of Area #1
6,998 Ultimate Site Traffic

Intersection/Segment	Area #1 Trip Generation				Area #2 Trip Generation				Total Trips	Total Volumes	Phased Local	Total Volumes	Split	Link Volume	Link Capacity
	In	Out	Total	Office	In	Out	Total	Office							
Office	71	345	416		0	0	0	0	0	0	0	0	0	0	0
Retail	343	343	686		0	0	0	0	0	0	0	0	0	0	0
Res.	1,210	657	1,867		0	0	0	0	0	0	0	0	0	0	0
Total			2,969												

Intersection/Segment	Area #1				Area #2				Total Trips	Total Volumes	Phased Local	Total Volumes	Split	Link Volume	Link Capacity
	Enter	Exit	Total	Office	Enter	Exit	Total	Office							
Route 360 - #1 to #2	0	711	711	0	0	0	0	0	711	664	521	1,185	47%	3,391	3,785
Route 360 - #2 to #3	91	0	91	0	0	0	0	0	91	664	551	1,215	46%	2,141	3,785
Otterdale Rd - #1 to #4	0	81	81	0	0	0	0	0	81	664	961	1,625	54%	668	992
Otterdale Rd - #4 to #5	0	105	105	0	0	0	0	0	105	53	337	390	45%	668	992
Otterdale - north of #5	173	0	173	0	0	0	0	0	173	31	334	365	55%	767	992
Woolridge Road	0	146	146	0	0	0	0	0	146	28	422	450	46%	760	992
Route 360 at Site Road	173	0	173	0	0	0	0	0	173	35	530	565	43%	991	992
	359	0	359	0	0	0	0	0	359	25	390	415	55%	991	992
	91	0	91	0	0	0	0	0	91	0	50	50			
	0	0	0	0	0	0	0	0	0	664	446	1,110			
	0	0	0	0	0	0	0	0	0	0	55	55			
	0	0	0	0	0	0	0	0	0	0	70	70			
	0	0	0	0	0	0	0	0	0	664	696	1,360			
	806	0	806	0	0	0	0	0	806	0	0	806			
	0	0	0	0	0	0	0	0	0	0	55	55			
	0	0	0	0	0	0	0	0	0	0	90	90			
	0	0	0	0	0	0	0	0	0	0	75	75			
	0	711	711	0	0	0	0	0	711	0	0	711			
	0	0	0	0	0	0	0	0	0	0	145	145			
	0	81	81	0	0	0	0	0	81	0	210	210			

MG_PM_4

Intersection/Segment	Area #1				Area #2				Total Trips	Total Volumes	Phased Local	Total Volumes	Split	Link Volume	Link Capacity
	Enter	Exit	Total	Office	Enter	Exit	Total	Office							
Woolridge/Site Road	0	146	146	0	0	0	0	0	146	0	45	18	165		
	0	303	303	0	0	0	0	0	303	0	95	40	343		
	0	105	105	0	0	0	0	0	105	0	0	0	105		
	359	0	359	0	0	0	0	0	359	19	65	39	39		
	0	0	0	0	0	0	0	0	0	260	260	119	478		
	194	0	194	0	0	0	0	0	194	12	70	37	37		
	0	0	0	0	0	0	0	0	0	0	0	0	164		
	0	0	0	0	0	0	0	0	0	18	319	151	151		
	0	0	0	0	0	0	0	0	0	15	55	32	32		
	0	0	0	0	0	0	0	0	0	145	145	72	72		
	0	0	0	0	0	0	0	0	0	34	300	147	147		
	173	0	173	0	0	0	0	0	173	0	75	32	205		

Source: Chesterfield Co.

