

**SEMINOLE COUNTY GOVERNMENT  
AGENDA MEMORANDUM**

**SUBJECT:** Cross Seminole Trail Interstate 4 Pedestrian Bridge  
Signing and Lighting Enhancement

**DEPARTMENT:** PUBLIC WORKS      **DIVISION:** ENGINEERING

**AUTHORIZED BY:** W. Gary Johnson      **CONTACT:** Frank M. VanPelt III EXT. 5703  
W. Gary Johnson, P.E., Director      Jerry McCollum, P.E., County Engineer

<b>Agenda Date</b> <u>03-09-04</u>	<b>Regular</b> <input type="checkbox"/>	<b>Consent</b> <input type="checkbox"/>	<b>Work Session</b> <input type="checkbox"/>	<b>Briefing</b> <input checked="" type="checkbox"/>
	<b>Public Hearing – 1:30</b> <input type="checkbox"/>		<b>Public Hearing – 7:00</b> <input type="checkbox"/>	

**MOTION / RECOMMENDATION:**

Direction regarding proposed concepts for the lighting and signing of the Cross Seminole Trail/Interstate 4 Pedestrian Bridge and direction to proceed with final design and construction.

**BACKGROUND:**

In September Of 2003, the Engineering Division was directed to proceed with the design and construction of an enhanced lighting and signage plan for the Cross Seminole Trail / Interstate 4 Pedestrian Bridge. An estimated budget of \$300,000 was provided to accomplish the engineering and construction work. A Conceptual Study Technical Memorandum has been prepared that offers two enhanced lighting and signing concepts. The engineering cost for either concept is \$36,597. Concept "A" has enhanced signage in the form of illuminated block letters on both sides of the bridge spelling out Cross Seminole Trail, or other verbiage as determined by the Board, pier lighting and increased cable lighting at an estimated construction cost of \$290,600. Concept "B" includes all features of Concept "A" with the addition of a lighted fiber-optic or LED outline of the bridge frame at an estimated construction cost of \$375,200.00. Concept "A" is the basic enhancement package meeting the minimum aesthetic requirements of the scope of work. However, the estimated engineering and construction cost for Concept "A" exceeds the project budget by \$27,197. If costs are to be reduced to the \$300,000 level, the presentation material provides a menu of specific elements and their costs to reduce the overall project costs. The estimated annualized operating and maintenance cost for either concept is \$21,500.

District 5 - Commissioner Daryl McLain

Attachment: Enhanced Signing and Lighting  
Conceptual Study Technical Memorandum

<b>Reviewed by:</b>
<b>Co Atty:</b> <u>NA</u>
<b>DFS:</b> _____
<b>Other:</b> _____
<b>DCM:</b> <u>[Signature]</u>
<b>CM:</b> <u>[Signature]</u>
<b>File No.</b> <u>BPWE01</u>

**ENHANCED SIGNING AND LIGHTING  
CROSS SEMINOLE TRAIL BRIDGE OVER I-4  
SEMINOLE COUNTY, FLORIDA  
FEBRUARY 4, 2004**

**PREPARED FOR:  
SEMINOLE COUNTY PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION  
520 W. LAKE MARY BOULEVARD. SUITE 200  
SANFORD, FLORIDA 32773**



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Conceptual Study Technical Memorandum

**ENHANCED SIGNING AND LIGHTING  
CROSS SEMINOLE TRAIL BRIDGE OVER I-4**

**Seminole County, Florida**

Prepared for:

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**Seminole County Public Works Department**  
**Engineering Division**  
520 W. Lake Mary Boulevard, Suite 200  
Sanford, Florida 32773

Prepared by:

**PBS&J**  
482 South Keller Road  
Orlando, Florida 32810

**February 4, 2004**

## Executive Summary

Seminole County in June of 2003 completed the highly visible and aesthetically enhanced Cross Seminole Trail Bridge over Interstate 4. This signature project for Seminole County's extensive recreational trails program has won awards and universal acclaim throughout the state. This distinctive cable-supported structure has served well during the daytime as a visual gateway to Seminole County for the thousands of motorists using the I-4 corridor.

While visually stunning during the daytime, the aesthetics are significantly understated at night. The existing lighting is currently underpowered to adequately illuminate the concrete pier towers rising 90 feet above the ground on each side of the structure. The main bridge structure and the supporting cables also currently lack sufficient illumination.

The existing signing includes the text "Seminole County Florida's Natural Choice" and includes the Seminole County logo. The existing sign is visible at night due to the diamond grade reflective sheeting. Improvements to the signing style and content will be explored.

This study presents two concepts to improve the daytime and nighttime visual aesthetics of the Cross Seminole Trail Bridge over Interstate 4. The intent is to provide the same powerful visual effect that is currently provided during the daytime.

## Existing Lighting

The existing bridge contains three main elements that could potentially be illuminated. These elements include the pier supports, the bridge truss and the cables. Currently the existing lighting for all elements is provided on each side by 4 fixtures mounted on a 4-foot bracket arm. These fixtures are as follows: Three 250 watt flood lights (facing up, down and out on the bridge) and one additional 70 watt flood light facing up. Illumination for the cables is not currently provided. The provided illumination calculations for the existing lighting indicate that the average illumination on the bottom 1/3 portion of the pier support was approximately 5.8 average initial foot-candles and 1.2 average initial foot-candles on the upper 2/3 portion of the pier support. The calculations do not take into account a maintenance factor. Existing lighting calculations for the bridge structure were not provided. Based on the Illuminating Engineering Society (IES) Lighting Handbook, the illumination level for a monument/structure depends on whether the surroundings are bright or dark and on the color of the surface to be illuminated. The recommended average maintained illumination values are as follows:

### Bright Surroundings

- Light surfaces – 15 foot-candles
- Medium light surfaces – 20 foot-candles
- Medium dark surfaces – 30 foot-candles
- Dark surfaces – 50 foot-candles

### Dark surroundings

- Light surfaces – 5 foot-candles
- Medium light surfaces – 10 foot-candles
- Medium dark surfaces – 15 foot-candles
- Dark surfaces – 20 foot-candles

Based on the electrical plans provided, there are two load centers, one on the east and one on the west, that control the existing floodlights on the bridge pier supports. The ampere rating of these load centers is not adequate for the additional load; the existing load centers need to be replaced with new ones and properly sized to accommodate the new electrical load.

### **Proposed Lighting Concepts**

Two lighting concepts were developed that address the three main elements to include: the pier supports, the bridge truss and the cables. The two lighting concepts (A and B) are proposed as follows:

#### Lighting Concept A – Basic Package

Lighting Concept A includes the basic elements to increase the illumination of the piers, bridge truss and cable supports. Components include replacing the existing floodlights at each pier support with new metal halide floodlight luminaires to illuminate the pier supports and the bridge structure, and provide new metal halide floodlight luminaires at each of the 36 cable stays.

- Each pier support will be illuminated on all four sides.
  - Each side plane shall be illuminated by one 1000-watt narrow beam (4 x 3) and one 400-watt metal halide floodlight facing up. One 400-watt metal halide floodlight luminaire will be placed on the side plane facing down.
  - The front and back planes shall each be illuminated by two 1000-watt narrow beam (4 x 3) floodlights and two 400-watt metal halide floodlights facing up. Two 400-watt metal halide floodlight luminaires will be placed facing down.

To summarize each of the two Piers will be illuminated with six 1000-watt luminaries and twelve 400-watt luminaries.

- The bridge structure will be illuminated with a 1000-watt metal halide floodlight installed on each pier support side plane facing the bridge structure.
- To illuminate the cable stays, one long life 250-watt or 400-watt metal halide floodlight luminaires will be position on the top of the bridge structure at each cable support. The 250-watt floodlight will be used for the shorter cables and the 400-watt floodlight will be used for the longer cables.

- The cable stays and the upper pier support floodlights will be focused vertically and shielded to avoid interference with airplanes. The lower pier support floodlight will be shielded and aimed to prevent adverse effects on I-4 drivers.
- The lamps used on the floodlights will have an average rated lamp life of 10,000 to 12,000 hours. In theory, at the end of the average rated life, half of the lamps will be burned out. At some predetermined time before then, the floodlights should be re-lamped as a group.

### **Lighting Concept B – Increased Bridge Lighting**

Lighting Concept B builds upon the elements presented in Lighting Concept A. All elements described in Concept A are incorporated with the exception of the floodlights illuminating the bridge structure. Bridge structure lighting in Concept B is accomplished by outlining the bridge structure with linear accent lighting.

- The bridge structure will be illuminated with either fiber-optic cable, continuous LED lights or continuous rope lights mounted at the top and bottom outside bridge frame members on both sides of the bridge. This shall serve to outline the basic shape of the bridge structure.
- If a fiber-optic cable is used, then an illuminator would be required at each end to provide illumination on the fiber-optic cable.
- LED continuous lights are available in white, red, amber, green and blue.

### **Existing Signing**

The existing sign is aluminum plate with color diamond grade face graphics. The sign incorporates the County name and logo. The sign is located at the center of the bridge span over the median and is not illuminated for nighttime viewing, but does reflect the oncoming lighting from vehicle headlights.

### **Proposed Signing**

*A bold new sign identifying the Cross Seminole Trail is desired. The proposed signage should compliment the dynamic aesthetics of the bridge structure and will be illuminated for night viewing.*

The developed sign concepts propose attachment of bold letters to the bridge structure. The letters will be raised to add depth and dimension for viewing and identify the project trail name - **CROSS SEMINOLE TRAIL**. The letters will utilize italics font to suggest movement. Illumination is proposed with LED lighting or fiber optic lighting around the perimeter of each letter for night viewing.

A dimensional full color logo of a bike rider and/or pedestrian has also been considered to provide additional character and interest. The cost of this optional feature is not included in either Concept.

Trail Name – *CROSS SEMINOLE TRAIL*

Two placement options are proposed:

1. Name Placement Centered on Bridge
2. Name Placement Off Center Over Travel Lanes

The signing is proposed for both sides of the bridge.

### **Preliminary Estimated Maintenance Costs**

Based on the concepts presented in this study estimated Maintenance costs were prepared as follows:

#### **Estimated Annual Operating Cost**

Based on \$.07/kilowatt hour, operation 12 hours a day, 365 days a year.

Total Estimated Annual Cost            \$16,500 a year

#### **Estimated Annual Maintenance Cost**

Assumes replacement of all 88 bulbs every three years. Estimate based on \$80 per bulb and \$75 labor per bulb.

Total Estimated Annualized Cost        \$5,000 a year

## Preliminary Estimated Construction Cost

### Concept A - Basic Package

Pier Support Flood Lighting & Wiring	\$45,000
Cable Stays Lighting & Wiring	\$90,000
Bridge Structure Lighting	\$6,500
Signing and Signing Illumination (Both Sides)	\$77,500
Optional Fence Screening for Signing	\$15,000
New Load Centers (And Misc. Elec.)	\$10,000
Sub-Total	\$244,000
Contingency (15%)	\$36,600
Maintenance of Traffic	\$10,000
<b>Total Estimate</b>	<b>\$290,600</b>
Cost per Bicycle Logo (1)	\$10,000
Cost per Hiker Logo (1)	\$7,800

### Concept B - Increased Bridge Lighting

Pier Support Flood Lighting & Wiring	\$45,000
Cable Stays Lighting & Wiring	\$90,000
Bridge Outline (LED, Fiber, Rope Light)	\$80,000
Signing and Signing Illumination (Both Sides)	\$77,500
Optional Fence Screening for Signing	\$15,000
New Load Centers (And Misc. Elec.)	\$10,000
Sub-Total	\$317,500
Contingency (15%)	\$47,700
Maintenance of Traffic	\$10,000
<b>Total Estimate</b>	<b>\$375,200</b>
Cost per Bicycle Logo (1)	\$10,000
Cost per Hiker Logo (1)	\$7,800

## Preliminary Estimated Construction Cost

Total Estimated Annual Operating Costs	\$16,500 year
Total Estimated Annual Maintenance Costs	\$5,000 year