



APPENDIX



Rev. 03/2011

Benefit-Cost Analysis

District: **Two** County: **78 - St Johns** Date Prepared: **08/12/13**

Location: **Wildwood Drive from 800 feet west of US 1 to US 1**

Section: **1A** Beg. Milepost: **198+00** End Milepost: **206+00**
 Rdway Type: **2 - 3 Lanes Rural UnDivided**

Control Element: **Other (describe in box below)**

Raised median to eliminate left turns into and out of gas station

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Recovery Factor	Capital	Total
ROW	\$ 35,000.00	100	0.0408	\$	1,428.00
P.E.C.E.I.	\$ 113,000.00	15	0.0899	\$	10,158.70
Structure	\$ -	75	0.0425	\$	-
Roadway	\$ 377,500.00	20	0.0736	\$	27,784.00
Drainage		20	0.0736	\$	-
Signal		20	0.0736	\$	-
Other		20	0.0736	\$	-
Sub-Total	\$ 525,500.00			\$	39,370.70
Annual Cost =				\$	39,370.70

Total number of crashes = 16
 # of correctable crashes, PC = 8
 # of years of crash data, YD = 4
 PC/YD = 2.00
 Crash reduction factor, CRF = 31.00%
 CRF x (PC/YD) = 0.62
 Cost per crash, CPC = \$402,003.00
 Benefit = \$249,242

Primary crash reduction factor: 31
 Add raised median

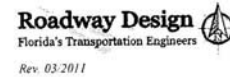
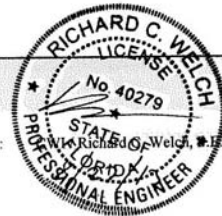
Additional crash reduction factor:

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$249,241.86}{\$39,370.70} = 6.33$$

Prepared by:



Rev. 03/2011

Benefit-Cost Analysis

District: **Two** County: **78 - St Johns** Date Prepared: **08/12/13**

Location: **Wildwood Drive from 1 mile west of US 1 to 800 feet west of US 1**

Section: **1B** Beg. Milepost: **Sta 153+50** End Milepost: **Sta 198+00**
 Rdway Type: **2 - 3 Lanes Rural UnDivided**

Control Element: **Other (describe in box below)**

Adding Left Turn Lanes at intersections Carter Road, Wicks Branch Road and Oak Lane

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Recovery Factor	Capital	Total
ROW	\$ 322,000.00	100	0.0408	\$	13,137.60
P.E.C.E.I.	\$ 293,000.00	15	0.0899	\$	26,340.70
Structure	\$ -	75	0.0425	\$	-
Roadway	\$ 1,465,000.00	20	0.0736	\$	107,824.00
Drainage		20	0.0736	\$	-
Signal		20	0.0736	\$	-
Other		20	0.0736	\$	-
Sub-Total	\$ 2,080,000.00			\$	147,302.30
Annual Cost =				\$	147,302.30

Total number of crashes = 21
 # of correctable crashes, PC = 10
 # of years of crash data, YD = 4
 PC/YD = 2.50
 Crash reduction factor, CRF = 20.00%
 CRF x (PC/YD) = 0.50
 Cost per crash, CPC = \$402,003.00
 Benefit = \$201,002

Primary crash reduction factor: 20
 Add Left Turn Lanes at several intersections

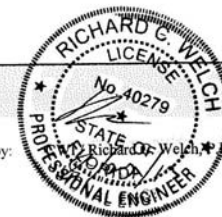
Additional crash reduction factor:

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$201,001.50}{\$147,302.30} = 1.36$$

Prepared by:



Rev. 03/2011

Benefit-Cost Analysis

District: **Two** County: **78 - St Johns** Date Prepared: **08/12/13**

Location: **Wildwood Drive from 1 mile west of US 1 to US 1**

Section: **1** Beg. Milepost: **153+50** End Milepost: **206+00**
 Rdway Type: **2 - 3 Lanes Rural UnDivided**

Control Element: **Other (describe in box below)**

Raised median to eliminate left turns into gas station, adding left turn lanes at 3 intersections

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Recovery Factor	Capital	Total
ROW	\$ 357,000.00	100	0.0408	\$	14,565.60
P.E.C.E.I.	\$ 461,000.00	15	0.0899	\$	41,443.90
Structure	\$ -	75	0.0425	\$	-
Roadway	\$ 1,842,500.00	20	0.0736	\$	135,608.00
Drainage		20	0.0736	\$	-
Signal		20	0.0736	\$	-
Other		20	0.0736	\$	-
Sub-Total	\$ 2,660,500.00			\$	191,617.50
Annual Cost =				\$	191,617.50

Total number of crashes = 37
 # of correctable crashes, PC = 18
 # of years of crash data, YD = 4
 PC/YD = 4.50
 Crash reduction factor, CRF = 44.80%
 CRF x (PC/YD) = 2.02
 Cost per crash, CPC = \$402,003.00
 Benefit = \$810,438

Primary crash reduction factor: 31
 Add raised median

Additional crash reduction factor: 20
 Left Turn Lanes

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$810,438.05}{\$191,617.50} = 4.23$$

Prepared by:



APPENDIX



Benefit-Cost Analysis

District: **Two** County: **78 - St Johns** Date Prepared: **08/12/13**

Location: **Wildwood Drive from 2 miles west of US 1 to 1 mile west US 1**

Section: **2** Beg. Milepost: **103+25** End Milepost: **153+50**
 Rdway Type: **2 - 3 Lanes Rural UnDivided**

Control Element: **Other (describe in box below)**

Removal of Guardrail and intersection improvements

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Recovery Factor	Total
ROW	\$ 28,925.00	100	0.0408	\$ 1,180.14
P.E.C.E.I.	\$ 262,057.00	15	0.0899	\$ 23,558.92
Structure	\$ -	75	0.0425	\$ -
Roadway	\$ 1,310,000.00	20	0.0736	\$ 96,416.00
Drainage	\$ -	20	0.0736	\$ -
Signal	\$ -	20	0.0736	\$ -
Other	\$ -	20	0.0736	\$ -
Sub-Total	\$ 1,600,982.00			\$ 121,155.06
Annual Cost =				\$ 121,155.06

Total number of crashes = **7** Primary crash reduction factor: **20**
 # of correctable crashes, PC = **2** Left Turn Lanes
 # of years of crash data, YD = **4**
 PC/YD = **0.50** Additional crash reduction factor: **29**
 Crash reduction factor, CRF = **43.20%** guardrail removal
 CRF x (PC/YD) = **0.22**
 Cost per crash, CPC = **\$402,003.00** Additional crash reduction factor:
 Benefit = **\$86,833**

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$86,832.65}{\$121,155.06} = 0.72$$

Prepared by:



Benefit-Cost Analysis

District: **Two** County: **78 - St Johns** Date Prepared: **08/12/13**

Location: **Wildwood Drive from 2.7 miles west of US 1 to 2 miles west US 1**

Section: **3** Beg. Milepost: **63+30** End Milepost: **103+25**
 Rdway Type: **2 - 3 Lanes Rural UnDivided**

Control Element: **Other (describe in box below)**

superelevation improvement and wider shoulders

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Recovery Factor	Total
ROW	\$ 72,810.00	100	0.0408	\$ 2,970.65
P.E.C.E.I.	\$ 219,600.00	15	0.0899	\$ 19,742.04
Structure	\$ -	75	0.0425	\$ -
Roadway	\$ 1,098,000.00	20	0.0736	\$ 80,812.80
Drainage	\$ -	20	0.0736	\$ -
Signal	\$ -	20	0.0736	\$ -
Other	\$ -	20	0.0736	\$ -
Sub-Total	\$ 1,390,410.00			\$ 103,525.49
Annual Cost =				\$ 103,525.49

Total number of crashes = **8** Primary crash reduction factor: **85**
 # of correctable crashes, PC = **1** superelevation improvement
 # of years of crash data, YD = **4**
 PC/YD = **0.25** Additional crash reduction factor: **91**
 Crash reduction factor, CRF = **98.65%** widen shoulders
 CRF x (PC/YD) = **0.25**
 Cost per crash, CPC = **\$402,003.00** Additional crash reduction factor:
 Benefit = **\$99,144**

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$99,143.99}{\$103,525.49} = 0.96$$

Prepared by:



Benefit-Cost Analysis

District: **Two** County: **78 - St Johns** Date Prepared: **08/12/13**

Location: **Wildwood Drive from SR 207 to 2.7 miles west of US 1**

Section: **4** Beg. Milepost: **10+00** End Milepost: **63+30**
 Rdway Type: **2 - 3 Lanes Rural UnDivided**

Control Element: **Other (describe in box below)**

removal of guardrail, superelevation improvement and wider shoulders

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Recovery Factor	Total
ROW	\$ 65,300.00	100	0.0408	\$ 2,664.24
P.E.C.E.I.	\$ 509,200.00	15	0.0899	\$ 45,777.08
Structure	\$ -	75	0.0425	\$ -
Roadway	\$ 2,546,000.00	20	0.0736	\$ 187,385.60
Drainage	\$ -	20	0.0736	\$ -
Signal	\$ -	20	0.0736	\$ -
Other	\$ -	20	0.0736	\$ -
Sub-Total	\$ 3,120,500.00			\$ 235,826.92
Annual Cost =				\$ 235,826.92

Total number of crashes = **7** Primary crash reduction factor: **29**
 # of correctable crashes, PC = **2** guardrail removal
 # of years of crash data, YD = **4**
 PC/YD = **0.50** Additional crash reduction factor: **91**
 Crash reduction factor, CRF = **99.04%** widen shoulders
 CRF x (PC/YD) = **0.50**
 Cost per crash, CPC = **\$402,003.00** Additional crash reduction factor:
 Benefit = **\$199,075** superelevation improvement

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$199,074.90}{\$235,826.92} = 0.84$$

Prepared by:





APPENDIX

CONCEPT ESTIMATE OF PROBABLE PROJECT COST WILDWOOD DRIVE FROM SR 207 TO US 1

PROJECT COST ELEMENTS	UNITS	UNIT COST	PHASE 1A		PHASE 1B		PHASE 1		PHASE 2		PHASE 3		PHASE 4	
			QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
ROADWAY CONSTRUCTION														
MOBILIZATION	LS		1	\$ 30,000.00	1	\$ 70,000.00	1	\$ 100,000.00	1	\$ 75,000.00	1	\$ 65,000.00	1	\$ 125,000.00
MAINTENANCE OF TRAFFIC	LS		1	\$ 50,000.00	1	\$ 50,000.00	1	\$ 100,000.00	1	\$ 75,000.00	1	\$ 65,000.00	1	\$ 125,000.00
EROSION CONTROL	LS	\$ 50,000.00	1	\$ 10,000.00	1	\$ 40,000.00	1	\$ 50,000.00	1	\$ 50,000.00	1	\$ 50,000.00	1	\$ 50,000.00
CLEARING & GRUBBING	AC	\$ 6,000.00	0.7	\$ 4,066.36	3.8	\$ 23,042.73	4.5	\$ 27,109.09	2.7	\$ 16,265.70	8.7	\$ 52,164.19	5.3	\$ 31,563.91
REGULAR EXCAVATION	CY	\$ 5.00	328	\$ 1,640.63	1,859	\$ 9,296.88	2,188	\$ 10,937.50	2,360	\$ 11,800.00	1,578	\$ 7,887.50	2,138	\$ 10,687.50
EMBANKMENT	CY	\$ 7.00	66	\$ 460.25	373	\$ 2,608.08	438	\$ 3,068.33	472	\$ 3,301.67	475	\$ 3,325.00	428	\$ 2,998.33
SOD	SY	\$ 3.00	1,526	\$ 4,578.20	8,648	\$ 25,943.13	10,174	\$ 30,521.33	18,677	\$ 56,030.00	6,058	\$ 18,173.33	9,835	\$ 29,505.00
STABILIZED SUBGRADE (12")	SY	\$ 3.00	700	\$ 2,100.00	4,851	\$ 14,553.00	5,551	\$ 16,653.33	2,973	\$ 8,920.00	4,519	\$ 13,558.33	613	\$ 1,838.33
LIMEROCK BASE (10")	SY	\$ 15.00	700	\$ 10,500.00	4,851	\$ 72,765.00	5,551	\$ 83,266.67	2,973	\$ 44,600.00	4,519	\$ 67,791.67	613	\$ 9,191.67
TYPE SP - 12.5 STRUCTURAL COURSE (2")	TN	\$ 85.00	77	\$ 6,545.00	534	\$ 45,357.89	611	\$ 51,902.89	327	\$ 27,800.67	497	\$ 42,256.81	67	\$ 5,729.47
FRICITION COURSE - 9.5 (1.5")	TN	\$ 100.00	323	\$ 32,265.75	1,648	\$ 164,806.25	1,971	\$ 197,106.25	1,930	\$ 193,031.67	1,526	\$ 152,579.17	1,799	\$ 179,877.50
MILLING EXISTING PAVEMENT (1.5")	SY	\$ 2.00	3,211	\$ 6,422.22	15,130	\$ 30,259.11	18,341	\$ 36,681.11	20,424	\$ 40,848.89	13,975	\$ 27,950.00	21,191	\$ 42,381.11
CITY STANDARD CURB & GUTTER	LF	\$ 11.00	725	\$ 7,975.00	0	\$ -	725	\$ 7,975.00		\$ -		\$ -		\$ -
4' TRAFFIC SEPARATOR (TYPE 1)	LF	\$ 27.00	300	\$ 8,100.00	0	\$ -	300	\$ 8,100.00		\$ -		\$ -		\$ -
4" CONCRETE SIDEWALK	SY	\$ 30.00	611	\$ 18,333.33	4,460	\$ 133,810.00	5,071	\$ 152,140.00	3,118	\$ 93,540.00	3,894	\$ 116,813.33	5,567	\$ 167,003.33
5" CONCRETE DRIVEWAYS	SY	\$ 36.00	130	\$ 4,680.00	260	\$ 9,360.00	390	\$ 14,040.00	0	\$ -	0	\$ -	0	\$ -
RETAINING WALL	SF	\$ 69.00	710	\$ 48,990.00	950	\$ 65,550.00	1,660	\$ 114,540.00	0	\$ -	0	\$ -	0	\$ -
15" PIPE, RCP	LF	\$ 35.00	0	\$ -	64	\$ 2,240.00	64	\$ 2,240.00	0	\$ -	0	\$ -	0	\$ -
18" PIPE, RCP	LF	\$ 40.00	280	\$ 11,200.00	661	\$ 26,440.00	941	\$ 37,640.00	54	\$ 2,160.00	235	\$ 9,400.00	731	\$ 29,240.00
24" PIPE, RCP	LF	\$ 50.00	370	\$ 18,500.00	687	\$ 34,350.00	1,057	\$ 52,850.00	126	\$ 6,300.00	420	\$ 21,000.00	347	\$ 17,350.00
30" PIPE, RCP	LF	\$ 60.00	0	\$ -	136	\$ 8,160.00	136	\$ 8,160.00	357	\$ 21,420.00	0	\$ -	42	\$ 2,520.00
36" PIPE, RCP	LF	\$ 75.00	0	\$ -	0	\$ -	0	\$ -	9	\$ 675.00	0	\$ -	127	\$ 9,525.00
48" PIPE, RCP	LF	\$ 140.00	0	\$ -	110	\$ 15,400.00	110	\$ 15,400.00	26	\$ 3,640.00	0	\$ -	0	\$ -
60" PIPE, RCP - Station 169 Pipe Replaced under Road	LF	\$ 175.00	0	\$ -	50	\$ 8,750.00	50	\$ 8,750.00	195	\$ 34,125.00	0	\$ -	0	\$ -
24" X 38" PIPE, RCP	LF	\$ 85.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	78	\$ 6,630.00	0	\$ -
29" X 45" PIPE, RCP	LF	\$ 120.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
34" X 53" PIPE, RCP	LF	\$ 150.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	410	\$ 61,500.00	2,084	\$ 312,600.00
5.5' X 9' BOX CULVERT	LF	\$ 300.00	0	\$ -	0	\$ -	0	\$ -	110	\$ 33,000.00	0	\$ -	0	\$ -
CURB INLETS	EA	\$ 3,500.00	4	\$ 14,000.00	0	\$ -	4	\$ 14,000.00	0	\$ -	0	\$ -		\$ -
MANHOLES	EA	\$ 4,000.00	1	\$ 4,000.00	0	\$ -	1	\$ 4,000.00	2	\$ 8,000.00	0	\$ -		\$ -
DITCH BOTTOM INLET	EA	\$ 3,000.00	2	\$ 6,000.00	11	\$ 33,000.00	13	\$ 39,000.00	6	\$ 18,000.00	11	\$ 33,000.00	252	\$ 756,000.00
CONCRETE HEADWALL	EA	\$ 5,000.00	0.00	\$ -	4.00	\$ 20,000.00	4.00	\$ 20,000.00	6.00	\$ 30,000.00	0.00	\$ -		\$ -
MES	EA	\$ 800.00	2	\$ 1,600.00	27	\$ 21,600.00	29	\$ 23,200.00	14	\$ 11,200.00	4	\$ 3,200.00	8	\$ 6,400.00
SUNTREE BAFFLE BOX	EA	\$ 61,190.00	0	\$ -	4	\$ 244,760.00	4	\$ 244,760.00	3	\$ 183,570.00	1	\$ 61,190.00	2	\$ 122,380.00
PROJECT UNKNOWNNS / 25% CONTINGENCY	LS			\$ 75,489.19		\$ 293,013.02		\$ 368,510.38		\$ 262,057.15		\$ 219,604.83		\$ 509,197.79
ROADWAY CONSTRUCTION TOTAL				\$ 377,445.93		\$ 1,465,065.09		\$ 1,842,551.88		\$ 1,310,285.74		\$ 1,098,024.16		\$ 2,545,988.95
RIGHT OF WAY														
RIGHT OF WAY	SF	\$ 5.00	7,000	\$ 35,000.00	64350	\$ 321,750.00	71350	\$ 356,750.00	5785	\$ 28,925.00	14562	\$ 72,810.00	13057	\$ 65,285.00
RIGHT OF WAY TOTAL				\$ 35,000.00		\$ 321,750.00		\$ 356,750.00		\$ 28,925.00		\$ 72,810.00		\$ 65,285.00
PROFESSIONAL SERVICES (20-30%)				\$ 113,233.78		\$ 293,013.02		\$ 460,637.97		\$ 262,057.15		\$ 219,604.83		\$ 509,197.79
TOTAL PROJECT COST				\$ 525,679.71		\$ 2,079,828.10		\$ 2,659,939.86		\$ 1,601,267.89		\$ 1,390,438.99		\$ 3,120,471.74

