

Appendix B

**Additional Matrix
Information**

Carolina Bays Parkway Extension

Feasibility Study Report



**Civil Engineering
Consulting Services, Inc.**

Additional Matrix Information



MATRIX SCORES

Corridor Alternative Designation	Score	Corridor Segments	Cost Score	Wetland Score	High Wetland Score	Total SC Wetland Score	Beneficial Wetland Score	Substantial Wetland Score	Exceptional Wetland Score	Total NC Wetland Score	Combined Wetland Score	Hazmat Score	Disp. Score*	Cult. Res. Score**	T&E Species Score***
E	1.45	A - H - I - M - N - P - G	0.30	4.02	2.34	6.36	0.00	4.49	0.00	4.49	5.35	0.00	1.44	0.00	0.00
B	1.46	A - H - I - J - K - G	0.29	1.21	0.00	1.21	1.50	6.70	0.00	8.20	5.56	0.00	0.00	1.33	0.00
D	3.97	A - H - I - M - N - O - E - F - G	0.00	4.02	2.34	6.36	3.30	0.86	9.86	14.02	10.59	0.00	5.26	4.00	0.00
C	5.25	A - H - I - J - L - D - E - F - G	1.67	1.21	0.00	1.21	0.08	0.00	9.86	9.94	6.22	0.00	7.53	10.00	0.00
F	6.38	A - H - Q - R - F - G	10.00	6.00	0.47	6.47	0.12	3.93	10.00	14.05	10.55	0.00	3.71	2.67	0.00
A	7.27	A - B - C - D - E - F - G	3.12	0.00	14.00	14.00	0.08	0.00	9.86	9.94	11.65	0.00	10.00	10.00	0.00

Note: * Displacement (of homes and businesses) Score, **Cultural Resources Score, ***Threatened and Endangered Species Score

The weighting factors for the alternative impact matrix are divided into two main categories:

- Total construction cost as measured by the combined construction and motorist user cost in cents per vehicle mile.
- Environmental impacts as measured by potential impacts to wetlands, hazardous material sites, residential and business displacements, cultural resources, and threatened and endangered species.

- Fuel cost
- Crash cost including fatalities, injuries and property damage

Environmental impacts were sub-categorized by potential impacts to wetlands of various quality designations, hazardous material sites, displacements (commercial and residential), cultural resource sites (to include churches and cemeteries), and threatened and endangered species. The weighting for each category is shown in the table to the left.

MATRIX WEIGHTING FACTORS

Factor	Weight
Cost	30%
Environmental	70%
Total	100%

Construction costs include:

- Road and bridge cost
- Right-of-way cost
- Utility relocation cost

Motorist user costs include:

- Travel time cost

ENVIRONMENTAL WEIGHTING FACTORS

Environmental Factors	Weight
Wetlands (combined)	20%
SC Quality Wetlands	6%
SC High Quality Wetlands	14%
NC Beneficial Wetlands	3.3%
NC Substantial Wetlands	6.7%
NC Exceptional Wetlands	10%
Hazardous Material Sites	5%
Displacements	20%
Cultural Resources	20%
Threatened and Endangered Species	5%
Environmental Total	70%

Additional Matrix Information

The user costs were calculated on a cents/vehicle mile basis and added together to determine a total user cost. The costs for construction were added together and converted to cents/vehicle mile. These two cost totals were then added together and assigned a weight of 30% in the matrix.

The environmental costs include those factors that impact the natural and human environment. The wetlands were divided into two categories for wetlands in South Carolina; Quality and High Quality. The wetlands in North Carolina were divided into three categories; Beneficial, Substantial and Exceptional. The higher the quality of the wetland area, the more weight it was assigned. After determining the individual wetland area scores, the combined wetland score was calculated using the ratio of the corridor mileage in each state.

The weights applied to each factor were selected by the project team based on weights used historically for similar projects with adjustments made to fit this specific project. For example, historically a weight has been assigned to average annual daily traffic (AADT); however, since the traffic values were very similar for each of the alternatives, the weight historically assigned to traffic was redistributed. The 70% weight applied to environmental factors is higher than historically used; however, the team determined that because of the potential impacts to the natural and human environment, these factors should be weighted more heavily.

