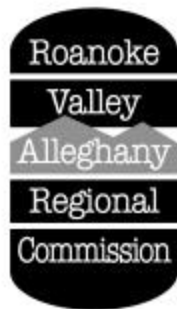


# **Clifton Forge Downtown Traffic Circulation Analysis**



February 2001

This report was prepared by the staff of the Roanoke Valley-Alleghany Regional Commission and funded with FY 2000 Rural Planning Assistance, State Highway Planning and Research funds.

The contents of this report reflect the view of the author who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or the policy of the Federal Highway Administration or the Virginia Department of Transportation. This report does not constitute a standard, specification or regulation.

Federal Highway Administration and Virginia Department of Transportation acceptance of this report as fulfillment of this planning study does not constitute endorsement/approval of the need for any recommended improvements, nor does it constitute approval of their location and design, nor commitment to fund any such improvements. Additional project level environmental assessments and/or studies of alternatives may be necessary.

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# **INTRODUCTION**

This study presents the results of a traffic operations analysis, safety analysis and citizen/business survey undertaken for the downtown area of Clifton Forge, Virginia. The traffic operations analysis compares the existing one-way street network to a proposed two-way network, the safety analysis identifies accident locations and types and the survey results document citizen/business concerns regarding existing and proposed traffic operations and safety in the downtown area. The goal of this analysis is to provide a planning level evaluation of the current and proposed downtown street network to be used. It is hoped that this evaluation, along with the safety analysis and survey results, will provide input into the decision making process undertaken by City Officials and the Virginia Department of Transportation for the Clifton Forge roadway network.

## **The Downtown Network**

Prior to 1972, both Main Street and Ridgeway Street carried two-way traffic along their entire length. Due to traffic circulation problems surrounding the Main Street-Ridgeway Street intersection and businesses nearby it was decided to convert Ridgeway Street, Main Street, and Keswick Street to one-way.

The downtown street network is shown in Map 1. This network currently includes three signalized intersections, with each signal in the study area operating independently of each other. Stop signs are used at all unsignalized intersections to assign right-of-way. Signs are also placed periodically throughout the downtown area to identify traffic directions on the one-way streets.

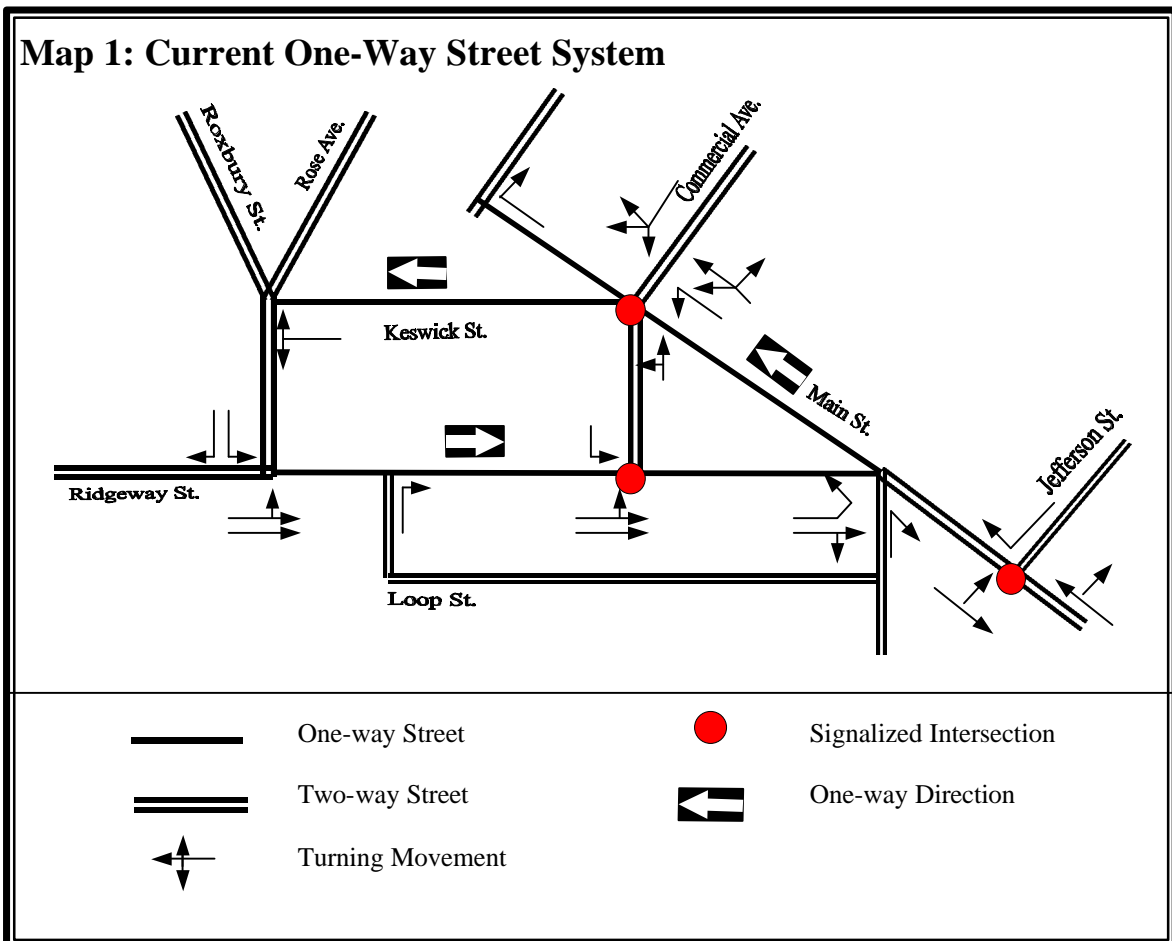
## **Overview of Evaluation Method**

This analysis is broken down into three separate tasks: 1) the traffic operations analysis, 2) safety analysis, and 3) the citizen/business survey.

The *traffic operations analysis* was conducted using Highway Capacity Software (HCS). This software allows users to perform capacity and level-of-service analysis for any given road segment or intersection. For the purposes of this analysis HCS was used to analyze level-of-service on selected intersections. Field investigations obtained by staff were used as input into HCS, and include evening peak hour traffic counts, turning movement data, and road geometries.

The *safety analysis* was conducted by obtaining accident records from the City of Clifton Forge Police Department for the years 1995 through 1998. This data was analyzed by location and type of accident.

The *citizen/business survey* was included in this analysis at the request of city officials. The main objective of the survey was to obtain input from citizens that use and businesses located in the downtown area.



## LEVEL-OF-SERVICE ANALYSIS

The concept of level-of-service (LOS) is central to the analysis of intersections, as it is for many types of transportation facilities. Essentially, the level-of-service is a qualitative rating of the effectiveness of a transportation facility in serving traffic. Level-of-service was first introduced in the 1965 version of the Highway Capacity Manual (HCM), a publication that allows a user to perform a capacity analysis for a given road facility. Staff used the HCM and Highway Capacity Software (HCS) to perform a LOS analysis for intersections within the study area. Intersections, both signalized and unsignalized, are some of the most complex elements in a traffic system. Signalized and unsignalized intersections must be analyzed differently. A description of how each type of intersection is evaluated is provided below.

For *signalized intersections*, level-of-service (LOS) is based on the average stopped delay per vehicle for various movements within the intersection. Delay is the measure of driver discomfort, frustration, fuel consumption and lost travel time. The Highway Capacity Manual (HCM) classifies LOS based on average stopped delay per vehicle using six levels of service: A, B, C, D, E and F. It is important to understand what each level of service represents. They are described below:

LOS A describes operations with very low delay (less than 5 seconds per vehicle). This occurs when forward progress is made with ease and most vehicles arrive during the green phase of the traffic light. Most vehicles do not stop at all.

LOS B describes operations with delay in the range of 5.1 to 15.0 seconds per vehicle. More vehicles stop than for LOS A, causing higher level of average delay.

LOS C describes operations with delay in the range of 15.1 to 25.0 seconds per vehicle. Individual cycle failures may begin to appear in this

level. The number of vehicles stopping is significant at this level, although many still pass through the intersection.

LOS D describes operations with delay in the range of 25.1 to 40.0 seconds per vehicle. At level D, influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay in the range of 40.1 to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 60.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (when arrival flow rates exceed the capacity of the intersection).

At most *unsignalized intersections*, as in this study, stop signs are used to assign the right-of-way to one street. The right-of-way is usually assigned to the street with the highest traffic volume. This designation forces drivers on the controlled street to use best judgment in selecting gaps on the major street traffic flow through which to execute crossing and turning maneuvers. Thus the capacity of the controlled street is based on two factors: 1) the distribution of gaps<sup>1</sup> in the major street traffic flow, and 2) driver judgment in selecting gaps through which to execute their desired maneuvers.

Analysis of unsignalized Stop controlled intersections results in the computation of a solution for the capacity of each lane on the minor approaches. LOS criteria are related to a very general series of delay ranges and are based on the reserve capacity of the lane in question. This provides a general time delay that can be expected at the intersection.

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<sup>1</sup> See Chapter 10 of the Highway Capacity Manual for a more detailed discussion of gap acceptance theory.

Reserve capacity refers to the number additional vehicles that can move through an intersection before the lane capacity is reached and major delays are incurred.

Table 1: Level-Of-Service Criteria for Unsignalized Intersections

Reserve Capacity (pcph)*	LOS	Expected Delay To Minor Street Traffic	
400 and Higher	A	5 seconds or less	Little Delay
300-399	B	5 - 10 seconds	Short Delay
200-299	C	10 - 20 seconds	Average Delays
100-199	D	20 - 30 seconds	Long Delays
0-99	E	30 - 45 seconds	Very Long Delays
**	F	greater than 45	**

\*pcph: stands for passenger car equivalents per hour

\*\* Demand volume exceeds the capacity of the lane, extreme delays will be encountered.

Note: This table is based on a table in the Highway Capacity Manual, page 10-9.

For the purpose of comparing the effectiveness of a one-way street system vs. a two-way street system staff selected five intersections within the downtown area of Clifton Forge to be analyzed. They include the signalized intersections of Main Street-Commercial Avenue and Ridgeway Street-Commercial Avenue, and the unsignalized intersections of Ridgeway Street-Roxbury Street, Keswick Street-Roxbury Street and Main Street-Ridgeway Street. It is important to note that although the intersection of Main Street-Ridgeway Street is unsignalized under the present one-way system, it would have to be signalized if a two-way traffic system is pursued.

### Analysis Results

A level-of-service analysis was conducted for the previously mentioned downtown Clifton Forge signalized and unsignalized intersections. The analysis was conducted using evening peak hour (4:00pm to 5:00pm) data. This time period was selected after staff evaluated historical traffic counts to determine the largest one-hour peak during a twenty-four hour period. To provide more precise data for analysis, staff performed traffic counts during the selected peak hour. In order to compare the effect of implementing a two-way traffic system within downtown Clifton Forge these peak hour



turning movements were used to analyze the existing one-way street system and then were extrapolated for each of the intersections to determine the delays and LOS under a two-way traffic system. Map 2 illustrates the proposed two-way street system. Table 2 provides a side-by-side comparison of the results of each analysis (for a more detailed look at the analysis performed for each intersection, see Appendix A).

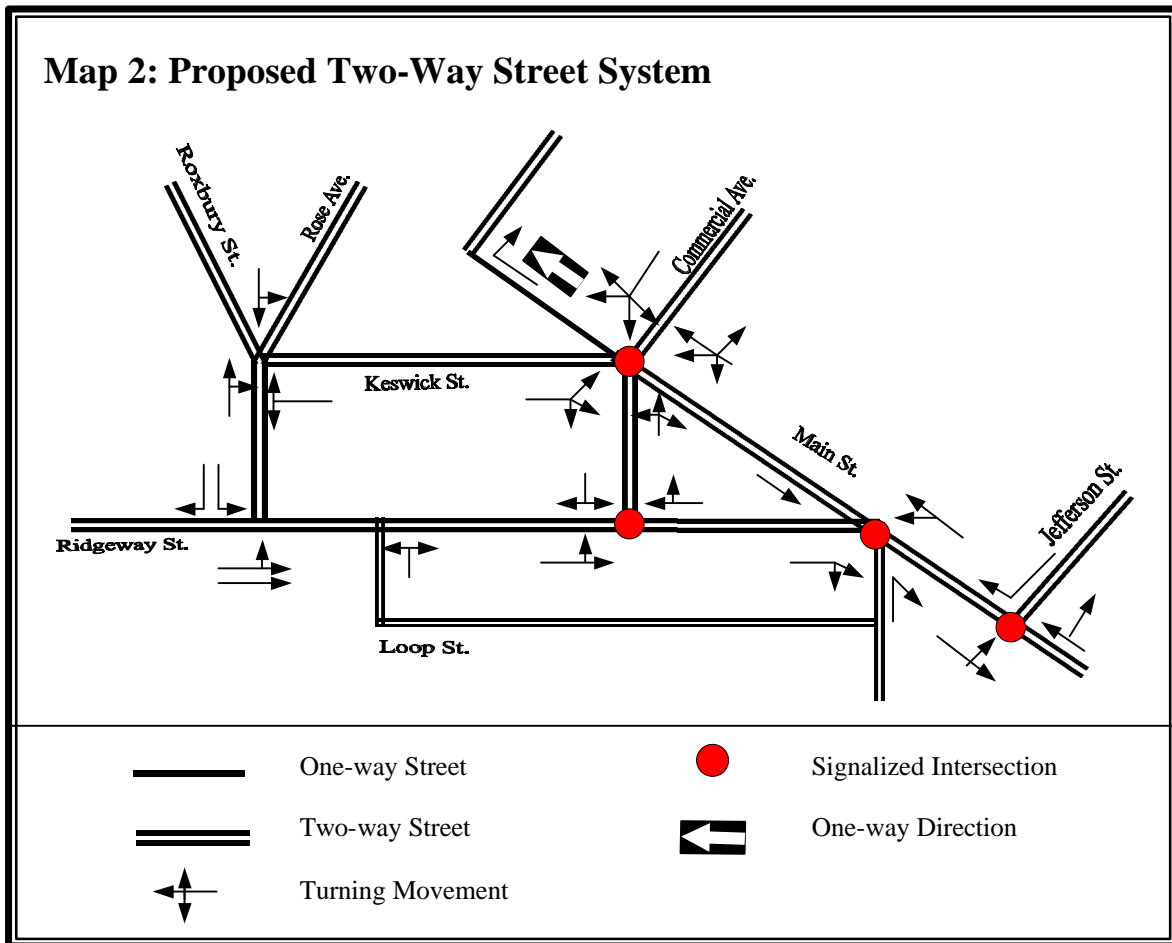


Table 2: Summary of Overall Intersection Level-of-Service

Intersection	One-Way System LOS	Two-Way System LOS
Main Street – Commercial Avenue	B	B
Ridgeway Street – Commercial Avenue	B	B
Ridgeway Street – Roxbury Street	A	A
Keswick Street – Roxbury Street	B	A
Main Street – Ridgeway Street*	A	B

\* Analyzed as an unsignalized intersection under the one-way system, and as a signalized intersection under the two-way system.

As Table 2 illustrates, the results of the HCS analysis indicate that all intersections are functioning at an acceptable level-of-service under the current one-way street system, and there would be little if any LOS benefit if the street system were changed to a two-way facility.

## **ISSUES**

There is an inherent flexibility in having two lanes in one direction versus a two-way street. For instance, motorists can presently maneuver around vehicles that attempt to parallel park along Ridgeway Street and the one-way sections of Main Street. Two-way sections will prevent such actions, causing additional delay that is not totally accounted for in the level-of-service statistics presented in this report. Other advantages to the current one-way system include:

- Double parking is allowed for delivery trucks when two lanes in the same direction are open.
- Emergency Rescue vehicle response will be slightly more impeded in a two-way system. Currently traffic can easily move aside for emergency vehicles and free up an entire lane. This would not be possible under two-way operations.
- A one-way system allows easy egress from the BB&T drive through. A two-way system would increase the delay for drivers exiting the bank.
- Pedestrians crossing Ridgeway currently only have to contend with traffic from one direction. A two-way system make crossing the streets more hazardous and time-consuming.
- Motorists have access to on street parking on both sides of Ridgeway.

However, there are also some inherent advantages to having a two-way traffic network.

- It is less confusing to those who are new to the area.

- It allows more traffic to pass regularly by the businesses on Main Street.
- It allows Easier access to the downtown area.
- It would divert much of Main Street traffic off of residential Keswick Street.

## CAPITAL COST IMPLICATIONS

Conversion to a two-way operation would require additional capital cost to implement. Specifically, the roadway pavement would need to be restriped, curb signs would have to be changed so motorist could read them in both directions, and traffic signal displays would have to be upgraded. All these improvements would need to occur along the primary streets in the downtown area. These streets would include Ridgeway, Main, Keswick, and a portion of Commercial Avenue. Table 3 provides a breakdown of the costs associated with provided these improvements along these primary streets.

Table 3: Primary Street Improvement Cost Estimates

Description	Quantity	Unit Cost	Total Cost
Remove existing pavement markings	3,300 ft	\$1.00	\$3,300
Remove existing signs and sign post	8	\$200	\$1,600
4" Wide Striping	6,600 ft	\$2.00 / ft	\$13,200
24" Wide Striping	120 ft	\$2.00 / ft	\$240
Arrow Markings on Pavement	12	\$150 ea.	\$1,800
Traffic Signal Concrete Foundations	2	\$1,500 ea.	\$3,000
Traffic Signal Pole	2	\$3,000 ea.	\$6,000
Signal Hanger Assembly	6	\$300 ea.	\$1,800
Traffic Signal Head, 12"	6	\$200 ea.	\$1,200
Signal Junction Box	1	\$300 ea.	\$300
Directional Signs to be mounted with Traffic Signals	3	\$150 ea.	\$450
<b><i>Sub-total for Main Road Improvements</i></b>			<b><i>\$32,890</i></b>

Source: Virginia Department of Transportation

The most significant cost, however, could be associated with upgrading the alleyways to handle an increase in delivery truck traffic. Currently, deliveries are made at both the

front and rear of buildings on Ridgeway Street. Loop Street provides rear access to businesses along the south side of Ridgeway Street, while an un-named alleyway provides rear access to businesses on the north side. Conversion to a two-way street system would significantly limit the number of deliveries that could be made to the front of businesses along Ridgeway Street, forcing more deliveries to the rear of buildings. Not only will these alleyways experience an increase in traffic, they will also need to accommodate larger delivery vehicles that currently use Ridgeway Street as parking. Table 4 provides a breakdown of the costs associated with improving these alleyways.

Table 4: Alleyway Improvement Cost Estimates

<b>Description</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total Cost*</b>
Grading & Resurfacing of Alley ways	1,900 ft	\$15.10 / ft	\$28,700
Replacing 40ft Loop Street Bridge	800 sq ft	150–185 / sq ft	\$120,000 to \$148,000
Replacing 20ft Bridge along Alleyway near Race Street	400 sq ft	150-185 / sq ft	\$60,000 to \$74,000
Relocation of Alley Utility Poles	800 ft	\$347 / ft	\$277,600
Acquisition of Right of Way	1,300 sq ft	----	----
<b><i>Sub-total Cost for Alleyway improvements</i></b>			<b><i>\$486,300 to \$528,300</i></b>

Source: Virginia Department of Transportation

\* VDOT adds 22% contingency on all bridge construction cost estimates

Dependent upon the improvements deemed necessary by City officials and VDOT, estimated costs for converting the downtown street network to a two-way system could range from \$32,000 to \$561,000.

## **SAFETY CONCERNS**

One-way streets inherently operate more safely than two-way streets because the potential number of vehicle conflicts is substantially smaller with one-way street operation. Additionally, pedestrian safety inherently is safer because there is one less vehicular traffic direction pedestrians need to observe.

Table 5 provides the total number of traffic related accidents and associated property damage for the years 1995 through 1998. Table 6 summarizes annual accidents for the intersections in the study area for each year.

The tables show that of all the accidents that occurred in the study area between 1995 and 1998, two of the accidents involved vehicles going the wrong way down a one-way street, two accidents involved a bicyclist, and four accidents involved vehicles striking a pedestrian or braking to avoid a pedestrian.

Table 5: Traffic Related Accidents and Associated Property Damage for Years 1995 – 1998, City of Clifton Forge, Virginia

<b>Year</b>	<b>Total Accidents</b>	<b>Reported Property Damage</b>
1998	26	\$ 23,550
1997	21	20,825
1996	17	19,250
1995	15	14,020
<b>Total:</b>	<b>79</b>	<b>\$ 77,645</b>

Source: Clifton Forge Police Department

Table 6: Summary of Intersection Accident Data for Years 1995 – 1998, City of Clifton Forge, Virginia

Accident Location	Year	Type of Accident			
		Rear End	Angle	Other	Total
Ridgeway Street & Main Street	1998	2	2	0	4
	1997	1	0	1	2
	1996	0	0	0	0
	1995	1	0	1	2
Intersection Ridgeway & Commercial	1998	2	3	0	5
	1997	4	2	1	7
	1996	2	1	0	3
	1995	2	0	0	2
Intersection Ridgeway & Roxbury	1998	1	1	1	3
	1997	0	1	0	1
	1996	0	0	0	0
	1995	0	0	0	0
Intersection Ridgeway & Race	1998	0	0	1	1
	1997	0	0	1	1
	1996	0	0	0	0
	1995	0	0	0	0
Intersection of Main & Jefferson	1998	0	2	0	2
	1997	1	0	2	3
	1996	3	1	0	4
	1995	3	1	0	4
Intersection Main & Commercial	1998	6	1	0	7
	1997	4	1	1	6
	1996	3	0	0	3
	1995	1	4	0	5
Intersection Keswick and Roxbury	1998	1	0	2	3
	1997	1	0	0	1
	1996	2	0	1	3
	1995	1	0	1	2
Intersection Ridgeway & Loop Street	1998	1	0	0	1
	1997	0	0	0	0
	1996	4	0	0	4
	1995	0	0	0	0
<b>Total</b>		<b>45</b>	<b>20</b>	<b>13</b>	<b>79</b>

Source: Clifton Forge Police Department

## SURVEY RESULTS

Citizen/business surveys are most often used to supplement technical analysis and provide decision-makers with additional input. The survey conducted for this analysis was targeted at businesses located in the downtown area and at citizens who use those businesses. The survey was made available from November 2 to November 16, 1999 at the locations listed in Table 7. To help notify citizens and business operators about the survey, an advertisement was run in the Saturday, November 11, 1999 edition of the Virginia Review. In addition, most of the business operators located in the downtown area were personally notified about the survey. A sample of the survey instrument is located in Appendix B.

Table 7: Locations in Clifton Forge where traffic surveys were made available to the public

Alleghany Highlands Arts & Crafts Center	Bacova
BB&T	Bull Pin
Clifton Forge City Hall	Clifton Forge Public Library
Club Car	First Citizens Bank
Northwest True Value Hardware	Owens Pharmacy
Save-a-lot	7-Eleven

In an effort to evaluate information gathered on the returned surveys, staff prepared a spreadsheet and entered each response to all questions. From this spreadsheet staff developed a spreadsheet for each question to help summarize the appropriate responses. These tables with their associated questions can be found in Appendix C. Appendix D provides a list of intersections identified by survey respondents as “unsafe”. Appendix E provides a list of additional survey respondent comments.

## **CONCLUSION**

This analysis was performed to help provide decision-makers with better information on which to base their decisions. This is a planning level analysis, and before any changes are made to the Clifton Forge downtown street network, a more thorough engineering level analysis should be performed.



## APPENDIX A: Intersection LOS Analysis Tables

Table A1a: LOS Intersection Analysis for Main Street – Commercial Avenue (one-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Main Street (major street)			Commercial Avenue			
	Westbound			Northbound		Southbound	
Turning movement	Left	Through	Right	Left	Through	Through	Left
Volumes	41	285	94	28	95	48	74
Average Total Delay	2.8	4.3	4.3	6.7	6.9	7.3	
Delay by Approach	4.2			6.9		7.3	
Level of Service	A			A		B	

Table A1b: LOS Intersection Analysis for Main Street – Commercial Avenue (two-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Main Street (major street)						Commercial Avenue					
	Westbound			Eastbound			Northbound			Southbound		
Turning movement	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volumes	21	10	94	15	20	5	10	95	48	57	35	30
Average Delay	2.1	N/A		1.9	N/A		8.6	9.9		10.8	N/A	
Delay by Approach	2.1			1.9			9.8			10.8		
Level of Service	A			A			B			B		

Table A2a: LOS Intersection Analysis for Ridgeway Street and Commercial Avenue (one-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Commercial Avenue		Ridgeway Street (major street)	
	Southbound		Eastbound	
Turning movement	LT	RT	LT	THR
Volumes	69	N/A	123	415
Average Total Delay	7.4		7.8	
Delay by Approach	7.4		7.8	
Level of Service	B		B	

Table A2b: LOS Intersection Analysis for Ridgeway Street and Commercial Avenue (two-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Commercial		Ridgeway (major street)			
	Southbound		Eastbound		Westbound	
Turning movement	LT	RT	LT	THR	THR	LT
Volumes	35	35	133	415	290	15
Average Total Delay	7.6		9.2		7.3	
Delay by Approach	7.6		9.2		7.3	
Level of Service	B		B		B	

Table A3a: LOS Intersection Analysis for Ridgeway Street and Roxbury Street (one-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Roxbury Street		Ridgeway Street (major street)	
	Southbound		Eastbound	
Turning movement	LT	RT	LT	THR
Volumes	91	374	59	431
Average Total Delay	8.9	4.7	2.2	
Delay by Approach	5.5		0.3	
Level of Service	B		A	

Table A3b: LOS Intersection Analysis for Ridgeway Street and Roxbury Street (two-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Roxbury Street		Ridgeway Street (major street)			
	Southbound		Eastbound		Westbound	
Turning movement	Left	Right	Left	Through	Through	Right
Volumes	65	34	59	431	355	10
Average Total Delay	14.9	4.2	---		3.3	
Delay by Approach	11.2		---		0.4	
Level of Service	C		---		A	

Table A4a: LOS Intersection Analysis for Keswick Street and Roxbury Street (one-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Roxbury Street		Keswick Street (major street)	
	Northbound	Southbound	Westbound	
Turning movement	Through	Through	Left	Right
Volumes	59	125	355	12
Average Total Delay	8.9	10.1	2.9	
Delay by Approach	8.9	10.1	2.8	
Level of Service	B	C	A	

Table A4b: LOS Intersection Analysis for Keswick Street and Roxbury Street (two-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Roxbury Street				Keswick Street (major street)	
	Northbound		Southbound		Westbound	
Turning movement	Through	Right	Left	Through	Left	Right
Volumes	59	12	50	75	24	12
Average Total Delay	3.8		4.5		2.1	
Delay by Approach	3.8		4.5		1.4	
Level of Service	A		A		A	

Table A5a: LOS Intersection Analysis for Main Street and Ridgeway Street (one-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Main Street	Ridgeway	
	Westbound	Eastbound	
Turning movement	Through	LT	THR
Volumes	375	58	400
Average Total Delay	2.1	6.5	4.0
Delay by Approach	0.0	4.3	
Level of Service	A	A	

Table A5b: LOS Intersection Analysis for Main Street and Ridgeway Street (two-way street system)

Evening Peak Hour (4:00 – 5:00 PM)	Ridgeway Street	Main Street		
	Northbound	Eastbound	Westbound	
Turning movement	RT	Through	Left	Through
Volumes	415	120	275	105
Average Total Delay	9.9	6.5	0.1	
Delay by Approach	9.9	6.5	0.1	
Level of Service	B	B	A	

## APPENDIX B: Survey Instrument

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### Roanoke Valley-Alleghany Regional Commission

#### 1999 Clifton Forge Downtown Traffic Survey

Thank you in advance for your time and participation in this very important survey. The Fifth Planning District Commission is conducting a survey to better plan for the transportation needs of the people in Clifton Forge. Please answer each question below, and after completing the survey deposit it in the survey return box.

---

1. Rank the following reasons that you have for using Ridgeway and Main Street 1, 2, 3, or 4; a ranking of 1 would be your most important and 4 the least important reason.

\_\_\_ **Work on Ridgeway or Main Street**

\_\_\_ **Do business or shopping there**

\_\_\_ **Just to drive through town**

\_\_\_ **Just to walk around town**

2. How often do you pass through downtown Clifton Forge using Ridgeway or Main Street?

**A. Less than Once a day**

**B. Once or Twice a day**

**C. Three times a day**

**D. Four or more times a day**

3. Does the one-way traffic system for Main Street and Ridgeway make getting to downtown business inconvenient?

**A. No**

**B. Sometimes**

**C. Yes**

4. Would a two-way street system be better on Main Street and Ridgeway?

**A. No**

**B. Yes**

5. Would the addition of a new traffic light at the intersection of Main Street and Ridgeway cause you to be against a two-way street system?

**A. No**

**B. Yes**



## APPENDIX C: Summary of Survey Responses by Question

**Question 1:** Rank the following reasons that you may have for using Ridgeway and Main Street using 1, 2, 3, or 4. A ranking of 1 would be your most important and 4 the least important reason.

Ranking	I use Ridgeway & Main St. because I work there		I use Ridgeway & Main St. just to drive through town		I use Ridgeway & Main St. to do business or shop there		I use Ridgeway & Main St. just to walk around town	
	#	%	#	%	#	%	#	%
#1	37	26%	31	22%	53	38%	8	6%
#2	5	4%	32	23%	47	33%	11	8%
#3	7	5%	29	21%	9	6%	37	26%
#4	39	28%	6	4%	3	2%	31	22%
No Response	53	38%	43	30%	29	21%	54	38%
TOTAL	141	100%	141	100%	141	100%	141	100%

*Question #1 Observation:* The most common #1 and #2 reasons given for using Ridgeway and Main was "to do business or shop there."

**Question 2:** How often do you pass through downtown Clifton Forge using Ridgeway or Main Street?

	# of Responses	% of Total Responses
<ONCE A DAY	23	16%
ONCE OR TWICE DAY	46	33%
THREE TIMES A DAY	7	5%
FOUR+ TIMES A DAY	58	41%
NO RESPONSE	7	5%
TOTAL	141	100%

*Question #2 Observation:* Most respondents pass through downtown Clifton Forge using Ridgeway or Main Street four or more times a day (41% of all respondents) or once or twice a day (33% or one-third of all respondents).

**Question 3:** Does the one-way traffic system for Main Street and Ridgeway make getting to downtown business inconvenient?

	# of Responses	% of Total Responses
YES	30	21%
NO	71	50%
SOMETIMES	38	27%
NO RESPONSE	2	1%
TOTAL	141	100%

*Question #3 Observation:* Respondents were almost evenly divided as to whether the current one-way traffic system on Main Street and Ridgeway made getting to downtown business inconvenient. One-half of respondents did not feel that it did, but nearly the same proportion (48%) said that it did cause some inconvenience in getting to businesses downtown.

**Question 4:** Would a two-way street system be better on Main Street and on Ridgeway?

	# of Responses	% of Total Responses
YES	63	45%
NO	75	53%
NO RESPONSE	3	2%
TOTAL	141	100%

*Question #4 Observation:* A slight majority (53%) were against a two-way traffic system for Main and Ridgeway.



**Question 5:**

Would the addition of a new traffic light at the intersection of Main Street and Ridgeway cause you to be against a two-way street system?

	# of Responses	% of Total Responses
YES	52	37%
NO	84	60%
UNSURE	2	1%
NO RESPONSE	3	2%
TOTAL	141	100%

*Question #5 Observation:* Most (60%) did not feel that putting a new light at the intersection of Main and Ridgeway would turn them against the idea of a two-way traffic system.

Slightly more than a third of the respondents (37%) said that it would turn them against a two-way system.

**Question 6:**

Are traffic signs posted in downtown easily readable or visible when driving?

	# of Responses	% of Total Responses
YES	63	45%
NO	14	10%
SOME ARE NOT	59	42%
NO RESPONSE	5	4%
TOTAL	141	100%

*Question #6 Observation:* A slim majority (52%) indicated problems with traffic signs being easily readable or visible when driving. 45% thought the signs were easily readable.

**Question 7:** Is truck traffic a problem when traveling on Ridgeway or Main in downtown Clifton Forge?

	# of Responses	% of Total Responses
YES	23	16%
NO	69	49%
SOMETIMES	48	34%
NO RESPONSE	1	1%
TOTAL	141	100%

*Question #7 Observation:* Respondents were evenly split as to whether truck traffic was a problem when traveling on Ridgeway or Main in downtown (50% "Yes" or "Sometimes" as problem vs. 49% not a problem).

**Question 8:** Should trucks be encouraged to use the US Route 220 bypass if they are not conducting downtown business?

	# of Responses	% of Total Responses
YES	116	82%
NO	21	15%
MAYBE	1	1%
NO RESPONSE	3	2%
TOTAL	141	100%

*Question #8 Observation:* A resounding majority (82%) were in favor of encouraging trucks to use the US Route 220 bypass rather than traveling through downtown Clifton Forge if they were not conducting business in the downtown area.

**Question 9:**

If facilities were made available should trucks making deliveries to downtown businesses unload their shipments at the back of those businesses and off the main streets?

	# of Responses	% of Total Responses
YES	99	70%
NO	15	11%
MAYBE	24	17%
NO RESPONSE	3	2%
TOTAL	141	100%

*Question #9 Observation:* Respondents favored (70%) the idea of having trucks make deliveries at the back of downtown buildings and off the main streets--if "facilities were made available" that enabled the trucks to do this.

**Question 10:**

Are there any intersections within the downtown area which you feel are unsafe?

	# of Responses	% of Total Responses
YES	54	38%
NO	82	58%
NO RESPONSE	5	4%
TOTAL	141	100%

*Question #10 Observation:* When asked if they felt that there were any unsafe intersections within the downtown area of Clifton Forge, 58% (82) respondents said that there were not.

38% (54) did believe there were some unsafe intersections in downtown Clifton Forge, however, and all but four of these respondents identified the intersections that they had in mind. A wide variety of "unsafe" locations were listed on the survey forms, some of the more common ones being the Main Street/Jefferson (7 respondents) and the Church/Commercial (5 respondents) intersections.

## **APPENDIX D: Intersections Identified by Survey Respondents as “Unsafe”**

@ Owen's Pharmacy

@ the Elks Lodge (the Dollar Store)

Church & McCormick

Church & Rose

Church & Commercial

Jefferson Avenue & Low Street

Jefferson Avenue: @ “the foot of” the street

Keswick, Roxbury, Race Streets and also @ Church, Race, & Rose Avenue

Main Street & Commercial

Main Street & Jefferson Avenue

Main Street & Ridgeway

Main Street @ Farrar's Drug Store

Railroad Yard & restaurant

Ridgeway & Commercial

Ridgeway @ the Clifton Forge Inn.

Ridgeway & 2<sup>nd</sup> Street at [?]

Ridgeway & 5<sup>th</sup> Street

Stopping @ stoplight in front of Press' at night [is unsafe].

Unsafe for pedestrians @ Dollar General & Farass; and for cars @ City Hall parking lot.

West end (new bridge)

## APPENDIX E: Additional Survey Respondent Comments

"I think Clifton Forge is a Circus."
"We don't need anymore traffic lights."
"You can turn left onto Jefferson when opposing traffic has red light. The opposing traffic has no sign to tell them that, so they are trying to turn right on red while traffic is trying to turn left up the same street."
"Cars making a right turn onto Jefferson (on a red light) could be hit by a car making a left onto Jefferson (on a green arrow)."
"I think you are going to have to add two stoplights-one at Ridgeway and Roxbury and one at Main and Ridgeway. Not to mention the light at Ridgeway and Commercial which will have to have a lead in light for cars turning onto Commercial that are coming East on Ridgeway. Cars that are turning left will back traffic up considerably. Therefore, the traffic flow will be worse than it is now. It is difficult to give directions presently; however, better signage would help to alleviate that problem. The cost of the change definitely needs to be considered as Clifton Forge is financially strapped now and maybe not be able to afford new lights and signs and painting, etc."
"1. Entrance to City Hall parking lot should be blocked in yellow with printing DO NOT BLOCK ENTRANCE. I have seen through traffic lined up back to Famous Café while [the] lead car sit[s] in traffic trying to make a left into park[ing] lot and the way is blocked by eastbound traffic. 2. Pedestrian crosswalks need to be marked in yellow and marked STOP FOR PED[ESTRIANS]. You cannot see a child behind a parked car @ Dollar General when you are heading east. Few driver pay attention to crosswalks if [the crosswalks] are not brightly marked and enforced. I've seen young and old alike stand @ Farras Corner until they were soaked with rain waiting to cross the street.---(?)"
[A 2-Way street System] ...has been tried. People are used to 1-Way: all businesses get equal attention. Heavy truck traffic dominates both streets" [i.e., Main & Ridgeway]. Many years ago a bypass on [?] street was considered."
"Leave it like it is."
"The stoplight in front of the Courthouse needs to be removed because if you come [down] Jefferson St. you can't turn left onto Main, so there is no reason for people heading east on Main to stop. A STOP or YIELD sign would work better." [Respondent drew street diagram on back of survey form].
"[I pass through downtown for] banking only. Where would I shop?" [Jefferson & Main]...intersection need[s] new light system--like the new ones recently established."
"All traffic coming from the south never even gets to the main business area--it travels around it and out of town."
"Need to put back the WALK and DON'T WALK signs. Also, bring in some reasonable businesses so you won't have to drive to Covington or Roanoke."
"Need to enforce pedestrian signs."
"Leave [downtown traffic system/pattern] as is."
"Leave [Main St. & Ridgeway] one-way."
"Leave it [downtown traffic system/pattern] like it is now."
"It is uneasy to see when trucks are parked on Ridgeway by the Clifton Forge Inn when you [are] trying to pull out of there."

"Coming down off of Jefferson Ave. [there] should be a traffic light put up coming down off of Jefferson Ave."
"Need a traffic light on the corner of Jefferson Ave. & Low Street."
"Need a traffic light on the corner of Jefferson Ave. & Low Street."
"I think the merchants would benefit from a two-way, normal traffic pattern on Ridgeway. So many visitors come off the highway for the Art Center, then shop [at] Bacova, eat lunch, get gas--but there are many who get lost and feel discouraged and go on. Many stop at Nicely's gas station to ask directions! Also, the parking spaces in the lot downtown should be changed..." [see respondent's drawing on back of survey form].
"I've used this system [a 2-way traffic system for Main and Ridgeway] years ago...the present set-up [i.e., a 1-way system] is better." "The pedestrian traffic signs should be placed at the crossings on Ridgeway Street. Cars do not want to stop for people in the crosswalks."
"If you had 2-way traffic on Ridgeway, you would never find a place to park! As it is, you come down the street and have the option to park on the right or left. If Ridgeway becomes 2-way, parking would be much more of a problem. Downtown needs more parking spaces as we have a lot of shoppers to come from other areas. At this time, I think the parking needs to be addressed before worrying about the traffic pattern."
"Not broke, don't fix it."
"[The Main & Jefferson]...intersection is very weird. Jefferson has a NO LEFT TURN sign, [and] Main Street has a green arrow that lights up when the Main Street light is red and Jefferson's light is green. To me it is silly to have a LEFT green arrow and a NO LEFT turn sign at this intersection [see respondent's drawing on back of survey form].
"There are not stoplights at the Elks Lodge, the Dollar Store or at Owen's Pharmacy--you have to run for your life in crosswalks."
"Leave it [the downtown traffic system/pattern] like it is."
"Pedestrian WALK signs are not seen and not observed by motorists! "Turn on red [at Main & Commercial] makes pedestrians crossing unsafe. "Pedestrians crossing from south to north on corner of Ridgeway & Commercial cannot see lights to know when [it's] safe to cross."
Sometimes traffic exits the wrong way at the railroad yard and restaurant. "On new road eastbound turn lane at Hardee's is unsafe. Yellow barrier lines should be removed and replaced by turn arrows and warning signs. Speed limit should remain 25 mph.
"How many drives the speed limit of 25mph? There is no warning where eastbound line [lane?] goes to a one-lane."
"Cars parking in NO PARKING zones make Commercial & Church intersection unsafe."
The intersections of Church/McCormick and Church/Rose are unsafe because you have to come so far out in the intersection to see traffic.
Intersection of Commercial and Ridgeway is unsafe because 1. you can't see easily around the old Zimmerman Building and people like to run that light..and 2. They cut that corner sharply--sometimes you have to back up. I personally believe that making the traffic flow 2-way would further complicate driving downtown. It's hard enough as it is to get onto Ridgeway and Main safely from many side streets and parking lots."
"[The] Alleys [in downtown] are too narrow for trucks to get through to make deliveries."
"Leave [the downtown traffic system] as is."
"Leave [the downtown traffic system/pattern] as it is now."
"[The] speed limit on new bridge should be raised to 35mph."