

BCA - 20 Years

Benefits	Undiscounted	NPV (3% Discount)	NPV (7% Discount)
Safety Benefits	\$ 76,362,558	\$ 51,148,887	\$ 31,690,366
Driver Travel Time	\$ 63,922,560	\$ 42,247,838	\$ 25,831,499
Environmental	\$ 34,385,185	\$ 22,563,639	\$ 13,671,718
Total Benefit	\$ 174,670,303	\$ 115,960,364	\$ 71,193,582
Deployment Cost	\$ 23,983,850	\$ 20,999,010	\$ 17,698,659
Maintenance Cost	\$ 21,585,465	\$ 14,653,914	\$ 9,202,638
Total Cost	\$ 45,569,315	\$ 35,652,924	\$ 26,901,297
B/C	3.83	3.25	2.65

Costs		
Total Deployment Cost	\$	23,983,850
2017 Deployment Cost	\$	11,991,925
2018 Deployment Cost	\$	11,991,925
O&M %		5%
Annual O&M Cost	\$	1,199,192.50

Year	Undiscounted	NPV (3%)	NPV (7%)
2014			
2015			
2016			
2017	\$ 11,991,925	\$ 10,654,670	\$ 9,148,582
2018	\$ 11,991,925	\$ 10,344,340	\$ 8,550,077
2019	\$ 1,199,193	\$ 1,034,434	\$ 855,008
2020	\$ 1,199,193	\$ 1,004,305	\$ 799,073
2021	\$ 1,199,193	\$ 975,053	\$ 746,797
2022	\$ 1,199,193	\$ 946,654	\$ 697,941
2023	\$ 1,199,193	\$ 919,081	\$ 652,281
2024	\$ 1,199,193	\$ 892,312	\$ 609,609
2025	\$ 1,199,193	\$ 866,322	\$ 569,728
2026	\$ 1,199,193	\$ 841,089	\$ 532,456
2027	\$ 1,199,193	\$ 816,592	\$ 497,622
2028	\$ 1,199,193	\$ 792,808	\$ 465,068
2029	\$ 1,199,193	\$ 769,716	\$ 434,643
2030	\$ 1,199,193	\$ 747,297	\$ 406,208
2031	\$ 1,199,193	\$ 725,531	\$ 379,634
2032	\$ 1,199,193	\$ 704,399	\$ 354,798
2033	\$ 1,199,193	\$ 683,883	\$ 331,587
2034	\$ 1,199,193	\$ 663,964	\$ 309,894
2035	\$ 1,199,193	\$ 644,625	\$ 289,621
2036	\$ 1,199,193	\$ 625,850	\$ 270,674
2037	\$ 1,199,193	\$ 607,621	\$ 252,966
2038	\$ 1,199,193	\$ 589,923	\$ 236,417
Total	\$ 47,967,700	\$ 36,850,468	\$ 27,390,680

Assumptions

Number of Parking Spots	2364
% of Utilization	80%
Number of Parking Spots Utilized	1891
Average Gallons Spent Per Parking Spots	2.5
Number of Miles Traveled Looking for Parking Spots Per Driver	14
Time Savings Per Parking Space (min)	15
Annual Working Days	260
Daily Peak	1

Commercial Motor Vehicle Travel Time

Number of Parking Spots Utilized	1891.2
Peak Hour Utilization	1891.2
Driver's hourly Wage	\$ 26
Hours Saved Per Day	472.8
Hours Saved Per Year	122928
Value of Annual Travel Time Savings	\$ 3,196,128

Year	Hourly Value	Annual TT Hours Saving	Undiscounted Benefits	NPV Benefits (3% Discount)	NPV Benefits (7% Discount)
2014					
2015					
2016					
2017					
2018					
2019	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,757,008	\$ 2,278,795
2020	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,676,707	\$ 2,129,715
2021	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,598,745	\$ 1,990,388
2022	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,523,053	\$ 1,860,176
2023	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,449,566	\$ 1,738,482
2024	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,378,219	\$ 1,624,749
2025	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,308,951	\$ 1,518,457
2026	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,241,700	\$ 1,419,119
2027	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,176,408	\$ 1,326,279
2028	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,113,017	\$ 1,239,514
2029	\$ 26.00	122,928.00	\$ 3,196,128	\$ 2,051,473	\$ 1,158,424
2030	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,991,721	\$ 1,082,639
2031	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,933,710	\$ 1,011,812
2032	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,877,388	\$ 945,619
2033	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,822,707	\$ 883,756
2034	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,769,619	\$ 825,940
2035	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,718,076	\$ 771,907
2036	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,668,035	\$ 721,408
2037	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,619,452	\$ 674,213
2038	\$ 26.00	122,928.00	\$ 3,196,128	\$ 1,572,283	\$ 630,106
Total			\$ 63,922,560	\$ 42,247,838	\$ 25,831,499

I-4 Eastbound Osceola/Orange Safety Benefits

S.No.	Description		
1	Total Number of Correctable Crashes	Fatal Crashes	6
		Injury Crashes	163
		PDO Crashes	186
		Total Crashes	355
2	Number of Years of Crash Data (2012 - 2014)		3
3	Number of Correctable Crahes Per Year	Fatal Crashes	2.00
		Injury Crashes	54.33
		PDO Crashes	62.00
		Total Crashes	118.33
4	Cost per Crash	Fatal Crash Costs	\$20,200,000
		Injury Crash Costs	\$19,587,819
		PDO Crash Costs	\$403,000
		Total Annual Cost	\$40,190,819
5	Crash Reduction Factor (%)		10%
6	Total Annual Benefit		\$4,019,082

Year	Undiscounted Benefit	NPV Benefits (3% Discount)	NPV Benefits (7% Discount)
2014			
2015			
2016			
2017			
2018			
2019	\$ 4,019,082	\$ 3,466,895	\$ 2,865,550
2020	\$ 4,019,082	\$ 3,365,918	\$ 2,678,084
2021	\$ 4,019,082	\$ 3,267,881	\$ 2,502,882
2022	\$ 4,019,082	\$ 3,172,700	\$ 2,339,142
2023	\$ 4,019,082	\$ 3,080,292	\$ 2,186,114
2024	\$ 4,019,082	\$ 2,990,574	\$ 2,043,097
2025	\$ 4,019,082	\$ 2,903,470	\$ 1,909,437
2026	\$ 4,019,082	\$ 2,818,903	\$ 1,784,520
2027	\$ 4,019,082	\$ 2,736,799	\$ 1,667,776
2028	\$ 4,019,082	\$ 2,657,087	\$ 1,558,669
2029	\$ 4,019,082	\$ 2,579,696	\$ 1,456,700
2030	\$ 4,019,082	\$ 2,504,559	\$ 1,361,402
2031	\$ 4,019,082	\$ 2,431,611	\$ 1,272,338
2032	\$ 4,019,082	\$ 2,360,787	\$ 1,189,101
2033	\$ 4,019,082	\$ 2,292,026	\$ 1,111,310
2034	\$ 4,019,082	\$ 2,225,268	\$ 1,038,607
2035	\$ 4,019,082	\$ 2,160,455	\$ 970,661
2036	\$ 4,019,082	\$ 2,097,529	\$ 907,160
2037	\$ 4,019,082	\$ 2,036,436	\$ 847,813
2038	\$ 4,019,082	\$ 1,977,122	\$ 792,348
Total	\$76,362,558	\$51,148,887	\$31,690,366

Notes:

- 1) Fatal Crash Cost = \$10,100,000, Per FDOT Roadside Safety Analysis Program
- 2) Average Injury Crash Cost = \$360,512, Per FDOT Roadside Safety Analysis Program
- 3) PDO Crash Cost = \$6,500, Per FDOT Roadside Safety Analysis Program
- 4) Combined Crash Reduction Factor (CRF) = $CRF1 + ((1 - CRF1) * CRF2) + ((1 - CRF1) * (1 - CRF2) * CRF3) + \dots + (1 - CRF1) * (1 - CRFn) * CRFn$

Per June 6, 2014 RDB: 14-12; Safety Office Bulletin: 14-01

Fatal Crash Cost	\$10,100,000.00
Injury Crash Cost (average)	\$360,512.00
PDO Crash Cost	\$6,500.00

Injury Crashes	\$
Severe Injury (A)	\$818,636.00
Moderate Injury (B)	\$163,254.00
Minor Injury (C)	\$99,645.00
Average Injury Cost	\$360,511.67
Average Crash Cost by Facility	\$195,791.00

Crashes

Year	PDO	Fatalities	Injuries
2012	49	2	18
2013	92	1	51
2014	45	3	94
Total	186	6	163

Environmental Benefits

Year	Undiscounted Benefits	NPV Benefits (3% Discount)	NPV Benefits (7% Discount)
2014			
2015			
2016			
2017			
2018			
2019	\$ 1,598,235	\$ 1,378,651	\$ 1,139,519
2020	\$ 1,610,711	\$ 1,348,945	\$ 1,073,285
2021	\$ 1,610,711	\$ 1,309,656	\$ 1,003,070
2022	\$ 1,635,665	\$ 1,291,209	\$ 951,972
2023	\$ 1,648,142	\$ 1,263,163	\$ 896,480
2024	\$ 1,660,618	\$ 1,235,656	\$ 844,174
2025	\$ 1,673,095	\$ 1,208,680	\$ 794,875
2026	\$ 1,685,572	\$ 1,182,226	\$ 748,414
2027	\$ 1,710,525	\$ 1,164,785	\$ 709,807
2028	\$ 1,723,002	\$ 1,139,107	\$ 668,210
2029	\$ 1,735,479	\$ 1,113,938	\$ 629,017
2030	\$ 1,747,956	\$ 1,089,268	\$ 592,093
2031	\$ 1,747,956	\$ 1,057,542	\$ 553,358
2032	\$ 1,772,909	\$ 1,041,397	\$ 524,540
2033	\$ 1,785,386	\$ 1,018,181	\$ 493,674
2034	\$ 1,797,863	\$ 995,433	\$ 464,602
2035	\$ 1,810,340	\$ 973,147	\$ 437,221
2036	\$ 1,810,340	\$ 944,803	\$ 408,618
2037	\$ 1,810,340	\$ 917,284	\$ 381,886
2038	\$ 1,810,340	\$ 890,567	\$ 356,902
Total	\$34,385,185	\$22,563,639	\$13,671,718

GHG Benefits

Gallons Saved Per Spot	4,728
CO2 Emission (lb CO2/gal Diesel)	22
CO2 Saved (lb)	105,813
CO2 Saved (metric tons)	47.99
CO2 Saved (metric tons/year)	12,476.77

Year	3% SCC	CO2 Reduction (metric tons)	Undiscounted Benefits	NPV Benefits (3%)	NPV Benefits (7%)
2014	\$ 44.00				
2015	\$ 45.00				
2016	\$ 46.00				
2017	\$ 47.00				
2018	\$ 49.00				
2019	\$ 51.00	12,476.77	\$ 636,315	\$ 548,891	\$ 453,684
2020	\$ 52.00	12,476.77	\$ 648,792	\$ 543,353	\$ 432,318
2021	\$ 52.00	12,476.77	\$ 648,792	\$ 527,527	\$ 404,035
2022	\$ 54.00	12,476.77	\$ 673,746	\$ 531,861	\$ 392,126
2023	\$ 55.00	12,476.77	\$ 686,223	\$ 525,932	\$ 373,260
2024	\$ 56.00	12,476.77	\$ 698,699	\$ 519,898	\$ 355,183
2025	\$ 57.00	12,476.77	\$ 711,176	\$ 513,769	\$ 337,875
2026	\$ 58.00	12,476.77	\$ 723,653	\$ 507,556	\$ 321,311
2027	\$ 60.00	12,476.77	\$ 748,606	\$ 509,765	\$ 310,645
2028	\$ 61.00	12,476.77	\$ 761,083	\$ 503,166	\$ 295,161
2029	\$ 62.00	12,476.77	\$ 773,560	\$ 496,519	\$ 280,374
2030	\$ 63.00	12,476.77	\$ 786,037	\$ 489,832	\$ 266,258
2031	\$ 63.00	12,476.77	\$ 786,037	\$ 475,565	\$ 248,839
2032	\$ 65.00	12,476.77	\$ 810,990	\$ 476,371	\$ 239,943
2033	\$ 66.00	12,476.77	\$ 823,467	\$ 469,612	\$ 227,696
2034	\$ 67.00	12,476.77	\$ 835,944	\$ 462,842	\$ 216,024
2035	\$ 68.00	12,476.77	\$ 848,421	\$ 456,068	\$ 204,905
2036	\$ 68.00	12,476.77	\$ 848,421	\$ 442,784	\$ 191,500
2037	\$ 68.00	12,476.77	\$ 848,421	\$ 429,888	\$ 178,972
2038	\$ 68.00	12,476.77	\$ 848,421	\$ 417,367	\$ 167,263
Total			\$ 15,146,803	\$ 9,848,566	\$ 5,897,370

SCC Standards Council of Canada

* <http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11>

VOC Benefits

Miles Saved/Spot	26,477
VOC Emission (g/miles)*	0.48
VOC Saved (g)	12,629
VOC Saved (Oz)	442
VOC Saved (lb)	27.63
VOC Saved (metric tons)	0.01
VOC Saved (metric tons/year)	3.26
Value/metric ton	\$1,999
VOC Savings Per Year (metric ton)	\$ 6,512

Year	Value/ Metric Ton	NOx Reduction (Metric Tons)	Undiscounted Benefits	NPV Benefits (3% Discount)	NPV Benefits (7% Discount)
2014					
2015					
2016					
2017					
2018					
2019	\$ 1,999	3.26	\$ 6,512	\$ 5,617	\$ 4,643
2020	\$ 1,999	3.26	\$ 6,512	\$ 5,454	\$ 4,339
2021	\$ 1,999	3.26	\$ 6,512	\$ 5,295	\$ 4,055
2022	\$ 1,999	3.26	\$ 6,512	\$ 5,141	\$ 3,790
2023	\$ 1,999	3.26	\$ 6,512	\$ 4,991	\$ 3,542
2024	\$ 1,999	3.26	\$ 6,512	\$ 4,845	\$ 3,310
2025	\$ 1,999	3.26	\$ 6,512	\$ 4,704	\$ 3,094
2026	\$ 1,999	3.26	\$ 6,512	\$ 4,567	\$ 2,891
2027	\$ 1,999	3.26	\$ 6,512	\$ 4,434	\$ 2,702
2028	\$ 1,999	3.26	\$ 6,512	\$ 4,305	\$ 2,525
2029	\$ 1,999	3.26	\$ 6,512	\$ 4,180	\$ 2,360
2030	\$ 1,999	3.26	\$ 6,512	\$ 4,058	\$ 2,206
2031	\$ 1,999	3.26	\$ 6,512	\$ 3,940	\$ 2,062
2032	\$ 1,999	3.26	\$ 6,512	\$ 3,825	\$ 1,927
2033	\$ 1,999	3.26	\$ 6,512	\$ 3,714	\$ 1,801
2034	\$ 1,999	3.26	\$ 6,512	\$ 3,605	\$ 1,683
2035	\$ 1,999	3.26	\$ 6,512	\$ 3,500	\$ 1,573
2036	\$ 1,999	3.26	\$ 6,512	\$ 3,399	\$ 1,470
2037	\$ 1,999	3.26	\$ 6,512	\$ 3,300	\$ 1,374
2038	\$ 1,999	3.26	\$ 6,512	\$ 3,203	\$ 1,284
Total			\$ 130,239	\$ 86,078	\$ 52,630

*GHG Emission Factor: <http://www.epa.gov/otaq/consumer/420f08027.pdf>

Nox Benefits

Miles Saved/Spot	26,477
Nox Emission (g/miles)*	9
Nox Saved (g)	227,965
Nox Saved (Oz)	7,979
Nox Saved (lb)	498.67
Nox Saved (metric tons)	0.23
Nox Saved (metric tons/year)	58.80
Value/metric ton	\$7,877
Nox Savings Per Year (metric ton)	\$ 463,172

Year	Value/ Metric Ton	NOx Reduction (metric tons)	Undiscounted Benefits	NPV Benefits (3% Discount)	NPV Benefits (7% Discount)
2014					
2015					
2016					
2017					
2018					
2019	\$ 7,877	58.80	\$ 463,172	\$ 399,536	\$ 330,235
2020	\$ 7,877	58.80	\$ 463,172	\$ 387,899	\$ 308,631
2021	\$ 7,877	58.80	\$ 463,172	\$ 376,601	\$ 288,440
2022	\$ 7,877	58.80	\$ 463,172	\$ 365,632	\$ 269,570
2023	\$ 7,877	58.80	\$ 463,172	\$ 354,983	\$ 251,935
2024	\$ 7,877	58.80	\$ 463,172	\$ 344,643	\$ 235,453
2025	\$ 7,877	58.80	\$ 463,172	\$ 334,605	\$ 220,050
2026	\$ 7,877	58.80	\$ 463,172	\$ 324,860	\$ 205,654
2027	\$ 7,877	58.80	\$ 463,172	\$ 315,398	\$ 192,200
2028	\$ 7,877	58.80	\$ 463,172	\$ 306,211	\$ 179,626
2029	\$ 7,877	58.80	\$ 463,172	\$ 297,292	\$ 167,875
2030	\$ 7,877	58.80	\$ 463,172	\$ 288,633	\$ 156,892
2031	\$ 7,877	58.80	\$ 463,172	\$ 280,227	\$ 146,628
2032	\$ 7,877	58.80	\$ 463,172	\$ 272,065	\$ 137,036
2033	\$ 7,877	58.80	\$ 463,172	\$ 264,141	\$ 128,071
2034	\$ 7,877	58.80	\$ 463,172	\$ 256,447	\$ 119,692
2035	\$ 7,877	58.80	\$ 463,172	\$ 248,978	\$ 111,862
2036	\$ 7,877	58.80	\$ 463,172	\$ 241,726	\$ 104,544
2037	\$ 7,877	58.80	\$ 463,172	\$ 234,685	\$ 97,705
2038	\$ 7,877	58.80	\$ 463,172	\$ 227,850	\$ 91,313
Total			\$ 9,263,440	\$ 6,122,413	\$ 3,743,413

*GHG Emission Factor: <http://www.epa.gov/otaq/consumer/420f08027.pdf>

PM2.5 Benefits

Miles Saved/Spot	26,477
PM2.5 Emission (g/miles)*	0.20
PM2.5 Saved (g)	5,295
PM2.5 Saved (Oz)	185
PM2.5 Saved (lb)	11.58
PM2.5 Saved (metric tons)	0.01
PM2.5 Saved (metric tons/year)	1.37
Value/metric ton	\$360,383
PM2.5 Savings Per Year (metric ton)	\$ 492,235

Year	Value/ Metric Ton	NOx reduction (Metric Tons)	Undiscounted Benefits	NPV Benefits (3% Discount)	NPV Benefits (7% Discount)
2014					
2015					
2016					
2017					
2018					
2019	\$360,383	1.37	\$ 492,235	\$ 424,606	\$350,957
2020	\$360,383	1.37	\$ 492,235	\$ 412,239	\$327,997
2021	\$360,383	1.37	\$ 492,235	\$ 400,232	\$306,539
2022	\$360,383	1.37	\$ 492,235	\$ 388,575	\$286,485
2023	\$360,383	1.37	\$ 492,235	\$ 377,257	\$267,743
2024	\$360,383	1.37	\$ 492,235	\$ 366,269	\$250,227
2025	\$360,383	1.37	\$ 492,235	\$ 355,601	\$233,857
2026	\$360,383	1.37	\$ 492,235	\$ 345,244	\$218,558
2027	\$360,383	1.37	\$ 492,235	\$ 335,188	\$204,260
2028	\$360,383	1.37	\$ 492,235	\$ 325,425	\$190,897
2029	\$360,383	1.37	\$ 492,235	\$ 315,947	\$178,409
2030	\$360,383	1.37	\$ 492,235	\$ 306,745	\$166,737
2031	\$360,383	1.37	\$ 492,235	\$ 297,810	\$155,829
2032	\$360,383	1.37	\$ 492,235	\$ 289,136	\$145,635
2033	\$360,383	1.37	\$ 492,235	\$ 280,715	\$136,107
2034	\$360,383	1.37	\$ 492,235	\$ 272,539	\$127,203
2035	\$360,383	1.37	\$ 492,235	\$ 264,601	\$118,881
2036	\$360,383	1.37	\$ 492,235	\$ 256,894	\$111,104
2037	\$360,383	1.37	\$ 492,235	\$ 249,411	\$103,835
2038	\$360,383	1.37	\$ 492,235	\$ 242,147	\$97,042
Total			\$9,844,703	\$6,506,582	\$3,978,305

*GHG Emission Factor: <http://www.epa.gov/otaq/consumer/420f08027.pdf>