

Township of Central Frontenac RCIP (Road Capital Investment Plan)

DRAFT with options

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to June 24 2008



This is further to Council requesting implementation of a RCIP as outlined in a management study received by Council in February 2008.

The purpose of this RCIP is to outline the method to be followed in determining ongoing scope, nature and priority of road capital projects.

Recommendations:

- 1 That Council set in policy the road classification system and designation as proposed
- 2 That Council consider the range of options for a RCIP as proposed
- 3 That Council consider consultation with the public with regard to the implications of a given RCIP
- 4 That Council adopt in multi year RCIP
- 5 That related activity now funded in road operations be transferred to assist in funding this capital plan.
- 6 That Council establish a Road Capital Reserve Fund to support this RCIP
- 7 That Council set a high priority on funding and maintaining the adopted plan
- 8 That road capital projects be determined having regard for the RCIP
- 9 That Council annually receive an update of progress and consider reasonable adjustments to the RCIP

Respectfully Submitted

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Classification

NOTES

1. Classification allows for the establishment of service levels, and condition thresholds and project priorities. Condition thresholds below are intended as goals for road improvements, not to indicate an sense of current substandard condition.

2. The approved road classification map indicates classification of the Central Frontenac Road system. Various factors were taken into account other than the specific criteria illustrated in this table.

3. * the 2 suffix means this classification of road is not considered the first means of access for the user, emergency services or school bus

Class	Approximate Prov. Class	Nature of Traffic	Typical traffic or households served
A	3	Arterial	1000 + aadt
B	4	Collector	200 + aadt
C	5	Local Collector	more than 15 households
C2*			50 - 200 summer average daily traffic
D	6	Local	less than 15 households
D2*			0-49 aadt

Measures to identify need

Measure	GEOMETRICS			RIDE		
	Width	Hilliness	Sightlines	Surface Type	Local Roughness	General Roughness
Description	width of the road including shoulders	The slope of hills	unimpeded sight of road ahead	Hard Surface or Gravel Surface	potholes, washboard or erosion	irregular surface settlement, frost heaving
Metric	metres or less including shoulders (or inside guiderail)	% slope or more averaged over at least 20m	metres or less (measured 1m above centreline)	HS , GS	% or more of length of road affected	% or more of length of road affected

Condition thresholds

Measure	GEOMETRICS			RIDE		
	Width	Hilliness	Sightlines	Surface Type	Local Roughness	General Roughness
Class A	9m	max of 10%,max 5% of road over 6%	100m	Hard Surface	5%	5%
Class B	80% at 8 m, balance at 7m	max of 12%,max 20% of road over 8%	60m	Hard Surface	10%	10%
Class C	90% at 6m	max of 14%,max 10% of road over 10%	50m	Hard Surface	20%	20%
Class C2	50% at 6m	max of 14%,max 20% of road over 10%	40m	Gravel Surface	30%	30%
Class D	100m at 6m every 500m balance at 5m	max of 16%,max 10% of road over 12%	30m	Gravel Surface	40%	40%

Class D2	5m	max of 16%,max 20% of road over 12%	20m	N/A	N/A	N/A
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Inventory

Condition Index (CI)

1	At or near design condition
2	At or better than condition threshold
3	Below condition threshold

Severity Index (SI)

H	High or severe cost to achieve CI of 2
M	Medium cost to achieve CI of 2
L	Lower cost to achieve CI of 2

Segment Name/s	Km in segment	HH served	Km in need (CI 3)	GEOMETRICS				RIDE				Under Condition Threshold
				Width	Hilliness	Sightlines	SI	Surface Type	Local Roughness	General Roughness	SI	
Class A												
Road 38	35.8	362	35.8	1	1	1		1	1	1		
Class B												
ARDEN RD (South of Village)	12.6	47	12.6	2	2	2		2	2	2		
ARDEN RD (Village & North)	3.7	43	3.7	2	2	2		2	2	3	L	Yes
ARDOCH RD	5.9	12	5.9	2	2	2		2	2	3	L	Yes
CROW LAKE RD (E of Village)	5.2	5	5.2	2	2	2		2	2	2		
CROW LAKE RD (Village)	1.9	37	1.9	3	2	2	M	2	3	2	L	Yes
CROW LAKE RD (W of Village)	5.1	16	5.1	2	2	2		2	2	2		
ELIZABETH ST	0.9	33	0.9	2	2	2		2	2	3	M	Yes
FIFTH LAKE RD	10.3	50	10.3	2	2	2		2	2	2		
GARRETT ST	0.6	26	0.6	2	2	2		2	2	3	L	Yes
HENDERSON RD	16.4	85	16.4	2	2	2		2	2	2		
LONG LAKE RD	16.9	74	16.9	2	2	2		2	2	3		Yes
MOUNTAIN GROVE RD	2.6	31	2.6	2	2	2		2	2	3	L	Yes
ROAD 509	11	24	11	2	2	2		2	2	2		
WAGARVILLE RD	7.6	56	7.6	2	2	2		2	2	2		
WESTPORT RD	4.1	13	4.1	2	2	2		2	2	3	L	Yes
ZEALAND RD (North of Hy)	7.2	22	7.2	2	2	2		2	2	2		

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Class C

ALF PATTERSON RD	0.8	0	0.8	1	1	1		1	1	1		
ANDERSON RD N	1.8	15	1.8	3	2	3	M	3	2	2	M	Yes
ARMSTRONG RD	5	7	5	3	3	3	M	3	2	3	M	Yes
BABCOCK RD	7.9	4	7.9	3	2	2	H	3	2	3	L	Yes
BAKER VALLEY RD (First 1.8km)	1.8	28	1.8	3	2	2	H	3	3	2	L	Yes
BALL RD	1.6	8	1.6	3	2	2	L	3	2	2	L	Yes
BELL LINE RD (2.7 km fr Zealand)	2.7	6	2.7	3	2	3	H	3	2	2	M	Yes
BELL LINE RD (West of 509)	12.6	34	12.6	3	2	3	H	3	3	2	M	Yes
BELL LINE RD (2.3 km E of 509)	2.3	8	2.3	3	2	3	H	3	2	2	M	Yes
BIG GULL LN	3.2	22	3.2	3	2	2	M	3	2	2	L	Yes
BORDENWOOD RD	6.4	24	6.4	3	2	2	L	3	2	2	L	Yes
BREWER RD	5.4	39	5.4	3	2	3	H	3	2	3	M	Yes
BRIDGE ST	0.5	23	0.5	2	2	2		2	2	3	M	Yes
BROCK RD (1 km E fr Clark)	0.9	0	0.9	2	2	2		3	2	2	L	Yes
BROCK RD	3.5	24	3.5	2	2	2		2	2	2		
BULL LAKE RD	3.8	16	3.8	3	2	2	H	3	2	3	M	Yes
BURKE SETTLEMENT RD	4.8	17	4.8	3	2	3	H	3	2	3	M	Yes
CANNON RD	1	19	1	3	2	3	H	3	3	3	H	Yes
CLARENDON RD	5.7	15	5.7	3	2	3	M	3	3	3	H	Yes
CLARK RD	3	16	3	3	2	2	L	3	2	2	L	Yes
CLEMENT RD	1.6	26	1.6	3	2	2	L	3	2	2	L	Yes
COX RD	2.1	18	2.1	3	2	2	H	3	2	3	M	Yes
CROSS RD (N from Crow lk. rd)	1.1	9	1.1	3	3	3	H	3	2	2	M	Yes
DUCHARME RD	7.6	24	7.6	3	3	3	H	3	2	2	L	Yes
EAGLE LAKE RD	1.4	11	1.4	3	2	2	M	3	2	2	L	Yes
ECHO LAKE RD (O. Flats-Raymo)	5.9	10	5.9	3	2	2	M	3	2	3	M	Yes
ELM TREE RD	10.2	53	10.2	3	2	2	L	3	2	2	L	Yes
FALL RIVER RD	3.9	8	3.9	3	2	2	M	3	2	2	M	Yes
FERGUSON RD	1.6	5	1.6	2	2	2		2	2	2		
FISH CREEK RD	3.9	13	3.9	3	2	2	L	3	2	2	L	Yes
FORTY FOOT RD (Rd 38 end)	2.3	11	2.3	3	2	2	L	3	2	2	L	Yes
FOURTH LAKE RD	3.4	8	3.4	3	2	3	L	3	2	3	L	Yes
FRONTENAC RD (N fr Dawson)	3.7	8	3.7	3	2	3	M	3	2	3	M	Yes
FRONTENAC RD (S fr Tryon)	3.5	14	3.5	3	2	3	M	3	2	3	M	Yes
GUIGUE RD	0.9	4	0.9	3	2	3	M	3	2	2	M	Yes
LEGION RD	0.2	11	0.2	3	2	2	L	3	2	2	L	Yes

Inventory (continued)

Segment Name/s	system km	HH served	Length CI 3 km	GEOMETRICS				RIDE				Under Condition Threshold
				Width	Hilliness	Sightlines	SI	Surface Type	Local Roughness	General Roughness	SI	
Class C continued												
MAPLEWOODS CL	0.1	5	0.1	2	2	2		2	2	2		
MARY MOORE RD	1.1	0	1.1	3	2	2	L	3	2	2	L	Yes
MATTHEW ST	0.2	9	0.2	2	2	2		2	2	2		
MCLEAN RD	5.2	10	5.2	3	2	3	H	3	2	3	M	Yes
MEDICAL CENTRE RD	0.2	6	0.2	2	2	2		2	2	2		
MILL RD	2.5	5	2.5	3	2	2	L	2	2	3	L	Yes
NORTH RD	3.7	19	3.7	3	2	2	H	3	2	2	L	Yes
OAK FLATS RD (surfaced)	5.7	32	5.7	2	2	2		2	2	2		
OAK FLATS RD (unsurfaced)	3.3	13	3.3	3	2	3	L	3	2	3	L	Yes
OLDEN PARK RD	0.4	3	0.4	3	2	2	L	3	2	2	L	Yes
OVER THE HILLS RD (fr Ardoch)	1.4	5	1.4	3	2	3	H	3	3	3	H	Yes
PICCADILLY RD	0.2	3	0.2	2	2	2		2	3	2	L	
PIT RD	5.7	11	5.7	3	2	3	H	3	2	2	L	Yes
PRICE RD (In Ward 2)	3	8	3	2	2	2		2	2	2		
PRICE RD (In Ward 1)	3.1	23	3.1	2	2	2		2	2	3	L	Yes
QUEEN ST	0.1	5	0.1	2	2	2		2	2	2	M	
ROBERT ST	0.2	6	0.2	2	2	2		2	2	2		
2nd LAKE RD (Bdy - O. Flats)	1.9	6	1.9	2	2	2		2	3	2	L	Yes
SHIBLEY RD	5	64	5	3	2	3	H	3	2	2	M	Yes
ST GEORGES LAKE RD	1.1	19	1.1	3	2	3	H	3	2	2	M	Yes
TRYON RD (6 km at Rd 38)	6	23	6	3	2	3	H	3	2	2	L	Yes
VELEY RD	2	11	2	3	2	2	L	3	2	2	L	Yes
VILLAGE WOODS DR	0.9	14	0.9	2	2	3	H	2	2	2		
WAGNER RD	2.2	33	2.2	3	2	3	L	3	2	2	L	Yes
WEMP RD	0.6	4	0.6	3	2	2	L	3	2	2	L	Yes
WESTGATE RD	1.1	1	1.1	2	2	2		3	2	2	L	Yes
WHITE LAKE RD	2	7	2	3	2	2	M	3	2	2	L	Yes
WILKINSON RD	4.5	7	4.5	3	2	2	M	3	2	2	L	Yes
WILLIS ARMSTRONG RD	2.8	8	2.8	3	2	3	M	3	2	2	M	Yes
WINDWOOD DR	0.9	12	0.9	2	2	2		2	2	2		
ZEALAND RD (South of Hy)	1.7	13	1.7	2	3	2	M	3	2	3	M	Yes
	196.8											

Class C2

ARENA BOUNDARY RD	4.7	10	4.7	3	2	2	L	3	2	2	L	Y
BREWER RD (W of S.L.)	4.7	4	4.7	3	3	3	H	3	2	3	M	Y
CLOW RD	2.9	11	2.9	3	2	2	M	3	2	2	M	Y
CRONK RD	2.9	11	2.9	3	2	3	M	3	2	2	L	Y
DWYER RD	1.4	1	1.4	3	2	3	H	3	2	3	M	Y
FOURTH LAKE RD (Echo-Wilk...)	4.2	7	4.2	3	2	2	M	3	2	3	M	Y
FOX RD	3.5	5	3.5	3	2	2	M	3	2	2	L	Y
HUNGRY BAY RD	6.4	20	6.4	3	2	3	H	3	2	2	M	Y
SECOND LAKE RD	5.5	11	5.5	3	2	3	H	3	2	3	M	Y
THOMPSON RD	2.5	14	2.5	3	2	3	M	3	2	2	L	Y
	38.7											

179 km of Class D & D2 shown on mapping only and not indexed in this table

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- NOTES**
1. Class A roads are not in the horizon for further investment.
 2. Roads of class D are not inventoried for purposes of project based capital investment. Conditions are addressed with operating funds.

Cost Estimate (in 2008 dollars)

Severity Index	H	High or severe cost to achieve threshold condition
	M	Medium cost to achieve threshold condition
	L	Low cost to achieve threshold condition

CLASS B Benchmark Cost Estimate

Typical Elements	Units	\$/Unit	# Units / km			\$/ km		
			H	M	L	H	M	L
GEOMETRICS								
Clearing & Stumping	m2	\$ 4	4000	2000	1000	\$ 16,000	\$ 8,000	\$ 4,000
Earth ex and disposal	m3	\$ 8	6000	4000	2000	\$ 48,000	\$ 32,000	\$ 16,000
Rock ex and disposal	m3	\$ 200	200	100	20	\$ 40,000	\$ 20,000	\$ 4,000
Culverts	m	\$ 100	60	40	20	\$ 6,000	\$ 4,000	\$ 2,000
Base supplied and placed	m3	\$ 8	2000	1000	500	\$ 16,000	\$ 8,000	\$ 4,000
Other	ls	\$ 1,000	10	5	0	\$ 10,000	\$ 5,000	\$ -
						\$ 136,000	\$ 77,000	\$ 30,000
RIDE								
Hard Surfacing	m2	\$ 13	7000	6000	5000	\$ 91,000	\$ 78,000	\$ 65,000
Gravel supplied and placed	t	\$ 17	1000	600	100	\$ 17,000	\$ 10,200	\$ 1,700
Other	ls	\$ 1,000	10	5	0	\$ 10,000	\$ 5,000	\$ -
						\$ 118,000	\$ 93,200	\$ 66,700
						\$/km \$ 254,000	\$ 170,200	\$ 96,700

CLASS C Benchmark Cost Estimate

Typical Elements	Units	\$/Unit	# Units / km			\$/ km		
			H	M	L	H	M	L
GEOMETRICS								
Clearing & Stumping	m2	\$ 4	3000	1500	500	\$ 12,000	\$ 6,000	\$ 2,000
Earth ex and disposal	m3	\$ 8	3000	2000	1000	\$ 24,000	\$ 16,000	\$ 8,000
Rock ex and disposal	m3	\$ 200	100	60	20	\$ 20,000	\$ 12,000	\$ 4,000
Culverts	m	\$ 100	60	40	20	\$ 6,000	\$ 4,000	\$ 2,000
Base supplied and placed	m3	\$ 8	1500	1000	500	\$ 12,000	\$ 8,000	\$ 4,000
Other	ls	\$ 1,000	6	3	0	\$ 6,000	\$ 3,000	\$ -
						\$ 80,000	\$ 49,000	\$ 20,000
RIDE								
Surface Treatment	m2	\$ 5	6000	6000	5000	\$ 30,000	\$ 30,000	\$ 25,000
Gravel supplied and placed	t	\$ 19	1000	600	100	\$ 19,000	\$ 11,400	\$ 1,900
Other	ls	\$ 1,000	6	3	0	\$ 6,000	\$ 3,000	\$ -
						\$ 55,000	\$ 44,400	\$ 26,900
						\$/km \$ 135,000	\$ 93,400	\$ 46,900

CLASS C2 Benchmark Cost Estimate

Typical Elements	Units	\$/Unit	# Units / km			\$/ km		
			H	M	L	H	M	L
GEOMETRICS								
Clearing & Stumping	m2	\$ 4	3000	1500	500	\$ 12,000	\$ 6,000	\$ 2,000
Earth ex and disposal	m3	\$ 8	2000	1250	500	\$ 16,000	\$ 10,000	\$ 4,000
Rock ex and disposal	m3	\$ 200	50	30	10	\$ 10,000	\$ 6,000	\$ 2,000
Culverts	m	\$ 100	60	40	20	\$ 6,000	\$ 4,000	\$ 2,000
Base supplied and placed	m3	\$ 8	700	500	300	\$ 5,600	\$ 4,000	\$ 2,400
Other	ls	\$ 1,000	6	3	0	\$ 6,000	\$ 3,000	\$ -
						\$ 55,600	\$ 33,000	\$ 12,400
RIDE								
Gravel supplied and placed	t	\$ 19	500	300	200	\$ 9,500	\$ 5,700	\$ 3,800
Other	ls	\$ 1,000	10	5	0	\$ 10,000	\$ 5,000	\$ -
						\$ 19,500	\$ 10,700	\$ 3,800
						\$/km \$ 75,100	\$ 43,700	\$ 16,200

PLAN Options

NOTES 1. The estimated annual funding allocation is averaged over 5 years however annual capital plans should be more specifically estimated. Costs are intended to average out within the scope of the plan.

Overview of Need

CLASS	System	Now Need		
	Km	Km	%	\$
A	35.8	0	0%	\$ -
B	112	19.7	18%	\$ 1,182,000
C	196.8	180.6	92%	\$ 8,362,160
C2	38.7	38.7	100%	\$ 1,407,660
D,D2	179.1	n/a		n/a
ALL	562.4	239		\$ 10,951,820

OPTION 1 : Basic

CLASS	Goal	Year				
		1	2	3	4	5
B	Address now need in 5 yrs	\$ 236,400	\$ 236,400	\$ 236,400	\$ 236,400	\$ 236,400
C	Address now need in 10 yrs	\$ 836,216	\$ 836,216	\$ 836,216	\$ 836,216	\$ 836,216
C2	Do not address	\$ -	\$ -	\$ -	\$ -	\$ -
5 yr Plan \$ 5,363,080		\$ 1,072,616	\$ 1,072,616	\$ 1,072,616	\$ 1,072,616	\$ 1,072,616

OPTION 2 : Sustaining

CLASS	Goal	Year				
		1	2	3	4	5
B	Address each km every 10 yrs	\$ 672,000	\$ 672,000	\$ 672,000	\$ 672,000	\$ 672,000
C	Address each km in 10 yrs	\$ 911,225	\$ 911,225	\$ 911,225	\$ 911,225	\$ 911,225
C2	Address now need in 10 yrs	\$ 140,766	\$ 140,766	\$ 140,766	\$ 140,766	\$ 140,766
5 yr Plan \$ 8,619,957		\$ 1,723,991	\$ 1,723,991	\$ 1,723,991	\$ 1,723,991	\$ 1,723,991

OPTION 3 : Improving

CLASS	Goal	Year				
		1	2	3	4	5
B	Address each km every 7 yrs	\$ 960,000	\$ 960,000	\$ 960,000	\$ 960,000	\$ 960,000
C	Address now needs in 5 yrs	\$ 1,672,432	\$ 1,672,432	\$ 1,672,432	\$ 1,672,432	\$ 1,672,432
C2	Do not address	\$ -	\$ -	\$ -	\$ -	\$ -
5 yr Plan \$ 13,162,160		\$ 2,632,432	\$ 2,632,432	\$ 2,632,432	\$ 2,632,432	\$ 2,632,432

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Priority List

1. The funding cap limits the investment in any given road and may result in certain conditions thresholds not being met.
2. The lower the Investment priority number the higher the relative priority.

Funding Cap in \$/km

Class B	\$ 60,000
Class C	\$ 50,000
Class C2	\$ 40,000

Yr 1
Yr 2
Yr 3
Yr 4
Yr 5

Segment Name/s	HH served	km in need	Estimated \$ /km	Estimated \$ / segment	Capped \$ / segment if necessary	If Capped	Investment Priority # \$/HH	OPTION 1	OPTION 2	OPTION 3	
CLASS B											
GARRETT ST	43	0.6	\$ 66,700	\$ 40,020	\$ 36,000	Y	831	Yr 1	Yr 1	Yr 1	
ELIZABETH ST	33	0.9	\$ 93,200	\$ 83,880	\$ 54,000	Y	1636	Yr 1	Yr 1	Yr 1	
MOUNTAIN GROVE RD	31	2.6	\$ 66,700	\$ 173,420	\$ 156,000	Y	5032	Yr 1	Yr 1	Yr 1	
ARDEN RD (Village & North)	43	3.7	\$ 66,700	\$ 246,790	\$ 222,000	Y	5163	Yr 2	Yr 1	Yr 1	
CROW LAKE RD (Village)	37	1.9	\$ 143,700	\$ 273,030	\$ 114,000	Y	3081	Yr 3	Yr 1	Yr 1	
WESTPORT RD	13	4.1	\$ 66,700	\$ 273,470	\$ 246,000	Y	18923	Yr 4	Yr 2	Yr 1	
ARDOCH RD	12	5.9	\$ 66,700	\$ 393,530	\$ 354,000	Y	29500	Yr 5	Yr 2	Yr 2	
WAGARVILLE RD	56	7.6	\$ -	\$ -			None		Yr 3	Yr 2	
HENDERSON RD	85	16.4	\$ -	\$ -			None		Yr 4	Yr 3	
FIFTH LAKE RD	50	10.3	\$ -	\$ -			None		Yr 5	Yr 3	
LONG LAKE RD	74	16.9	\$ -	\$ -			None			Yr 4	
ARDEN RD (South of Village)	47	12.6	\$ -	\$ -			None			Yr 5	
CROW LAKE RD (W of Village)	16	5.1	\$ -	\$ -			None				
ZEALAND RD (North of Hy)	22	7.2	\$ -	\$ -			None				
ROAD 509	24	11	\$ -	\$ -			None				
CROW LAKE RD (E of Village)	5	5.2	\$ -	\$ -			None				
		18%						\$ 1,182,000			

