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CHITTENDEN COUNTY METROPOLITAN PLANNING ORGANIZATION

South Burlington Planned East-West Roads Analysis

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March 19, 2001

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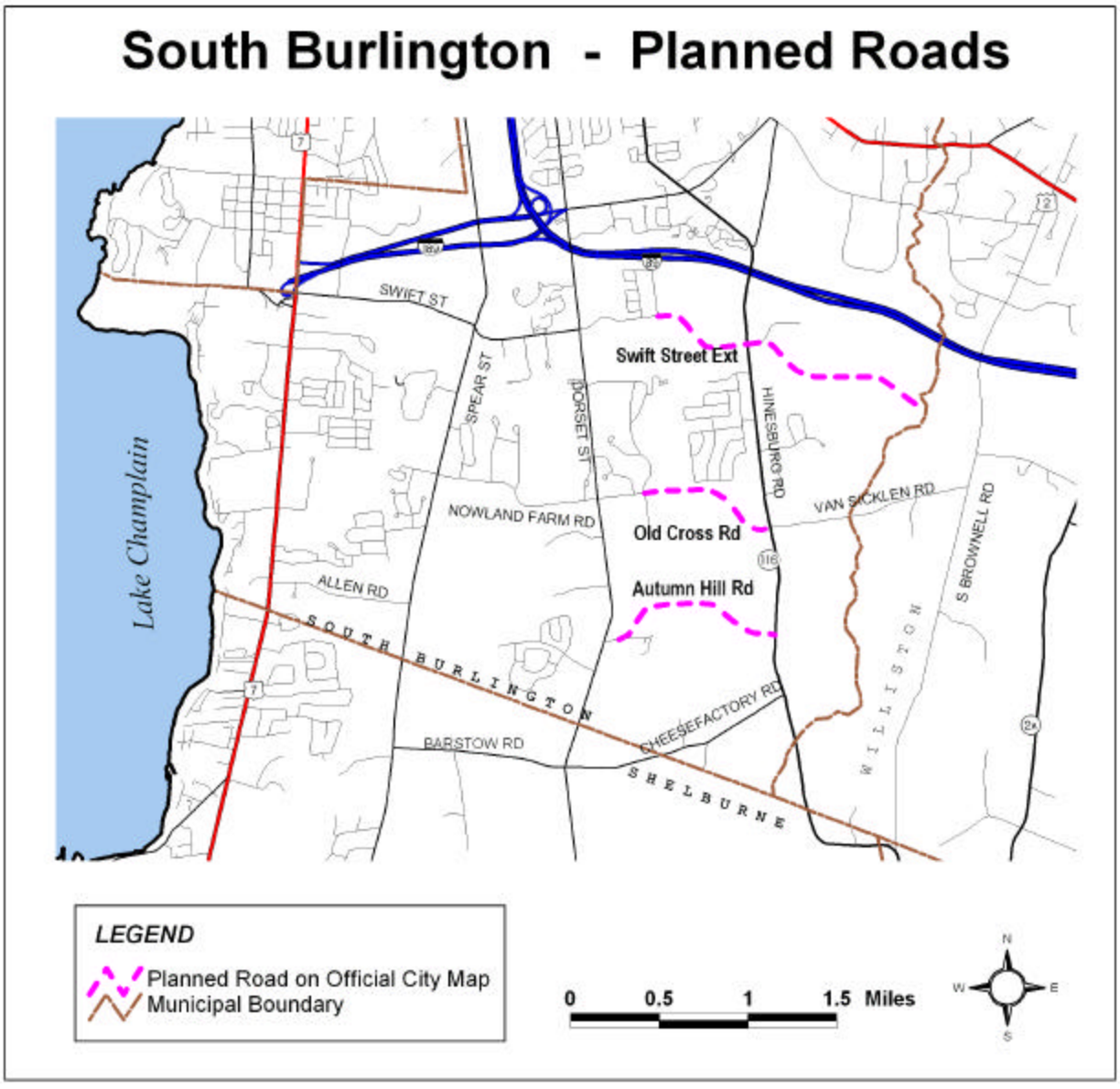
Introduction

The City of South Burlington requested assistance from the Chittenden County Metropolitan Planning Organization (CCMPO) in examining three proposed local roads included in official South Burlington city plans. The three roads would provide access between Dorset Street and Hinesburg Road (VT Route 116) in the southeastern area of the city. Figure 1 below illustrates the location of the existing and planned roads.

Figure 1



To examine the planned roads in detail, several scenarios were developed for analysis using the Regional Transportation Model. Table 1 below summarizes the various combinations of roadway alternatives considered in these scenarios.

TABLE 1: Analysis Scenarios

Scenario	Proposed Road Included in Scenario		
	Swift St Extended	Old Cross Rd	Autumn Hill Rd
1. No Build (Existing Roads)	Existing Facilities Only		
2. Swift St Ext	X		
3. Old Cross Rd		X	
4. Autumn Hill Rd			X
5. Swift & Old Cross	X	X	
6. Swift & Autumn Hill	X		X
7. Old Cross & Autumn Hill		X	X
8. Build All	X	X	X

Although Swift Street Extended is shown on the official South Burlington City map as extending to the City boundary with Williston, it would currently end there. Williston has not developed or discussed plans to provide a transportation facility in that area. Therefore, the analysis performed in this document assumes Swift St Ext would dead end with no connection to South Brownell Road in Williston.

Analysis Method

The Chittenden County Transportation Model (the Model) was used to estimate how the various scenarios under consideration would affect travel patterns in the Southeastern portion of the City. The Model in its current form was originally developed in 1993, but a significant update was performed in 1998. The Model works by taking housing and employment and projecting regional travel patterns based on the distribution and quantity of these inputs. The model underwent a calibration process as part of the 1998 update to ensure the results reflect current relationships between the use of transportation facilities and household and employment data for Chittenden County. While the MPO uses the Model as an invaluable tool for the type of analysis requested by the City of South Burlington, it is important to recognize the limitations inherent any time we try to predict the future. The Model is a tool to supplement and guide decision-making based on the best information we have currently available, but it does not take the place of discussion and consensus building on issues of vital interest to local residents and elected officials.

The Model is a "peak hour model" – this means the analysis results are provided in terms of either the AM or PM peak hour travel period. This is standard practice in transportation planning, as most planning is done to accommodate travel during the peak travel periods in the day. The analysis results provided in this document are for the PM Peak hour of travel. It is important to consider that many PM peak hour trips modeled are people coming home from work, so normally there is a reversal in many of the traffic flows in the PM peak hour during the AM peak hour. An estimate of Average Daily Traffic (ADT) can be made by assuming the peak hour volume is 10% of the ADT.

All of the scenarios were modeled using an analysis year of 2005. This year was selected to account for significant major developments now in the permitting or construction phase. Among the largest planned commercial developments included were:

- ?? Maple Tree Place – Williston, Taft Corners area
- ?? Additional Taft Corners Buildings – Williston
- ?? Lowes Home Center – South Burlington, Shelburne Road
- ?? O'Dell Parkway development – South Burlington, Shelburne Road / Farrell St
- ?? Technology Park – South Burlington, Marshall Ave

The appendix has more detailed information on future commercial development and housing estimates provided by the South Burlington Dept of Planning and Zoning and the Williston Town Planning Department for this analysis.

Several assumptions were made regarding the transportation network in 2005 as well:

- ?? Kennedy Drive widened from 2 to 4 lanes
- ?? Shelburne Road widened from 2 to 4 lanes between Imperial Drive and Webster Road
- ?? Champlain Parkway (Southern Connector) constructed

The Exit 13 on-ramp from Kennedy Drive to I-89 northbound was not included in the 2005 roadway assumptions. Similarly, unbuilt segments of the Circumferential Highway segments were not included. Given the current statewide transportation funding shortfall, it is unlikely these projects would be completed in the 2005 timeframe used for this analysis.

Analysis Results

Each one of the eight scenarios under consideration was analyzed with the Model. Table 2 below summarizes the 2005 projected traffic volumes on the planned roads as well as two existing roads – Cheese Factory Road and Van Sicklen Road. WB is Westbound, and EB is Eastbound in the table. For a frame of reference, the 1998 PM Peak hour traffic total on Cheese Factory road was 721 vehicles per hour, and Van Sicklen Rd was 500 vehicles per hour.

TABLE 2: Model Results for 2005 PM Peak Hour

Scenario	Projected 2005 PM Peak Hour Volume (vehicles / hour)														
	Swift St Extended			Old Cross Rd			Autumn Hill Rd			Cheese Factory Rd			Van Sicklen Rd		
	EB	WB	**Total**	EB	WB	**Total**	EB	WB	**Total**	EB	WB	**Total**	EB	WB	**Total**
1. No Build (Existing Roads)										291	517	**808**	252	383	**635**
2. Swift St Ext	346	322	**668**							281	498	**779**	266	391	**657**
3. Old Cross Rd				298	299	**597**				245	456	**701**	310	411	**721**
4. Autumn Hill Rd							76	143	**219**	281	416	**697**	262	397	**659**
5. Swift & Old Cross	333	268	**601**	127	174	**301**				244	458	**702**	319	415	**734**
6. Swift & Autumn Hill	345	308	**653**				22	117	**139**	275	412	**687**	274	403	**677**
7. Old Cross & Autumn Hill				289	285	**574**	12	32	**44**	253	457	**710**	312	416	**728**
8. Build All	336	269	**605**	117	152	**269**	24	12	**36**	244	456	**700**	320	415	**735**

Table 3 below summarizes the increases in traffic forecast for Van Sicklen Rd in 2005 for each of the eight scenarios compared to the base case. The percent increase from the 2005 base case of existing roads (Scenario 1) is given for each direction and for the total volume. The highest projected increase in total volume on Van Sicklen Rd was in Scenario 8 – Build All. This scenario is forecast to generate 15.7% more traffic on Van Sicklen Rd in 2005 than the no build scenario would in 2005. Van Sicklen Road was used for this comparison because it is included in all of the analysis scenarios.

TABLE 3: Increase in 2005 PM Peak Hour Volumes on Van Sicklen Rd

Increase in 2005 PM Peak Hour Volume on Van Sicklen Rd compared to No Build Scenario			
Scenario	**Van Sicklen Rd**		
	Eastbound	Westbound	Combined Total
1. No Build (Existing Roads)	0.0%	0.0%	0.0%
2. Swift St Ext	5.6%	2.1%	3.5%
3. Old Cross Rd	23.0%	7.3%	13.5%
4. Autumn Hill Rd	4.0%	3.7%	3.8%
5. Swift & Old Cross	26.6%	8.4%	15.6%
6. Swift & Autumn Hill	8.7%	5.2%	6.6%
7. Old Cross & Autumn Hill	23.8%	8.6%	14.6%
8. Build All	27.0%	8.4%	15.7%

Table 4 below includes information on the Vehicle Miles of Travel (VMT) for each of the analysis scenarios. One vehicle mile of travel is equal to one vehicle traveling one mile. VMT is often used as a measure of overall motor vehicle use in a region. Most of the scenarios analyzed resulted in minor decreases in VMT countywide. The lowered VMT figures signify slightly more efficient travel due to the more direct routes provided with the construction of new roads.

TABLE 4: 2005 Vehicle Miles of Travel

Vehicle Miles of Travel (VMT)	Scenario (2005 PM Peak Hour)							
	1. No Build (Existing Roads)	2. Swift St Ext	3. Old Cross Rd	4. Autumn Hill Rd	5. Swift & Old Cross	6. Swift & Autumn Hill	7. Old Cross & Autumn Hill	8. Build All
Interstate	119,561	119,092	119,089	119,485	118,860	119,064	119,062	118,827
Other Freeways	10,925	10,906	10,917	10,926	10,903	10,906	10,907	10,902
Arterials	158,777	158,319	158,021	158,643	158,014	158,299	158,089	158,039
Collectors\Local	107,936	108,528	109,006	108,177	109,081	108,611	108,990	109,041
Total	397,198	396,845	397,032	397,231	396,857	396,879	397,048	396,809
Percent Change from No-Build	n/a	-0.09%	-0.04%	0.01%	-0.09%	-0.08%	-0.04%	-0.10%

Figure 2 below gives a visual picture of traffic flows in the 2005 Scenario 1 (Existing Conditions). The small numbers adjacent to the road are the forecast PM peak hour volumes (the numbers are the totals of each direction).

FIGURE 2: Scenario 1 – No Build 2005 Forecast Traffic Volumes

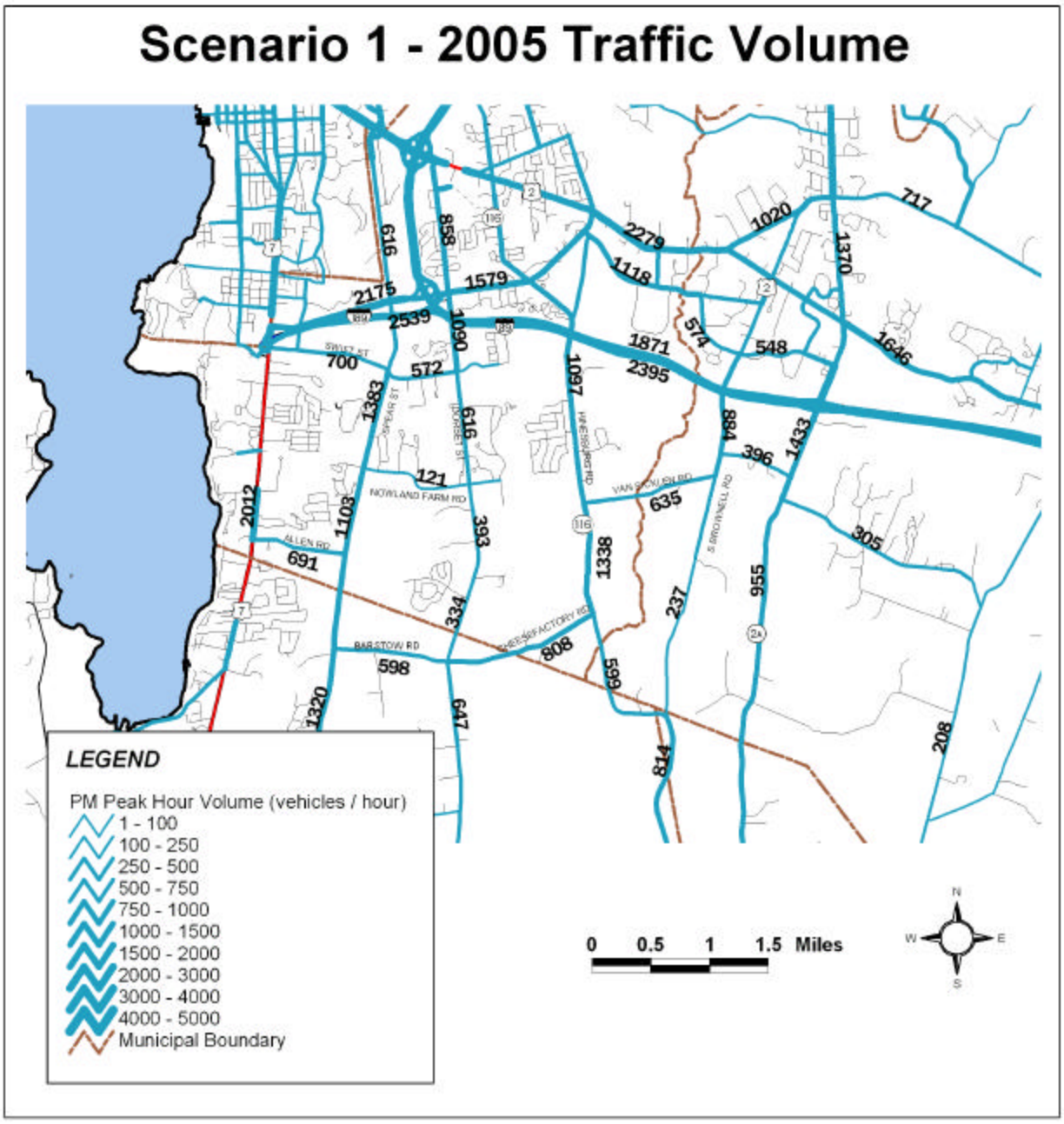
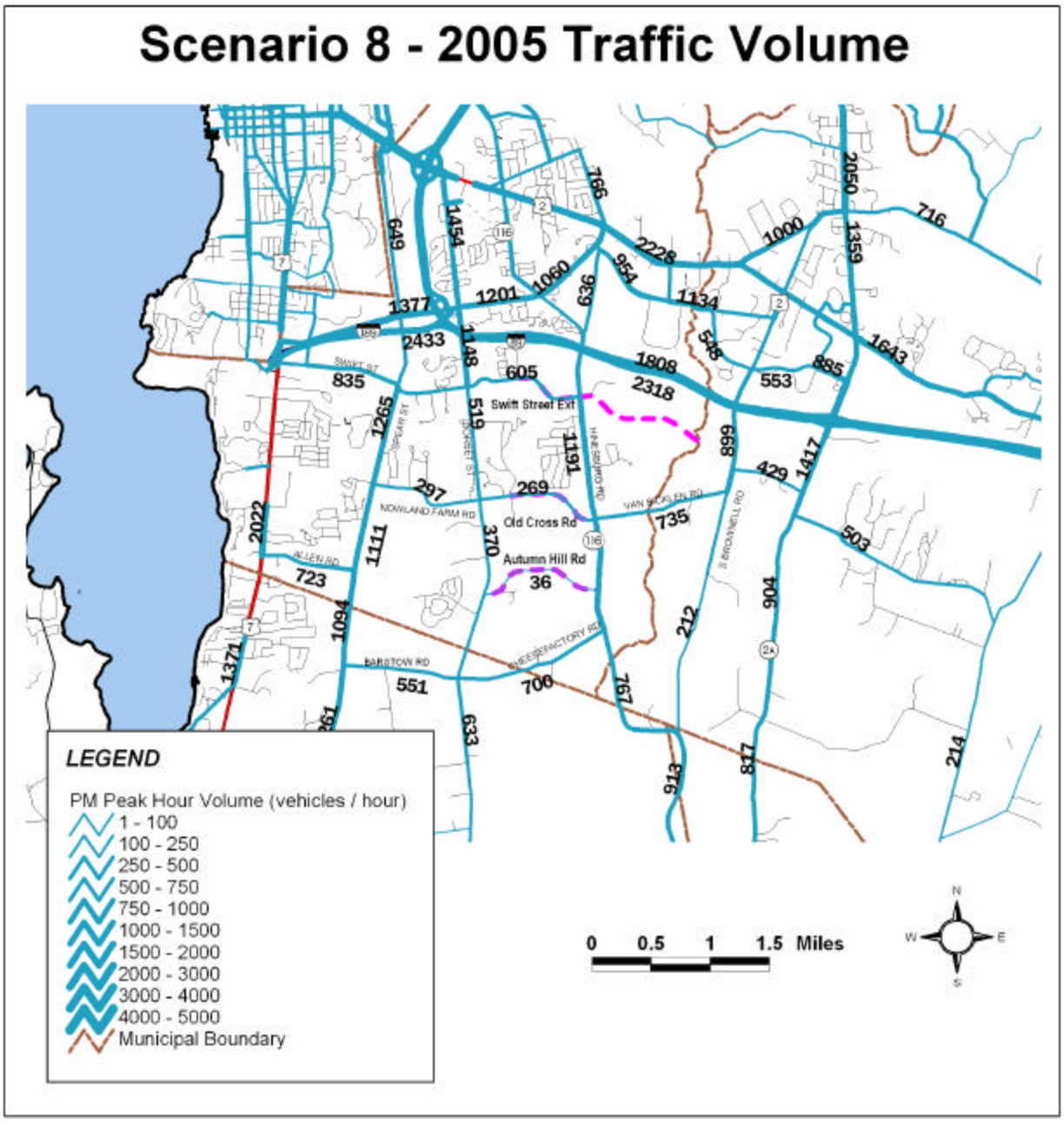


Figure 3 below illustrates traffic flows in the 2005 Scenario 8 (Build All). The small numbers adjacent to the road are the forecast PM peak hour volumes (the numbers are the totals of each direction).

FIGURE 3: Build All 2005 Forecast Traffic Volumes



The following figures were developed with a "select link analysis". This is a capability of the Model to track the origins and destinations of vehicles over a certain section of roadway. The volume annotations and road widths represent users of the "select link" facility as they traverse the roadway network. For example, in Figure 4 below at Barstow Rd there are 225 Van Sicklen Rd select vehicles. This means that 225 of the vehicles traversing Barstow road in either direction will use Van Sicklen Rd. Figure 5 presents a similar map, but with select link volumes on Swift St Ext for Scenario 2. Figure 6 is select link volumes for Old Cross Rd, Figure 7 for Autumn Hill Rd, and Figure 8 for Van Sicklen Rd again, but this time with volumes for Scenario 8.

FIGURE 4: Scenario 1 – Van Sicklen Rd Select Link Analysis

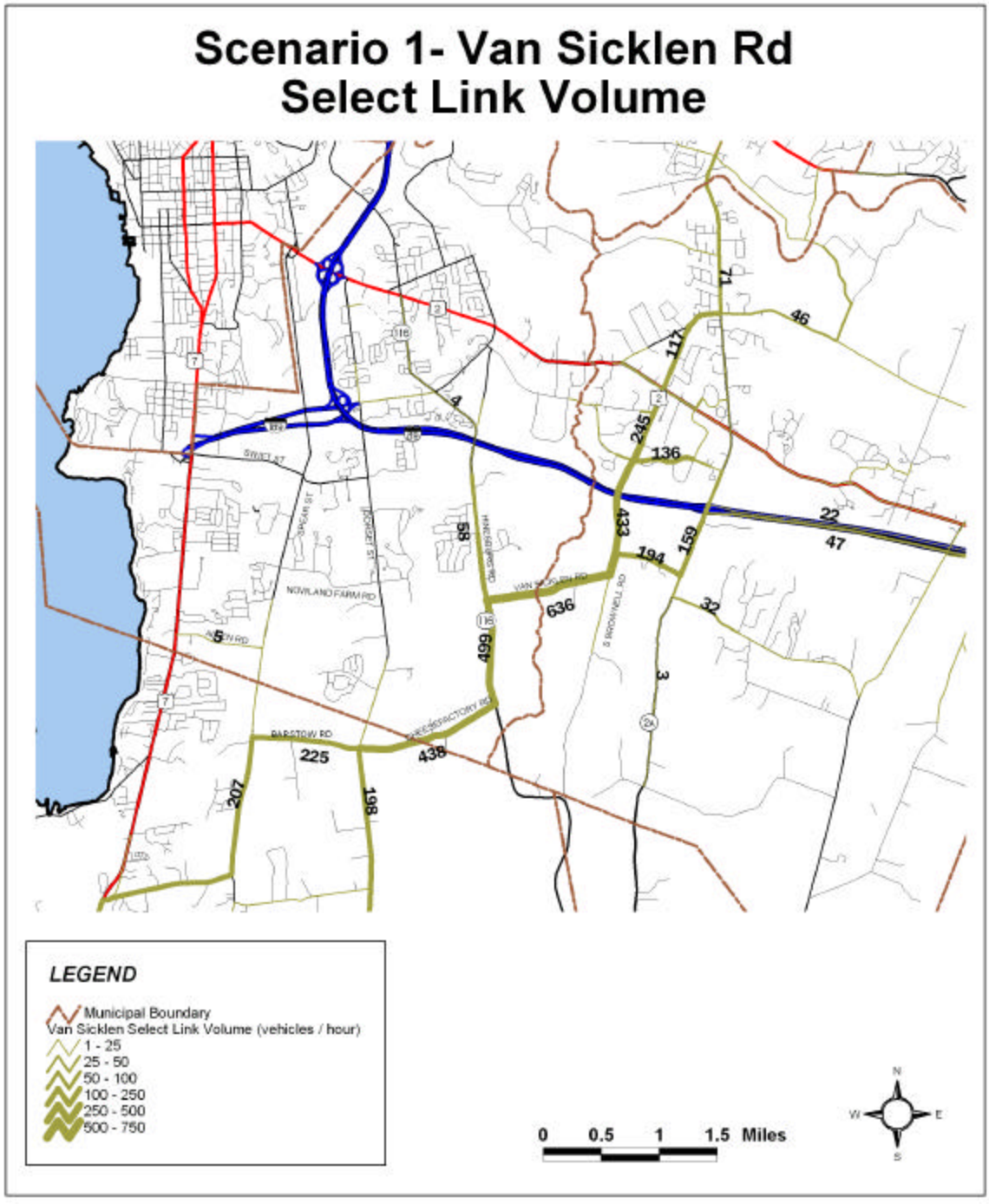


FIGURE 5: Scenario 2 – Swift St Ext Select Link Analysis

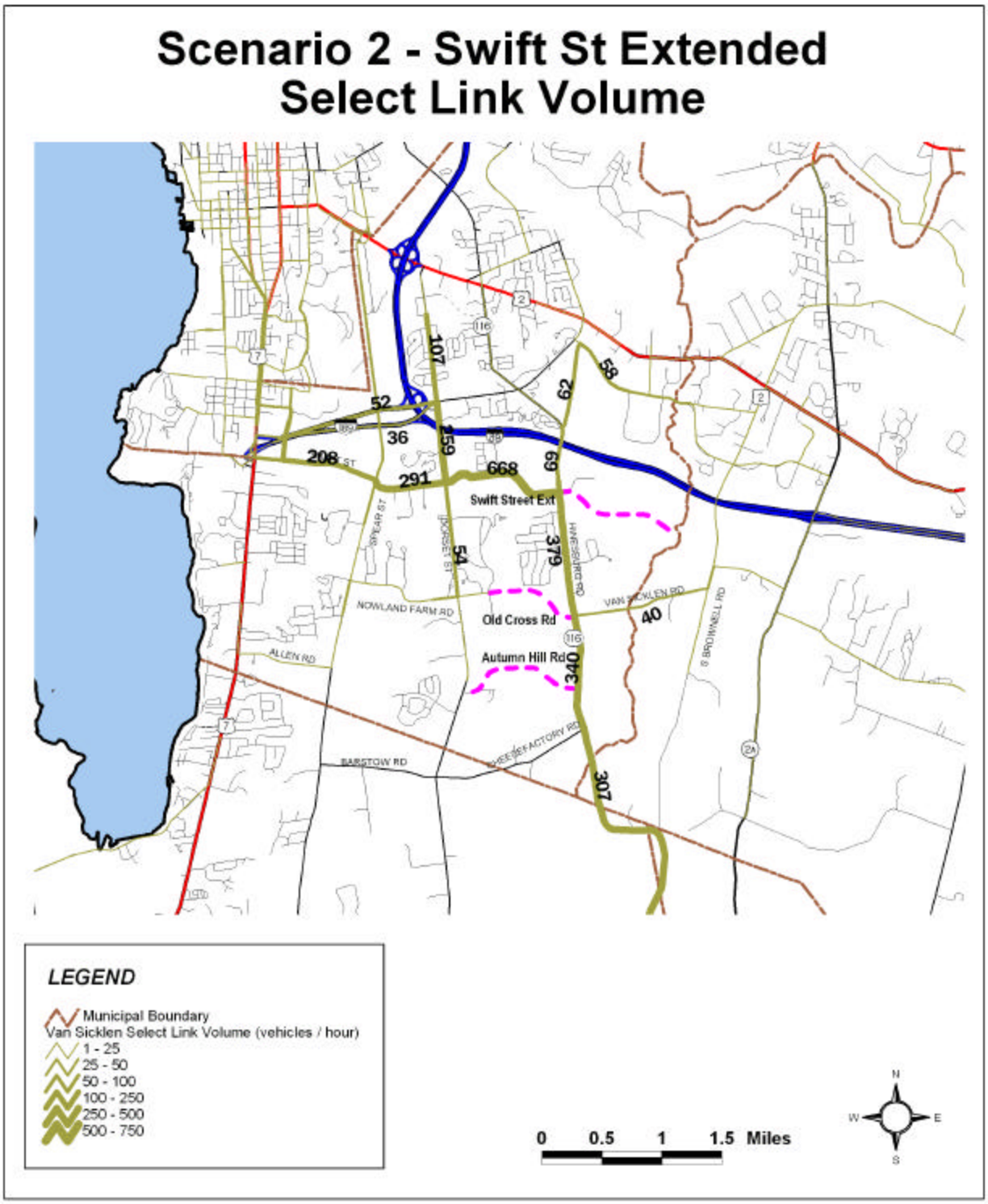


FIGURE 6: Scenario 3 – Old Cross Rd Select Link Analysis

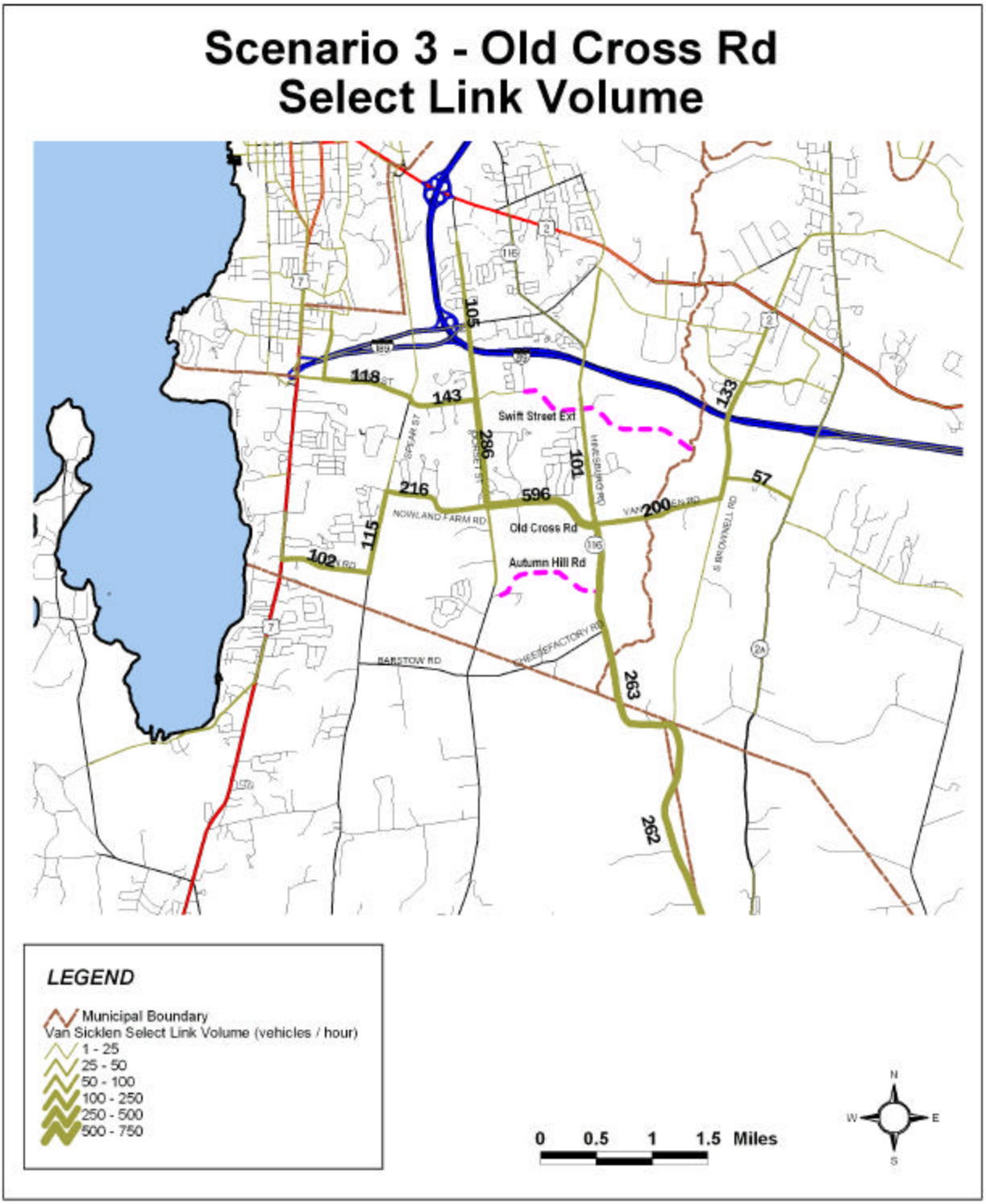


FIGURE 7: Scenario 4 – Autumn Hill Rd Select Link Analysis

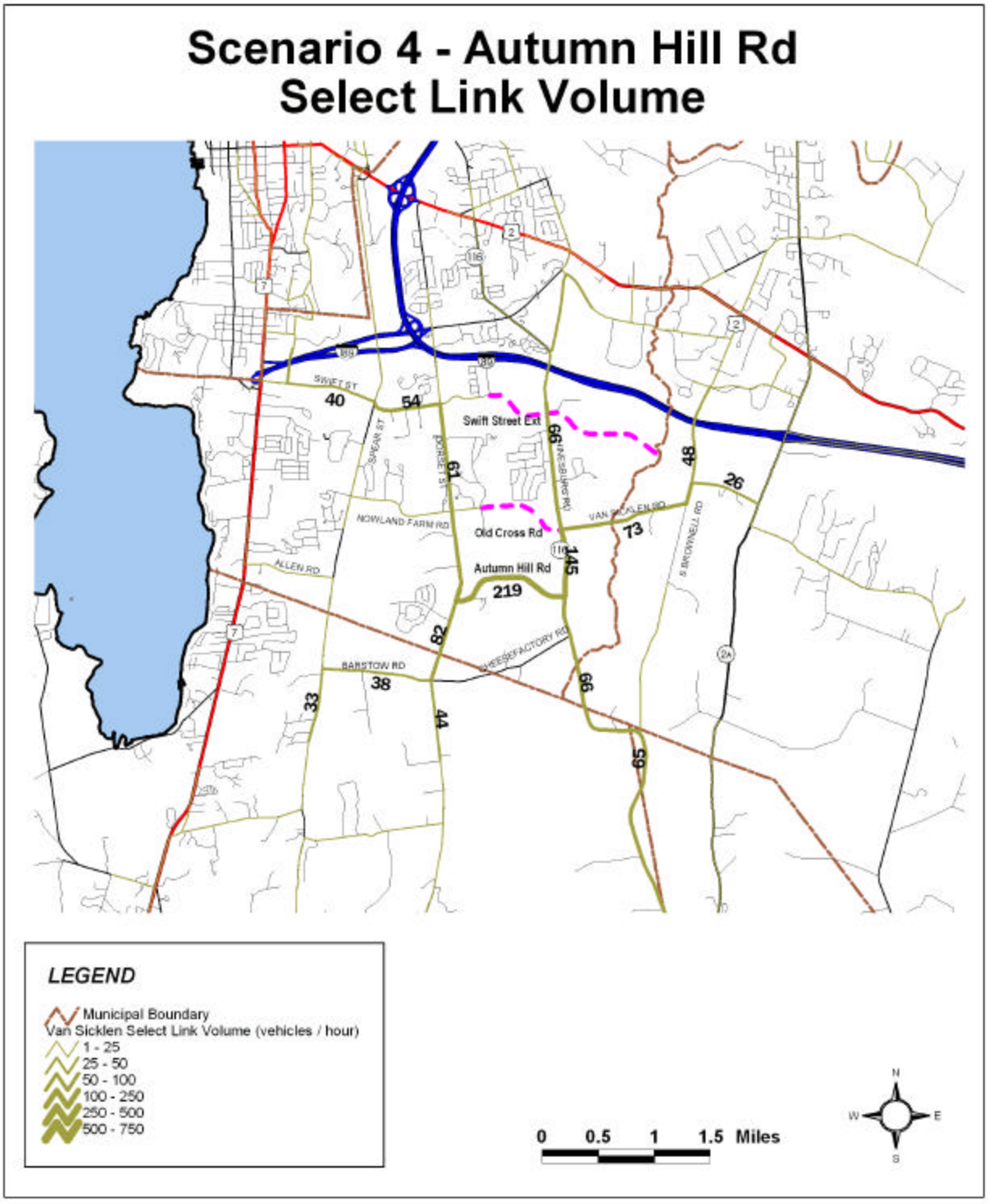
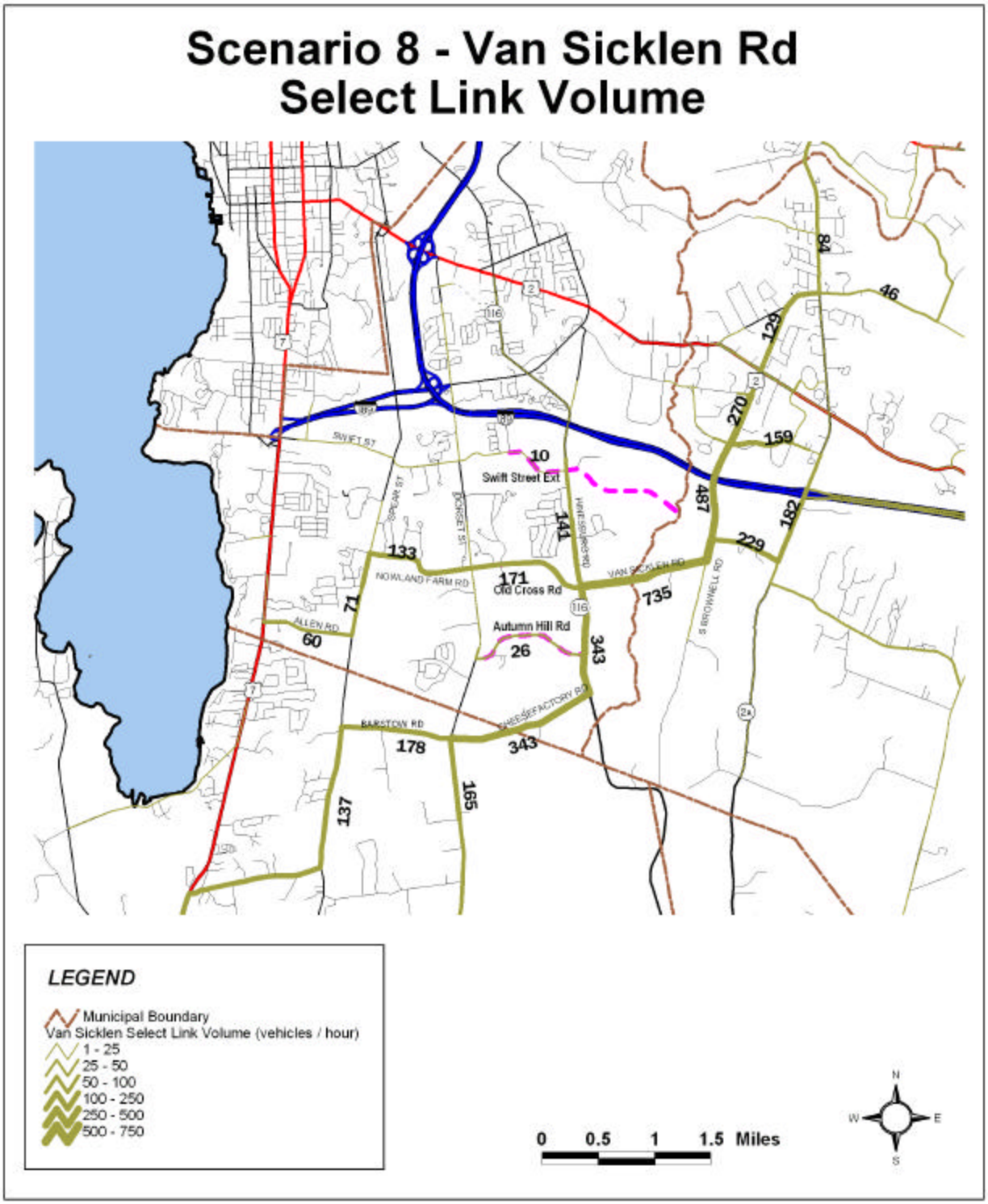


FIGURE 8: Scenario 8 – Van Sicklen Rd Select Link Analysis



Analysis of Travel Patterns

An examination of the select link analysis for the various planned roads in the above figures reveals a very discernable pattern of use in the PM Peak hour of roadway users traveling to and from the urbanized area to points south – St George, Hinesburg and Addison County. The planned roads included on the official South Burlington City map will provide alternate routes of travel and result in a more grid-like network of streets. A grid network provides more alternate routes of travel without unduly impacting any single street with traffic cutting through the neighborhood as a shortcut. Many areas developed in the last 30 years use more cul-de-sac and dead end streets which can actually exacerbate traffic issues on the few streets which do provide access through neighborhoods – similar to what has occurred in the Proctor-Hadley neighborhood in South Burlington over the last several years (eventually resulting in making Farrell St 1-way southbound at its northern tip).

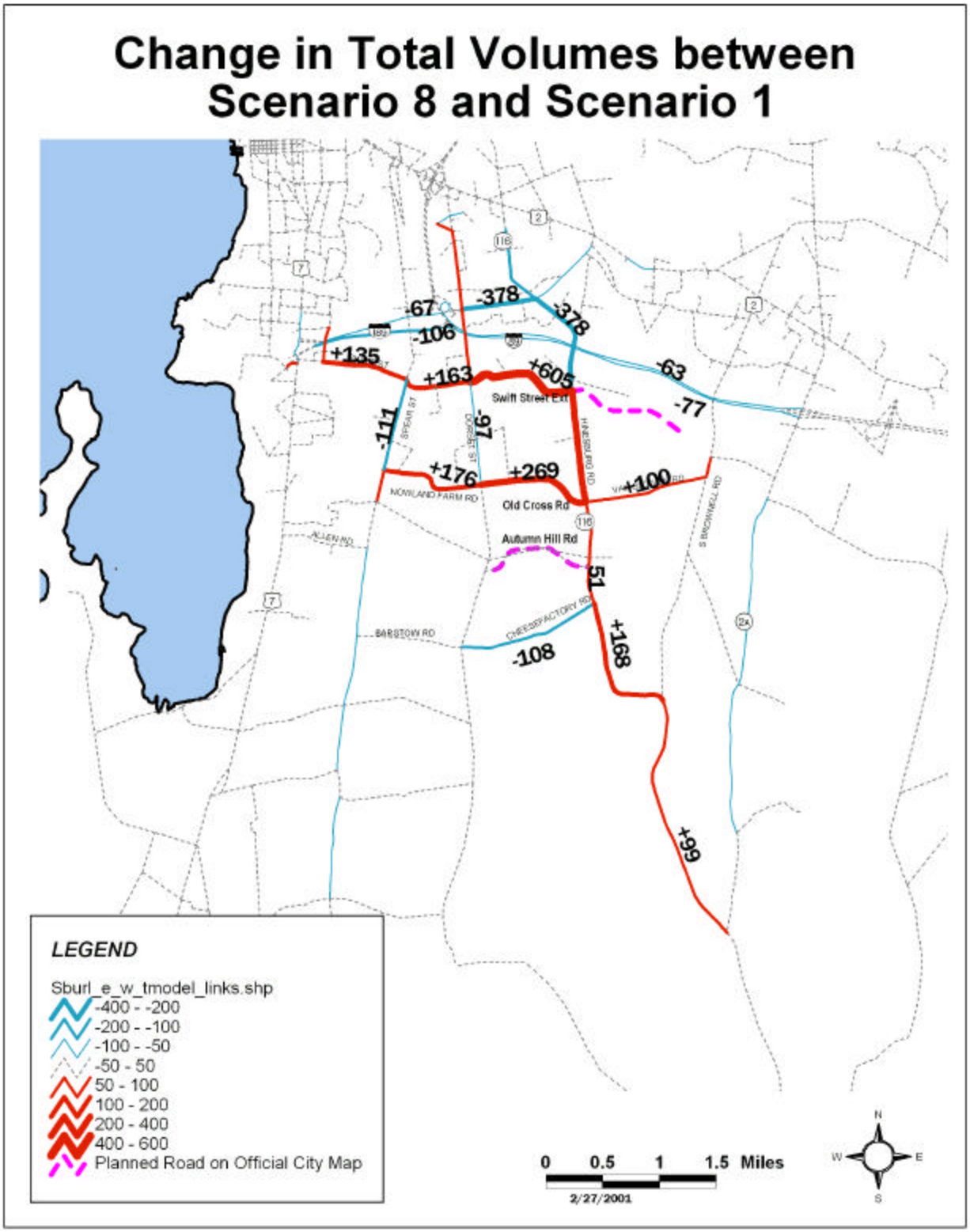
The wider distribution of traffic into a more efficient network will result in increased traffic for some of the roadways in the vicinity of the planned roads. Figure 9 on the next page summarizes the change in traffic volumes between Scenario 8 (Build All) and Scenario 1 (No Build) – an increase (e.g. +100) means there are 100 more vehicles using the facility in Scenario 8 than in Scenario 1. Table 3 in the analysis results section above summarizes the increased traffic volumes for a single section of roadway on Van Sicklen Rd of about 16% at the maximum. This increase is a result of the large scale of development, both existing and planned, in South Burlington and Williston. A substantial portion of the users of Van Sicklen Rd are traveling to or from the Taft Corners area of Williston and as more development occurs, the need for efficient transportation facilities to serve the demand increases. Transit, pedestrian, and bicycle facilities all provide alternatives to help balance the use of automobiles and should be encouraged. Roadway designs incorporating these elements, and which are sensitive to the character of neighborhoods can discourage cut-through traffic while still providing access and mobility for neighborhood residents as well as through travelers in the South Burlington – Williston area.

Summary Findings

- Swift St Extended has the greatest demand of the three planned roads analyzed. Autumn Hill Rd has the least – primarily due to its close proximity to the existing Cheese Factory Rd.
- Each one of the planned roads serves slightly different travel patterns
  - Swift St – from northwest to points south
  - Old Cross Rd – from east north, east, and west to points south
  - Autumn Hill Rd – primarily local access from east to west
- Approximately 80% of the no-build scenario traffic on Van Sicklen Rd is traveling to/from the Taft Corners area of Williston.

This analysis was performed to determine the relative travel patterns associated with the existing and planned transportation facilities as requested by the City of South Burlington. The analysis did not include issues normally associated with specific roadway and intersection design issues, such as the provision of turning lanes and traffic signals at intersections or the level of service of various roadways. As the planned roads are constructed, it will be necessary to address these design issues in detail.

FIGURE 9: Change in Volume Between Scenario 8 and Scenario 1



APPENDIX

South Burlington Expected Development by 2005

Commercial Development in S Burl						
From Sarah MacCallum - S Burl Planning and Zoning - 2/20/20001						
Development	TAZ #	Use	Sq. Ft.	#Emps (1 emp/400 SF)	TAZ	HHs
Chase	117	house & light manufacturing	20,160	50.4	117	
Duf-Henry	119	general office	3,250	8.125	119	
IDX	147	general office	384,392	960.98	147	
Lowes	142	retail	121,000	above	142	
Tech Park	121	general office	65,000	162.5	121	
Tech Park	121	general office	48,000	120	121	
Willard	116	general office	41,289	103.2225	116	
O'Dell	124	hotel	95 room	est 30	124	
O'Dell	124	congregate housing	130 units		124	130
O'Dell	124	drive-up bank	2,500	6.25	124	
O'Dell	124	indoor rec	7,500	18.75	124	
O'Dell	124	retail	11,000	27.5	124	
O'Dell	124	restaurant	7,500	18.75	124	
O'Dell	124	general office	70,000	175	124	
RSG - O'Dell permitted est					124	375
City Center	110	mixed	200 residenti	362	110	200
Residential Development in S Burl						
From Sarah MacCallum - S Burl Planning and Zoning - 2/20/20001						
	# of Units Proposed	# of New Units Approved	# of Permits Issued	TAZ Number	2003 HH (permitted)	2005 HH (approved - permitted)
Dorset Farms		220	135	149	135	85
Pinnacle		80	66	145	66	14
Vermont National Country Club		306	100*	138 &141	100	206
Butler Farms		143	135	137	135	8
Oak Creek		113	112	137	112	1
Irish & Larkin		44	0	151	0	44
Van Sicklen Partnership		48	0	143	0	48
Marceau Meadow	119	0	0	150	0	119
MBL - 1955 Dorset St		1	0	148	0	1
Village @ Dorset Park		167	115	128	115	52
Goldberg		3	0	150	0	3
TOTAL	119	1,136	663			
* Estimated						

Williston Expected Development by 2005

Williston Expected Development by 2005					
Updated with figures provided by Mike Munson - 2/23/2001					
TAZ Num	**Households**				**Development Name**
TAFT CORNERS PERMITTED DEVELOPMENT SINCE 1998 (Assume all in place by 2005)					
	HH Permitted	**HH by 2003**	**HH add'l by 2(**	**Emps**	
174	46	23	23	0	Heritage Meadows
174	72	8	8	0	Coyote Run Subdivision
174				20	Marty Keene Golf World (complete)
178	49	8	8	0	Hinesburg Investments
180	65	65		0	Senecal - Assisted Living (complete)
180				125	Senecal - Retail (50,000 SF) (complete)
180				125	Senecal - Office (50,000 SF) (complete)
188				95	Marriot (95 unit hotel) (complete)
195				50	Bob Miller (300,000 SF warehouse) (complete)
195				50	Catamount Holding (50,000 SF indoor soccer) (
194		8	8	0	Chatham Woods
203		8	8	0	LaCasse
198				80	Taft Corners - Retail (32,000 SF) (2005)
198				75	Taft Corners - Retail (30,000 SF) (2005)
199				64	Taft Corners garden center (25,600 SF) (2005)
186		60		0	Blair Park Senior Housing
186			66	0	Blair Park Senior Housing
186				40	VT Plastics expansion - industrial (20,000 SF) (2
MAPLE TREE PLACE BUILD OUT ESTIMATE (complete by 2005 - see below for 2005 estimate)					
197	50			1326	Maple Tree Place build out estimate
MAPLE TREE PLACE 2003 ESTIMATE (Assume 75% build out for 2003 model year)					
197	38			996	Maple Tree Place 75% build out estimate
Maple Tree Place (additional 25% build-out for completion)					
197	12	0			
Employment figures should be square footage differentiated by Retail, Office, Industrial, or Other					
Employment Assumptions:					
Retail, Office, Hotel = 1 emp / 400 SF					
Industrial = 1 emp / 500 SF					
Williston - Built since 1998					
TAZ	SIC			Emps	
198	5731			77	Circuit City
198	5999			29	Pet Smart
198	5719			53	Bed Bath & Beyond