I-595 (SR-862)

PROJECT DEVELOPMENT & ENVIRONMENT STUDY

FM No. 409354-1-22-01
FAP No. 5951 539 I
From the I-75 Interchange
To the I-95 Interchange
Broward County, Florida

Prepared for:
FDOT District Four
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

Prepared by:
Reynolds, Smith and Hills, Inc.
300 South Pine Island Road, Suite 300
Plantation, Florida 33324

March 13, 2006

RS&H

Architectural, Engineering, Planning and Environmental Services

Reynolds, Smith and Hills, Inc.
300 South Pine Island Road, Suite 300
Plantation. Florida 33324
954.474.3005
Fax 954.474.1304
FL Cert. Nos. AAC001886 • EB0005620 • LCC000210

February 13, 2006

To: Steve Braun, PE; FDOT Project Manager
From: Jeff Bowen, PE; RS&H Project Manager

Subject: Value Engineering / Design Review Documentation Report
I-595 PD&E Study
FM # 409354-1-22-01

As part of the I-595 PD&E Study, a comprehensive Value Engineering / Design Review (VE/DR) process was established to conduct detailed design reviews of the I-595 Master Plan Locally Preferred Alternative (LPA) at critical stages of the refinement progression to assure that the project improvements were cost effective, constructible, and minimized project impacts (by maximizing the use of existing right of way). The VE/DR Team was assembled from senior staff of FDOT District 4, Broward County, Florida Turnpike Enterprise, and other specialty consultants.

This Value Engineering/Design Review Documentation report contains our formal responses to each of the VE/DR Team's recommendations, along with the original transcripts or summaries of the detailed discussions, which took place during the following VE/DR sessions.

- Value Engineering / Design Review Kickoff Meeting – February 14, 2004
- Value Engineering / Design Review Session 1 - April 26-30, 2004
- Value Engineering / Design Review Session 2 - November 1-5, 2004
- Value Engineering / Design Review Session 3 - January 18-21, 2005
- Value Engineering / Design Review Session 4 - May 16-20, 2005
- Value Engineering / Design Review Session 5 – December 16, 2005

The objective of VE/DR Kickoff Meeting was to introduce the I-595 Master Plan LPA concepts to the new VE/DR Team and to inform them of the refinement parameters. The objective of the final VE/DR Session was to coordinate with the Florida Turnpike Enterprise on the proposed I-595 improvements at the Turnpike interchange and the associated impacts (i.e. potential direct connector impacts and utility impacts). VE/DR Sessions 1-4 were the main value engineering / design reviews of the project and is the focus of this report.

Value Engineering Session 1 – April 26-30, 2004

Value Engineering Session 1 - Recommendation 1: Analysis and documentation of Environmental Impacts at Interstate 595 PD&E.

Social Impacts – this will include land use, community cohesion, R/W issues and utilities.

Identify your audience in each section of the project and meet with them throughout the process

Potential Audience for Viaduct – Railroad and FPL, Marina owners, Permit Agencies
Potential Audience for Turnpike to University Drive – residents who have already experienced 595 construction
Potential Audience for University Drive to the west – residents who have always lived with I 595

Physical Impacts – this will include contamination, noise and constructability
Coordinate with D4 Environmental Services Staff to gain historic perspective and utilize library (Action item – set up meeting with D4 Env. Services staff)

Identify your audience in each section of the project and meet with them throughout the process.

Noise may be the issue but the audience may be different.

Cultural Impacts – this will include Parks and Recreation, archeological sites and historic properties

Identify your audience in each section and meet with them throughout the process

Potential Audience for Viaduct – Broward County Natural Resources and Parks, Local Environmental Groups, State and Federal agencies

Potential Audience for Turnpike to University Drive – users of SFWMD ROW

Potential Audience for University Drive to the west – historical/archeological societies

SFWMD trail users

Recognize the role this element will play in pond siting and mitigation – do not treat them as separate entities

(Action item – field review of Pond Apple Slough with Pond Siting team)

Natural Resource Impacts – this includes listed species (both plants and animals), wetlands, water quality/drainage

Identify your audience in each section and meet with them throughout the process

Anticipate the need for design and construction of accelerated mitigation projects

Response: All recommendations and procedures recommended have been implemented and followed by the Design Team

Value Engineering Session 1 - Recommendation 2: Drainage/Permitting for the I-595 corridor.

DRAINAGE/PERMIT TASKS FOR THE I-595 CORRIDOR:

Begin the Pond Siting Process, which will also include mitigation considerations – Process to managed and coordinated by Consultant.
STEP 1 – Develop Initial Roadway and Drainage Data (Primarily a Consultant Task)
1. Assembly of Preliminary Roadway Data
    a. All existing plans
    b. Proposed typical sections and layout
    c. Proposed profile (i.e., low point consideration)
    d. Aerial photography
    e. R/W information- tax maps, land owners, land use data, existing and proposed r/w

2. Develop Preliminary Drainage/Permit Report (Conceptual Only)
    a. Define all Drainage and Permit Criteria
        • Identify and locate all stormwater treatment required under the existing permits – note water quality and quantity requirements, all outfall locations and permitted sizes, sub-basin limits, TW constraints and SHGWT controls
        • Identify and locate all mitigation areas required under the existing permits and via NOVs during Construction – *ensure all existing mitigation areas in proposed r/w are identified
        • Identify and locate all wetland jurisdictional boundaries adjacent to the corridor
        • Identify all General Permit criteria for the corridor – water quality and quantity, continued use of scuppers – hardship, canal R/W issues (i.e., sheet piling, relocation, dredging, etc.), canal clearances for crossings (i.e., SFWMD, USCG and possibly OPWCD), mitigation ratios for wetland impacts and existing mitigation areas
        • Identify all Drainage criteria for corridor – tail water constraints for outfalls (latest operating controls - CERP impacts to the west), spread limitations on deck drainage, SHGWT limitations on dry pond depth
    b. Quantify all existing stormwater management areas from survey
    c. Based on proposed typical section
        • Identify and quantify mitigation impacts
        • Sub-divide the corridor into logical sub-basins based on distance to major existing treatment areas at interchanges or hydraulic divides such as lateral canals, bridges, etc. – consider existing permit basins, and future construction limits for permitting
        • Assess drainage needs (quality and quantity criteria) per sub-basin
    d. Compare existing drainage areas with drainage needs to quantify volume required
    e. Evaluate expansion of existing facilities in r/w (i.e. dig out existing ponds with concern for creation of water hazards, maximize interchange area, development under new/existing bridge structure at viaduct area, supplement conveyance with ditches /exfilteration trench between major storage areas, etc.)
    f. Estimate volume required off right-of-way

3. Initial Coordination with R/W to define preliminary pond sites (new right-of-way)
*Pond Sitting Process has numerous steps, but getting through Step 1 is the bulk of the time. Note that most of the activities can occur concurrently.
STEP 2 – Pond Siting Kick-off Meeting

Identify and Develop alternative stormwater facilities with team
STEP 3 – Evaluation of Conceptual Options by Individual Offices
Each office looks at the conceptual sites and options to develop any fatal flaws or constraints for each site
STEP 4 – Team Meeting to Screen Alternatives with all Feedback and start Matrix
Start deciding on weighting factors for evaluation matrix, and document the elimination of sites with fatal flaws.
*From this point on the process is an iterative process in evaluating the alternative, refining them and getting as much public input as possible from Information meetings, etc.
*Biggest task for Team is to decide the level of Documentation based on the expected timing of funding for R/W purchases and the design phase.
II. DRAINAGE/PERMIT CONCERNS FOR THE I-595 CORRIDOR:
EASTERN SECTION AT I-95 -
Drainage most likely accommodated in existing areas with expansion – must consider FAA bird hazards if wet ponds are considered
VIADUCT –

1. Identify all vacant parcels (consider bird hazards for any wet ponds at eastern end)
    - Open Australian pine areas south of I-595 on either side of canal to scrape-down and provide mitigation
    - Vacant property south of I-595, north of SR 84 and west of Airport Road could provide drainage as well
2. Develop a dry pond under new expanded viaduct at western end as best use due to shading and need to collect water from superstructure above – overflow to Pond Apple Slough Relocate existing wet pond on south side in Pond Apple to dry pond, and fill for mitigation Evaluate triangular area in between SR 84 and I-595 to use for drainage/mitigation – will facilitate future replacement of SR 84 bascule to the south
3. Coordinate with City of Dania Beach on 32nd Avenue - look into buying vacant land and truck property to the south as possible drainage alternative – need to look at 26th avenue impacts as well
4. Develop a dry pond under eastern end of Viaduct west of 26th Avenue
5. Coordinate with Broward County on Pond Apple Slough recharge and mitigation needs

SR 7/TURNPIKE –

1. Identify all vacant parcels
    - Area at Davie Road in SE quadrant
2. Increase wet pond at SR 7&I-595 in NW quadrant -eliminate access road and square area
3. Appears to be quite a few areas at interchange which can provide additional storage – again consideration for taking dry areas to wet versus creation of roadway hazards
4. Coordinate with Turnpike on any surplus in their lakes
5. Approach Ski School Lakes with joint-use
6. Consideration for 7.2 acres of flowage easement in Foreman Lake

MAINLINE DRAINAGE/WETLAND ISSUES TO CONSIDER –
*West of the Turnpike consideration for properties to the north is almost eliminated due to New River Canal – Could consider as worst-case, but would involve pumping.

1. Identify all vacant parcels
2. Joint-Use potentials including three golf courses, and new developments
3. Coordinate with the City of Davie on adjacent flooding concerns especially at mobile home park with potential of buying for drainage needs
4. Canal relocation/impact potential with SFWMD

WESTERN SECTION –
1. Identify all vacant parcels
   - 2. Appears to be quite a few areas at the I-75 interchange that can provide additional storage

Response: Proposed ponds are for treatment only because attenuation will be taken care of in the interchange areas. Therefore, routing stormwater to the south will not be needed. Areas outside of the 1000 feet study area are not hydraulically feasible. The use of french drains throughout the corridor has been and will continue to be considered where possible. All recommendations have been addressed in the pond siting report.

Value Engineering Session 1 - Recommendation 3: Right-of-way scope

Obtain Raster Images from RS&H with master plan right of way lines Plot property lines on rasters if not done by RS&H RS&H to estimate acquisition area sizes RESEARCH FOR MAIN LINE AND DRAINAGE Listings and Sales with time trend analysis Contact local municipalities for proposed recent developments COST ESTIMATES FOR MAIN LINE Segregate mainline and transit requirements Attend workshop meeting in winter of 2004/2005 Attend public hearings Prepare Cost Estimates for right of way identified in the LPA master plan Update Cost Estimates as right of way is reconfigured

Prepare cost estimate with transit facility included
DRAINAGE COST ESTIMATES & SITE SELECTION MATRIX DEVELOPMENT

- Participation on Drainage Team
- Prepare Cost Estimates for potential drainage parcels
- Contact and feedback from local municipalities
- Identify advanced acquisition parcels

Response: The design team in conjunction with the FDOT Right-of-Way Office has taken a proactive course in determining right-of-way impacts thoughout the PD&E process. R/W impacts (areas) were determined for the LPA. Costs for the impacts were developed using listings and recent sales for both the roadway and transit components. The LPA has been revised in areas and additional roadway and transit alternatives have been developed since the original estimates were completed in an attempt to reduce Right-of-Way impacts associated with the revised LPA. Finally, combined costs for the new alternative alignments have been produced for both roadway and transit needs.

A different approach has been taken for the R/W takings for ponds. The design team has ascertained total acreage per basin and possible pond sites in each basin have been selected. FDOT Right-of-Way staff has determined an average cost per basin for the ponds, but not specific parcels to be taken with the costs associated with those parcels.

Value Engineering Session 1 - Recommendation 4: ITS Improvements

Original Concept: ITS as designed by RS&H
Proposed Concept: The local traffic management center (TMC) provides the capability of managing the whole I-595

corridor with the forms of its unique features: reversible lanes, ramp metering, variable speed limits, etc., and coordinating among all agencies; DOT, Broward County, Police, Fire Department, Road Rangers, and FHP.
The local TMC will also control, monitor, and manage the daily reversible lane operations, CCTV, Dynamic and Message Sign (DMS), traffic detection, traffic control devices on the corridor.

Advantages:

- Better traffic control and operation given complexity of traffic in the corridors
- Improves mobility and reduced travel time, etc
- Improves security and safety
- Better monitoring
- Improves capacity
- Quicker emergency response
- Support to other operations
- Better utilization of resources
- Smoother coordination between agencies
- Improved operations
- Less Life Cycle costs

Disadvantages:

- Additional initial and operation costs

Response: A local traffic management center (TMC) is proposed for the corridor and is to be used by FDOT, Broward County, Police, Fire and Road Rangers to manage incidents, DMS signing (Dynamic Message Signing), Reversible lane operations, ramp metering (if proposed), and signalization. A Preliminary site for the facility is located near the FHP station along SR-84 west of SW 136th Street.

Value Engineering Session 1 - Recommendation 5: I-595 Ramp to SB Turnpike

Original Concept: RS&H Design
Problem: SB Turnpike at Griffin Road exit weave conflict

- Peak hour traffic is 5280
- Need 3 lane ramp

Proposed Concept: SB Turnpike to Griffin Road traffic exits before flyover and bringing on I-595 3 lane ramp

- I-595 3 lane ramp traffic bifurcated into:
  - Two lanes to southbound turnpike
  - Two lanes to Griffin Road Ramp

Advantages:

- Meets traffic demand
- At grade ramp
- Eliminates weave conflicts

Disadvantages:

- 27 Relocations at mobile home park
- Cost of first row of mobile homes $2.2 million estimated

*Relocations pending final geometry

Response: The growth of traffic projections to the design year of 2034 requires a three-lane ramp from I-595 to the SB Turnpike (only in alternatives that do not have reversible lane direct connections to the Turnpike). The three lane on ramp creates an undesirable (failing) weave with the Griffin Road off-ramp. The VE team proposes to relocate the Griffin Road off-ramp upstream from the three-lane on-ramp from I-595 to eliminate the weave. A result of this recommendation is the need to acquire 27 mobile homes in the Everglades City Mobil Home Park. This revised design is proposed by the PD&E study.

Value Engineering Session 1 - Recommendation 6: Viaduct-split WB ramps from I-95 to I-595 (after) Viaduct further west.

Original Concept: RS&H design
Proposed Concept: Split WB ramps from I-95 to I-595 (after) Viaduct further West
Advantages:

- Operational advantage combine SR 84 and CD
- Removes weave sections out of interchange area

Disadvantages:

- Help CD operation but entrance to I-595 moves West affecting reversible lane transitions

Response: The PD&E Design team understands the VE Teams recommendation, however it cannot be incorporated into the design because of the weave to the entrance of the reversible lane system.

Value Engineering Session 1 - Recommendation 7: I-595 WB CD Connect to SR-84 WB near viaduct.

Original Concept: RS&H design
Proposed Concept: Combine WB CD and SR 84 from Bascule Bridge West to SR 7 Interchange

Advantages:

- Easier to Construct
- More area for MOT and construction activities
- More mitigation opportunities due to R/W impacts
- More drainage opportunities (SR 84)
- Bascule Bridge replacement needed within the next 10 years, could be incorporated into design
- Simplifies existing SR 84 geometry

Disadvantages:

- Increased cost of R/W

Response: The VE Teams recommendation is to combine the WB CD road traffic with SR-84 WB traffic by bridging SR-84 WB over SR-84 EB and combining it with the WB CD Road in the area west of the Viaduct. A split would then occur on SR-84 only 1100' downstream from the merge. Traffic would split to go to SR-7 or continue on SR-84 WB. The design team evaluated this extensively recognizing the many benefits, but found that the traffic in the newly created weave would fail. FDOT is in agreement with the design team that this alternative should no longer be pursued due to the failing traffic.

Value Engineering Session 1 - Recommendation 8: University Flyovers
Original Concept: RS&H Design, Replace Flyovers in kind

Issues:

- Bridge supports are in conflict with median and outside widening

Proposal:

- Add an additional level to the interchange or around Flyovers (to the south)

Advantages of Bridge over Flyovers:

- Simplify MOT
- Less Cost

Advantages of Replacing Flyovers:

- Allows reversible lanes to stay at mainline grade

Disadvantages of Adding Bridge over Flyovers:

- Public perception of more noise and visual impacts

Disadvantages of Removing Flyovers:

- Removing/reconstructing flyovers
- Added cost
- Traffic disruption / MOT cost

Response: The VE teams recommendation is to keep the University Flyovers in place and construct the reversible lanes over the flyovers at the 4th level. The design team has determined that the braid in the WB direction with the University NB to WB on-ramp and the Pine Island off-ramp requires the reconstruction of the NB to WB flyover. It is therefore, no longer viable to try and keep the other flyover and take the reversible lanes to the 4th level due to high costs, objectionable visuals and potentially increased noise. The design teams proposes to replace the existing flyovers adjacent to their old positions (MOT purposes) at the elevations needed for the braid and with the spans needed to accommodate the reversible lanes at the same profile as the I-595 mainline.

Value Engineering Session 1 - Recommendation 9: Auxiliary Lanes

Original Concept: RS&H Design
Issues:

- Aux lanes are not continuous

- Does not meet 2034 Traffic projections

Proposal: Provide continuous Aux lanes from University Drive to 136th Ave
Advantages:
- Meets 2034 traffic demands

Disadvantages:
- Moves mainline closer to outside which reduces width for braided ramps

Note:
Additional widening of RS&H preliminary design for the mainline bridges on outside where Aux lanes were not included by the VE review team

Response: A continuous auxiliary lane is provided in the westbound direction between SW 136th Street and University Drive and a second auxiliary lane is provided between interchanges. A continuous auxiliary lane in the eastbound direction is not needed to meet 2034 traffic projections between 136th Street and University Drive. Adding the lane will increase right-of-way impacts along the south side of eastbound SR-84 to accommodate the ramp braids and bypass ramps as well as the transit alignment.

Value Engineering Session 1 - Recommendation 10: Braided Ramps

Original Concept: RS&H Design
Issues:
- Vertical and Horizontal geometry

Proposal: Shift SR 84 to the outside
Advantages:
- Improved access to SR 84 by moving SR 84 to the outside
- By moving MSE walls to the outside will provide additional noise attenuation

Disadvantages:
- Longer structures
- High Costs

Response: The Design team agrees with the VE team that SR-84 must remain on the outside of any mainline on and off ramps in order to maintain business access and to maintain continuous sidewalks and bicycle lanes along SR-84. The design team has redesigned the braids to accommodate this with the exception of one along westbound SR-84 in the area of the braid with the Nob Hill Road off ramp. The team wasn't able to concur with the VE team's recommendation at this location because of limited space between I-595 and the North New River Canal.

Value Engineering Session 1 - Recommendation 11: SW 136th Ave Ramps (Spin-off project-Alternative 1)

Original Concept: RS&H Design
Issues:

- Weston Rd traffic exiting thru 136th Ave signal

Proposal:

- Provide slip ramp west of 136th Ave to avoid 136th Ave signal

Advantages:

- Relieves congestion at 136th Ave intersection
- Compatible with ultimate improvements

Disadvantages:

- Added cost for slip ramp

Response: Several Spin off projects have resulted from recommendations from the VE team. The first of which is the eastbound slip ramp project that is now open to traffic. The eastbound slip ramp allows SR-84 eastbound traffic to get onto I-595 without having to go through the SW 136th Ave intersection.

Value Engineering Session 1 - Recommendation 12: Elevated Reversible 3 Lane structure w/Transit option.

Problem: Optimize Mainline and Reversible lane usage

- High Right of Way cost associated with separate transit corridor
- Reconstruction of University Drive Flyovers
- Long term (past 2034) expansion of facility

Proposal: Elevated reversible 3 lane structure with transit option from East of 136th to West of Davie Road

(Sketches included with presentation slides shown in the appendix)

Advantages:

- Preserves University Drive Flyovers
- Maximum utilization of R/W
- Construction under traffic-possible fewer MOT lane reductions
- Minimizes Business and Residential Relocations
- Moves traffic away from residential
- Provides for express bus service in reversible lanes
- Construction phasing moves quickly
- Higher utilization of Turnpike Toll revenue forecast (to be verified)
- Direct connection to Sawgrass, I-75, and Turnpike
- Future expansion for transit or general purpose lanes in median
- One additional reversible lane for direct connect
- Alternate route during incident management
- Convenient median transit stations
- Additional lane for increased capacity
- Minimizes Business and Community impacts
- No impact to Electrical Substation or Cemetery

Disadvantages:

- Complex Geometry for Ingress-Egress

- No intermediate connection points (slip ramps)
- Cost approximately $25 million per mile ~ $150 million
- 3rd level structures at University Drive
- Public and political perception of elevated roadway

Suggestion:
Turnpike to complete the Revenue comparison and provide feedback to FDOT/RS&H.
Team to consider carrying this forward based on Turnpike revenue projection study.

Response: The design team agrees with the VE team that elevated reversible lane alternatives have merit and should be pursued. Two elevated reversible alternatives have been developed, the first of which (2A) places the transit in the existing median under the reversible lane structure, the second alternative shifts the mainline in 12' underneath the structure, allowing more room for transit on the outside. Later in the PD&E process, it was determined that the second alternative (2B) was cost prohibitive, visually objectionable, difficult to phase and was rejected by the public. This alternative was later dropped from consideration. Alternative 2A was recommended by the VE team following the May VE/DR meeting.

Value Engineering Session 1 - Recommendation 14-1: Interim WB I-595 to Weston Road (Spin off project Alternative #2)

Proposal: Interim WB I-595 to Weston Rd Ramp
Advantages:

- Builds ramp sooner than mainline improvements
- Inexpensive to implement sooner

Disadvantages:

- Costs $1.43 million
- Currently not programmed
- Not Compatible with ultimate mainline plans

Cost Estimate:
Roadway $100,000
Structures
Embankment $300,000
MSE Wall $480,000
Intersection Improvements at Weston Rd $250,000
Subtotal $1.13 million
MOT/Mobilization $200,000
Contingencies $100,000
Total $1.43 million

Response: Several Westbound Slip Ramp alternatives resulted from the VE study, An ultimate alignment rather than an interim solution was determined to be the best. FDOT District IV is currently designing this project. Both of these slip ramp projects are compatible with the design alternatives being proposed as part of this PD&E study.

Value Engineering Session 1 - Recommendation 14-2: Ultimate WB I-595 to Weston Road (Spin off project Alternative #3)

Proposal: Ultimate WB I-595 to Weston Rd, (Sketches included with presentation slides shown in the appendix)
Advantages:

- Builds ramp sooner than mainline improvements
- Compatible with ultimate mainline plans

Disadvantages:

- Costs $3.5 million
- Currently not programmed

Cost Estimate
Roadway $450,000
Structures $810,000
Embankment $600,000
MSE Wall $600,000
Intersection Improvements at Weston Rd $250,000
Subtotal $2.71 million
MOT/Mobilization $500,000
Contingencies $300,000
Total $3.5 million

Response: Several Westbound Slip Ramp alternatives resulted from the VE study, An ultimate alignment rather than an interim solution was determined to be the best. FDOT District IV is currently designing this project.

Value Engineering Session 1 - Recommendation 14-3: Creating Continuous Connection WB SR-84 to Davie Road (Spin-off project).

Proposal: Creating Continuous Connection WB SR 84 from SR 7 to Davie Rd.
Advantages:

- Closes "Missing Link" on SR 84 between SR 7 and Davie Rd
- Access from SR7 SB directly to SR 84
- Removes traffic from Mainline
- Ties to Ultimate SR 84 WB CD
- Matches LPA Concept

Disadvantages:

- Requires PD&E study
- Potential noise wall needed (+- $4 million for construction)

Cost Estimate
SR 84 Roadway $600,000
Embankment $300,000
Bulkhead $400,000
Subtotal $1.3 million
Contingency 20% $260,000
MOT/Mobilization 10 % $130,000

Total $1.69 million +- plus noise walls at $4 million

Response: The design team disagrees with the VE teams suggestion of advancing the SR-84 continuous connection project for two reasons. First, the project in which the continuous connection is made has been identified as the number one priority in the corridor and will be the first to be constructed. Second, the profile of the 595 WB to Turnpike NB ramp will drastically change the profile of the ramp if it were constructed as a spin-off. Third, the project would require a complete PD&E study and a Noise Study since this project is adding capacity to the faclility.

Value Engineering Session 2 - November 1-5, 2004

Value Engineering Session 2 - Recommendation 1: Turnpike Interchange Ramp D-1 Improvements

Original Concept: RS&H LPA
Proposed Concept: VE team proposes the following concepts be considered:
Coordination is needed with the SFWMD (North New River Canal). Various options are being reviewed including:

1. Excavating the North Bank of the canal to offset the encroachment that may be needed to cross the canal
2. Additional structure extended vs. embankment
3. Pier in the canal
4. Sheet piling to reduce the extra depth section
    a. Reduces Maintenance
    b. Approved on past projects

Advantages:

- Optimize Canal crossing
- Reduce construction sequences
- Allow Canal Maintenance clearances

Disadvantages:

- Coordination time

Cost Estimate: Not estimated as this is under consideration

Response: The design team has refined all alternatives currently being pursued to allow for the sheet piling of the North New River Canal. Extensive coordination has taken place with SFWMD to locate bulkheading and bridge columns as to not impede flow or reduce capacity of the canal. A proposed three span bridge is proposed with intermediate piers located on the existing north and south canal banks.

Value Engineering Session 2 - Recommendation 2: Turnpike Interchange Ramp B-3 Improvements

Original Concept: RS&H LPA
Proposed Concept: VE team proposes the following concept as a refinement from the VE No. 1 meeting.

1. Move gore areas north
2. Physical separation to eliminate undesirable weaving
    i. Adds R/W impacts to the mobile home park (Approximately $3 million)

Advantages:

- Separates traffic
- Less conflicts

Disadvantages:

- Additional R/W cost

Cost Estimate: (Adds $+-3 million in R/W cost)

Response: The design team has relocated the Griffin Road southbound exit ramp to the north upstream from the I-595 entrance ramp to the southbound turnpike eliminating the weave section.

Value Engineering Session 2 - Recommendation 3: Turnpike Interchange Ramps C-1 and C-2 and revise Griffin Road on-ramp to Turnpike.

Original Concept: RS&H LPA

Proposed Concept: By combining Ramps C-1, C-2 and Griffin road on ramp to NB Turnpike the following are advantages:
Advantages:

- One exit decision point
- System to System connector
- Improves weaving between Griffin Road and I-595
- Reduces NB Griffin Rd on ramp to Turnpike from two lanes to one at the gore

Disadvantages:

- None apparent, redesign effort

Response: The design team has redesigned the ramps in accordance with the VE team's recommendations. Northbound Exit Ramps C-1 and C-2 are combined to form a single three lane exit ramp and diverges further upstream to I-595 EB and WB to eliminate the deficient spacing of ramp gores. Modifications to the striping and alignment of the Griffin Road northbound on ramp are a result of the redesign.

Value Engineering Session 2 - Recommendation 4: Turnpike Interchange Ramps C-3 and C-4 separation:

Original Concept: RS&H LPA
Proposed Concept: By separation of the C-3 and C-4 ramps the following are advantages
Advantages:

- Eliminates undesirable weave between ramps

Disadvantages:

- Redesign effort

Response: The design team has redesigned ramps C-3 and C-4 where they are running parallel to each other and has separated the ramps with barrier wall in order to prevent any unwanted weaving. The weaving movements had been eliminated with the addition of ramps D-1 and the restriping of Ramp C-3, however the weaves were not physically restricted. Barrier wall with proper shoulder widths between the two ramps has been incorporated into the design.

Value Engineering Session 2 - Recommendation 5: Design Suggestions for the Turnpike interchange for Ramps B-1, C-4 and B-3 drainage slope:

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to improve the horizontal sight distance for the following locations

1. Ramps B-1 and C-4 to 12 ft shoulders
2. Shift ramp C-4 north to enlarge radius/improve sight distance
3. Slope ramp B-3 (any ramp adjacent to MSE wall) reverse cross slope for drainage

Advantages:

- Improves sight distance

Disadvantages:

- Validate Ramps B-1 and C-4, redesign effort

Response: The design team has widened inside shoulders to 12' to allow for proper sight distance and ramp C-4 has been relocated to the north to allow for a larger turning radius.

Value Engineering Session 2 - Recommendation 6: Reversible lanes Option 1 (2 lanes at-grade)

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to consider using two lanes at grade, as this option is compared to other options in the same category
Advantages:

- Lower initial cost
- LPA (approved concept)
- Transition areas (release points) operate within existing medians
- Neighborhood impacts minimized

Disadvantages:

- 64 ft median provides only two lanes
- Inflexible for future capacity improvements
- No accommodation for Transit within the existing R/W
- No direct connection to Turnpike (direct connect requires three lanes

Response: This is not so much a recommendation, but rather a summary of what will later be known as Alternative 1B. This is one of two design alternatives being recommended and incorporated in the final PD&E documentation.

Value Engineering Session 2 - Recommendation 7: Reversible lanes Option 2 (3 lanes elevated)

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to elevate the three reversible lanes
(This has the potential for R/W savings ranging to $100 million)

Advantages:

- Center lane direct connect to the Turnpike (traffic reduction to mainline)
- Shifts traffic toward median (General Purpose Lanes)
- More room for transit, noise walls, drainage
- Room for transit underneath (Fall-back plan)
- Reduces R/W takes on outside
- Flexible for future uses, i.e., bus, special purpose
- Minimize the use of existing R/W and provides more flexibility in design

Disadvantages:

- Construction costs are higher
- Requires redesign of current Turnpike interchange that is currently 90% complete
- Aesthetics
- Release points for 3rd lane needs to be redesigned

Response: This is not so much a recommendation, but rather a summary of what will later be known as Alternative 2A. This is one of 2 design alternatives being presented at the Public Hearing and incorporated in the final PD&E documentation. The concept behind this Option is to elevate the reversible lanes on a structure running in the existing I-595 median, thus freeing up space in the median to allow for the transit alignment to run at grade in the median.

Value Engineering Session 2 - Recommendation 8: Reversible lanes Option 3 (3 lanes elevated)

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to elevate two reversible lanes
Advantages:

- Shifts traffic toward median (General Purpose Lanes)
- More room for Transit, noise walls, drainage
- Room for Transit underneath (Fall-back plan)
- Reduces R/W takes on outside
- Flexible for future uses, i.e., bus, special purpose
- Less expensive than 3-lane option
- Release points/transition areas operate same as option #1

Disadvantages:

- No direct connect to Turnpike
- Aesthetics
- Traffic between Turnpike and I-75 increased on GPL
- Not as much flexibility as No. 7

Response: This is not so much a recommendation, but rather a summary of what will later be known as Alternative 2B. This Alternative would later be eliminated due to excessive cost and project phasing issues. The concept behind this Option is to elevate the reversible lanes on a structure running in the existing I-595 median, thus freeing up space in the median to allow for the mainline to be widened 12' towards the median and creating additional space on the outside for transit.

Value Engineering Session 2 - Recommendation 9: Braided Ramps – SR-84 on outside

Original Concept: VE No.1 included Eastbound/Westbound braided ramps reviewed at Nob Hill and Pine Island; University Drive and Davie Rd.; SR 7 to the Turnpike.

Proposed Concept: VE team proposes to keep SR 84 on the outside
Advantages:

- Improves travel space for bicycles and pedestrians
- Provides continuity for pedestrians and bicycles
- Keeps access to SR 84 for businesses at all locations
- Room for Transit underneath (Fall-back plan)

Disadvantages:

- R/W costs for keeping SR 84 to the outside are higher with the reversible lanes at grade
- Pushes transit south

Response: SR-84 must remain on the outside of any mainline on and off ramps in order to maintain business access and to maintain continuous sidewalks and bicycle lanes along SR-84. The design team has redesigned the braids to accommodate this with the exception of one along westbound SR-84 in the area of the braid with the Nob Hill Road off ramp. The design team wasn't able to concur with the VE team's recommendation at this location because of limited space between I-595 and the North New River Canal.

Value Engineering Session 2 - Recommendation 10: Improve Entrance and Exit weaving on I-595 between 136th and Flamingo.

Original Concept: VE No. 1

Proposed Concept: Reposition the entrance and exit positions on SR 84 to/from I-595 near Flamingo Rd

Advantages:
- Eliminates weave on I-595

Disadvantages:
- Construction costs are higher

Response: The addition of the reversible lanes interchange in the area between Flamingo Road and SW 136th Ave. creates additional opportunities for vehicles weaving from the reversible lanes across I-595 and to the SW 136th Ave exit ramp. The design team agrees with the VE team's recommendation to swap the locations of the on and off ramps to eliminate the weaving condition with the reversible lanes. The revised design is reflected in the Final PD&E designs.

Value Engineering Session 2 - Recommendation 11: Combine Intelligent Transportation System.

Original Concept: VE No. 1

Proposed Concept: VE team proposes to combine ITS/TMC with the Transit Control Center

Advantages:
- Reduces construction costs
- Better coordination among agencies

Disadvantages:
- Management issues

Response: Agree, this concept will be presented in the PD&E documentation and analyzed further during final design. Some of the ITS improvements are A local traffic

management center (TMC) is proposed for the corridor and is to be used by FDOT, Broward County, Police, Fire and Road Rangers to manage incidents, DMS signing (Dynamic Message Signing), Reversible lane operations, ramp metering (if proposed), and signalization. A Preliminary site for the facility is located near the FHP station along SR-84 west of SW 136th Street.

Value Engineering Session 2 - Recommendation 12: ITS Fiber Optic Conduit:

Proposed Concept: VE team proposes to incorporate the ITS fiber optical conduit with the final design

Advantages:
- Reduces construction costs
- Better coordination among agencies

Disadvantages:
- Coordination effort

Response: The design team recognizes that the Fiberoptics conduit is an important component of the I-595 corridor and provisions shall be made during final design to accommodate the conduit within the corridor.

Value Engineering Session 2 - Recommendation 13: Coordinate Broward County Greenway Project

Original Concept: Broward County Greenway plans and LPA plans

Proposed Concept: VE team proposes to coordinate with the Broward County Greenway projects along SR 7 to Davie Road (South of SFWMD Canal) and the University Drive to Markham Park (North of the SFWMD Canal). Team needs to determine if this is determined if the Greenway is a possible Section 4(f) property. There is an existing 50 ft permit alongthe north side of SFWMD canal that could be used for the Greenway in lieu of routing as shown on RS&H plans (SW 25th Street is south of the dedication).

Advantages:
- Reduces total construction costs
- Possible better route for users
- Avoids relocation of the Greenway if it is built in the ultimate location at first

Disadvantages:
- Possible Section 4(f) property
- Requires coordination among agencies
- May impact County's schedule/design

Response: The relocation of the greenway has been extensively coordinated with the county. The greenway shall be relocated to the north bank of the New River Canal

between SR-7 and Davie Road to allow for the proposed turnpike interchange ramps. The county is currently constructing this stretch of the greenway on the south side of the North New River Canal with the understanding that FDOT may relocate the greenway as part of the PD&E project in the future. Section 4(f) may apply to the impacts of the Greenway.

Value Engineering Session 2 - Recommendation 14: Environmental Considerations, Constraints, and opportunities – Minimize impacts to Sewell Lock, Noise Wall Considerations. Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes to minimize the impacts that may exist with the current planned location for the braided ramps nearby the Sewell Lock.

Advantages:

- Preserves historical significance
- Avoid, minimize impacts to Sewell Lock by:
    - i. Shift braid to the west
    - ii. Reverse the braid

The team also recommends that the noise walls be located on the plans

- Noise walls design shall include specifics needed for the team to review
    - o Locations
    - o Height
    - o Costs
    - o Constructibility details
    - o R/W Costs
    - o Sequencing plan

The team also continues to recommend not impacting the contaminated areas shown on the plans.

Disadvantages:

- None apparent

Response 1: Pursuant to the VE team's recommendations, the University Drive off ramp / Davie Road on ramp braid has been reversed and shifted to the west to avoid impacts to Sewell Lock Park.

Response 2: Noise wall locations have been closely analyzed and were presented to the public at the public workshops held in April. Input from the public was received on type of wall (shoulder mounted or right-of-way) and locations. The design team agrees that noise wall locations shall be shown in the final PD&E documents.

Value Engineering Session 2 - Recommendation 15: Design Exceptions as noted

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes that RS&H incorporate the design exceptions noted on the RS&H spreadsheet as revised by the VE team during the meeting.

Advantages:

- Accommodate travel lanes

Disadvantages:

- May not meet FDOT PPM requirements

Response: A list of the expected variations and exceptions has been developed and is being coordinated with the District Roadway Design Engineer. Variations and Exceptions are necessary to reuse existing structures and minimize costly R/W impacts.

Value Engineering Session 2 - Recommendation 16: Turnpike, Braided Ramp and Reversible Lane Phasing.

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes that RS&H incorporate the planned phasing plans as are developed and refined before the next VE meeting.

Advantages:

- Reduce construction time and impacts
- Ease maintenance of traffic
- Produce efficient construction phasing

Disadvantages:

- None apparent

Response: Careful phasing of corridor projects has been undertaken. The goals of the project phasing is as follows:

Construct most needed projects first.
Reduce Construction time and impacts.
Maintain all corridor movements.

Value Engineering Session 2 - Recommendation 17: Braided Ramp Costs and Phasing.

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes that RS&H incorporate the planned phasing plans as are developed and refined before the next VE meeting for all the braided ramps. Braided ramps reviewed by the VE team were

1. EB 1 lane bridge 1-lane road $35 M
    a. East of Flamingo West of Nob Hill Rd including Hiatus bypass

2. EB 2-lane bridge/2-lane road $20 M
    a. West of Nob Hill Rd to Pine Island Rd

3. WB 1-lane bridge/2-lane road $65 M
    a. University Drive to Pine Island Rd

4. WB 2-lane bridge/2-lane road $20 M
    a. Pine Island Rd to Nob Hill Rd

5. WB 2-lane bridge/2-lane road $45 M
    a. Nob Hill Rd to Flamingo Rd includes Hiatus bypass

6. WB 2-lane bridge/1-lane road $20 M
    a. West of Turnpike to University Drive

Construction items considered in the costs included

- Structures, REWall, Noise Wall, Barrier wall
- Sidewalk, pavement, embankment, drainage
- Maintenance of Traffic, Mobilization
- Miscellaneous, and contingencies

Response: Comment noted. This appears to be merely a summary of the braided ramps in the corridor.

Value Engineering Session 2 - Recommendation 18: Drainage Design and Coordination with Agencies.

Proposed Concept: VE team proposes that RS&H develop the following drainage details before the January VE meeting:

1. Meet with permitting agencies and understand their requirements
2. Determine the existing treatment that is provided throughout the corridor
3. Determine the required volume for treatments and attenuation
4. Evaluate areas where ponds are required
5. Evaluate pond sites
6. Sequencing/phasing of permits/mitigation/construction projects
7. Define drainage requirements based on refined alternatives

Response: The steps listed for Recommendation No. 18 have already been completed and results are reflected in Pond Siting Report.

Value Engineering Session 3 - January 18-21, 2005

Value Engineering Session 3 - Recommendation 1: Turnpike Interchange Ramp D-1 Improvements

Original Concept: RS&H LPA
Proposed Concept: VE team proposes the following concepts be considered:
Coordination is needed with the SFWMD (North New River Canal). Various options are being reviewed including:

1. Excavating the North Bank of the canal to offset the encroachment that may be needed to cross the canal
2. Additional structure extended vs. embankment
3. Pier in the canal
4. Sheet piling to reduce the extra depth section
    a. Reduces Maintenance
    b. Approved on past projects

Advantages:

- Optimize Canal crossing
- Reduce construction sequences
- Allow Canal Maintenance clearances

Disadvantages:

- Coordination time

Cost Estimate: Not estimated as this is under consideration

Response: The design team has refined all alternatives currently being pursued to allow for the sheet piling of the North New River Canal. Extensive coordination has taken place with SFWMD to locate bulkheading and bridge columns as to not impede flow or reduce capacity of the canal. A proposed three span bridge is proposed with intermediate piers located on the existing north and south canal banks.

Value Engineering Session 3 - Recommendation No. 1A: Elevated Reversible Direct Connect to the West End

Original Concept: For options 1 & 2 only, have three lanes reversible on structure and can only release 2 at-grade into the I-595 median. Original concept is to carry remaining (1) lane on structure and terminate on Sawgrass Expressway, south of Sunrise Blvd.

Proposed Concept: VE team proposes to connect to the Sawgrass and I-75 at the West end per the sketches shown on the following pages. This connection allows for connection to the heaviest projected movements. Westbound I-595 to SB I-75 will have a direct-connect to the existing WB to SB Flyover and will release two lanes at grade into the median. A more expensive alternative would be to direct connect the reversible lanes to and from all directions.

Advantages:

- Less Bridge cost
- Eliminates structure length going to Sawgrass and provide ramp (partial structure) to heaviest movements WB/SB or SB/EB on I-75 I/C and I-595
- Noise impacts reduced
- Visual impacts reduced
- Allows for future direct connects as traffic demand increases

Disadvantages:

- Needs straddle bent support
- Redesign needed

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

Response: Ramp spacing prohibits the I-75 NB from Miami to the I-595 eastbound reversible lanes as recommended by the VE team. An option of connecting into the I-75 median south of I-595 was explored and was presented to the VE team at Value Engineering Session No. 4. A later recommendation (Value Engineering Session No. 4, Recommendation No. 5 has been incorporated into the design).

Value Engineering Session 3 - Recommendation No. 1B: Elevated Reversible Direct Connect to the Turnpike on the East End

Original Concept: For options 1 & 2 only direct connect ramp servicing Turnpike south of I-595 extends on structure to the south of the I-595 interchange.

Proposed Concept: VE team proposes to refine the connection to the Turnpike at the East end to reduce the structure length by bringing ramp down to grade within the I-595/Turnpike Interchange

Advantages:

- Visual impacts reduced
- Noise impacts reduced
- Less cost/less structure

Disadvantages:

- Redesign needed for Turnpike/I-595 geometry

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

Response: Refinements to the elevated direct connection to the south of I-595 into the Turnpike median were and reduced the amount of structure needed. The original design called for carrying the reversible lane on structure on the west side of the turnpike until

clear of the I-595 interchange. The VE recommended design carries the reversible lane in the I-595 median and brings it to grade and onto mainline in a much shorter distance.

Value Engineering Session 3 - Recommendation No. 2: Braided Ramp improvements at Hiatus and Flamingo

Proposed Concept: VE team proposes improvements to the WB Braided ramp system at Hiatus and Flamingo Roads. These improvements propose to maintain SR 84 with accompanying bike lane along the canal. The VE team also reviewed the braided ramps at Nob Hill Road and concluded that the canal encroachment has been maximized and could not re-align SR 84 to the north to allow bike lanes to stay on the outside adjacent to the curb. If the roadway typical section Option 2 is chosen for the project, these braided ramps may be further improved.

Advantages:

- Eliminates two braided bridges at Hiatus/Flamingo Roads
- Reduces need for bulkhead on canal
- Simpler design and provides operational improvement
- Allows for bike lanes on SR 83 in this area (keeps SR-84/bike lanes adjacent to canal)

Disadvantages:

- Creates a weave on frontage road

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

Response: The improvements to the braided ramp system at Nob Hill Road and Flamingo are incorporated into all alternatives being developed in order to allow SR-84 and the bike lanes along SR-84 to remain on the outside of the braided ramps. The improvements also diminish impacts to the adjacent SFWMD canal.

Value Engineering Session 3 - Recommendation No. 3: (Transit Connections to the median)

Original Concept: Option 1 only (not previously detailed) – use space freed up in the median, by elevating reversible lanes for transit.

Proposed Concept: The Transit crosses I-595 at 136th Street to the south side and runs on the south to east of Flamingo Road and enters the median at level 2 and drops to level 1. Between Davie Road and University Drive the Transit line crosses the mainline at level 2 and runs along the south side to SR 7.

Advantages:

- Validates median transit concept by showing median transit concept geometry that can be accommodated

Disadvantages:

- Raises the reversible lane at the connection points

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

Response: The design team worked in conjunction with the CBEWTAA design team to accommodate transit in the median and the entrance and egress points in/out of the median in what will later be known as Alternative 2A. Transit station locations and designs of those stations (in median or on outside of I-595) are still yet to be determined.

Value Engineering Session 3 - Recommendation No. 4: R/W issues

RS&H LPA Design without ponds estimated at $92 million

Proposed Concept: The LPA design considered a substantial taking for right of way to build the project. The current concepts that are going forward are reducing the acquisition requirements so the following is an example of R/W savings at one location.

An example: Location Eastbound Flamingo to Nob Hill Road 1. 11/01/04 LPA $15,449,070 2. 12/08/04 LPA modified VE revised $549,665

Objective for 3/31/05 • Prepare Cost estimates for 2 acquisition scenarios • Finalize R/W cost estimates for 9 drainage basins

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

Response: The Design team worked with FDOT R/W personnel to estimate R/W impacts at an early stage. Preliminary costs of parcels adjacent to the corridor were developed. Care was taken to design around these parcels to minimize costs. R/W needs for the transit mainline have been developed and are incorporated into this PD&E study to avoid having to impact parcels twice for the roadway and later the transit alignment.

Value Engineering Session 3 - Recommendation No. 5: Analysis and Documentation of Environmental Impacts

The following is a outline-narrative the Environmental Team developed regarding issues, action items, concerns and status of progress:

- Cultural Impacts – current work is on track
- Section 4(f) – continue discussion with Greenways, Parks
- Contamination Impacts – current work is on track
- Noise Impacts -Identify your audience in each section of the project and meet with them throughout the process.

- Natural Resource Impacts – continue to determine the temporary and permanent wetland impacts at the viaduct.Action Items:
    - o Public Involvement - Identify your audience in each section of the project and meet with them throughout the process
    - o Wetlands – develop mitigation options for the Workshop. Anticipate the need for design and construction of accelerated mitigation projects.
    - o ROW/Ponds – continue to work with Drainage and ROW
    - o Noise - may be the issue but the audience could be different in different sections of the corridor.

- Drainage and Permit Update
    - o Drainage and Permit Background Work Completed
    - o Permit Locations Defined
    - o Basin Limits Delineated
    - o Basin Storage Needs Defined
    - o Potential Pond Sites Located
    - o Preliminary Evaluations Completed on Sites
    - o Matrix Criteria Defined for each Parcel
    - o Discussion of "New" Criteria Added for this Matrix
        - □ Joint Use
        - □ Noise Abatement Opportunities
        - □ Mitigation Opportunities
    - o SFWMD R/W Criteria Defined
    - o Held Preliminary Discussions with Local Agencies

- Outstanding Concerns
    - o Use of Compensating Storage in Basins
    - o Compensating/Mitigation options to North
    - o Mitigation feasible in Pond Apple
    - o Use of Marinas for Mitigation/Drainage
    - o Drainage/Permit Criteria at Viaduct
        - □ Can Existing Scuppers Remain?
        - □ Retrofit with Drainage Inlets/Pipes
        - □ Viable Storage under Viaduct
- Action Plan
    - o Forward all Parcels to R/W Estimating
    - o Include all parcels for both drainage and mitigation
    - o Evaluate Marina takings with SR 84
    - o Follow-up with Pond Siting Team Meeting
    - o Evaluate any new parcels from R/W

Response: All recommendations and procedures recommended have been implemented and followed by the Design Team

Value Engineering Session 3 - Recommendation No. 6: Preliminary Noise Wall Analysis

Original Concept: RS&H LPA did not indicate proposed noise wall locations.

Proposed Concept: Consider location of the noise walls per the drawings presented by RS&H at VE Study No. 4 held Thursday January 20, 2005.

Preliminary Analysis indicates the following:

- 26 communities along corridor
- 22 communities affected and being evaluated for noise barriers
- Noise barrier analysis
  - o North and south of the New River Canal
    - □ 22-feet tall
  - o Shoulder mounted noise barriers along elevated roadways on MSE walls and bridges are 8-feet tall Preliminary cost of noise barriers
  - o Using SFWMD property north of the new river canal - $26.3 million
  - o Within FDOT's right of way - $27.8 millionNoise barriers on the north side of the canal are less costly and more effectiveRefine noise barrier analysis
  - o Assess effectiveness of 10-, 12-, and 14-feet tall shoulder mounted barriers on MSE walls and bridges
  - o Request unit cost of shoulder mounted barriers greater that 8-feet tall
  - o Quantify noise levels of reversible lane alternatives – elevated versus at gradeEvaluate effectiveness of 5- to 6- feet tall noise barriers on elevated structures associated with reversible lanes
  - o Evaluate sound absorptive materials for noise barriers on elevated roadways
  - o Refine estimated total noise barrier cost
    - Coordination activities
      - Meet with SFWMD to discuss possibility of construction of noise barriers north of new river canal
      - Coordinate with FHWA regarding commercial property and modeling of existing privacy walls
      - Request variance for shoulder mounted barriers on MSE walls and bridges greater than 8- feet tall
      - Coordinate with Broward County regarding greenway and potential conflicts
      - Public involvement and barrier aesthetics
        - o Barrier aesthetics should be consistent within the corridor
        - o Discuss advanced construction of noise barriers
        - o Coordinate with individual communities regarding noise barrier locations and aesthetics north of the new river canal
          - Survey affected residents

Response: Noise analysis has been ongoing for the 26 communities along the project corridor. The ongoing analysis has included the assessment of noise barriers within the FDOT right of way and north of the New River Canal. The shoulder mounted noise barriers that are being analyzed on elevated roadway and on MSE walls include heights of 8 ft, 10 ft, 12 ft, and 14 ft. The ongoing analysis is using the unit cost provided by FDOT for shoulder mounted barriers at heights of 8 ft, 10 ft, and 12 ft, and 14 ft. A refined cost estimate will be incorporated into the Noise Study Report.

The quantification of the noise levels associated with the reversible lanes and the use of sound absorptive materials for noise barriers on elevated structures associated with reversible lanes are ongoing and will include the assessment of the 5- to 6- foot tall shoulder mounted barriers.

Coordination activities also have been ongoing. A meeting was held with South Florida Water Management District to confirm the use of their right of way north of the New River Canal for the construction of noise barriers. Coordination with FHWA regarding commercial property and modeling of existing privacy walls has been initiated but is not yet complete. It has been confirmed that variations for shoulder mounted noise barriers on MSE walls and bridges greater than 8 ft will be required. The request for variances will be completed following the noise barrier analysis, which is ongoing. Coordination with Broward County regarding greenways and potential conflicts with noise barriers, is ongoing. Coordination with the public has included a Public Workshop held in April 2005 and meetings with some of the communities, including Hawks Landing and Everglades Lakes Mobile Home Park. Additional coordination with the public is ongoing and will include additional meetings with the communities and possibly a survey of affected residences to obtain their input regarding noise barrier location and aesthetics.

Value Engineering Session 3 - Recommendation No. 7: Construction Issues

Braids: Construction within constrained areas
- Temporary construction phasing plan for SR-84 on/off ramps
  - o Establish hours of operation for construction
  - o Build the new ramps first before old ramps are taken out of service
  - o Consider piling versus drilled shafts

Reversible Lanes: Select the typical section to be built
Elevated reversible lanes to be built first

Response: MOT, Construction and Project phasing are being evaluated to determine alternative development.

Value Engineering Session 4 – May 16-20, 2005

Value Engineering Session 4 - Recommendation No. 1 Finalize Evaluation and NEPA Documents for Alternatives 1B and 2A.

Original Concept: Follow the typical PD&E procedures checklist

Proposed Concept:
- Identify areas for ground mounted noise walls (Noise Study)
- EPA sign off on the Petroleum re-processor site (contamination report)
- Environmental Summit – Pond Apple Slough (Wetlands and Endangered Species)
- Industry vs. History (Section 4f)
- Provide enough information in the Categorical Exclusion to:
  - o Address cumulative and secondary impacts (emphasizing the positive aspects)
  - o Provide reasonable assurance that the project is clearly in the public's interest
  - o Tell the story (how did we get here?)

Why is Sewell Lock Unique?

- Dredging the North New River Canal allowed for the land to drain and be available for agriculture
- The Lock kept saltwater intrusion from impacting agricultural lands
- The Lock allowed for the canal transport of goods from Lake Okeechobee to Fort Lauderdale

Potential Cost Savings: TBD

Value Added to Project: Sewell Lock Park, a Section 4F site and currently listed on the National Registry of Historical Sites has been avoided in the two final PD&E alternatives.

Response: The design team agrees that Alternatives 1B and 2A are the best alternatives for the I-595 corridor given the corridor constraints. Alternatives 1B and 2A will be presented at the Public Hearing, after which a recommendation of the preferred alternative will be made and reflected in the NEPA documents.

Value Engineering Session 4 - Recommendation No. 2 Consider drainage improvements to the south of I-595.

Original Concept: Follow the typical PD&E procedures checklist

Proposed Concept: Plans are to maximize the available land in the drainage basins, existing Interchange infield areas, golf courses, and planned future developments. Consider routing the drainage to the south after pre-treatment through the South Fork of the New River Canal. Look for retention/detention areas outside of the 1,000 feet area that has presently been investigated. Also, continue to review the use of French drains along the corridor in addition to pond sites.

Potential Cost Savings: TBD

Value Added to Project: Any savings associated with the locations of pond sites will be determined during final design.

Response: Proposed ponds are for treatment only because attenuation will be taken care of in the interchange areas. Therefore, routing stormwater to the south will not be needed. Areas outside of the 1000 feet study area are not hydraulically feasible. The use of french drains throughout the corridor has been and will continue to be considered where possible. All recommendations have been addressed in the pond siting report.

Value Engineering Session 4 - Recommendation No. 3 Minimize R/W acquisition

Original Concept: LPA Alternative = $132 million

Proposed Concept:

Alternative 1A = $130 million
Alternative 1B = $107 million
Alternative 2A = $107 million
Alternative 2B = $92-$114 million

Alternative	Roadway Parcels	Transit Parcels	Roadway R/W $	Transit R/W $
1A	28	30	$98M	$32M
1B	28	4	$98M	$9M
2A	28	15	$98M	$9M
2B	15	29	$39M	$53-$73M

Potential Cost Savings: Ranges from $ 2 million to $40 million

Value Added to Project: The alignment has been modified in a number of areas to avoid expensive right of way acquisitions. As the alignment has been modified FDOT personnel and VE Team members have provided cost savings resulting from the modifications. The most current right of way estimate for the roadway and transit alignments is 163 million for alternative 1B and 164 million for alternative 2a. Unlike the numbers in the tables above, these numbers include ponds. If pond costs were added to the amounts above, one would realize a savings of approximately $67 to $68 million when comparing the 2 final PD&E alternatives to LPA Alternative 1A.

Response: The two Alternatives that minimize overall R/W acquisition have been selected as the preferred alternatives in this study. These alternatives include an envelope for the potential transit system. However, a reevaluation of the PD&E alternatives will be required to reflect the status of the CBEWTAA prior to acquiring right-of-way.

Value Engineering Session 4 - Recommendation No. 4 Deflect Mainline to avoid FPL Davie Substation

Original Concept: Shifting the Braid west to avoid the Sewell Lock Park would push the typical section into the FP&L Substation. Based on the Interstate 4 experience this right of way taking is estimated at $43 million.

Proposed Concept: With a slight deflection of the mainline and by constraining the typical section with 11 feet lanes on SR 84, 6 feet bike lanes on SR 84, traffic barrier cast integrally with the columns, and reducing the inside mainline shoulders from 10 to 8 feet, with other refinements to be developed during design, the entire FP&L substation can be avoided and R/W cost could be saved.

Potential Cost Savings: $43 million

Value Added to Project: The above modifications save the FPL facility and therefore provide cost savings of $43 Million.

Response: Mr Neelesh Shah of FPL Transmission indicated that avoidance of this facility is the only suitable alternative. This coupled with FDOT R/W estimates of a $43 million dollar cost to relocate the substation prompted other alternatives to be developed that avoid the substation. The new alignment developed that has been incorporated into the preferred alternatives shifts the mainline 4.5' to the north with a 15 minute deflection. This in combination with 11' travel lanes on SR-84 EB and a reduced sidewalk width in front of the FPL substation avoids impacts to the FPL facility. No design exceptions or variations are needed to accomplish this. Provisions have been made for 4' wide columns for a future transit line in between I-595 and SR-84 EB in front of the substation.

Value Engineering Session 4 - Recommendation No. 5 Request the Turnpike to defer the current contract to accommodate future Turnpike Direct Connections and revise West end direct connection concept.

Turnpike Direct Connections

Original Concept: The Turnpike's current design does not have enough space in the median for direct connections from I-595 to Turnpike for northbound and southbound traffic. Current design will only have a 28-ft wide median.

Proposed Concept: VE Team recommends deferring the letting (approximately 6 months) to revise the design to accommodate the future direct connects. Turnpike should be requested to work with the District 4 design team to redesign the section to allow for an 80-ft median.

Advantages:

- Provides a ramp lane reduction for I-595 to SB Turnpike prior to Griffin Road toll plaza
- Allows for more revenue collections to improve financial viability for Turnpike bonds
- Eliminates throw away cost and rework of this area in the future for reconstructing the Turnpike from Peters to Griffin Rd –see Turnpike for bid amount (due to be let in 3 weeks)
- VE team recommends deferring the letting (approximately 6 months) to revise the design to accommodate the future direct connection
- Allows for an additional reversible lane on I-595
- Improves LOS on I-595 GP lanes

Disadvantages

- Revision to the current plans out for bid in three weeks (~6 months)
- Redesign
- Median expansion on mainline Turnpike from 28 to 80 feet
- Major conflict with current design (Southbound only due to major gas line conflicts) on the Turnpike due to be let in 3 weeks
- Current Turnpike design (if implemented) would need to be reconstructed from Griffin to Peters Road

Potential Cost Savings: TBD

West End Connections

Original Concept: RS&H alternative concept after VE Workshop No. 3: Alternatives 2A and 2B as originally proposed provided a single lane flyover from the reversible lanes to SB I-75. This was the result of the VE team asking the RS&H team to consider a connection to the I-75 SB movement.

Proposed Concept: VE team recommends releasing all three lanes at grade and carry two lanes forward to the existing two-lane flyover SB I-75 ramp. One lane will merge into the general purpose lanes. For the EB traffic on I-75 an at-grade ramp can peal off the inside lane and merge into the express lanes.

Advantages:

- Eliminates a fourth level SB I-75 Flyover
- Utilizes existing flyover
- Traffic transitions are at-grade
- Less cost

Disadvantages

- Minor redesign

Potential Cost Savings: $18 million

Response 1: After discussion, the Turnpike decided to avoid the delay of letting the contracts on their Turnpike Widening Project from Griffin Rd. to Sunrise Blvd citing close proximity of letting dates and the problems associated with redesign. Only one of the final Alternatives includes the direct connections to the turnpike.

Response 2: The design team agrees with the recommendation of releasing two reversible lanes at grade into the I-595 mainline. The third reversible lane would then remain on structure in the I-595 median supported by straddle bents. It would then merge directly onto the I-75 SB towards Miami off-ramp in the westbound direction and diverge into the reversible lanes from the I-75 NB ramp from Naples.

Value Engineering Session 4 - Recommendation No. 6 Alternative 2A is the preferred alternative.

Proposed Concept: Develop a methodology to evaluate four new Alternatives (1A, 1B, 2A and 2B).

The VE team listed all criteria without weighting, scored positive, zero, or negative based on comparison to other alternatives for Roadway and Transit. The goal was to identify two Alternatives to take to Public Hearing and identify one as a preferred multimodal alternative. After the first cut evaluation the team determined the scoring to be close, so the options were evaluated using selected key criteria with a scoring from 1 to 4 to select the best alternatives within the I-595 corridor. See Matrices in Section 5.

Value Added to Project: Although Alternative 2A is significantly more expensive, it does provide two major values to the project that the other Alternatives cannot provide.

1. Direct connection to the Turnpike from the reversible lanes hence funding from the Turnpike (approximately $50 million)
2. Provides an envelope for the transit component at grade in the median of I-595. This significantly reduces the cost of the transit project by approximately $101 million

Response: Alternative 2A has been designated as the preferred elevated reversible lanes alternative and Alternative 1B has been selected as the preferred at-grade reversible lanes alternative that will be presented at the upcoming Public Hearing in November, 2005. A decision regarding a recommended alternative for the project will be made following the Public Hearing.

In closing, the Value Engineering/Design Review effort has been an overwhelming success and has resulted in a PD&E design that is lower in cost, is better operating and reduces impacts on the surrounding neighborhoods and businesses. The commitment of District IV and its consultants in this innovative approach has resulted in a product that can more easily and efficiently be advanced into final design.

If you have any questions, please feel free to contact me at (904) 256-2173.

Sincerely,

Reynolds, Smith and Hills, Inc.

Jeffrey Bowen, PE

cc: File

Value Engineering
For Transportation Improvements

I-595 Corridor PD&E from I-75 to East of I-95

Value Engineering Study Report

FM Number: 409354-1

Fed. Aid Project: Yes

Project Description: I-595 from West of I-75 to East of I-95

Study Dates: April 26 - 30, 2004

Project Development Phase			Study Identification Number
PD&E	Design	Other	VE Item No.
FDOT-D4			Yr. 0 4 Dist. 0 4 No. 0 8

This study has been performed in accordance with current applicable FDOT Value Engineering Procedures and Techniques

Richard L. Johnson, CVS No.20030201, PE No. 38681

Date: June 23, 2004

TABLE OF CONTENTS

SECTIONS

EXECUTIVE SUMMARY 1

1.1 Introduction

The proposed improvements are planned for I-595 from the I-75/Sawgrass Expressway Interchange to East of the I-95 Interchange. A master plan has been completed and the identified Locally Preferred Alternative (LPA) was endorsed by the Broward County Authorities and approved by FHWA. The project begins at Weston Road on the west end and proceeds eastward to 3,350 feet East of I-95 centerline (approximately). See **Figure 1.1-1.**

The proposed improvements reviewed during the April 26-30, 2004 meeting included:

- Turnpike and I-595 Interchange
- Viaduct (SR7 to I-95)
- I-595 Entire Corridor

Scope of the VE Process

- The FDOT has advanced the project into the PD&E phase
- Differs from normal PD&E due to complexity, size and integration with other projects
- VE effort will encompass a 16 month process defining the system geometry
- Each VE effort will focus on design packages
- Each Design package will be coordinated with the system requirements
- Consistency will be maintained with the LPA intent

1.2 Organizational Structure

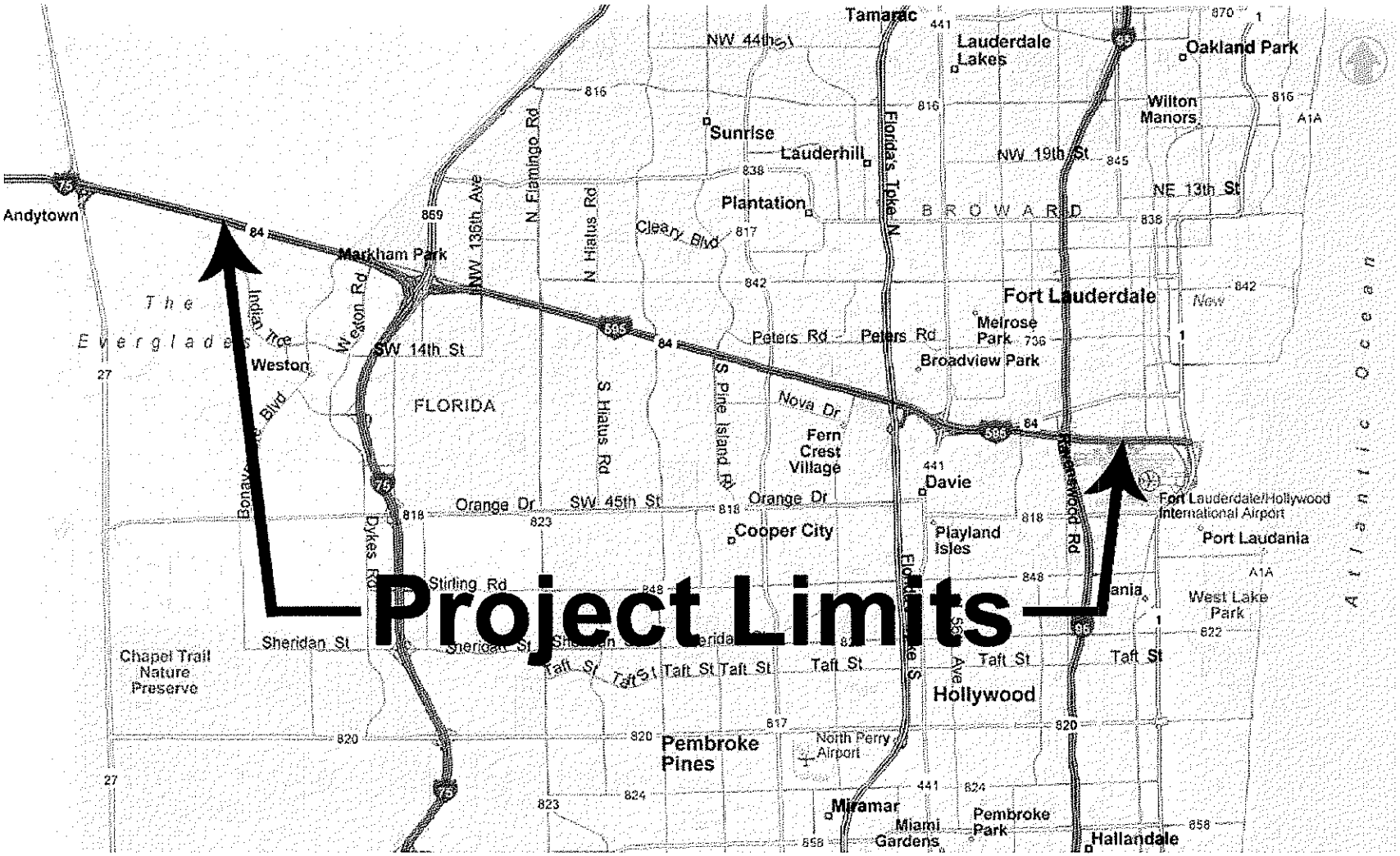
- The team will be Managed by the FDOT Management Team
    - The PD&E Design team consists of the RS&H, HDR, Parsons, PBS&J and Wantman groups
    - Integrated as part of the Design and Reviews will the VE Meetings Facilitators
    - The FDOT Design Review team had representation from the following areas
        - Planning and Environmental Management
        - Design
        - Construction
        - ITS/Traffic Operations
        - Utilities
        - Structures
        - Drainage/Permitting
        - Right of Way
        - Surveying

The Locally Preferred Alternative (LPA) was endorsed by Broward County and approved by the FHWA. The LPA evolved through Public Involvement workshops held during the Master Plan phase.

1.3 Project Purpose

The current project purpose is to meet the existing and projected 2034 traffic demand needs of the corridor by maximizing the existing corridor's potential with minimal impacts.

Figure 1.1 – 1
Project Location Map



1.4 Master Plan Locally Preferred Alternative (LPA)

Major components of the LPA Roadway system improvements include:

- Collector-Distributor System
- Continuous connection of SR 84 between Davie Road and SR 7
- General Purpose use lanes
- Reversible lanes in the median from Hiatus Road to SR 7
- Two lane off-ramps
    - Westbound at
        - University Drive
        - Nob Hill Road
        - Pine Island Road
        - Flamingo Road
    - Eastbound at
        - Pine Island Road
        - University Drive
        - Davie Road
- Two lane on-ramps
    - Westbound at
        - Pine Island Road
    - Eastbound at
        - University Drive
- Braided ramps
    - Westbound between
        - University Drive and Pine Island Road
        - Pine Island Road and Nob Hill Road
        - Hiatus Road and Flamingo Road
    - Eastbound between
        - Flamingo Road and Hiatus Road
        - Nob Hill Road and Pine Island Road
    - Grade Separate Overpass at
        - Hiatus Road WB
        - Hiatus Road and Pine Island Road EB
- Interchange efficiency improvements at
    - Florida's Turnpike
    - SR 7
    - I-95 Interchange
    - I-75 Interchange

- Transit system considerations evaluated for future extensions from I-75 to SR 7 or the Ft. Lauderdale Airport long-term parking, Tri-Rail, and Downtown locations with stations located along the I-595 corridor between I-75 and 136th Avenue, Hiatus Road and Nob Hill Road and between University Drive and Davie Road. (not part of the I-595 Corridor reviewed by the VE team during this VE study). This element was reviewed so at a minimum a transit corridor is preserved within the I-595 corridor.

1.5 I-595 PD&E

Traffic has been updated from the 2020 to 2034 projections. Toll revenue study and congestion management is under analysis. The original LPA was updated to a revised LPA updated to show effects of the 2034 traffic projections.

Key considerations of the PD&E/VE:

- South of Frontage Rd (SR 84 eastbound, multiple issues related to proximity of businesses, cemetery, Electrical substation, schools, etc.)
- Flyover at University or other locations to be demolished and constructed over traffic
- Flyover pier locations
- EB bridge cross sloped to the north
- Piers located within the canal
- Bikeway WB by canal (move or reconfigure)
- Deep facia beam on the bridges (restrictions for widening bridges?)
- Left turns at Texas U-Turns
- Environmental impacts at the viaduct (Pond Apple Slough)
- Weaving movements at the Turnpike (Exiting to I-595)
- Gas and Utility lines on North side
- Advance 136th Avenue WB off ramp (Spinoff project with three Alternatives)
- Sheeting in canal/widen to north (For ramp widening and braids)
- Located archeological site at west end of project near the windmill area between frontage Road and WB I-595
- Existing Sign Structures (ITS) will need to be redone
- Consider elevated lanes in median (transit/reversible lanes)
- Drainage could go into existing infield interchange areas
- Weaves from mainline to SR 84 (see braided ramps)
- Transition weave and Flyover from Sawgrass to I-595 reversible lanes/release points for reversible lanes east of flyover connection
- Cemetery and power station at Davie Road (Accommodation for transit on south side)
- Weaving at I-595 and Turnpike (mainline reversible and transit lines)
- Turnpike SB 3 lanes from I-595 (mobile home park, toll booths, etc) (additional R/W impacts)
- Contaminated areas near SE quadrant of Turnpike Interchange (Superfund site)
- Check as-built drawings as existing built drainage may have excess drainage capacity
- Possible joint use drainage with golf courses and other planned developments along the corridor (Pond sitting)
- Updated traffic projections (2034)
- Environmental and permitting concerns to be investigated (Bring environmental agencies into the process early)

I-595 CORRIDOR ACTION ITEM LIST ESTABLISHED DURING FEBRUARY 2004 MEETING UPDATED APRIL 26, 2004

Items shown below were noted as part of the February 2004 Kick off meeting and shown on the Actions Flip Chart. Action Items to be tracked Additional action items were noted during VE Study No. 1 and are included below. **Table 1.5-2** Summarizes the Highest Rated Alternatives.

TABLE 1.5 – 1 PROJECT ACTION IDEMS

Action Items	Assignee	Due by date	Completion date—Status as of April 26, 2004
Independent drainage team to review options	Howard/Scott RSH	Before Meeting #2	To take place during Meeting 2
Consider limits of cross road improvements	RSH	By Meeting #5	On-going
Incorporate traffic mgt sys I-595 ITS corridor	RSH	Continuous	On-going
Determine R/W needed for Mainline and coordinate with Transit to determine R/W needed ASAP	Scott RSH	July 2004	On-going
Update traffic for 2034 and adjust current LPA	Jeff/Scott RSH	May 2004	**Updated and incorporated**
Meeting with Gus prior to March PIM to discuss noise issues and placement of walls	Jeff RSH	Mid March 2004	**Complete**
Set schedule to meet/coordinate with Tpk and others	Scott/Gerry RSH/FDOT/TPK	March 2004	**To be Scheduled**
Obtain feedback from Paul Re: EPA regulations	Paul	February 17, 2004	Paul reported on current status at April 26, 2004 meeting
Obtain FHWA approval for LPA refinements	Scott/Jeff/Nick RSH/FDOT	February 23, 2004	On-going
Coordinate I-595 and Tpk I/C work segments	Scott	Meeting #4	On-going
Phasing to be established, reviewed/approved	Team	Begin Meeting #4, finalize by Meeting #5	On-going
VE Recommendations and Design Suggestions	TEAM	RS&H to review and incorporate acceptable options prior to next	On-going

		meeting	

TABLE 1.5 – 2
SUMMARY OF HIGHEST RATED ALTERNATIVES

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description**	**Management Action**	**Comments**	**Potential Cost Improvement (Additive)**	
1	Analysis and Documentation of Environmental Impacts I-595			*	
2	Drainage/Permitting for I-595 Corridor			*	
3	Right of Way Scope			*	
4	ITS Improvements			*	
5	I-595 Ramp to SB Turnpike			*	
6	Split WB Ramps from I-95 (after) Viaduct farther West			*	
7	Connector-Distributor Road Connect to SR 84			*	
8	University Flyovers			*	
9	Auxiliary Lane			*	
10	Braided Ramps			*	
11	SW 136th Avenue Ramp			*	
12	Elevate Reversible Lanes option			* ($25 million per mile) to be verified	
14-1	Interim WB I-595 to Weston Rd Ramp			($1.43 million) To be replaced by 14.2 in future	
14-2	Ultimate WB I-595 to Weston Rd Ramp			($3.5 million) part of original alternative	
14-3	Creating Continuous connections WB SR 84 from SR 7 to Davie Rd			Cost was presented + $4 million (including noise walls)	

Notes: Management Action: A-Accepted, CA-Conditionally Accepted, PR-Pending Resolution, R-Rejected *=Costs not estimated, due to insufficient information

VALUE ENGINEERING METHODOLOGY 2

2.1 General

In general a traditional VE study process would include analysis during a timeframe that meets the needs of the project. In this case the VE methodology planned will be applied during several meetings and studies during the 16-month process. The process is outlined below:

2.2 Preliminary Information Gathering Preparation Effort-Meetings

At least two one-week studies are planned, one in April 2004 and the second during January 2005. Each one will have pre-study preparation for the VE effort consisting of scheduling study participants and tasks; reviews of documents; gathering necessary background information on the facility; and compiling project data. The Value Engineering Process Schedule is shown in the Appendix. The cost model will be tabulated prior to the first VE study. Information relating to the design, construction, and operation of the facility is important as it forms the basis of comparison for the study effort. Information relating to funding, project planning, operating needs, systems evaluations, cost basis, soil conditions, and construction of the facility is also a part of the analysis.

2.3 Value Engineering Workshop Study Efforts Meetings No. 2 and 3 (3- to 5-day Studies)

Conceptual concepts will be reviewed during Meeting No. 2 (3-5 days). Alternative design concepts will be reviewed during Meeting No. 3 (5 days). Each planned VE workshops will follow a 3 - 5-day study plan effort (an agenda is included in the appendix).

During the workshop, the VE job plan will be followed. The job plan will guide the search for high value improvement areas in the Project and included procedures for developing alternative solutions for consideration while at the same time considering other efficiencies. It includes these phases:

- Information Gathering Phase
- Function Identification and Cost Analysis Phase
- Creative Phase
- Evaluation Phase
- Development Phase
- Presentation, Reporting Phase

2.3.1 Information Phase

At the beginning of the study, the conditions and decisions that influence the development of the project must be reviewed and understood. For this reason, the Design Consultant Project Manager will provide design information about the project to the VE Team. Following the presentation, the VE Team will discuss the project using the documents provided.

2.3.2 Function Identification and Cost Analysis Phase

Based on the FDOT cost estimate, historical and background data, a cost model will be developed for this project organized by major construction elements. It is used to distribute costs by project element; serve as a basis for alternative functional categorization; and to assign worth to the categories, where worth is the least cost to provide

the required function, as determined by the VE Team. The VE Team identifies the functions of the various project elements and subsystems and creates a Function Analysis System Technique Diagram (F.A.S.T.) to display the relationships of the functions.

2.3.3 Creative Phase

This VE study phase involves the creation and listing of ideas. During this phase, the VE Team generates as many ideas as possible allowing for a productive and creative atmosphere and to help team members to "think outside the box." Judgment of the ideas is restricted at this point to insure vocal critics do not inhibit creativity. The VE Team is looking for a large quantity of ideas and association of ideas.

The FDOT and the design team may wish to review the creative design suggestions that are listed in **Section 6**, because they may contain ideas, which can be further evaluated for potential use in the design.

2.3.4 Evaluation Phase

During this phase of the workshop, the VE Team judges the ideas generated during the creative phase. Advantages and disadvantages of each idea are discussed and a matrix will be developed to help determine the highest-ranking ideas. Ideas found to be irrelevant or not worthy of additional study are discarded. Those that represent the greatest potential for cost savings or improvement to the project are "carried forward" for further development.

The creative listing is re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may change, or they may be combined into a single idea. For these reasons, some of the originally high-rated ideas may not be developed.

2.3.5 Development Phase

During the development phase, each highly rated idea is expanded into a workable solution. The development consisted of a description of the idea, life cycle cost comparisons, where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed ideas. Each idea will be written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, are also prepared in this part of the study. The developed VE ideas will be summarized in the section entitled **Section 7 – Recommendations**.

2.4 Post Study Effort

The post-study portion of the VE study includes the preparation of this Value Engineering Study Report and the discussions and resolution meetings with FDOT personnel. The FDOT Management team should analyze each alternative and prepare a short response, recommending incorporating the idea into the project, offering modifications before implementation, or presenting reasons for rejection. The VE Team is available for consultation after the ideas are reviewed. Please do not hesitate to call on the VE team for clarification or further information for considerations to implement any of the presented ideas.

2.4.1 Presentation and Resolution Phase

The final phase of the VE study begins with the presentation of the ideas on the last day of the VE Study. The VE Team screens the VE ideas before draft copies of the report are prepared. The initial VE ideas are

arranged in the order indicated to facilitate cross-referencing to the final recommendations for revision to the Contract Documents.

2.4.2 Final Report

The acceptance or rejection of ideas described in this report is subject to FDOT's review and approval. The VE Team is available to address any final draft report comments for incorporation into the final report.

2.5 Interim and Follow on Meetings (Several are planned - One was held in early February 2004, One was held during April 26-30, 2004, and One is planned for Early November 2004)

The RS&H Design team presented their Preliminary Design Concepts to the VE team during the April 26-30, 2004 meeting. The RS&H team will refine the preliminary design until the next meeting in November 2004. The VE team will again meet in November 2004 to make final refinements. RS&H will complete the preliminary design and the VE team will meet during February 2005 to work out any details that are remaining issues. During planned meetings in April 2005 and May 2005 RS&H will present the Final Design Concept for review and comments by the FDOT VE team.

WORKSHOP PARTICIPANTS AND PROJECT INFORMATION 3

3.1 Participants

Representatives from the RSH Design Consultants presented an overview of the project to the Value Engineering Study Team on April 26, 2004. The purpose of this meeting was to acquaint the Study Team with the overall project and scope of the VE team involvement during this VE study held April 26-30, 2004. The study team included the following experts who attended or made contributions to the presentation:

Name	Role	Affiliation
Viaduct Team		
Richard Creed	Roadway Design Team Leader	FDOT
Ann Broadwell	Environmental/PD&E	FDOT
Steve Braun	Environmental/PD&E	FDOT
Mary Tery Vilches	Environmental/PD&E	FDOT
Amie Goddeau	Drainage	FDOT
Eduardo Cabellero	Construction	FDOT
Pat McCann	Construction	FDOT
Jack Crahan	R/W	FDOT
John Danielsen	Structures	FDOT
Javier Bustamante	R/W	FDOT
Joseph Rojas	Design	FDOT
Nick Danu	Environmental/PD&E	FDOT
Dong Chen	ITS/Traffic Operations	FDOT
Mark Plass	ITS/Traffic Operations	FDOT
Gregor Senger	Noise wall environmental	FDOT
Turnpike Team		
Joe Borrello	Roadway Design Team leader	FDOT
Paul Lampley	Environmental/PD&E	FDOT
Shandra Davis	Drainage	FDOT
Mike Bone	Construction/Structures	FDOT
Tom Stepp	R/W	FDOT
Norm Bryant	Turnpike	FDOT
Guillermo Becerra	Roadway Design	FDOT
Howard Webb	Roadway Design	FDOT
Bill Taylor	R/W	FDOT
Rick Mittinger	Signage	FDOT
Ben Burton	Roadway Design	FDOT
Others		
Jeff Bowen	RS&H	RS&H
Steve Wilson	RS&H	RS&H
Jeff Easley	RS&H	RS&H
Philippe Jolicoeur	RS&H	RS&H
Rick Johnson	Team Leader	PMA Consultants LLC
Name	**Role**	**Affiliation**
Gerry O'Reilly	Director Transportation	FDOT

	Development Division	
Scott Seeburger	Project Manager	FDOT
Del Younker	Co-Team Leader	PMA Consultants LLC
Rocky Deprimo	VE Manager	FDOT
Yajaira Moleiro	RS&H	RS&H
Jonathan Overton	Traffic Operations	FDOT
Mortenza Alian	Roadway Design	FDOT
Joseph Yesbeck	Transit	Carter-Burgess

3.2 Project Information

The VE Team reviewed the project informtion that included conceptual layouts on aerial maps, trypical sections, as well as the schedule of events and the Actions Item list that was developed at the meeting on the February 12, 2004. The review was followed by a site visit to physically see the facility and introduce the VE Team to the overall project.

3.3 List of VE Study Material

1. Interstate I-595 LPA by RS&H (11 x 17 drawings)
2. CADD drawings (LPA/Typical Sections) posted on the boards
3. Agenda
4. PowerPoint slide presentation by RS&H
5. As-built drawings from previously built I-595 construction
6. VE study process recommended to be used during the PD&E design process (shown in the slide presentation)
7. Updated LPA with 2034 traffic
8. Redi maps for R/W along corridor
9. R/W Cost Estimates
10. LPA preliminary plans

3.4 Summary Of General Project Input - Objectives, Policies, Directives, Constraints, Conditions & Considerations

The following is a summary of general project input, including the goals, objectives, directives, policies, constraints, conditions and considerations presented to the study team. Any "element" specific input is indicated by parentheses around the elements, disciplines and interests (i.e., right-of-way, roadway, environmental). Representatives from the FDOT and RSH Design team provided a project background from the February 12, 2004 meeting and updated it during the morning of April 26, 2004.

3.5.1 Project Functions, Goals & Objectives (what the project should do as determined at the February 12 meeting):

1. The primary project objective is to optimize the scope and expenditure for the intended functions

2. Meet the demanding complex design for the intended LPA improvements
3. Meet the 16-month combined PD&E and VE review process
4. Maintain consistency with the LPA
5. Integrate the updated traffic projections into the LPA
6. Meet the existing and projected traffic demands needs of the corridor by maximizing the existing corridor's potential with minimal impacts

3.5.2 Project Policies & Directives: *(documented things the project must or must not do)*

1. The project will meet economic, engineering design, environmental and social criteria requirements.
2. Meet the goals of the future development.

3.5.3 General Project Issues: *(unchangeable project restrictions)*

1. No additional R/W over LPA identified areas
2. Environmental requirements
3. Production schedule
4. Permitting requirements

3.5.4 General Project Conditions & Considerations:

1. Corridor configurations
2. Previous issues listing

ECONOMIC DATA, COST MODELS AND ESTIMATES 4

4.1 Economic Data

The Study Team developed economic criteria used for evaluation with information gathered from the Planning and Environmental Management Team. To express costs in a meaningful manner, the cost comparisons associated with alternatives are presented on the basis of total Life Cycle Cost and discounted present worth. Project period interest rates are based on the following parameters:

Year of Analysis:	2004
Economic Planning Life:	30 years starting in undetermined year
Discount Rate/Interest:	5.00%
Inflation/Escalation Rate:	3.00%

The Study Team developed some very preliminary cost estimates that include the major construction elements for some of the project elements. As can be expected, judgments at this stage of the study are based on experience and intuition rather than facts, which may not be uncovered until later in the study. The Study Team realizes this is a very preliminary and cursory estimate of costs. Sufficient information and detail has not yet been developed to allow for a proper value analysis.

CREATIVE IDEA LISTING 5

5.1 Creative Idea Listing

This VE study phase involves the creation and listing of ideas. During this phase, the VE Team generates as many ideas as possible allowing for a productive and creative atmosphere to help team members "think outside the box." Judgment of the ideas is restricted at this point to insure vocal critics do not inhibit creativity. The VE Team is looking for a large quantity of ideas and association of ideas.

The FDOT and the design team may wish to review the creative design suggestions that are listed in **Section 6**, because they may contain ideas, which can be further evaluated for potential use in the design. The creative idea phase yielded the following list of design suggestions.

Design Suggestions

Sort Code	**Design Suggestions**
DR	Assess existing drainage (some ponds were over-dug) and determine new drainage needs
DR	FDOT will assist with drainage issue areas (background data)
DR	Fix drainage problems along Marina/SR 84 - upgrade I-595
DR	Investigate FP&L easement for use as a borrow pit/mitigation and/or treatment
DR	Investigate NW quadrant at SR 7 drainage pond separation
DR	Pond siting team to outline a plan for drainage, mitigation, and permitting
DR	Pond siting team to review project and hold periodic meetings with RS&H
DR	Utilize infield area at the Turnpike interchange for ponds
Enviro	Investigate under viaduct to determine extent of existing wetlands
Enviro	Minimize wetland impacts and avoid Pond Apple Slough impacts
Enviro	Obtain Tallahassee input and testing for taller noise walls at bridges
Enviro	Organize a design/construction team to review phasing and noise walls and other issues
Enviro	Upfront mitigation effort
GEO	Avoid impacts to Marina
GEO	Check current Coast Guard/COE for clearance criteria - South Fork - "New River"
GEO	Correct typical on bridge (east of SR 7 to west of I-95)
GEO	Correct viaduct typical section (existing viaduct was changed during construction by a VECP)
GEO	Include SR 84 in corridor analysis
GEO	Investigate adding a SB Turnpike to WB I-595 direct ramp connection
GEO	Relocate ramps CD etc. to SR 84 to north of I-595/I-95 interchange
GEO	Schedule replacement of SR84/Bascule Bridge in next 10 years - how does this tie into I-595?
GEO	Try to make exit to right consistently
ITS	Consider Ramp metering
ITS	Consider using TMC, ITS and advanced signing to assist with driver
ITS	Give decision maker more time to make movement

ITS	Give driver chance to reverse decision if needed (improve signage)
ITS	Motorist to understand commitment to decision points - advanced into needed (signage)
ITS	Provide communication to driver earlier to make decisions on routing
ITS	Sign Airport to I-595 EB and separate from CD NB/SB I-95
ITS	Simulation of the ITS/signing for driver expectancy after Meeting #3
PDE	Expand corridor study area east to US 1 and Airport
PDE	Include I-595 analysis with others with network analysis
Public	Next submittal to include color coded lanes and corrected traffic arrows
Public	Prepare 3-D model for public input/team analysis
RW	Investigate all vacant properties along corridor - 1,000 ft each direction for pre-purchase
RW	Investigate who owns properties and uses for possible best value R/W acquisition
Sign/ITS	Sign traffic I-595 EB to I-95 SB, Airport, Port, and US 1 to I-95 SB

Legend:
DR – Drainage
Enviro – Environmental Issue
GEO – Geometry
ITS – Information Traffic Systems
PDE – Project Development & Environment Consideration
Public – Public Concern
RW – Right of Way
Sign/ITS – Signage and ITS Issue

EVALUATION 6

During this phase of the workshop, the VE Team judged the ideas generated during the creative phase. Advantages and disadvantages of each idea are discussed and a matrix was developed to help determine the highest-ranking ideas. Ideas found to be irrelevant or not worthy of additional study are discarded. Those that represent the greatest potential for cost savings or improvement to the project are "carried forward" for development.

The creative listing is re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may change, or they may be combined into a single idea. For these reasons, some of the originally high-rated ideas may not be developed.

During the creative phase numerous ideas, alternative proposals and/or recommendations were generated for each required function using conventional brainstorming techniques and are recorded on the following pages. These ideas were discussed and evaluation criteria were determined. We identified seven weighted evaluation criteria that included constructability and MOT, operations, transit accommodations, MPO and public acceptance, environmental impacts, capital and life cycle costs, and geometric features. The evaluation criteria were assigned a weighted value from 1 to 10 based on a VE Team consensus on the importance of each item. Criteria with the most importance received a 10 weight and the least important received a 3 weight. The ideas were then individually discussed and given a score, on a scale of 1 to 5 with 1 being the least beneficial and 5 most beneficial. The score for each item is multiplied by the weighted criteria value and each multiplication product is added to obtain a total score for the idea.

Table 6.1 – 1 is a list of ideas that were generated during the creative phase and how each idea scored in the individual evaluation criteria. **Table 6.1 – 2** illustrates the weighted values for the evaluation criteria and **Table 6.1 – 3** shows the evaluation matrix for Idea Ranking total scores for all ideas carried forward. The ideas that scored equal to or greater than the original design concepts total score were sufficiently rated to warrant further development. The ideas in the table with strike-through were not developed because they were combined with other ideas, not feasible, or were eliminated from consideration for other reasons.

There were 16 ideas that were evaluated and scored. The VE Team discussed each of the evaluated ideas with the Consultant Project Manager during a mid-point review conversation on Wednesday, April 28, 2004. The VE Team discussed each and narrowed the final group of ideas to a total of 15 for final development and analysis.

From that discussion, a summary list of viable ideas, Table 6.1 – 4, was confirmed to warrant developing. The write-ups for those ideas are in Section 7. The tables that follow show the original 52 ideas, with the ideas that were eliminated shown as strike-through. The ideas that survived the evaluation, analysis and development phases of the study became viable alternatives for cost savings.

TABLE 6.1 –1
Value Engineering Study Ideas and Scores

Entire Corridor

Idea No.	Ideas	Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance	Environ. Impacts (30)	Capital and LCC	Geometric Features (15)
	Original Concept							
	LPA Alternative	3	4.5	3	5	3	4.5	4
	Entire Corridor Team							
ds	WB Off ramp - West of 136th and east of FHP (Interim Project)	5	4	3	5	4	4	2
ds	WB Off ramp - West of Sawgrass X-way with braiding (Ultimate Project)	4	5	3	5	3	5	5
ds	Restriping the Viaduct in the EB direction to increase capacity starting at the Turnpike to east of I-95							
ds	Shift the WB braided ramp at Pine Island east to hold the grade and then drop after the braid	4	4.5	3	5	3	4.5	5
ds	Shift SR 84 north at Pine Island holding one through lane and maintain current SR 84 alignment	5	5	3	5	3	5	5
ds	Shift the WB braided ramp at Pine Island east to hold the grade and then drop after the braid and reverse the braid to take the on ramp over the off ramp	5	5	3	5	3	4.5	5
ds	Shift the EB braided ramp at Flamingo west to hold the grade and then drop after the braid	4	4.5	3	5	3	4.5	5
ds	Keep SR 84 along the southern R/W and hold the flyover lane adjacent to the mainline with MSE wall to just east of Hiatus and then install a braided bridge to allow for an EB on ramp							
ds	Two lane ramp width striped for a single lane ramp from I-595 to Nob Hill							
ds	WB SR 84 continuous connection through SR 7 interchange (small ramp to SR 84)							
ds	LPA: Reversible lanes (2) in median at grade.							
1	Elevated reversible lanes (3) with direct connnections to Turnpike facilities. Future at-grade highway lanes added to the median underneath.	2	5	3	2	3	3	4
2	Elevated reversible lanes (3) with direct connnections to Turnpike facilities. Extra room for braids in median.	2.5	5	3	2	3	3	3
3	Elevated reversible lanes (3) with direct connnections to Turnpike facilities. Transit underneath with tunnels from stations to outside.	2.5	5	4	4	3	3	3
4	Elevated reversible lanes (2) and single reversible bus lane for off-peak. Extra room for braids in median. Stations underneath with tunnels to outside.	2.5	4.5	2	2	3	4	4
5	Elevated reversible lanes (2) and reversible transit lanes (2). Future at-grade highway lanes added to the median underneath. Stations underneath with tunnels to outside.	1	5	4	5	3	1	2
6	Elevated reversible lanes (2) and reversible transit lanes (2). Extra room for braids in median. Stations underneath with tunnels to outside.	1	5	4	5	3	1	2
7	Local Traffic Management Center	5	5	3	5	3	4	4

TABLE 6.1 –1 (Continued)
Value Engineering Study Ideas and Scores

Turnpike Team

	Ideas	Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance (45)	Environ. Impacts (30)	Capital and LCC	Geometric Features (15)
	Original Concept							
	LPA Alternative	3	4.5	3	5	3	4.5	4
	Turnpike Team							
ds	Can we fit mainline of I-595 between the piers for the reversible lanes flyovers to the Turnpike							
	~~Direct connects to the Turnpike~~							
	Look at 5 and 5 General Use lanes	3	2	3	4	3	2	3
ds	~~Build an expandable flyover SB onto the Turnpike that is 2 lanes new and future 3- or 4-lanes~~							
	~~Build a 3 lane flyover and stripe 2 lane for SB flyover to the Turnpike~~							
ds	Ramp Turnpike SB exiting at Griffin before the flyover and eliminate the weave							
ds	Combine exit movements for Griffin and I-595 from SB Turnpike							
	~~Take reversible lanes over the flyover at the Trunpike~~							
	~~Go to 4 and 4 with elevated reversible lanes~~							
	~~Build the 6- and 4-lane typical section using Aux. Lanes for capacity~~							
ds	At the Turnpike Overpass shift the WB mainline north 21± ft with No. 7							
	~~Exit SB Turnpike to WB I-595 with a right exit to Toll booth and west onto SR 84 or I-595~~							
	~~Exit SB Turnpike to EB I-595 with a flyover directly to the mainline~~							

Viaduct Team

Idea No.	Ideas	Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptan	Environ. Impacts (30)	Capital and LCC	Geometric Features (15)
	Original Concept							
	LPA Alternative	3	4.5	3	5	3	4.5	4
	Viaduct Team							
	I-595 WB CD move north/closer to SR 84	4	4.5	3	4.5	4	3	4
	~~SB I-95 to WB CD utilize SR 84~~							
	Split WB ramps from I-95 to I-595 after the viaduct	4	3	3	5	3	4.5	4
ds	NB I-95 to WB I-595 - Move departure ramp after existing end bent - Correct opposite superelevation on bridge - Close proximity of merge lanes (issue)							
ds	Mainline CD ramp move it farther west							
	~~Tansition to I-595 mainline as a CD - move WB mainline to a new adjacent structure~~							
ds	Braid SB I-95 to WB I-595 over or under							
ds	See Layout B. Braid NB/SB I-595 ramps							
ds	See Layout C Braid over I-95 to I-595 NB exit to I-595 WB							
ds	See Layout D, Separate braids and spread out movement of A, B, or C along I-595 WB							
ds	Improve connection EB I-595 to I-95 SB south of ramps, push ramp gore farther south							
ds	Move mainline to south to avoid boat owners - may impact Pond Apple Slough							
ds	Realign SR 84 - reduce median and allow more room for I-595 widening							

TABLE 6.1 –2
Value Engineering Study Criteria Weighted Values

Entire Corridor

Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance (45)	Environ. Impacts (30)	Capital and LCC (25)	Geometric Features (15)
10	7	5	9	6	5	3

Turnpike Team

Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance (45)	Environ. Impacts (30)	Capital and LCC (25)	Geometric Features (15)
10	7	5	9	6	5	3

Viaduct Team

Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance (45)	Environ. Impacts (30)	Capital and LCC (25)	Geometric Features (15)
10	7	5	9	6	5	3

TABLE 6.1 –3
Value Engineering Study Evaluation Scores

Entire Corridor

Idea No.	Ideas (Weight)	Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance (45)	Environ. Impacts (30)	Capital and LCC (25)	Geometric Features (15)	TOTAL
	Original Concept								
	LPA Alternative	30	31.5	15	45	18	22.5	12	**174**
	Entire Corridor Team								
ds	WB Off ramp - West of 136th and east of FHP (Interim Project)	50	28	15	45	24	20	6	**188**
ds	WB Off ramp - West of Sawgrass X-way with braiding (Ultimate Project)	40	35	15	45	18	25	15	**193**
ds	Restriping the Viaduct in the EB direction to increase capacity starting at the Turnpike to east of I-95	0	0	0	0	0	0	0	**0**
ds	Shift the WB braided ramp at Pine Island east to hold the grade and then drop after the braid	40	31.5	15	45	18	22.5	15	**187**
ds	Shift SR 84 north at Pine Island holding one through lane and maintain current SR 84 alignment	50	35	15	45	18	25	15	**203**
ds	Shift the WB braided ramp at Pine Island east to hold the grade and then drop after the braid and reverse the braid to take the on ramp over the off ramp	50	35	15	45	18	22.5	15	**200.5**
ds	Shift the EB braided ramp at Flamingo west to hold the grade and then drop after the braid	40	31.5	15	45	18	22.5	15	**187**
1	Elevated reversible lanes (3) with direct connnections to Turnpike facilities. Future at-grade highway lanes added to the median underneath.	20	35	15	18	18	15	12	**133**
2	Elevated reversible lanes (3) with direct connnections to Turnpike facilities. Extra room for braids in median.	25	35	15	18	18	15	9	**135**
3	Elevated reversible lanes (3) with direct connnections to Turnpike facilities. Transit underneath with tunnels from stations to outside.	25	35	20	36	18	15	9	**158**
4	Elevated reversible lanes (2) and single reversible bus lane for off-peak. Extra room for braids in median. Stations underneath with tunnels to outside.	25	31.5	10	18	18	20	12	**134.5**
5	Elevated reversible lanes (2) and reversible transit lanes (2). Future at-grade highway lanes added to the median underneath. Stations underneath with tunnels to outside.	10	35	20	45	18	5	6	**139**
6	Elevated reversible lanes (2) and reversible transit lanes (2). Extra room for braids in median. Stations underneath with tunnels to outside.	10	35	20	45	18	5	6	**139**
7	Local Traffic Management Center	50	35	15	45	18	20	12	**195**

TABLE 6.1 –3 (Continued)
Value Engineering Study Evaluation Scores

Turnpike Team

Idea No.	Ideas (Weight)	Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance (45)	Environ. Impacts (30)	Capital and LCC (25)	Geometric Features (15)	TOTAL
	Original Concept								
	LPA Alternative	30	31.5	15	45	18	22.5	12	174
	Turnpike Team								
ds	Can we fit mainline of I-595 between the piers for the reversible lanes flyovers to the Turnpike	0	0	0	0	0	0	0	0
	~~Direct connects to the Turnpike~~	0	0	0	0	0	0	0	0
	Look at 5 and 5 General Use lanes	30	14	15	36	18	10	9	132
ds	Build an expandable flyover SB onto the Turnpike that is 2-lanes now and future 3- or 4 lanes	0	0	0	0	0	0	0	0
	~~Build a 3-lane flyover and stripe 2-lane for SB flyover to the Turnpike~~	0	0	0	0	0	0	0	0
ds	Ramp Turnpike SB exiting at Griffin before the flyover and eliminate the weave	0	0	0	0	0	0	0	0
ds	Combine exit movements for Griffin and I-595 from SB Turnpike	0	0	0	0	0	0	0	0
	~~Take reversible lanes over the flyover at the Trunpike~~	0	0	0	0	0	0	0	0
	~~Go to 4 and 4 with elevated reversible lanes~~	0	0	0	0	0	0	0	0
	~~Build the 6- and 4-lane typical section using Aux. Lanes for capacity~~	0	0	0	0	0	0	0	0
ds	At the Turnpike Overpass shift the WB mainline north 21+ ft with No. 7	0	0	0	0	0	0	0	0
	~~Exit SB Turnpike to WB I-595 with a right exit to Toll booth and west onto SR 84 or I-595~~	0	0	0	0	0	0	0	0
	~~Exit SB Turnpike to EB I-595 with a flyover directly to the mainline~~	0	0	0	0	0	0	0	0

Viaduct Team

Idea No.	Ideas (Weight)	Constructability and MOT (50)	Ops. (35)	Transit Accomodation (25)	MPO and Public Acceptance (45)	Environ. Impacts (30)	Capital and LCC (25)	Geometric Features (15)	TOTAL
	Original Concept								
	LPA Alternative	30	31.5	15	45	18	22.5	12	174
	Viaduct Team								
	I-595 WB CD move north/closer to SR 84	40	31.5	15	40.5	24	15	12	178
	~~SB I-95 to WB CD utilize SR 84~~	0	0	0	0	0	0	0	0
	Split WB ramps from I-95 to I-595 after the viaduct	40	21	15	45	18	22.5	12	173.5
ds	NB I-95 to WB I-595 - Move departure ramp after existing end bent - Correct opposite superelevation on bridge - Close proximity of merge lanes (issue)	0	0	0	0	0	0	0	0
ds	Mainline CD ramp move it farther west	0	0	0	0	0	0	0	0
	~~Tansition to I-595 mainline as a CD - move WB mainline to a new adjacent structure~~	0	0	0	0	0	0	0	0
ds	Braid SB I-95 to WB I-595 over or under	0	0	0	0	0	0	0	0
ds	See Layout B. Braid NB/SB I-595 ramps	0	0	0	0	0	0	0	0
ds	See Layout C Braid over I-95 to I-595 NB exit to I-595 WB	0	0	0	0	0	0	0	0
ds	See Layout D, Separate braids and spread out movement of A, B, or C along I-595 WB	0	0	0	0	0	0	0	0
ds	Improve connection EB I-595 to I-95 SB south of ramps, push ramp gore farther south	0	0	0	0	0	0	0	0
ds	Move mainline to south to avoid boat owners - may impact Pond Apple Slough	0	0	0	0	0	0	0	0
ds	Realign SR 84 - reduce median and allow more room for I-595 widening	0	0	0	0	0	0	0	0

TABLE 6.1 – 4 SUMMARY OF RECOMMENDATIONS

Recommendation No.	Recommendations (Ideas)
1	Analysis and Documentation of Environmental Impacts of I-595 project
2	Drainage/Permitting for I-595 Corridor
3	Right of Way Scope
4	ITS Improvements
5	I-595 Ramp to SB Turnpike
6	Split WB Ramps from I-95 (after) Viaduct farther West
7	Connector-Distributor Road Connect to SR 84
8	University Flyovers
9	Auxiliary Lane
10	Braided Ramps
11	SW 136th Avenue Ramp
12	Elevate Reversible Lanes option
13	All Design Suggestions (shown earlier in the report in **Section 5**)
14-1	Interim WB I-595 to Weston Rd Ramp
14-2	Ultimate WB I-595 to Weston Rd Ramp
14-3	Creating Continuous connections WB SR 84 from SR 7 to Davie Road

Readers are encouraged to review the Creative Idea Listing and Evaluation Worksheets, since they may suggest additional ideas that can be applied to the design or construction.

RECOMMENDATIONS 7

The results of this VE study are shown as individual recommendations developed for each area of the three focus areas (Turnpike, Viaduct and Entire Corridor) of the project. These recommendations include a comparison between the VE Team's proposal and the project's original concept. Each proposal consists of a summary of the original design, a description of the proposed change, a life cycle cost comparison (where applicable), and descriptive evaluation of the advantages and disadvantages of the proposed alternative. Sketches and calculations are shown, if appropriate, are shown with the presentation slides in the appendices. The estimated cost comparisons reflect unit prices and quantities on a comparative basis. Value improvement is the primary basis for comparison of competing ideas. To ensure that costs are comparable within the ideas proposed by the VE Team, the FDOT average construction costs were used as the pricing basis.

7.1 Evaluation Of Recommendations

Some of the VE alternatives' potential savings are interrelated, if one is accepted another one may be or may need to be added, or acceptance of one may mutually exclude another. The VE Team identified total potential savings as shown on **Table 1.5 – 2, Summary of Recommendations**. The write-ups for the individual developed recommendations are included in this section and are presented in the same order as was presented.

Each recommendation should be evaluated by the FDOT and the design team to determine whether to accept or not accept the idea. The recommendations that are accepted should be listed for documentation purposes. For each idea that will not be accepted, the design team normally documents, in writing, the reason or reasons for the non-acceptance. The design suggestions are for consideration by FDOT and the designers. No specific action is normally required to accept or not accept the suggestions, though it is often helpful, for documentation purposes, to formally list those suggestions that will be incorporated into the project design.

7.2 Considerations And Assumptions

In the preparation of this report and the recommendations that follow, the Study Team made some assumptions with respect to conditions that may occur in the future. In addition, the Study Team reviewed the listed project documentation, relying solely upon the information provided by the designer and owner, and relying on that information as being true, complete and accurate. This value analysis and report are based on the following considerations, assumptions and conditions:

> The recommendations rendered herein are as of the date of this report. The Study Team or Leaders assume no duty to monitor events after the date, or to advise or incorporate into any of the alternatives, any new, previously unknown technology.
>
> The Study Team or Leaders assume that there are no material documents affecting the design or construction costs that the Team has not seen. The existence of any such documents will necessarily alter the alternatives contained herein.

The Study Team or Leaders do not warrant the feasibility of these recommendations or the advisability of their implementation. It is solely the responsibility of the designer in accordance with the owner, to explore the technical feasibility and make the determination for implementation.

RECOMMENDATION NO. 1: Analysis and Documentation of Environmental Impacts at Interstate 595 PD&E

Social Impacts – this will include land use, community cohesion, R/W issues and utilities
Identify your audience in each section of the project and meet with them throughout the process

Potential Audience for Viaduct – Railroad and FPL
Marina owners
Permit Agencies

Potential Audience for Turnpike to University Drive – residents who have already experienced 595 construction

Potential Audience for University Drive to the west – residents who have always lived with I 595

Physical Impacts – this will include contamination, noise and constructability
Coordinate with D4 Environmental Services Staff to gain historic perspective and utilize library (Action item – set up meeting with D4 Env. Services staff)

Identify your audience in each section of the project and meet with them throughout the process. Noise may be the issue but the audience may be different.

Cultural Impacts – this will include Parks and Recreation, archeological sites and historic properties
Identify your audience in each section and meet with them throughout the process

Potential Audience for Viaduct – Broward County Natural Resources and Parks
Local Environmental Groups
State and Federal agencies

Potential Audience for Turnpike to University Drive – users of SFWMD ROW

Potential Audience for University Drive to the west – historical/archeological societies
SFWMD trail users
Recognize the role this element will play in pond siting and mitigation – do not treat them as separate entities
(Action item – field review of Pond Apple Slough with Pond Siting team)

Natural Resource Impacts – this includes listed species (both plants and animals), wetlands, water quality/drainage
Identify your audience in each section and meet with them throughout the process
Anticipate the need for design and construction of accelerated mitigation projects

RECOMMENDATION NO.2: Drainage/Permitting for I-595 Corridor

I. DRAINAGE/PERMIT TASKS FOR THE I-595 CORRIDOR:
*Begin the Pond Siting Process, which will also include mitigation considerations – Process to managed and coordinated by Consultant.

STEP 1 – Develop Initial Roadway and Drainage Data (Primarily a Consultant Task)

1. Assembly of Preliminary Roadway Data
    a. All existing plans
    b. Proposed typical sections and layout
    c. Proposed profile (i.e., low point consideration)
    d. Aerial photography
    e. R/W information- tax maps, land owners, land use data, existing and proposed r/w

2. Develop Preliminary Drainage/Permit Report (Conceptual Only)
    a. Define all Drainage and Permit Criteria
        - Identify and locate all stormwater treatment required under the existing permits – note water quality and quantity requirements, all outfall locations and permitted sizes, sub-basin limits, TW constraints and SHGWT controls
        - Identify and locate all mitigation areas required under the existing permits and via NOVs during Construction – *ensure all existing mitigation areas in proposed r/w are identified
        - Identify and locate all wetland jurisdictional boundaries adjacent to the corridor
        - Identify all General Permit criteria for the corridor – water quality and quantity, continued use of scuppers – hardship, canal R/W issues (i.e., sheet piling, relocation, dredging, etc.), canal clearances for crossings (i.e., SFWMD, USCG and possibly OPWCD), mitigation ratios for wetland impacts and existing mitigation areas
        - Identify all Drainage criteria for corridor – tail water constraints for outfalls (latest operating controls - CERP impacts to the west), spread limitations on deck drainage, SHGWT limitations on dry pond depth
    b. Quantify all existing stormwater management areas from survey
    c. Based on proposed typical section
        - Identify and quantify mitigation impacts
        - Sub-divide the corridor into logical sub-basins based on distance to major existing treatment areas at interchanges or hydraulic divides such as lateral canals, bridges, etc. – consider existing permit basins, and future construction limits for permitting
        - Assess drainage needs (quality and quantity criteria) per sub-basin
    d. Compare existing drainage areas with drainage needs to quantify volume required
    e. Evaluate expansion of existing facilities in r/w (i.e. dig out existing ponds with concern for creation of water hazards, maximize interchange area, development under new/existing bridge structure at viaduct area, supplement conveyance with ditches /exfilteration trench between major storage areas, etc.)
    f. Estimate volume required off right-of-way

3. Initial Coordination with R/W to define preliminary pond sites (new right-of-way)

*Pond Sitting Process has numerous steps, but getting through Step 1 is the bulk of the time. Note that most of the activities can occur concurrently.

STEP 2 – Pond Siting Kick-off Meeting
Identify and Develop alternative stormwater facilities with team

STEP 3 – Evaluation of Conceptual Options by Individual Offices
Each office looks at the conceptual sites and options to develop any fatal flaws or constraints for each site

STEP 4 – Team Meeting to Screen Alternatives with all Feedback and start Matrix
Start deciding on weighting factors for evaluation matrix, and document the elimination of sites with fatal flaws.

*From this point on the process is an iterative process in evaluating the alternative, refining them and getting as much public input as possible from Information meetings, etc.

*Biggest task for Team is to decide the level of Documentation based on the expected timing of funding for R/W purchases and the design phase.

II. DRAINAGE/PERMIT CONCERNS FOR THE I-595 CORRIDOR:

EASTERN SECTION AT I-95 -
Drainage most likely accommodated in existing areas with expansion – must consider FAA bird hazards if wet ponds are considered

VIADUCT –

1. Identify all vacant parcels (consider bird hazards for any wet ponds at eastern end)
    - Open Australian pine areas south of I-595 on either side of canal to scrape-down and provide mitigation
    - Vacant property south of I-595, north of SR 84 and west of Airport Road could provide drainage as well
2. Develop a dry pond under new expanded viaduct at western end as best use due to shading and need to collect water from superstructure above – overflow to Pond Apple Slough
   Relocate existing wet pond on south side in Pond Apple to dry pond, and fill for mitigation
   Evaluate triangular area in between SR 84 and I-595 to use for drainage/mitigation – will facilitate future replacement of SR 84 bascule to the south
3. Coordinate with City of Dania Beach on 32nd Avenue - look into buying vacant land and truck property to the south as possible drainage alternative – need to look at 26th avenue

impacts as well
4. Develop a dry pond under eastern end of Viaduct west of 26th Avenue
5. Coordinate with Broward County on Pond Apple Slough recharge and mitigation needs

SR 7/TURNPIKE –
1. Identify all vacant parcels
    - Area at Davie Road in SE quadrant
2. Increase wet pond at SR 7&I-595 in NW quadrant -eliminate access road and square area
3. Appears to be quite a few areas at interchange which can provide additional storage – again consideration for taking dry areas to wet versus creation of roadway hazards
4. Coordinate with Turnpike on any surplus in their lakes
5. Approach Ski School Lakes with joint-use
6. Consideration for 7.2 acres of flowage easement in Foreman Lake

MAINLINE DRAINAGE/WETLAND ISSUES TO CONSIDER –
***West of the Turnpike consideration for properties to the north is almost eliminated due to New River Canal – Could consider as worst-case, but would involve pumping.**
1. Identify all vacant parcels
2. Joint-Use potentials including three golf courses, and new developments
3. Coordinate with the City of Davie on adjacent flooding concerns especially at mobile home park with potential of buying for drainage needs
4. Canal relocation/impact potential with SFWMD

WESTERN SECTION –
1. Identify all vacant parcels
    - 2. Appears to be quite a few areas at the I-75 interchange that can provide additional storage

RECOMMENDATION NO. 3: Right of Way Scope

GENERAL
Identify/Locate Parcel ownerships and property lines
Obtain Raster Images from RS&H with master plan right of way lines
Plot property lines on rasters if not done by RS&H
RS&H to estimate acquisition area sizes

RESEARCH FOR MAIN LINE AND DRAINAGE
Listings and Sales with time trend analysis
Contact local municipalities for proposed recent developments

COST ESTIMATES FOR MAIN LINE
Segregate mainline and transit requirements
Attend workshop meeting in winter of 2004/2005
Attend public hearings
Prepare Cost Estimates for right of way identified in the LPA master plan
Update Cost Estimates as right of way is reconfigured
Prepare cost estimate with transit facility included

DRAINAGE COST ESTIMATES & SITE SELECTION MATRIX DEVELOPMENT

- Participation on Drainage Team
- Prepare Cost Estimates for potential drainage parcels
- Contact and feedback from local municipalities
- Identify advanced acquisition parcels

RECOMMENDATION NO. 4: ITS Improvements

Original Concept: ITS as designed by RS&H

Proposed Concept: The local traffic management center (TMC) provides the capability of managing the whole I-595 corridor with the forms of its unique features: reversible lanes, ramp metering, variable speed limits, etc., and coordinating among all agencies; DOT, Broward County, Police, Fire Department, Road Rangers, and FHP.
The local TMC will also control, monitor, and manage the daily reversible lane operations, CCTV, Dynamic and Message Sign (DMS), traffic detection, traffic control devices on the corridor.

Advantages:

- Better traffic control and operation given complexity of traffic in the corridors
- Improves mobility and reduced travel time, etc
- Improves security and safety
- Better monitoring
- Improves capacity
- Quicker emergency response
- Support to other operations
- Better utilization of resources
- Smoother coordination between agencies
- Improved operations
- Less Life Cycle costs

Disadvantages:

- Additional initial and operation costs

RECOMMENDATION NO. 5: I-595 Ramp to SB Turnpike

Original Concept: RS&H Design

Problem: SB Turnpike at Griffin Road exit weave conflict

- Peak hour traffic is 5280
- Need 3 lane ramp

Proposed Concept: SB Turnpike to Griffin Road traffic exits before flyover and bringing on I-595 3 lane ramp

- I-595 3 lane ramp traffic bifurcated into:
  - Two lanes to southbound turnpike
  - Two lanes to Griffin Road Ramp

Advantages:

- Meets traffic demand
- At grade ramp
- Eliminates weave conflicts

Disadvantages:

- 27 Relocations at mobile home park
- Cost of first row of mobile homes $2.2 million estimated

*Relocations pending final geometry

RECOMMENDATION NO. 6: Viaduct-Split WB ramps from I-95 to I-595 (after) Viaduct further West

Original Concept: RS&H design

Proposed Concept: Split WB ramps from I-95 to I-595 (after) Viaduct further West

Advantages:

- Operational advantage combine SR 84 and CD
- Removes weave sections out of interchange area

Disadvantages:

- Help CD operation but entrance to I-595 moves West affecting reversible lane transitions

RECOMMENDATION NO. 7: I-595 WB CD Connect to SR 84 WB near Viaduct

Original Concept: RS&H design

Proposed Concept: Combine WB CD and SR 84 from Bascule Bridge West to SR 7 Interchange

Advantages:

- Easier to Construct
- More area for MOT and construction activities
- More mitigation opportunities due to R/W impacts
- More drainage opportunities (SR 84)
- Bascule Bridge replacement needed within the next 10 years, could be incorporated into design
- Simplifies existing SR 84 geometry

Disadvantages:

- Increased cost of R/W

RECOMMENDATION NO. 8: University Flyovers

Original Concept: RS&H Design, Replace Flyovers in kind

Issues:

- Bridge supports are in conflict with median and outside widening

Proposal:

- Add an additional level to the interchange or around Flyovers (to the south)

Advantages of Bridge over Flyovers:

- Simplify MOT
- Less Cost

Advantages of Replacing Flyovers:

- Allows reversible lanes to stay at mainline grade

Disadvantages of Adding Bridge over Flyovers:

- Public perception of more noise and visual impacts

Disadvantages of Removing Flyovers:

- Removing/reconstructing flyovers
- Added cost
- Traffic disruption / MOT cost

RECOMMENDATION NO. 9: Auxiliary Lanes

Original Concept: RS&H Design

Issues:

- Aux lanes are not continuous
- Does not meet 2034 Traffic projections

Proposal: Provide continuous Aux lanes from University Drive to 136th Ave

Advantages:

- Meets 2034 traffic demands

Disadvantages:

- Moves mainline closer to outside which reduces width for braided ramps

Note:
Additional widening of RS&H preliminary design for the mainline bridges on outside where Aux lanes were not included by the VE review team

RECOMMENDATION NO. 10: Braided Ramps

Original Concept: RS&H Design

Issues:

- Vertical and Horizontal geometry

Proposal: Shift SR 84 to the outside

Advantages:

- Improved access to SR 84 by moving SR 84 to the outside
- By moving MSE walls to the outside will provide additional noise attenuation

Disadvantages:

- Longer structures
- High Costs

RECOMMENDATION NO. 11: SW 136th Ave Ramps (Spin-off project – Alternative #1)

Original Concept: RS&H Design

Issues:

- Weston Rd traffic exiting thru 136th Ave signal

Proposal:

- Provide slip ramp west of 136th Ave to avoid 136th Ave signal

Advantages:

- Relieves congestion at 136th Ave intersection
- Compatible with ultimate improvements

Disadvantages:

- Added cost for slip ramp

RECOMMENDATION NO. 12: Elevate Reversible 3 Lane Structure w/ Transit Option

Problem: Optimize Mainline and Reversible lane usage

- High Right of Way cost associated with separate transit corridor
- Reconstruction of University Drive Flyovers
- Long term (past 2034) expansion of facility

Proposal: Elevated reversible 3 lane structure with transit option from East of 136th to West of Davie Road
(Sketches included with presentation slides shown in the appendix)

Advantages:

- Preserves University Drive Flyovers
- Maximum utilization of R/W
- Construction under traffic-possible fewer MOT lane reductions
- Minimizes Business and Residential Relocations
- Moves traffic away from residential
- Provides for express bus service in reversible lanes
- Construction phasing moves quickly
- Higher utilization of Turnpike Toll revenue forecast (to be verified)
- Direct connection to Sawgrass, I-75, and Turnpike
- Future expansion for transit or general purpose lanes in median
- One additional reversible lane for direct connect
- Alternate route during incident management
- Convenient median transit stations
- Additional lane for increased capacity
- Minimizes Business and Community impacts
- No impact to Electrical Substation or Cemetery

Disadvantages:

- Complex Geometry for Ingress-Egress
- No intermediate connection points (slip ramps)
- Cost approximately $25 million per mile ~ $150 million
- 3rd level structures at University Drive
- Public and political perception of elevated roadway

Suggestion:
Turnpike to complete the Revenue comparison and provide feedback to FDOT/RS&H.
Team to consider carrying this forward based on Turnpike revenue projection study. (Norm)

RECOMMENDATION NO. 14-1: Interim WB I-595 to Weston Rd (Spin-off project – Alternative #2)

Proposal: Interim WB I-595 to Weston Rd Ramp

Advantages:

- Builds ramp sooner than mainline improvements
- Inexpensive to implement sooner

Disadvantages:

- Costs $1.43 million
- Currently not programmed
- Not Compatible with ultimate mainline plans

Cost Estimate:		
Roadway	$100,000	
Structures		
Embankment	$300,000	
MSE Wall	$480,000	
Intersection Improvements at Weston Rd		$250,000
Subtotal	$1.13 million	
MOT/Mobilization	$200,000	
Contingencies	$100,000	
Total	**$1.43 million**	

RECOMMENDATION NO. 14-2: Ultimate WB I-595 to Weston Rd (Spin-off projects – Alternative #3

Proposal: Ultimate WB I-595 to Weston Rd, (Sketches included with presentation slides shown in the appendix)

Advantages:

- Builds ramp sooner than mainline improvements
- Compatible with ultimate mainline plans

Disadvantages:

- Costs $3.5 million
- Currently not programmed

Cost Estimate		
Roadway	$450,000	
Structures	$810,000	
Embankment	$600,000	
MSE Wall	$600,000	
Intersection Improvements at Weston Rd		$250,000
Subtotal	$2.71 million	
MOT/Mobilization	$500,000	
Contingencies	$300,000	
Total	**$3.5 million**	

RECOMMENDATION NO. 14-3: Creating a Continuous Connection WB SR 84 from SR 7 to Davie Road (Spin-off project)

Proposal: Creating Continuous Connection WB SR 84 from SR 7 to Davie Rd.

Advantages:

- Closes "Missing Link" on SR 84 between SR 7 and Davie Rd
- Access from SR7 SB directly to SR 84
- Removes traffic from Mainline
- Ties to Ultimate SR 84 WB CD
- Matches LPA Concept

Disadvantages:

- Requires PD&E study
- Potential noise wall needed (+- $4 million for construction)

Cost Estimate	
SR 84 Roadway	$600,000
Embankment	$300,000
Bulkhead	$400,000
Subtotal	$1.3 million
Contingency 20%	$260,000
MOT/Mobilization 10%	$130,000
Total	**$1.69 million +- plus noise walls at $4 million**

IMPLEMENTATION PLAN

RS&H will continue to refine the preliminary design concepts with the VE team recommendations made during the VE study.

APPENDIX

I-595 Corridor PD&E from I-75 to East of I-95
Meeting Agenda
April 26 – 30, 2004

Monday

8:30
- Welcome
- Purpose of This Overall Design Review/VE Process
- Schedule – Where We Are at in The Process
- Review of Kickoff Meeting
- Purpose of Meeting II
- Weeks Agenda
- Traffic 2020 vs. 2034
- Problem Areas (LOS Failures)

12:00
- Lunch

1:00
- In Field Review
  - Ramp Connections @ I-95
  - -Viaduct/Pond Apple Slough
  - -Turnpike Connections
  - -Braided Ramp Locations (north & south of I-595)
  - -University Drive. Flyovers
  - -Transition Areas of Reversible Lanes
  - -Noise Wall Locations (potential)
  - -136th Ave. Slip Ramp
- Divide into two Teams

Tuesday

8:30 **Turnpike Interchange Review**

Focus Areas:
- Turnpike SB Onramp (Area between ramp connection and Griffin Rd)
- Flyover Locations
- Superfund Site Location

I-595 (I-95 to Turnpike

Focus Areas:
- I-95 Ramp Connections
- Pond Apple Slough
- CD System
- Reversible Lane Transition Area
- EB SR7 On Ramp to I-595 EB

12:00
- Lunch

1:00
- Continue

4:30
- End

Wednesday

8:30	**Turnpike**	**Viaduct**
	• Continue from Tuesday	• Continue from Tuesday
Noon	• Lunch	
1:00	**I-595 West (Davie Road to I-75)**	
	Focus Areas: - Braided Ramp Locations - University Drive Flyovers - Reversible Lane Transition area - Noise Wall Locations (potential) - EB & WB 136th Slip Ramps - Flyover Locations	
4:30	• End	

Thursday

8:30	**I-595 West (Continue from Wednesday)**
12:00	• Lunch
1:00	• Continue
4:30	• End

Friday

8:30	• Design Team Review Recommendations
10:00	• Turnpike
10:30	• Design Team Review Recommendations I-595 (I-95 to Turnpike) Viaduct
11:00	• Design Team Review Recommendations (I-595 West)
12:30	• End

PMA Consultants LLC

SLIDE PRESENTATION

Value Engineering
For Transportation Improvements

I-595 Corridor PD&E from I-75 to East of I-95

Value Engineering Study Report

FM Number: 409354-1-22-01

Fed. Aid Project: Yes

Project Description: I-595 from West of I-75 to East of I-95

Study Dates: November 1 - 5, 2004

Project Development Phase				Study Identification Number											
PD&E	Design		Other								VE Item No.				
FDOT-D4											Yr.		Dist.		No.	
											0	5	0	4	0	4

This study has been performed in accordance with current applicable FDOT Value Engineering Procedures and Techniques

Richard L. Johnson, CVS No.20030201, PE No. 38681

Date: December 30, 2004

TABLE OF CONTENTS

SECTIONS

EXECUTIVE SUMMARY 1

1.1 INTRODUCTION

The proposed improvements are planned for I-595 from I-75/Sawgrass Expressway Interchange to East of the I-95 Interchange. A master plan has been completed and the identified Locally Preferred Alternative (LPA) was adopted by the Broward County Authorities and FHWA. The project begins at Weston Road on the West end and proceeds eastward to 3350 feet East of I-95 centerline (approximately).

The proposed improvements reviewed during the November 1-5, 2004 meeting included:

- Turnpike and I-595 Interchange
- I-595 Entire Corridor
- University Drive and I –595 Interchange (5 options)
- Broward County Greenway
- Elevated Reversible Lanes
- Exceptions (horizontal and vertical along corridor)
- Reversible lane entrance and exit transitions
- Braided Ramps
- Drainage and Environmental
- Transit

Scope of the VE Process

- The FDOT has advanced the project into the PD&E phase
- Differs from normal PD&E due to complexity, size and integration with other projects
- VE effort will encompass a 16 month process defining the system geometry
- Each VE effort will focus on Design Packages
- Each Design Package will be coordinated with the system requirements
- Consistency will be maintained with the LPA intent

1.2 ORGANIZATIONAL STRUCTURE

- The team will be managed by the FDOT Management Team
    - The PD&E Design team consists of the RS&H, HDR, Parsons, PBS&J and Wantman groups
    - Integrated as part of the Design and Reviews will the VE Meetings Facilitators
    - The FDOT Design Review team had representation from the following areas
        - Planning and Environmental Management
        - Design
        - Construction
        - ITS/Traffic Operations
        - Utilities
        - Structures
        - Drainage/Permitting
        - Right of Way
        - Surveying

The Locally Preferred Alternative (LPA) was endorsed by Broward County and approved by the FHWA. Through Public Involvement workshops held during the Master Plan phase the LPA evolved.

Project Purpose

The current project purpose is to meet the existing and projected traffic demand needs of the corridor by maximizing the existing corridor's potential with minimal impacts

1.3 MASTER PLAN LOCALLY PREFERRED ALTERNATIVE

Major components of the LPA Roadway system improvements include:

- Collector-Distributor System
- Continuous connection at SR 84 between Davie Road and SR 7
- General Purpose use lanes
- Reversible lanes in the median from Hiatus Road to SR 7
- Two lane off ramps
    - Westbound at
        - University Drive
        - Nob Hill Road
        - Pine Island Road
        - Flamingo Road
    - Eastbound at
        - Pine Island Road
        - University Drive
        - Davie Road
- Two lane on ramps
    - Westbound at
        - Pine Island Road
    - Eastbound at
        - University Drive
- Braided ramps
    - Westbound between
        - University Drive and Pine Island Road
        - Pine Island Road and Nob Hill Road
        - Hiatus Road and Flamingo Road
    - Eastbound between
        - Flamingo Road and Hiatus Road
        - Nob Hill Road and Pine Island Road
    - Flyovers at
        - Hiatus Road WB and
        - Hiatus Road and Pine Island Road EB
- Interchange efficiency improvements at
    - Florida's Turnpike
    - SR 7
    - I-95 Interchange
    - I-75 Interchange
- Transit system to be extended from I-75 to the Ft. Lauderdale Airport long-term parking, Tri-Rail, and Downtown locations with stations located along the I-595 corridor between I-75 and 136th Avenue, Hiatus Road and Nob Hill Road and between University Drive and Davie Road. (not part of the I-595 Corridor reviewed by the VE team during this VE study).

1.4 I-595 PD&E

Traffic has been updated from the 2020 to 2034 projections. Toll and congestion management has been analyzed. The original LPA was updated to a revised LPA updated to show effects of the 2034 traffic projections. The original LPA has been updated with recommendations made by the VE team after the last meetings since April 2004 and interim VE team meetings held from April through October 2004.

I-595 CORRIDOR ACTION ITEM LIST ESTABLISHED DURING FEBRUARY 2004 MEETING UPDATED APRIL 26, 2004 & NOVEMBER 1-5, 2004

Items shown below were noted as part of the February 2004 Kick-off meeting and VE Study No. 1:

Action Items	Assignee	Due by date	Completion date—Status as of 11/1-5/04
Independent drainage team to review options	Howard/Scott RS&H	Before Meeting #2	Took place with drainage group during the interim meetings, drainage, pond siting, list of pond locations
Consider limits of cross road improvements	RS&H	By Mtg #5	Identified by intersection already
Incorporate traffic mgt sys I-595 ITS corridor	RS&H	Continuous	Not fully identified yet, ongoing with Mark
Determine R/W needed for Mainline and coordinate with Transit to determine R/W needed ASAP	RS&H/FDOT	July 2004	R/W estimated per option
Update traffic for 2034 and adjust current LPA	Jeff RS&H	May 2004	Updated and incorporated
Meeting with Gus prior to March PIM to discuss noise issues and placement of walls	RS&H	Mid March 2004	Complete, meetings continue with noise wall locations, need analysis for noise walls, struct. analysis
Set schedule to meet/coordinate with Tpk and others	RS&H/FDOT/TPK	March 2004	Phasing needs to be determined
Obtain feedback from Paul Re: EPA regulations	FDOT	Feb 17, 2004	Consent decree submitted not signed off yet, 595 improvements covered
Obtain FHWA approval for LPA refinements	Scott/Jeff/Nick RS&H/FDOT	Feb 23, 2004	FHWA advised and up to speed
Coordinate I-595 and Tpk I/C work segments	FDOT/Turnpike	Meeting #4	Phasing to be looked at during the VE study 3 session, with detailed review during January 2005

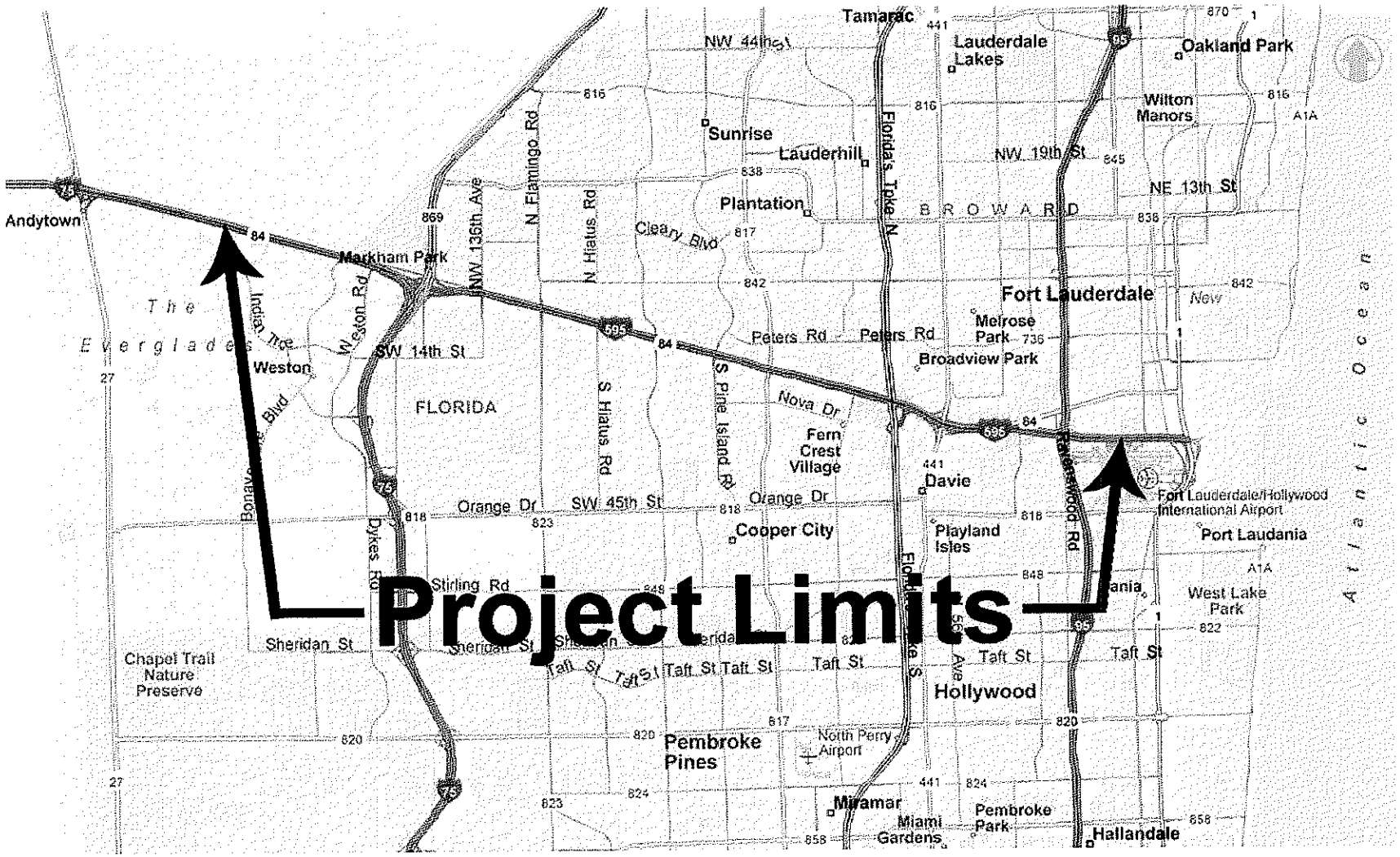
Action Items	Assignee	Due by date	Completion date—Status as of 11/1-5/04
Phasing to be established, reviewed/approved	TEAM	Begin Mtg #4, finalize by Mtg #5	Phasing to be looked at during the VE study 3 session-also drainage ponds
VE Recommendations and Design Suggestions	TEAM	RS&H to review and incorporate acceptable options prior to next meeting	Ongoing
Added items at November 1-5, 2004 meetings Noise walls	RS&H	RS&H to continue noise wall analysis and optimize noise wall locations and types	Ongoing
Sewell Lock	RS&H	Minimize impacts to site (may need to move the braided ramp discuss with NEPA	Ongoing
ITS meeting with Mark Plass	RS&H/FDOT	Special meeting to review ITS needs/wants	Ongoing
Extend Study limits to Cherry Camp	RS&H	Environmental purposes	Ongoing
Talk with City of Davie, Police Dept, School Board about R/W for two options at Nob Hill Braided ramps	RS&H	R/W requirements at braided ramps	Ongoing
Meeting with SFWMD	RS&H	Coordinate Drainage Permitting and Construction needs	Ongoing
Meeting with Coast Guard	RS&H	Coast Guard coordination with plan	Ongoing
Meeting with Greenway	RS&H	Coordination	Ongoing

TABLE 1.4 – 1
SUMMARY OF HIGHEST RATED ALTERNATIVES

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description**	**Management Action**	**Comments**	**Potential Cost Improvement (add)**	
1	Turnpike I/C Ramp D-1 improvements			*	
2	Turnpike I/C Ramp B-3 improvements			($3 million)	
3	Turnpike I/C Ramps C-1, C-2 and revise Griffin Rd on ramp to NB Turnpike			*	
4	Turnpike I/C Ramps C-3 & C-4 separations			*	
5	Design suggestions for Turnpike I/C improvements for Ramps B-1, C-4 and B-3 drainage slope			*	
6	Reversible Lanes Option 1-2 at grade			*	
7	Reversible Lanes Option 2-3 L elev		Mostly fits within exist R/W	Approx. $100 million R/W only	
8	Reversible Lanes Option 3-2 L elev			*	
9	Braided Ramps – SR 84 on outside			*	
10	Improve Entrance/Exit weaving on I-595 between 136th and Flamingo each side			*	
11	Combine ITS/TMC Center with Transit Control Center			*	
12	ITS Fiber Optical conduit needs incorporated with final design			*	
13	Coordinate with Broward County Greenway project			*	
14	Minimize impacts to Sewell Lock			*	
15	Design exceptions as noted			*	
16	Turnpike I/C, Braided Ramps, Reversible Lanes Phasing			*	
17	Braided Ramp phasing			*	
18	Drainage Design & Coordination with agencies			*	

Notes: Management Action: A-Accepted, CA-Conditionally Accepted, PR-Pending Resolution, R-Rejected *=Costs not estimated, due to insufficient information

Figure 1.1 – 1
Project Location Map



VALUE ENGINEERING METHODOLOGY 2

2.1 GENERAL

In general a normal VE study process would include analysis during a timeframe that meets the needs of the project. In this case the VE methodology planned will be applied during several meetings and studies during the 16-month process. The process is outlined below.

2.2 PRELIMINARY INFORMATION GATHERING PREPARATION EFFORT-MEETINGS

At least two one-week studies are planned, one in May 2004 and the second during January 2005. Each one will have pre-study preparation for the VE effort consisting of scheduling study participants and tasks; reviews of documents; gathering necessary background information on the facility; and compiling project data. The cost model will be tabulated prior to the first VE study. Information relating to the design, construction, and operation of the facility is important as it forms the basis of comparison for the study effort. Information relating to funding, project planning, operating needs, systems evaluations, cost basis, soil conditions, and construction of the facility is also a part of the analysis.

2.3 VE WORKSHOP STUDIES EFFORTS MEETINGS NO. 2 AND 3 (3- TO 5-DAY STUDIES)

Conceptual concepts will be reviewed during Meeting No. 2 (3-5 days). Alternative design concepts will be reviewed during Meeting No. 3 (5 days). Each planned VE workshops will follow a 3 - 5-day study plan effort (an agenda is included in the appendix).

During the workshop, the VE job plan will be followed. The job plan will guide the search for high value improvement areas in the Project and included procedures for developing alternative solutions for consideration while at the same time considering other efficiencies. It includes these phases:

- Information Gathering Phase
- Function Identification and Cost Analysis Phase
- Creative Phase
- Evaluation Phase
- Development Phase
- Presentation, Reporting Phase

2.3.1 Information Phase

At the beginning of the study, the conditions and decisions that influence the development of the project must be reviewed and understood. For this reason, the Design Consultant Project Manager will provide design information about the project to the VE Team. Following the presentation, the VE Team will discuss the project using the documents provided.

2.3.2 Function Identification and Cost Analysis Phase

Based on the FDOT cost estimate, historical and background data, a cost model will be developed for this project organized by major construction elements. It is used to distribute costs by project element; serve as a basis for alternative functional categorization; and to assign worth to the categories, where worth is the least cost to provide the required function, as determined by the VE Team. The VE Team identifies the functions of the various project elements and subsystems and creates a Function Analysis System Technique Diagram (F.A.S.T.) to display the

relationships of the functions. Function analysis was determined by area discussed.

2.3.3 Creative Phase

This VE study phase involves the creation and listing of ideas. During this phase, the VE Team generates as many ideas as possible allowing for a productive and creative atmosphere and to help team members to "think outside the box." Judgment of the ideas is restricted at this point to insure vocal critics do not inhibit creativity. The VE Team is looking for a large quantity of ideas and association of ideas.

The FDOT and the design team may wish to review the creative design suggestions that are listed in the report, because they may contain ideas, which can be further evaluated for potential use in the design.

2.3.4 Evaluation Phase

During this phase of the workshop, the VE Team judges the ideas generated during the creative phase. Advantages and disadvantages of each idea are discussed and a matrix will be developed to help determine the highest-ranking ideas. Ideas found to be irrelevant or not worthy of additional study are discarded. Those that represent the greatest potential for cost savings or improvement to the project are "carried forward" for further development.

The creative listing is re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may change, or they may be combined into a single idea. For these reasons, some of the originally high-rated ideas may not be developed.

2.3.5 Development Phase

During the development phase, each highly rated idea is expanded into a workable solution. The development consisted of a description of the idea, life cycle cost comparisons, where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed ideas. Each idea will be written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, are also prepared in this part of the study. The developed VE ideas will be summarized in **Section 6 – Recommendations**.

2.4 POST STUDY EFFORT

The post-study portion of the VE study includes the preparation of this Value Engineering Study Report and the discussions and resolution meetings with FDOT personnel. The FDOT Management team should analyze each alternative and prepare a short response, recommending incorporating the idea into the project, offering modifications before implementation, or presenting reasons for rejection. The VE Team is available for consultation after the ideas are reviewed. Please do not hesitate to call on the VE team for clarification or further information for considerations to implement any of the presented ideas.

2.4.1 Presentation and Resolution Phase

The final phase of the VE study begins with the presentation of the ideas on the last day of the VE Study. The VE Team screens the VE ideas before draft copies of the report are prepared. The initial VE ideas are arranged in the order indicated to facilitate cross-referencing to the final recommendations for revision to the Contract Documents.

2.4.2 Final Report

The acceptance or rejection of ideas described in this report is subject to FDOT's review and approval. The VE Team is available to address any final draft report comments for incorporation into the final report.

2.4.3 Interim and Follow-on Meetings

The next Value Engineering Workshop is scheduled for January 18 – 21, 2005 with subsequent Workshops March 27 through April 1, 2005 and a final Workshop during April 24 – 29 2005. The RS&H Design team presented their Preliminary Design Concepts to the VE team during the November 1-5, 2004 meeting.

The RS&H team will refine the preliminary design, drainage requirements, noise wall locations and incorporate the VE team recommendations for presentation at the next meeting in January 2005. A Public Workshop is scheduled for March 2004. During planned meetings in March 2005 and April 2005 RS&H will present the Final Design Concept for review and comments by the FDOT VE team. The I-595 PD&E combined VE Study process flow diagram is shown in the appendix.

WORKSHOP PARTICIPANTS AND PROJECT INFORMATION 3

3.1 PARTICIPANTS

Representatives from the RSH Design Consultants presented an overview of the project to the Value Engineering Study Team on November 1, 2004. The purpose of this meeting was to acquaint the Study Team with the overall progress and what the main areas the VE team needs to focus on during this VE study. The study team included the following experts who attended or made contributions to the presentation:

Name	Role	Affiliation
Amie Goddeau	Drainage	FDOT
Ann Broadwell	Environmental	FDOT
Bao Dang	Greenway representative	Broward County
Bill Dell'Oggo	Survey	FDOT
Daphne Geogiadis	Prof. Eng. Trainee	FDOT
Del Younker	Co-Team Leader	PMA Consultants LLC
Dong Chen	ITS/Traffic Operations	FDOT
Eric Neugazrd	RS&H	RS&H
Eduardo Cabellero	Construction	FDOT
Gary Keife	VE/Utilities	FDOT
Guillermo Becerra	Roadway Design	FDOT
JJ Hsu	Greenway representative	Broward County
Jack Crahan	R/W-FPC Group	FDOT
Jeff Easley	RS&H	RS&H
John Danielsen	Structures	FDOT
Keith Brockman	RS&H	RS&H
Mary Tery Vilches	PD&E	FDOT
Mike Bone	Construction/Structures (CEC)	FDOT
Mike Hammond	Coradino-I-95 WPB	FDOT
Nancy Nomikos	R/W	FDOT
Paul Lampley	Environmental	FDOT
Phil Schwae	RS&H	RS&H
Ramon Sierra	Greenway representative	Broward County
Richard Creed	Roadway Design Team leader	FDOT
Rick Johnson	Team Leader	PMA Consultants LLC
Roberto Rubio	Structures	FDOT
Roger Scott	RS&H	RS&H
Shandra Davis	Drainage	FDOT
Steve Braun	PL&EM	FDOT
Steve Wilson	HDR	RS&H
Tom Stepp	R/W	FDOT
Jimmy Mykytka	Noise Analysis	FDOT
Art Hunter	Transit	Carter & Burgess
Reed Everett Lee	Transit	Carter & Burgess
Joe Yesbeck	Transit	Carter & Burgess
Marcin Gadek	Office of Modal Development	FDOT

3.2 PROJECT INFORMATION

The purpose of the project orientation meeting on the November 1, 2004, in addition to being an integral part of the Information Gathering Phase of the VE Study, was to bring the VE Team "up-to-speed" regarding the overall project progress, decisions that had been made and portions of the corridor that needed special attention.

3.3 LIST OF VE STUDY MATERIAL REVIEWED

1. Interstate I-595 LPA by RSH
2. Turnpike and I-595 Interchange
3. Turnpike and I-595 plan, cross sections and construction phasing/Construction costs
4. SR 7 and I-595 plan and cross sections
5. Construction phasing / MOT and construction costs for Turnpike and I-595 alternative phasing
6. 2034 Traffic
7. Environmental impacts (whole project)
8. Turnpike and I-595 Interchange (with updated ramp C-3 fixed geometry)
9. Braided ramps at Nob Hill Plans and profiles
10. Greenway construction plans for East end of project near SR 7 to Sewall Lock, August 2004
11. Greenway construction plans - Weston Road to Davie
12. R/W plans for northside of the canal between Turnpike and SR 7
13. PowerPoint slide presentations (PMA, RS&H, FDOT Environmental)
14. Alternate western reversible lanes exchange area (WB on-off ramps near west end of project)
15. Noise Monitoring location map (current indicators)
16. Updated LPA with cross sections
17. Project preliminary construction phasing throughout the project
18. Construction Phasing with Construction Costs (Turnpike and I-595)
19. R/W Cost Estimates
20. Elevated reversible lanes cross sections
21. Four options at University and I-595 for Elevated reversible lanes
22. Design Exceptions/Variations spreadsheet (horizontal)
23. Existing Turnpike plans
24. Ramp profiles
25. Greenway routing brochure
26. Transit routing on the South side of I-595 ($120 million R/W++)
27. Transit information shown on www.centralbrowardtransit.com
28. Project VE Report dated June 23, 2004

3.4 SUMMARY OF GENERAL PROJECT INPUT - OBJECTIVES, POLICIES, DIRECTIVES, CONSTRAINTS, CONDITIONS & CONSIDERATIONS

The following is a summary of general project input, including the goals, objectives, directives, policies, constraints, conditions and considerations presented to the study team. Any "element" specific input is indicated by parentheses around the elements, disciplines and interests (i.e., right-of-way, roadway, environmental). Representatives from the FDOT and RSH Design team provided a project background on February 12 , April 26, and November 1, 2004.

3.4.1 Project Functions, Goals & Objectives (what the project should do as determined at the kickoff meeting and subsequent Workshops):

1. The primary project objective is to optimize the scope and expenditure for the intended functions
2. Meet the demanding complex design for the intended LPA improvements
3. Meet the 16 month combined PD&E and VE review process
4. Maintain consistency with the LPA
5. Integrate the updated traffic projections into the LPA
6. Meet the existing and projected traffic demands needs of the corridor by maximizing the existing corridor's potential with minimal impacts

3.4.2 Project Policies & Directives: (documented things the project must or must not do)

1. The project will meet economic, engineering design, environmental and social criteria requirements.
2. Meet the goals of the future development.

3.4.3 General Project Constraints: (unchangeable project restrictions)

1. No additional R/W over LPA identified areas
2. Environmental requirements
3. Production schedule
4. Permitting requirements

3.4.4 General Project Conditions & Considerations:

1. Corridor configurations
2. Previous issues listing

3.4.5 Function Analysis for areas reviewed

1. Turnpike Interchange Ramps-----Change direction
2. Greenway----------Accommodate Pedestrians/Bicycles
3. Braided Ramps----------Avoid Conflicts, Improve LOS
4. Reversible Lanes----------Increase Capacity, reduce delays, avoid congestion
5. Transit----------Allow space for Transit traffic in corridor
6. Environmental----------Reduce pollution, Meet NEPA regulations, treat stormwater
7. Construction Phasing----------Optimize project costs and sequencing and reduce impacts during construction

4.1 CREATIVE IDEA LISTING

This VE study phase involves the creation and listing of ideas. During this phase, the VE Team generates as many ideas as possible allowing for a productive and creative atmosphere and to help team members to "think outside the box." Judgment of the ideas is restricted at this point to insure vocal critics do not inhibit creativity. The VE Team is looking for a large quantity of ideas and association of ideas.

The FDOT and the design team may wish to review the creative design suggestions that are listed in **Section 4.2**, because they may contain ideas, which can be further evaluated for potential use in the design. Ideas listed below are to be considered for further development:

- **Turnpike Interchange and I-595**
  1. Discuss Ramp D1 Canal crossing with SFWMD
  2. Greenway routing
  3. Shift Ramp C4 to improve horizontal sight distance
  4. Combine two exits from I-595 into one exit
  5. Improve ramps B-1,B-3, C-1, C-2, C-3, and C-4

- **Reversible Lanes**
  1. Add a 2 ft buffer between GP lanes and transition area
  2. ITS lane signals with progressively longer gates
  3. Optimize at grade layout
  4. Elevated reversible lanes with general purpose, transit, or special use lanes below
  5. Adds Direct connection to the Turnpike
  6. Reversible lane options, at grade, 2 or 3 lanes elevated

- **Braided Ramps**
  1. Talk with Town of Davie and School Board
  2. Keep SR 84 to outside
  3. Improve entrance/exit weaving on I-595 between 136th and Flamingo Rd
  4. Review Braided Ramp Phasing

- **Elevated Reversible Lanes/GP lanes under**
  1. Shift GP lanes under ERL, adds space between Mainline and SR 84
  2. Add additional GP lanes in each direction under ERL, Adds capacity
  3. Add special use lanes under ERL, accommodates transit
  4. Transit prefers to be at grade on the South side of the I-595 corridor within the existing R/W.
  5. Use straddle bents to avoid R/W takings

- **ITS**
  1. Combine ITS/TMC with Transit Control Center
  2. ITS fiber optical conduit with final design

- **Environmental**
  1. Reduce impacts to Sewell Lock
  2. Avoid Contamination areas
  3. Coordinate with agencies regarding design elements
  4. Evaluate design/constructability of noise wall locations

5. Avoid/minimize wetland and Section 4(f) impacts

- **Greenway**
  1. Coordinate routing with Broward County

- **Transit**
  1. Coordinate with Broward County

The Team developed an Exceptions List (see excel spreadsheet from RS&H in Appendix). See **Section 6** for the items developed.

4.2 DESIGN SUGGESTIONS

1	Eliminate undesirable weaving between ramps and on mainline
2	Improve decision distances and points
3	Reduce maintenance costs
4	Maintain roadway clearances
5	Avoid conflict points
6	Provide system to system connectors
7	Maintain horizontal and vertical clearances
8	Reverse sloped ramp B-3 surface drainage and piping (and others next to exterior RE Wall) to inside to avoid potential conflict with the Wall structural strap supports
9	Minimize neighborhood impacts
10	Accommodate Transit
11	Any redesign at the Turnpike Interchange to be accomplished before Turnpike construction phases begin
12	Accommodate bicycles and pedestrians
13	Reposition entrance and exit points at I-595 between 136th Avenue and Flamingo Road on both sides of I-595
14	ITS-One center combined with the Transit Control Center
15	ITS- Incorporate the fiber optical conduit design into the overall construction design
16	Coordinate this project with the Broward County Greenway project that runs along the New River Canal
17	Coordinate with EPA, Coast Guard, and SFWMD
18	Coordinate with drainage, permitting, and other environmental groups
19	Review Drainage options in January VE meeting

EVALUATION 5

During this phase of the workshop, the VE Team judges the ideas generated during the creative phase. Advantages and disadvantages of each idea are discussed and ideas were selected on the basis of value improvement potential and the ability to meet the project needs. Ideas found to be irrelevant or not worthy of additional study are discarded. Those that represent the greatest potential for cost savings or improvement to the project are "carried forward" for further development.

The creative listing is re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may change, or they may be combined into a single idea. For these reasons, some of the originally selected ideas may not be developed.

During the creative phase numerous ideas, alternative proposals and/or recommendations were generated for each required function using conventional brainstorming techniques and are recorded on the following pages. These ideas were discussed and evaluation criteria were determined. A list of the group's discussion and selection of the ideas is summarized on the following section.

RECOMMENDATIONS 6

During the development phase, each highly rated idea is expanded into a workable solution. The development consisted of a description of the idea, life cycle cost comparisons (not developed in this VE study due to insufficient information), where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed ideas. Each idea was written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, included in the presentation slides shown in the appendix.

TABLE 6.1 SUMMARY OF RECOMMENDATIONS

Recommendation No.	Alternative Recommendation (Idea)
1	Turnpike I/C Ramp D-1 improvements
2	Turnpike I/C Ramp B-3 improvements
3	Turnpike I/C Ramps C-1, C-2 and revise Griffin Rd on ramp to NB Tpk
4	Turnpike I/C Ramps C-3 & C-4 separations
5	Design Suggestions for Turnpike I/C improvements for Ramps B-1, C-4 and B-3 drainage slope
6	Reversible Lanes Option 1-2 at grade
7	Reversible Lanes Option 2-3 L elev
8	Reversible Lanes Option 3-2 L elev
9	Braided Ramps – SR 84 on outside
10	Improve Entrance/Exit weaving on I-595 between 136th and Flamingo each side
11	Combine ITS/TMC Center with Transit Control Center
12	ITS Fiber Optical conduit needs incorporated with final design
13	Coordinate with Broward County Greenway project
14	Minimize impacts to Sewell Lock
15	Design exceptions as noted
16	Turnpike I/C, Braided Ramps, Reversible Lanes Phasing
17	Braided Ramp phasing
18	Drainage Design & Coordination with agencies

The results of this VE study are shown as individual recommendations developed for each of the focus areas (Turnpike, Braided Ramps, Reversible Lanes, Transit, Environmental, Greenway, and Construction Phasing) of the project. These recommendations include a comparison between the VE Team's proposal and the designer's original concept. Each proposal consists of a summary of the original design, a description of the proposed change, a life cycle cost comparison (where applicable), and descriptive evaluation of the advantages and disadvantages of the proposed alternative. Sketches and calculations, if appropriate, are shown with the presentation slides in the appendices. The estimated cost comparisons reflect unit prices and quantities on a comparative basis. Value improvement is the primary basis for comparison of competing ideas. To ensure that costs are comparable within the ideas proposed by the VE Team, the FDOT average construction costs were used as the pricing basis.

6.1 EVALUATION OF RECOMMENDATIONS

Some of the VE alternatives' potential savings are interrelated, if one is accepted another one may be or may need to be added, or acceptance of one may mutually exclude another. The VE Team identified total potential savings as shown on **Table 1.4 – 1, Summary of Recommendations.** The write-ups for the individual developed recommendations are included in this section and are presented in the same order as was presented.

The FDOT and the design team to determine whether to accept or not accept the idea should evaluate each recommendation. The recommendations that are accepted should be listed for documentation purposes. For each idea that will not be accepted, the design team normally documents, in writing, the reason or reasons for the non-acceptance. The design suggestions are for consideration by FDOT and the designers. No specific action is normally required to accept or not accept the suggestions, though it is often helpful, for documentation purposes, to formally list those suggestions that will be incorporated by the designers.

6.2 CONSIDERATIONS AND ASSUMPTIONS

In the preparation of this report and the recommendations that follow, the Study Team made some assumptions with respect to conditions that may occur in the future. In addition, the Study Team reviewed the listed project documentation, relying solely upon the information provided by the designer and owner, and relying on that information as being true, complete and accurate. This value analysis and report are based on the following considerations, assumptions and conditions:

The recommendations rendered herein are as of the date of this report. The Study Team or Leaders assume no duty to monitor events after the date, or to advise or incorporate into any of the alternatives, any new, previously unknown technology.

The Study Team or Leaders assume that there are no material documents affecting the design or construction costs that the Team has not seen. The existence of any such documents will necessarily alter the alternatives contained herein.

The Study Team or Leaders do not warrant the feasibility of these recommendations or the advisability of their implementation. It is solely the responsibility of the designer in accordance with the owner, to explore the technical feasibility and make the determination for implementation.

RECOMMENDATION NO. 1: Turnpike Interchange Ramp D-1 Improvements

Original Concept: RS&H LPA

Proposed Concept: VE team proposes the following concepts be considered:
Coordination is needed with the SFWMD (North New River Canal). Various options are being reviewed including:

1. Excavating the North Bank of the canal to offset the encroachment that may be needed to cross the canal
2. Additional structure extended vs. embankment
3. Pier in the canal
4. Sheet piling to reduce the extra depth section
    a. Reduces Maintenance
    b. Approved on past projects

Advantages:

- Optimize Canal crossing
- Reduce construction sequences
- Allow Canal Maintenance clearances

Disadvantages:

- Coordination time

Cost Estimate: Not estimated as this is under consideration

RECOMMENDATION NO. 2: Turnpike Interchange Ramp B-3 Improvements

Original Concept: RS&H LPA

Proposed Concept: VE team proposes the following concept as a refinement from the VE No. 1 meeting.

1. Move gore areas north
2. Physical separation to eliminate undesirable weaving
    i. Adds R/W impacts to the mobile home park (Approximately $3 million)

Advantages:

- Separates traffic
- Less conflicts

Disadvantages:

- Additional R/W cost

Cost Estimate: (Adds $+-3 million in R/W cost)

RECOMMENDATION NO. 3: Turnpike Interchange Ramps C-1, C-2 and revise Griffin Rd. on ramp to NB Turnpike

Original Concept: RS&H LPA

Proposed Concept: By combining Ramps C-1, C-2 and Griffin road on ramp to NB Turnpike the following are advantages:

Advantages:

- One exit decision point
- System to System connector
- Improves weaving between Griffin Road and I-595
- Reduces NB Griffin Rd on ramp to Turnpike from two lanes to one at the gore

Disadvantages:

- None apparent, redesign effort

RECOMMENDATION NO. 4:Turnpike Interchange Ramps C-3 & C-4 separation

Original Concept: RS&H LPA

Proposed Concept: By separation of the C-3 and C-4 ramps the following are advantages

Advantages:

- Eliminates undesirable weave between ramps

Disadvantages:

- Redesign effort

RECOMMENDATION NO. 5: Design Suggestions for Turnpike Interchange for Ramps B-1, C-4 and B-3 drainage slope

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to improve the horizontal sight distance for the following locations

1. Ramps B-1 and C-4 to 12 ft shoulders
2. Shift ramp C-4 north to enlarge radius/improve sight distance
3. Slope ramp B-3 (any ramp adjacent to MSE wall) reverse cross slope for drainage

Advantages:

- Improves sight distance

Disadvantages:

- Validate Ramps B-1 and C-4, redesign effort

RECOMMENDATION NO. 6: Reversible Lanes-Option #1 (Two lanes at grade)

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to consider using two lanes at grade, as this option is compared to other options in the same category

Advantages:

- Lower initial cost
- LPA (approved concept)
- Transition areas (release points) operate within existing medians
- Neighborhood impacts minimized

Disadvantages:

- 64 ft median provides only two lanes
- Inflexible for future capacity improvements
- No accommodation for Transit within the existing R/W
- No direct connection to Turnpike (direct connect requires three lanes

RECOMMENDATION NO. 7: Reversible Lanes Option #2 (3 lanes elevated)

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to elevate the three reversible lanes
(This has the potential for R/W savings ranging to $100 million)

Advantages:

- Center lane direct connect to the Turnpike (traffic reduction to mainline)
- Shifts traffic toward median (General Purpose Lanes)
- More room for transit, noise walls, drainage
- Room for transit underneath (Fall-back plan)
- Reduces R/W takes on outside
- Flexible for future uses, i.e., bus, special purpose
- Minimize the use of existing R/W and provides more flexibility in design

Disadvantages:

- Construction costs are higher
- Requires redesign of current Turnpike interchange that is currently 90% complete
- Aesthetics
- Release points for 3rd lane needs to be redesigned

RECOMMENDATION NO. 8: Reversible Lanes Option #3 (2 lanes elevated)

Original Concept: RS&H LPA

Proposed Concept: VE team proposes to elevate two reversible lanes

Advantages:

- Shifts traffic toward median (General Purpose Lanes)
- More room for Transit, noise walls, drainage
- Room for Transit underneath (Fall-back plan)
- Reduces R/W takes on outside
- Flexible for future uses, i.e., bus, special purpose
- Less expensive than 3-lane option
- Release points/transition areas operate same as option #1

Disadvantages:

- No direct connect to Turnpike
- Aesthetics
- Traffic between Turnpike and I-75 increased on GPL
- Not as much flexibility as No. 7

RECOMMENDATION NO. 9: Braided Ramps – SR 84 on outside

Original Concept: VE No.1 included Eastbound/Westbound braided ramps reviewed at Nob Hill and Pine Island; University Drive and Davie Rd.; SR 7 to the Turnpike.

Proposed Concept: VE team proposes to keep SR 84 on the outside

Advantages:

- Improves travel space for bicycles and pedestrians
- Provides continuity for pedestrians and bicycles
- Keeps access to SR 84 for businesses at all locations
- Room for Transit underneath (Fall-back plan)

Disadvantages:

- R/W costs for keeping SR 84 to the outside are higher with the reversible lanes at grade
- Pushes transit south

RECOMMENDATION NO. 10: Improve Entrance/Exit weaving on I-595 between 136th and Flamingo Rd.

Original Concept: VE No. 1

Proposed Concept: Reposition the entrance and exit positions on SR 84 to/from I-595 near Flamingo Rd

Advantages:

- Eliminates weave on I-595

Disadvantages:

- Construction costs are higher

RECOMMENDATION NO. 11: Combine Intelligent Transportation System

Original Concept: VE No. 1

Proposed Concept: VE team proposes to combine ITS/TMC with the Transit Control Center

Advantages:

- Reduces construction costs
- Better coordination among agencies

Disadvantages:

- Management issues

RECOMMENDATION NO. 12: ITS Fiber Optical Conduit

Original Concept: VE No. 1

Proposed Concept: VE team proposes to incorporate the ITS fiber optical conduit with the final design

Advantages:

- Reduces construction costs
- Better coordination among agencies

Disadvantages:

- Coordination effort

RECOMMENDATION NO. 13: Coordinate with Broward County Greenway project

Original Concept: Broward County Greenway plans and LPA plans

Proposed Concept: VE team proposes to coordinate with the Broward County Greenway projects along SR 7 to Davie Road (South of SFWMD Canal) and the University Drive to Markham Park (North of the SFWMD Canal). Team needs to determine if this is determined if the Greenway is a possible Section 4(f) property. There is an existing 50 ft permit along the north side of SFWMD canal that could be used for the Greenway in lieu of routing as shown on RS&H plans (SW 25th Street is south of the dedication).

Advantages:

- Reduces total construction costs
- Possible better route for users
- Avoids relocation of the Greenway if it is built in the ultimate location at first

Disadvantages:

- Possible Section 4(f) property
- Requires coordination among agencies
- May impact County's schedule/design

RECOMMENDATION NO. 14: Environmental Considerations, Constraints, and Opportunities - Minimize impacts to Sewell Lock, Noise Wall Considerations,

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes to minimize the impacts that may exist with the current planned location for the braided ramps nearby the Sewell Lock.

Advantages:

- Preserves historical significance
- Avoid, minimize impacts to Sewell Lock by:
  i. Shift braid to the west
  ii. Reverse the braid

The team also recommends that the noise walls be located on the plans

- Noise walls design shall include specifics needed for the team to review
  - Locations
  - Height
  - Costs
  - Constructibility details
  - R/W Costs
  - Sequencing plan

The team also continues to recommend not impacting the contaminated areas shown on the plans.

Disadvantages:

- None apparent

RECOMMENDATION NO. 15: Design Exceptions as noted

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes that RS&H incorporate the design exceptions noted on the RS&H spreadsheet as revised by the VE team during the meeting.

Advantages:

- Accommodate travel lanes

Disadvantages:

- May not meet FDOT PPM requirements

RECOMMENDATION NO. 16: Turnpike, Braided Ramp, Reversible Lane Phasing

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes that RS&H incorporate the planned phasing plans as are developed and refined before the next VE meeting.

Advantages:

- Reduce construction time and impacts
- Ease maintenance of traffic
- Produce efficient construction phasing

Disadvantages:

- None apparent

RECOMMENDATION NO. 17: Braided Ramp Costs/Phasing

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes that RS&H incorporate the planned phasing plans as are developed and refined before the next VE meeting for all the braided ramps. Braided ramps reviewed by the VE team were

1. EB 1 lane bridge 1-lane road $35 M
    a. East of Flamingo West of Nob Hill Rd including Hiatus bypass
2. EB 2-lane bridge/2-lane road $20 M
    a. West of Nob Hill Rd to Pine Island Rd
3. WB 1-lane bridge/2-lane road $65 M
    a. University Drive to Pine Island Rd
4. WB 2-lane bridge/2-lane road $20 M
    a. Pine Island Rd to Nob Hill Rd
5. WB 2-lane bridge/2-lane road $45 M
    a. Nob Hill Rd to Flamingo Rd includes Hiatus bypass
6. WB 2-lane bridge/1-lane road $20 M
    a. West of Turnpike to University Drive

Construction items considered in the costs included

- Structures, REWall, Noise Wall, Barrier wall
- Sidewalk, pavement, embankment, drainage
- Maintenance of Traffic, Mobilization
- Miscellaneous, and contingencies

RECOMMENDATION NO. 18: Drainage Design & Coordination with Agencies

Original Concept: LPA and VE No. 1

Proposed Concept: VE team proposes that RS&H develop the following drainage details before the January VE meeting:

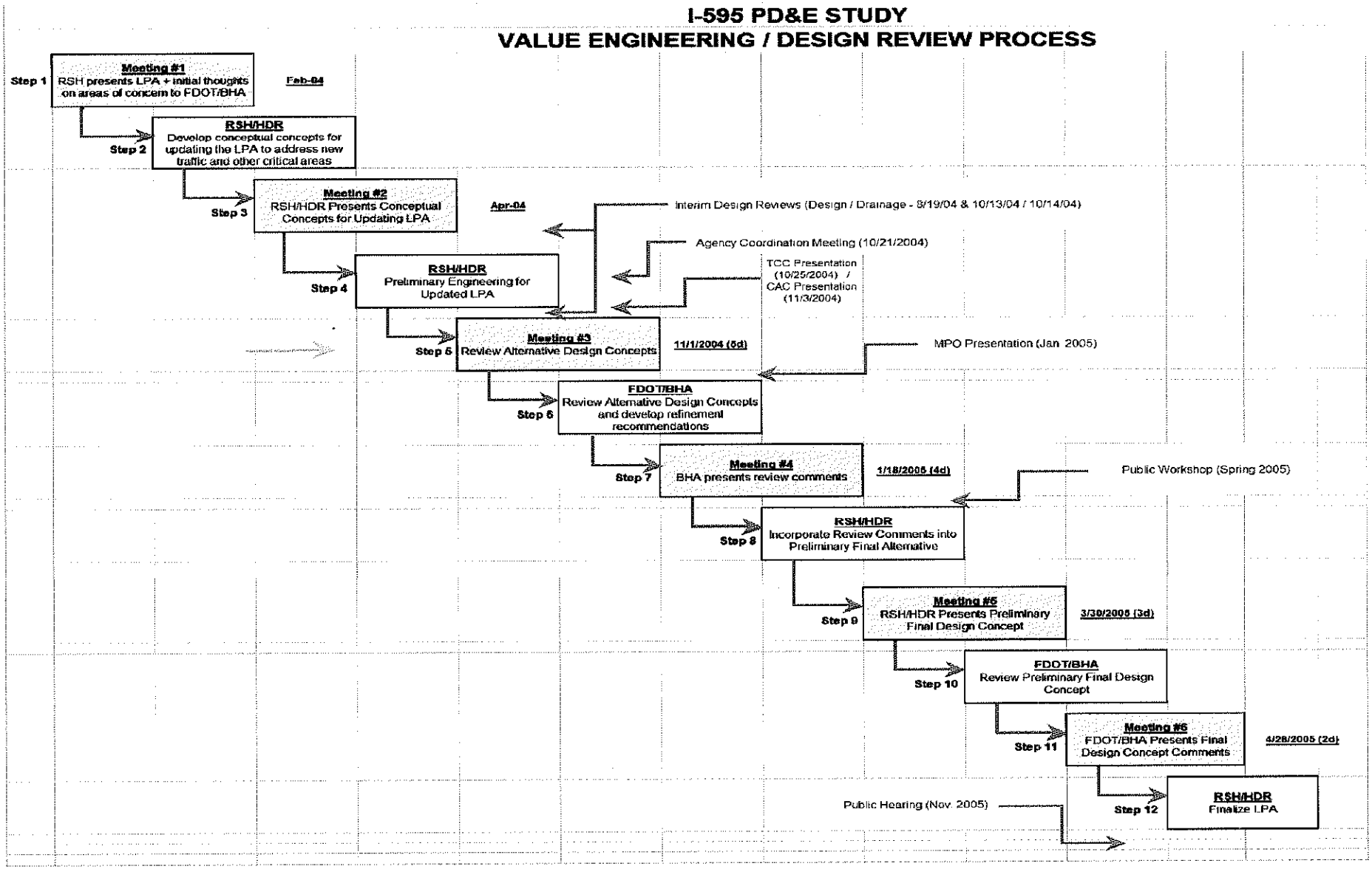
1. Meet with permitting agencies and understand their requirements
2. Determine the existing treatment that is provided throughout the corridor
3. Determine the required volume for treatments and attenuation
4. Evaluate areas where ponds are required
5. Evaluate pond sites
6. Sequencing/phasing of permits/mitigation/construction projects
7. Define drainage requirements based on refined alternatives

DRAINAGE WILL BE A MAJOR FOCUS AT THE JANUARY VE MEETING

APPENDIX

Agenda
Schedule November 1 - 5, 2004

Day One	Corridor west of the Turnpike (including the Interchange) to I-75
Day Two	Corridor west of the Turnpike (including the Interchange) to I-75
Day Three	Elevated reversible lanes, transit and the I-95 interchange
Day Four	Drainage and refine the: • SR 7 Interchange • Braids • Reversible lane transitions • Reversing of 136th/Flamingo Road Ramps • Elevate reversible lanes
Day Five	Presentation of Results


I-595 PD&E STUDY
VALUE ENGINEERING / DESIGN REVIEW PROCESS
Step 1
Meeting #1
RSH presents LPA + initial thoughts on areas of concern to FDOT/BHA
Feb-04
Step 2
RSH/HDR
Develop conceptual concepts for updating the LPA to address new traffic and other critical areas
Step 3
Meeting #2
RSH/HDR Presents Conceptual Concepts for Updating LPA
Apr-04
Interim Design Reviews (Design / Drainage - 8/19/04 & 10/13/04 / 10/14/04)
Agency Coordination Meeting (10/21/2004)
TCC Presentation (10/25/2004) / CAC Presentation (11/3/2004)
Step 4
RSH/HDR
Preliminary Engineering for Updated LPA
Step 5
Meeting #3
Review Alternative Design Concepts
11/1/2004 (5d)
MPO Presentation (Jan 2005)
Step 6
FDOT/BHA
Review Alternative Design Concepts and develop refinement recommendations
Step 7
Meeting #4
BHA presents review comments
1/18/2005 (4d)
Public Workshop (Spring 2005)
Step 8
RSH/HDR
Incorporate Review Comments into Preliminary Final Alternative
Step 9
Meeting #5
RSH/HDR Presents Preliminary Final Design Concept
3/30/2005 (3d)
Step 10
FDOT/BHA
Review Preliminary Final Design Concept
Step 11
Meeting #6
FDOT/BHA Presents Final Design Concept Comments
4/28/2005 (2d)
Public Hearing (Nov. 2005)
Step 12
RSH/HDR
Finalize LPA

DESIGN EXCEPTIONS AND VARIATIONS

Border Width

LOCATION	AASHTO	PPM	ACTUAL
Freeway Border width throughout the corridor with Flush Shoulder		94'	Varies
Arterial >45 mph border width throughout the corridor with Flush Shoulder		33'	Varies

Cross Slope in the Same Direction

LOCATION	AASHTO	PPM	ACTUAL
Mainline Tangent Sections		2@.02, 1@.03	3@.02

Bridge Width

LOCATION	AASHTO	PPM	ACTUAL
Flamingo Road WB Off Ramp	40'	40'	36'
Pine Island Road EB Off Ramp	40'	40'	36'
Nob Hill Road WB Off Ramp	40'	40'	36'
University Drive WB Off Ramp	40'	40'	36'

Paved Shoulder Width

LOCATION	AASHTO	PPM	ACTUAL
SR-84 outside shoulder under Flamingo Road WB Off Ramp	10'	10'	6'
SR-84 outside shoulder under Pine Island Road EB Off Ramp	10'	10'	6'
SR-84 outside shoulder under Nob Hill Road WB Off Ramp	10'	10'	6'
SR-84 outside shoulder under University Drive WB Off Ramp	10'	10'	6'
EB Mainline GP lanes inside shoulder @Turnpike	10'	10'	5'
Reversable Lane Outside Shoulder @Turnpike	10'	10'	6'
WB Mainline GP lanes inside shoulder @Turnpike	10'	10'	4'
EB Mainline GP lanes outside shoulder @Turnpike	10'	10'	5'
Flamingo Road WB Off Ramp outside shoulder at braid approach	10'	10'	6'
Pine Island Road EB Off Ramp outside shoulder at braid approach	10'	10'	6'
Nob Hill Road WB Off Ramp outside shoulder at braid approach	10'	10'	6'
University Drive WB Off Ramp outside shoulder at braid approach	10'	10'	6'

VERTICAL CLEARANCE EXCEPTIONS

Location	Existing Clearance (ft)	Proposed Clearance (ft)	AASHTO Criteria Clearance (ft)	PPM Criteria Clearance (ft)	Reason
Flamingo Rd.	16.26	15.67	16.0	16.5	Widen I-595
Hiatus Rd.	16.52	15.79	16.0	16.5	Widen I-595
Nob Hill Rd.	16.83	16.27	16.0	16.5	Widen I-595
Pine Island Rd.	15.99	15.41	16.0	16.5	Widen I-595
University Dr.	16.75	16.34	16.0	16.5	Widen I-595
Davie Rd.	16.58	16.3	16.0	16.5	Widen I-595
Turnpike	16.54	16.5	16.0	16.5	Widen I-595
E-S Ramp over I-595	17.3	17.3	16.0	16.5	Construct Reversible Lanes
SR-7	17.6	17.1	16.0	16.5	Widen I-595

SLIDE PRESENTATION

Minutes from the November 1-5, 2004 meetings:

1. Steve Braun is the current PM for FDOT.
2. Objective of this meeting to obtain level of comfort of the project geometry and phasing of the project
3. Coordination of the layout with Turnpike
4. Interim design reviews occurred over the last few months with input from design and others
5. Similar meetings have occurred with drainage group and environmental
6. Right of way still needs to be determined for roadway and drainage
7. TAC meeting with Broward county last meeting, Hawks landing meeting a few days ago
8. Focus of the VE study this week-concur with layout, and go forward to the public
9. Go over the action items (see list above)
10. Advantages of the VE team process was very beneficial to derive the optimum operation of the project intent
11. Agenda for the week of November 1-5, 2004
    a. Monday - Tuesday-Turnpike Interchange, 595 corridor west
    b. Wednesday-Elevated reversible lanes, Transit (outside the corridor?) and I-95 Interchange
    c. Thursday-Drainage, SR I/C, Braids, Reversible lanes transitions, reversing 136th/Flamingo Rd ramps
    d. Friday-Results presentation
12. Trying to get the layout for the public workshop as it is currently scheduled for Feb/Mar, Incorporate 3D CAD layouts
13. Result of the VE process is to get a conceptual permit
14. Constraints, opportunities, solutions---Pond Apple slough (example)
15. Mitigation sites are identified, with some sites in question
16. I-595 NEPA Considerations slides presentation by Eric Newgarden-(see slides Eric presented)
17. Discussion of the park locations along the corridor (S Lock on N R of Historic Places)
18. Contaminate plumes are evident along corridor (see map)
19. Resolve noise wall locations
20. View of roadway from neighborhoods, or driver view from road to their house.
21. Explore different aesthetics on the noise walls.
22. Mitigation twice as usual because we impact the areas under the bridge
23. Determine project limits Cherry Camp?
24. Sewell Lock breakout group needed to discuss NEPA issues
25. Permitting/sequencing to be reviewed on the entire project
26. Set up meeting with Mark Plass for ITS issues after November 5, 2004
27. Exceptions to be included as part of the project (review notes on the drawings)

Items noted during November 1, 2004 for the Turnpike team

- Turnpike team consisted of
  - Guillermo Becerra - All areas
  - Joseph Rojas - Roadway
  - Mike Bone - Constructability
  - Joe Borello - Roadway
  - Steve Wilson - Geometry
  - Nancy Nomikos - R/W
  - Roberto Rubio - Structures
  - Del Younker - Facilitator

The team focused on the following areas

1. Geometry
2. Canal near ramp D1
3. Phasing

➢ Geometry

A. Top items noted were

i. Ramp D1 options

1. Cut canal on other side to compensate for the loss of land along the ramp
2. Sheet pile bulkhead wall along the bank
3. Extend and cantilever on structure over canal

- Greenway on cat walk or on northside of the canal along Ramp D 1
- Shift C4 slightly north to improve horizontal sight distance which causes potential widening of the NB Turnpike on the outside
-Combine 2 exits from Tpk to 595 on one exit instead of two

Other items discussed include the following

1. Slope ramp to inside to avoid conflict with drain pipes and soil straps at the Rewall
2. During an interim VE meeting fixed the weaving C3-C4 see current geometry
3. Exceptions to be reviewed at a subsequent meeting tomorrow
4. 900 ft gore distances between C1/C2 is already covered above
5. Need meeting with SFWMD soon
6. Canal Cross section to be discussed at another meeting (Tuesday)
7. Construction phasing seems workable as shown on current phasing for the Turnpike interchange
8. Consider wireless ITS due to so many phases during construction
9. Look at reversible entrance/exits on mainline

The other team reviewed the following items

1. Greenway at the Turnpike
   a. Cross canal with two 17ft x 700 ft bridges to get under the new I-595 to Turnpike ramp
   b. Elevate 1000 ft of the Greenway along this right side of the ramp with curb and gutter
   c. North of Canal from SR 7 to Plantation Harbor

2. Davie Road
   a. Rider actuated signal to cross to the south west of the intersection
   b. Deflect mainline around FPL substation and cemetery

3. Reversible lane Transitions
    a. ITS lane signals with progressively longer gates to direct the lane shifts

4. ITS MOT
    a. Maintain ITS during ALL phases of construction

Mainline items discussed

1. Reversible lanes
2. Reversed ramp at 136th/Flamingo
3. Braided ramps
4. Transit
    a. Elevated reversible mainline
    b. Outside R/W on southside
5. SR 84 bike lane on north side location (confirm with Greenway)
6. Design Exceptions (Shoulders on braided ramps and others)
7. FPL impact with bikelane
8. Review Davie / SR 84 braided ramp
9. Greenway section needed
10. Constructibility/phasing discussions needed
11. Need to review cost estimates/and optimize project with VE options
12. Review noise wall locations
13. Drainage/ponds and sequencing to be reviewed
14. Review geometry
15. Review bike lanes on northside
16. 12 ft Noise walls on structures to be determined (review meeting three)---**Action Item**
17. Sewell Lock breakout group discussion needed (NEPA)---**Action Item**
18. Set up meeting with Mark Plass (ITS) after November 5, 2004---**Action Item**
19. Project limits to include Cherry Camp location for environmental reasons---**Action Item**
20. Talk with the City of Davie, Police Dept and School Board about R/W for two options at Nob Hill Braid---**Action Item**

Items already reviewed during Interim VE meetings held by Steve Braun with the key VE team and designers (during August 19 and October 12-13, 2004

1. Separate SB Turnpike ramp B3 from the mainline
2. Eliminate weave between SB Turnpike and C3 on ramp and Griffin Road
3. Off ramp spacing ramp B1 and B3 optimized
4. Refined Ramp D1 geometry to provide required clearances over SFWMD canal

The items to be further reviewed included:

1. I-595 West
    a. University Drive Flyover ramps

   b. Braided ramps
   c. Entrance/Exits
2. Greenway
3. Exceptions
4. SR I/C options
5. Transit
6. Bicycle lane placements
7. Noisewalls
8. Drainage
9. R/W
10. Phasing

Items reviewed during November 2, 2004.

1. University Intersection
2. Braided Ramps
3. Reversible transitions
4. Exceptions

Ideas generated during the reviews were as follows by area:

1. One signal ILO two at Davie Rd Intersection
2. Braid at Nob Hill-Use the alternative design from the Interim VE study-see dwg
3. Braid at Hiatus-modify alternative design from IVE study (use bypass lanes in the middle and SR 84 on the outside
4. Keep bypass ramp adjacent to I595 outside lane, separated by barrier wall, SR 84 on outside at grade (parallel to canal)
5. Reversible lanes-start 1st auxiliary lane further west prior to entering reversible lanes
6. Pull back to the East the West end entrance to the reversible lanes
7. not used
8. Accordian type gate arm
9. Stripe auxiliary lane with 2ft buffer with tubular separation markers
10. Include ITS with reversible lane concepts
11. Leave SR 7 location as – is include the LPA improvements from previous VE study
12. IVE-Switch location of 136th Avenue ramps
13. Sewall Lock
    a. Move braid to west
    b. SR 84 over ramp
       i. Section 4(f) avoidance of lock and greenway
14. Exception List discussed
    a. List of horizontal exceptions were reviewed (see markup on dwg Keith)
    b. Need to review the vertical exception list (list to be sent to RJ via email)
15. Need to coordinate with the SFWMD and Coast Guard ramp D1 location of any piers to be

located in the canal.

16. May need to have a navigation/boat study
17. SFWMD coordination (ramp D1)
    a. Backwater analysis required?
    b. Pier location/design –maintenance
        i. Access
        ii. Staging
    c. Canal design cross section
    d. Bulkhead – no maintenance on south side
18. Elevated reversible lane discussion and review
    a. Direct connect to Turnpike
    b. Elevate Rev. ln ILO at grade
    c. Transit prefers not to be in the median
    d. Transit stations out of the median at 3 locations
    e. Could access station on side from transit in median
    f. Elevate rev. ln allows 5 lanes to be built, 3 rev ln above, 2 GP ln at grade
    g. Develop this idea
        i. VE 5 options (see separate page)
    h. How do we release 3rd lane?
19. Greenway review
    a. Need meeting with Broward Co to discuss Greenway on Northside from SR 7 to Station 535+00+-
    b. Greenway cost is $1million per mile +-
    c. Could use steel ILO aluminum sheet piling (note in case team needs to replace the greenway installed along south side of canal from SR 7 to west)
    d. Minimum landscaping was used by BC
    e. No utilities along the greenway
    f. No lighting was used along greenway
20.

Option	R/W cost	Const Cost	Advantages	Disadvantages
Red-3rd level Rev Ln bulb out to North Elevated	$3.1 million	$37 million	Existing Univ Flyovers not rebuilt	R/W impacts Rev Ln closer to residential areas Canal crossing MOT issues Hi cost Does not allow Pine Island/Univ Braid
Yellow-4th level median Rev Ln Elevated	0	$26 million	Traffic away from residents No R/W impacts Exist Flyover do need to be rebuilt as part of rev ln concept	Visual impacts Constructibility of Flyovers more difficult, Increased future cost, does not allow for Pine Island/Univ braid

Option	R/W cost	Const Cost	Advantages	Disadvantages
Blue-Yellow—Replace Existing Flyovers, At grade or Elevated	0	$17 million	No R/W Visual impacts reduced Traffic away from residents Allows for future braid between PI/Univ Could drop or pickup 3rd lane at University	Replace Flyover earlier Only two lanes ** see other page ILO 5 lanes Gen use lanes capacity less West of University where it is needed
4- Rev lanes south side	$40.8 million	$37 million	Same as option 1 except station locations	Same as option 1 except major R/W impacts no canal crossing
5-Elevated to University and two lanes to East at grade	0	$17 million	Same as option 3 and 4	Direct connect to Turnpike and 595 later
6-Elevate rev ln and two GP lanes under, allows for shifting 3 GP lanes to median under ERL, or add additional GP lanes in each direction under ERL, or add special use lanes under ERL	$	$39	Additional space between mainline and SR 84 or Adds capacity Or Accommodates Transit	Modifies current planning for corridor

Design Exceptions and Variations discussed on November 3, 2004:
Summarized as follows—

1. Location
    a. Freeway border width throughout the corridor with flush shoulder varies from the 94 ft recommended PPM width
    b. Arterial >45 mph border width throughout the corridor with flush shoulder varies from 33 ft width recommended by the PPM
    c. Cross slope on the mainline tangent section varies from the PPM and team decides to match the existing cross slope at .02
    d. Shoulder widths at the bridges will be 6 ft ILO 10 ft as recommended by the PPM at Flamingo Rd WB Off ramp, Pine Island EB off ramp, Nob Hill WB off ramp,

and Unversity Drive WB off ramp

e. Paved should widths varies from the PPM recommended width of 10 ft to 4 ft to 6 ft at locations shown on the table shown below (RS&H) next page(s)

Items to be covered on November 3, 2004

AM—

Develop viable improvements to LPA (modified)
Look at Keith's latest rendition
Phasing (preliminary)
TPK I/C
Braids
Aux Lanes
Reversible Lanes/mainline

PM—

Noise Abatement
Discussion from Jimmy Mykytka

- Along corridor 25 developments affected
- Structures limited to 8 ft height
- $24/sf noise wall
- $30-55/sf for barrier noise wall
- Criteria No.1 5db reduction
- $35k per receiver benefit
- Decision to make if some areas would not get noise abatement due to
- Cost prohibitive or nature of business not residence, utility conflicts costs to fix to be included
- Are they constructible
- Stay away from overhead power lines
- If we do not add through capacity, ramp mods do not qualify for Noise Abatement
- FDOT needs to do study and FHWA funds, but DOT pays for
- Increased noise levels would need to be covered
- Keep within DOT R/W or get R/W for walls
- Based on traffic noise monitoring, already studied twelve sites to get existing information
- 5 db at 1st and 2nd level homes
- Modeling certain areas (west end) where residents would be affected
- Lago estates has an 8ft wall on their own property
- Other developments are to be studied and included in the analysis
- Need 78 homes in the Flamingo area to warrant noise abatement
- Braided ramps may serve as noise walls

Transit
Discussion with VE team by Transit team
The Agenda items to be discussed were:

1. LPA and Master Plan
2. PD&E Overview
3. CBEWT Overview

4. Elevated Reversible Lanes
5. Alignment concepts from April through November 2004
6. Workshop coordination
    i. Station Locations
    ii. Typicals
    iii. Costs
    iv. Impacts
    v. Cohesiveness between Transit and Roadway along I-595

Items as presented by Carter Burgess on November 3, 2004

- LPA approved, but move transit forward at the same time
- Need to determine the alignment within the I-595 corridor
- Typicals, costs, impacts, and general discussion
    - Partnering to be initiated
    - Workshop
    - Include Transit alignment station locations within I-595 improvements
    - Single alignment for transit alternative
        - Route options are taking place outside I-595
        - Schedule – Transit has extra phase up front for feasibility
        - Sawgrass mills and down 136th and moving along I-595
        - Alignments to be approved later this month by MPO
        - Technology to be chosen (light rail, or bus)
        - Financial analysis to be developed
        - LPA in March 2005
        - PE in early 2006
        - Routes are still being determined
        - South side is preferred
        - Station locations are in next phase, looking at three now
        - 1 at College Ave west of Davie Rd, 1 at University and Pine Island Rd (northside of I-595-not sure how to transition across
        - Stay on north side until SR 7
        - Other stations are being reviewed
        - Have not determined the stations locations or typical because of not knowing LRT or BRT technology
        - Elevated guideway? Not known yet
        - Financial component for Transit
            - $1 billion program high level system, elevated
            - Sawgrass Office Depot center to downtown 21 miles long
            - Do not prefer to be located in the median, as it does not allow for commercial development

next to the station, and ridership diminishes
- Ridership not determined
- Originally at LPA the transit thought transit would go into existing I-595 R/W
- See preliminary route on dwg by RS&H
- Stay on South side of I-595
- Need 40 ft width
- Use Elevated guideway
- May be able to fit within existing R/W
- Maintenance Yard at Infield of SR 7 I/C
- Peds can walk under the guideway
- More information can be found on www.centralbrowardtransit.com

Items to be covered on November 4, 2004
AM—

Phasing

Will project be constructed with limited funding
Or will the project have enough funding to allow for packaging in segments, i.e., I-95 to Turnpike, Turnpike to University Ramps, University Ramps to I-75/Sawgrass

Drainage

Maintain existing pavement treatment as-is
Provide for new pavement area treatment
Provide compensatory treatment
Treat the original pavement at 1inch over existing pavement
Treat the new pavement at 21/2 inch over new pavement areas
Allow for pre and post discharge
Attenuate at existing Interchange infield areas
Agency may waive limited discharge to the New River Canal
VE Item

1. Minimize the need for R/W for ponds
2. Use Turnpike I/C and overtreat
3. Need Cost Analysis to optimize the treatment types by area
4. Review phasing to see if we need a separate phasing for drainage, and review putting drainage in with Braids, Mainline, and I/C work
5. Expand existing ponds and provide temporary piping
6. Joint treatment with developers and golf courses for ponds and treatment
7. Stay away from contaminated areas
8. Permit in portions (not as a whole project)
9. Extend project limits to Cherry Camp at Sawgrass I/C area

Value Engineering
For Transportation Improvements

I-595 Corridor PD&E from I-75 to East of I-95

Value Engineering Study Report

FM Number: 409354-1-22-01

Fed. Aid Project: Yes

Project Description: I-595 from West of I-75 to East of I-95

Study Dates: January 18-21, 2005

Project Development Phase				Study Identification Number													
PD&E	Design		Other								VE Item No.						
FDOT-D4											Yr.		Dist.		No.		
											0	5	0	4	0	6	

This study has been performed in accordance with current applicable FDOT Value Engineering Procedures and Techniques

Richard L. Johnson, CVS No.20030201, PE No. 38681

Date: March 14, 2005

TABLE OF CONTENTS

SECTIONS

EXECUTIVE SUMMARY 1

1.1 INTRODUCTION

The proposed improvements are planned for Interstate 595 (I-595) from Interstate 75 (I-75)/Sawgrass Expressway Interchange to East of the Interstate 95 (I-95)/I-595 Interchange. A master plan has been completed and the identified Locally Preferred Alternative (LPA) was adopted by the Broward County Authorities and FHWA. The project begins at Weston Road on the West end and proceeds eastward to approximately 3,350 feet East of I-95, see **Figure 1.1 - 1.**

The proposed improvements were reviewed during the January 18-21, 2005 meetings. The following items were discussed on Tuesday morning, January 18, 2005 when the team reviewed design progress since VE Study No. 3. For purposes of this report the team identified three Typical Section Options; the LPA Typical Section; Typical Section Option 1 and Typical Section Option 2. These typical sections correlate to PD&E Alternate Design Concepts prepared earlier in the process by RS&H, Inc. The correlation between the typical sections is: **LPA Typical Section = Alternate 1A; Typical Section Option 1 = Alternate 2A; and Typical Section Option 2 = Alternate 2B:**

- **Tuesday**
  - Introduction of team members
  - Previous meetings focused on design options
  - This VE will focus more on drainage, noise and environmental issues
  - Master Plan LPA design/VE review process
  - Schedule review now at step 8 on schedule
  - Action item review
  - Where are we now, and VE study focus
  - Agenda review
  - Review changes to corridor since last meeting
    - Three options including 2 with elevated reversible lanes (REC):
      - LPA Typical Section – Reversible Lanes in median at grade, Transit outside R/W on the South
      - Typical Section Option 1 –Transit in median under the ERL
      - Typical Section Option 2 – Add General Purpose Lanes under ERL and elevate Transit on South side within the R/W (Alternate 2B for the purpose of the PD&E study)
    - Sewell Lock issue
    - Maintenance of North New River canal issues:
      - Consider a 10 ft shoulder for maintenance to use for canal
      - Use urban typical section on SR 84
      - Limited access on north side (use SR 84 to get access to canal, at crossroads)
      - SFWMD wants bulkhead walls when crossing over Canal R/W line
    - Meeting with Turnpike staff held one month ago resulted in:
      - Tolled reversible lanes, minimal revenue gained $14.5 million (without direct connection to Turnpike)
      - Parallel Turnpike revenue study of direct connect to Pine Island and Turnpike indicated a $50 million increase in revenue
      - Another meeting with the Turnpike is planned this week
      - Two flyovers ramps providing direct connect to Turnpike is being planned
      - Additional lanes on the Turnpike to accommodate the reversible lanes will be the Turnpike's responsibility
  - SFWMD R/W Impacts – Tuesday
  - Latest Alternatives – Tuesday
  - Transit – Tuesday
    - Broward County stated that it is important to incorporate transit

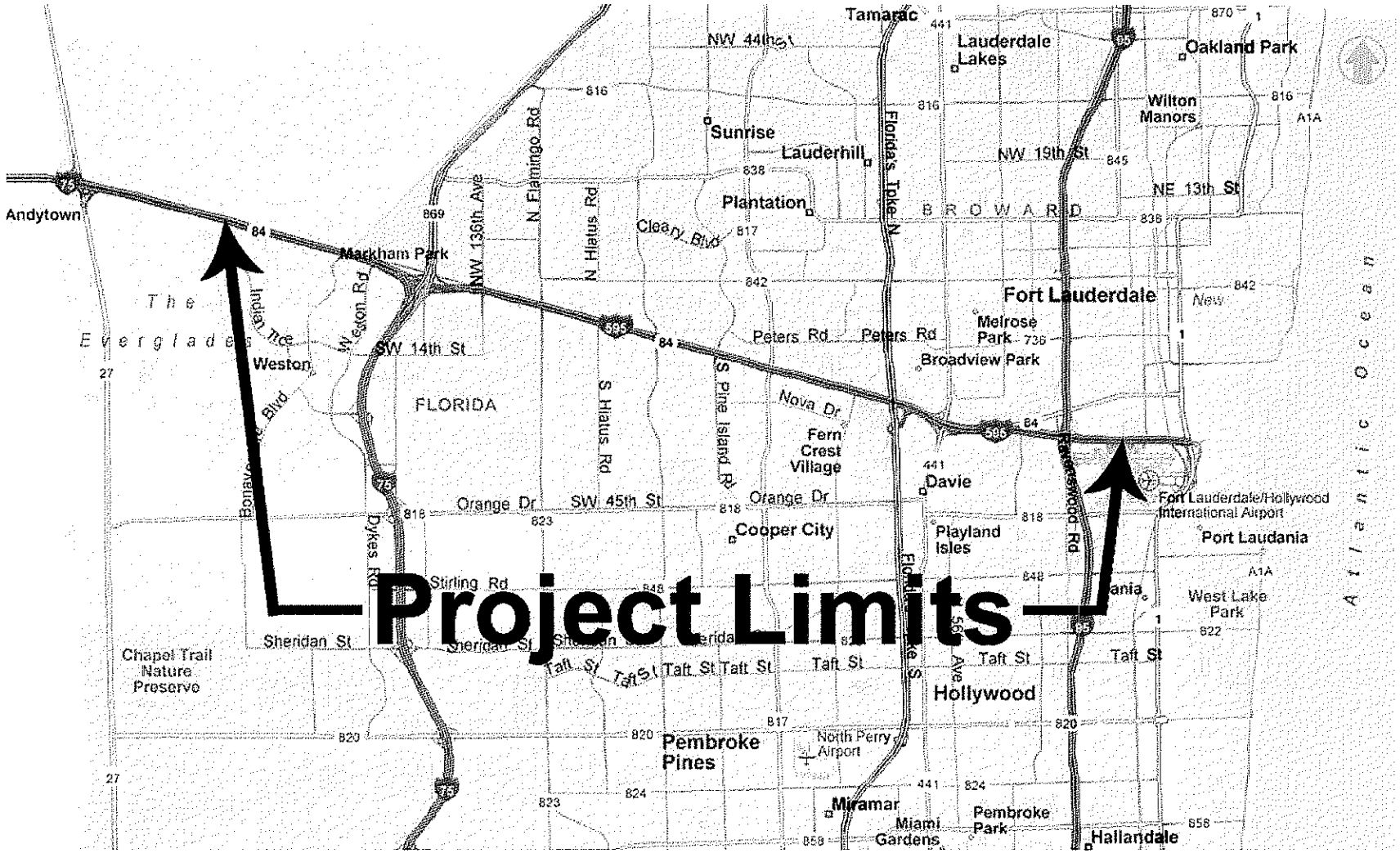
- Geometry, Coordination (may end up with LPA, no room for transit within R/W for roadway)
  - Status of Greenway (if moving bike path and placement of the noise walls along the Greenway, need to determine maintenance responsibility of the canal)
  - Status of Section 4(f) and Environmental Impacts
  - Transit going at grade south side of I-595, workshop in February with public to layout what works with type of transit and cost/technology that fits within the corridor, leading to sales tax for funding the Project
- Improve or shorten ERL direct connections to the Southbound Turnpike
- Elevated structure direct connections to be reviewed connecting I-595 mainline to I-75 on west end of project
- Consider cantilevered bike lane over the canal to accommodate the braided ramps at the Pine Island crossroad location
- Bypass ramp to be moved to the inside to accommodate the braided ramps at Hiatus and Pine Island crossroad locations
- Keith Brockman to review traffic to see if we could use fewer lanes or exit/entrance points
- Consider routing SR 84 bike lanes to the canal side with the trail to accommodate width problems at Hiatus Rd
- Consider a tightened width typical section to accommodate required lanes
  - Consider having bikes use an alternative route (i.e., trail along canal) with a dedicated bike lane on the trail

- **Wednesday - Drainage**
  - Coordinate pond locations with station locations (Hiatus, Flamingo, College Ave, Davie extension, University/Pine Island, (5-6 acres footprint at each location), City of Plantation master plan drawn up for land use changes-- and almost at every intersection)
  - See pond layout drawings and 24-pond spreadsheet located by station (prepared by RS&H for pond site selection was updated with FDOT)

- **Thursday - Noise, Design, Location & Constructability**
  - Idea Development
  - Prepare, rehearse Presentation
    - Presentation of Results – Friday
    - A VE meeting is being planned after the April Public Workshop to complete results of VE effort
    - FHWA approved SIMR
    - Need to meet with MPO with LPA (updated with roadway and transit improvements being planned) in April 2005.

- **Scope of the VE Process**
  - The FDOT has advanced the project into the PD&E phase
  - Differs from normal PD&E due to complexity, size and integration with other projects
  - VE effort will encompass a 16-month process defining the system geometry
  - Each VE effort will focuses on Design Packages
  - Each Design Package will be coordinated with the system requirements
  - Consistency will be maintained with the LPA intent

Figure 1.1 – 1
Project Location Map



1.2 ORGANIZATIONAL STRUCTURE

- The team will be managed by the FDOT Management Team
  - The PD&E Design team consists of the RS&H, HDR, Parsons, PBS&J and Wantman groups
  - Integrated as part of the Design and Reviews will the VE Meetings Facilitators
  - The FDOT Design Review team had representation from the following areas:
    - Planning and Environmental Management
    - Design
    - Construction
    - ITS/Traffic Operations
      - Utilities
      - Structures
      - Drainage/Permitting
      - Right of Way
      - Surveying

The Locally Preferred Alternative was endorsed by Broward County and approved by the FHWA. The LPA evolved through Public Involvement workshops held during the Master Plan Phase.

Project Purpose
The current project purpose is to meet the existing and projected traffic demand needs of the corridor by maximizing the existing corridor's potential with minimal impacts

1.4 MASTER PLAN LOCALLY PREFERRED ALTERNATIVE

Major components of the LPA Roadway system improvements include:

- Collector-Distributor System
- Continuous westbound at SR 84 between Davie Road and SR 7
- General Purpose lanes
- Reversible lanes in the median from west of Flamingo Road to east of SR 7
- Two-lane off ramps
  - Westbound at
    - University Drive
    - Nob Hill Road
    - Pine Island Road
    - Flamingo Road
  - Eastbound at
    - Pine Island Road
    - University Drive
    - Davie Road
  - Two-lane on ramps
    - Westbound at
      - Pine Island Road
    - Eastbound at
      - University Drive
- Braided ramps
  - Westbound between
    - University Drive and Pine Island Road
    - Pine Island Road and Nob Hill Road
    - Hiatus Road and Flamingo Road
- Eastbound between

- Flamingo Road and Hiatus Road
- Nob Hill Road and Pine Island Road

- Flyovers at
  - Hiatus Road WB and
  - Hiatus Road and Pine Island Road EB
- Interchange efficiency improvements at
- Florida's Turnpike
- SR 7
- I-95 Interchange
- I-75 Interchange
- Transit system to be extended from I-75 to the Ft. Lauderdale Airport long-term parking, Tri-Rail, and Downtown locations with stations located along the I-595 corridor between I-75 and 136th Avenue, Hiatus Road and Nob Hill Road and between University Drive and Davie Road. (not part of the I-595 Corridor reviewed by the VE team during this VE study).

1.5 I-595 PD&E

Traffic has been updated from the 2020 to 2034 projections. Toll and congestion management has been analyzed. The original LPA was updated to a revised LPA updated to show effects of the 2034 traffic projections. The original LPA has been updated with recommendations made by the VE team after the last meetings since April 2004 and interim VE team meetings held from April through November 2004.

I-595 CORRIDOR ACTION ITEM LIST ESTABLISHED DURING FEBRUARY 2004 MEETING UPDATED JANUARY 18-21, 2005

Items shown below were noted as part of the February 2004 Kick-off meeting and VE Studies 1, 2, 3 and 4:

Action Items	Assignee	Due by date	Completion date—Status as of 1/18/05
Independent drainage team to review options	Howard/Scott RS&H	Before Meeting #2	Took place with drainage group during the interim meetings, drainage, pond siting, list of pond locations
Consider limits of cross road improvements	RS&H	By Mtg #5	Identified by intersection already
Incorporate traffic mgt sys I-595 ITS corridor	RS&H	Continuous	Not fully identified yet, ongoing with Mark
Determine R/W needed for Mainline and coordinate with Transit to determine R/W needed ASAP	RS&H/FDOT	July 2004	R/W estimated per option
Update traffic for 2034 and adjust current LPA	Jeff RS&H	May 2004	Updated and incorporated
Meeting with Gus prior to March PIM to discuss noise issues and placement of walls	RS&H	Mid March 2004	Complete, meetings continue with noise wall locations, need analysis for noise walls, struct. analysis
Set schedule to meet/coordinate with Tpk and others	RS&H/FDOT/TPK	March 2004	Phasing needs established consideration continues
Action Items	**Assignee**	**Due by date**	**Completion date—**

			Status as of 1/18/05
Obtain feedback from Paul Re: EPA regulations	FDOT	Feb 17, 2004	Consent decree submitted not signed off yet, 595 improvements covered
Obtain FHWA approval for LPA refinements	Scott/Jeff/Nick RS&H/FDOT	Feb 23, 2004	FHWA advised and up to speed
Coordinate I-595 and Tpk I/C work segments	FDOT/Turnpike	Meeting #4	Phasing established with costs (see VE study #3)
Phasing to be established, reviewed/approved	TEAM	Begin Mtg #4, finalize by Mtg #5	Phasing established with cost
VE Recommendations and Design Suggestions	TEAM	RS&H to review and incorporate acceptable options prior to next meeting	3 lane NB Tpk off ramp to I-595 SR 84 behind braided ramps
Added items at November 1-5, 2004 meetings Noise walls	RS&H	RS&H to continue noise wall analysis and optimize noise wall locations and types	Presented during VE #4
Sewell Lock	RS&H	Minimize impacts to site (may need to move the braided ramp discuss with NEPA	Adjustments made to minimize or eliminate impact to the park
ITS meeting with Mark Plass	RS&H/FDOT	Special meeting to review ITS needs/wants	Ongoing
Extend Study limits to Cherry Camp	RS&H	Environmental purposes	Incorporated into project
Talk with City of Davie, Police Dept, School Board about R/W for two options at Nob Hill Braided ramps	RS&H	R/W requirements at braided ramps	Braids adjusted to minimize/eliminate impacts
Meeting with SFWMD	RS&H	Coordinate Drainage Permitting and Construction needs	Meetings were held on 12/10/04 and 1/05/05 Meeting needed to coordinate with the WMD to review maintenance access to the canal with noise wall improvements in place
Meeting with Coast Guard	RS&H	Coast Guard coordination with plan	Ongoing
Meeting with Greenway	RS&H	Coordination	Meetings held on 8/6/04 and 12/7/04
Meeting with FHWA	RS&H	FHWA	Check on walls already in place at neighborhoods, in calculating wall heights at those locations (Hawks landing area)
Survey Communities	RS&H	Public meeting needs to be planned	Hold meeting with affected communities Get data needed, i.e., location, color, texture, etc
Action Items	**Assignee**	**Due by date**	**Completion date—**

			Status as of 1/18/05
Environmental Issues – See Section 6 Recommendation No. 5 for Action Items	RS&H/FDOT/ Others	ASAP	

1.6 SUMMARY OF RECOMMENDATIONS

Over the course of the Planning VE Process the team has created, evaluated and developed a number of ideas and recommendations that have been incorporated into the I-595 Corridor Design Program. The previous reports for Studies No. 2 and 3 documented the Alternatives that were recommended. The following tables, Table 1.6 – 1, Summary of Recommendations, shows the ideas and that were identified and the actions taken (e.g., Incorporated in PD&E).

TABLE 1.6 – 1
SUMMARY OF RECOMMENDATION FROM VE STUDY No. 4

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description**	**Management Action**	**Comments**	**Potential Cost Improvement (add)**	
TS1	Typical Section Option Summary			*	
1A	West end direct connects			*	
1B	East end direct connects to the Turnpike			*	
2	Braided ramps between Hiatus and Flamingo Roads			*	
3	Transit issues			*	
4	Right of Way status			*	
5	Environmental issues			*	
6	Noise Wall considerations			*	
7	Construction Phasing			*	

***=Costs comparisons not feasible since RS&H has not estimated the LPA and refinements yet. VE Study No. 5 will calculate the potential cost savings from all recommendations in a summary report**

TABLE 1.6 – 2
SUMMARY OF REOCOMMENDATIONS FROM VE STUDY No. 3

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description** Modified description from Original submitted report	**Management Action**	**Comments, Rec'd from RS&H Jan. 21, 2005**	**Potential Cost Improvement (add)**	
1	I-595 WB to NB Turnpike Interchange		Incorporated in PD&E	Added operational improvements, geometric improvements, less delay	
2	I-595 EB to Turnpike NB		Incorporated in PD&E	"	
3	I-595 to Turnpike SB		Incorporated in PD&E	"	
4	Turnpike SB to I-595		Incorporated in PD&E	"	
5	Turnpike NB to I-595		Incorporated in PD&E	"	
6	Reversible Lanes LPA Option 1 at grade		LPA modified	No cost difference	
7	ERL LPA modified Option 2		Incorporated in PD&E, needs refinement	No cost difference	
8	ERL LPA modified Option 3		Incorporated in PD&E, needs refinement	Approx. $100 million R/W only, to be estimated by R/W after VE #3	
9	Braided Ramps – SR 84 on outside		Incorporated in PD&E, needs refinement	$12 million	
10	Improve Entrance/Exit weaving on I-595 between 136th and Flamingo each side		**Incorporated**	**Evaluation of different Geometry**	
11	Combine ITS/TMC Center with Transit Control Center		Ongoing	Suggestion	
12	ITS Fiber Optical conduit needs incorporated with final design		Ongoing	Suggestion	
13	Coordinate with Broward County Greenway project		Ongoing	Finalized mitigation plan	
14	Minimize impacts to Sewell Lock		Incorporated	Preserved the value of historic Lock	
15	Design exceptions as noted		Incorporated	Removed four design exceptions from Project	
16	Turnpike I/C, Braided Ramps, Reversible Lanes Phasing		Part of PD&E development	No cost difference	
17	Braided Ramp phasing		Part of PD&E development	No cost difference	
18	Drainage Design & Coordination with agencies		Ongoing	No cost difference	

TABLE 1.6 – 3
SUMMARY OF RECOMMENDATIONS FROM VE STUDY No. 2

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description**	**Management Action**	**Comments, Rec'd from RS&H on Jan. 21, 2005**	**Potential Cost Improvement (add)**	
1	Analysis and Documentation of Environmental Impacts I-595		PD&E Documents	Design Observation Suggestion	
2	Drainage/Permitting for I-595 Corridor		-	Suggestion	
3	Right of Way Scope		-	To be determined, see VE No. 4	
4	ITS Improvements		Meeting with ITS, once alternatives refined	Value increased, no estimated yet	
5	I-595 Ramp to SB Turnpike		**Implemented**	No cost difference	
6	Split WB Ramps from I-95 (after) Viaduct farther West		Discussed and eliminated	No cost difference	
7	Connector-Distributor Road Connect to SR 84		No action required	No cost difference	
8	University Flyovers		----------	No cost difference	
9	~~Auxiliary Lane~~		----------	-	
10	Braided Ramps		**Moved SR 84 behind braid**	**No cost difference**	
11	~~SW 136th Avenue Ramp~~		Out replaced by 14-1	-	
12	Elevate Reversible Lane options		Options being refined	* $25 million per mile to be verified	
14-1	Interim WB I-595 to Weston Rd Ramp		To design and construct alternate	$1.43 million To be replaced by 14.2 in future	
14-2	Ultimate WB I-595 to Weston Rd Ramp	Currently within design	Ramp to Weston Rd	$6.2 million part of original scope	
14-3	~~Creating Continuous connections WB SR 84 from SR 7 to Davie Rd~~		See No. 7 above	--	
add	I-595 EB viaduct re-striping to 5 lanes			Minimal cost, great benefit	

***=Costs not estimated, due to insufficient information**

VALUE ENGINEERING METHODOLOGY 2

2.1 GENERAL

In general a normal VE study process would include analysis during a timeframe that meets the needs of the project. In this case the VE methodology planned will be applied during several meetings and studies during the 16-month process. The process is outlined below.

2.2 PRELIMINARY INFORMATION GATHERING PREPARATION EFFORT-MEETINGS

At least two one-week studies were planned, one in May 2004 and the second during January 2005. Each one will have pre-study preparation for the VE effort consisting of scheduling study participants and tasks; reviews of documents; gathering necessary background information on the facility; and compiling project data. A cost model was projected before the first VE study. Information relating to the design, construction, and operation of the facility is important as it forms the basis of comparison for the study effort. Information relating to funding, project planning, operating needs, systems evaluations, cost basis, soil conditions, and construction of the facility is also a part of the analysis.

2.3 VE WORKSHOP STUDIES EFFORTS MEETINGS NO. 2, 3 AND 4 (3- TO 5-DAY STUDIES)

Conceptual ideas will be reviewed during Meeting No. 2 (3-5 days). Alternative design concepts will be reviewed during Meeting No. 3 (5 days). Each planned VE workshops will follow a 3- to 5-day study plan (an agenda is included in the appendix).

During each workshop, the VE job plan will be followed. The job plan will guide the search for high value improvement areas in the Project and include procedures for developing alternative solutions for consideration while at the same time considering other efficiencies. It includes these phases:

- Information Gathering Phase
- Function Identification and Cost Analysis Phase
- Creative Phase
- Evaluation Phase
- Development Phase
- Presentation, Reporting Phase

2.3.1 Information Phase

At the beginning of the study, the conditions and decisions that influence the development of the project must be reviewed and understood. For this reason, the Design Consultant Project Manager will provide design information about the project to the VE Team. Following the presentation, the VE Team will discuss the project using the documents provided.

2.3.2 Function Identification and Cost Analysis Phase

Based on the FDOT cost estimate, historical and background data, a cost model will be developed for this project organized by major construction elements. It is used to distribute costs by project element; serve as a basis for alternative functional categorization; and to assign worth to the categories, where worth is the least cost to provide the required function, as determined by the VE Team. The VE Team identifies the functions of the various project elements and subsystems and creates a Function Analysis System Technique Diagram (F.A.S.T.) to display the

relationships of the functions. Function analysis was determined by area discussed.

2.3.3 Creative Phase

This VE study phase involves the creation and listing of ideas. During this phase, the VE Team generates as many ideas as possible allowing for a productive and creative atmosphere and to help team members to "think outside the box." Judgment of the ideas is restricted at this point to insure vocal critics do not inhibit creativity. The VE Team is looking for a large quantity of ideas and association of ideas.

The FDOT and the design team may wish to review the creative design suggestions that are listed in the report, because they may contain ideas, which can be further evaluated for potential use in the design.

2.3.4 Evaluation Phase

During this phase of the workshop, the VE Team judges the ideas generated during the creative phase. Advantages and disadvantages of each idea are discussed and a matrix will be developed to help determine the highest-ranking ideas. Ideas found to be irrelevant or not worthy of additional study are discarded. Those that represent the greatest potential for cost savings or improvement to the project are "carried forward" for further development.

The creative listing is re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may change, or they may be combined into a single idea. For these reasons, some of the originally high-rated ideas may not be developed.

2.3.5 Development Phase

During the development phase, each highly rated idea is expanded into a workable solution. The development consisted of a description of the idea, life cycle cost comparisons, where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed ideas. Each idea will be written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, are also prepared in this part of the study. The developed VE ideas will be summarized in **Section 6 – Recommendations.**

2.4 POST STUDY EFFORT

The post-study portion of the VE study includes the preparation of this Value Engineering Study Report and the discussions and resolution meetings with FDOT personnel. The FDOT Management team should analyze each alternative and prepare a short response, recommending incorporating the idea into the project, offering modifications before implementation, or presenting reasons for rejection. The VE Team is available for consultation after the ideas are reviewed. Please do not hesitate to call on the VE team for clarification or further information for considerations to implement any of the presented ideas.

2.4.1 Presentation and Resolution Phase

The final phase of the VE study begins with the presentation of the ideas on the last day of the VE Study. The VE Team screens the VE ideas before draft copies of the report are prepared. The initial VE ideas are arranged in the order indicated to facilitate cross-referencing to the final recommendations for revision to the Contract Documents.

2.4.2 Final Report

The acceptance or rejection of ideas described in this report is subject to FDOT's review and approval. The VE Team is available to address any final draft report comments for incorporation into the final report.

2.4.3 Interim and Follow-on Meetings

The next Value Engineering Workshop is scheduled for May 16 - 20, 2005 and a final Workshop sometime there after. The RS&H Design team presented their three Preliminary Design Concepts to the VE team to consider during the January 18 - 21, 2005 VE study workshop when the team focused on the improvements incorporated in braided ramps, corridor improvements, drainage pond site matrix, noise wall location considerations, contruction phasing, as well as other corridor improvements.

The RS&H team will refine the preliminary design, drainage requirements, noise wall locations and incorporate the VE team recommendations for presentation at the next meeting scheduled for March 28, 2005. A Public Workshop is scheduled for April 13 th & 14th 2005. During the upcoming VE Workshop in May 2005. Ideas and comments received at Public Workshopswill be shared with the VE/DR team. These comments and input from the VE team will be considered in the selection of the preferred alternative for the Public Hearing and final PD7E documents. The I-595 PD&E combined VE Study process flow diagram (schedule) is shown in the Appendix.

WORKSHOP PARTICIPANTS AND PROJECT INFORMATION 3

3.1 PARTICIPANTS

Representatives from the RSH Design Consultants presented an overview of the project to the Value Engineering Study Team on January 18, 2005. The purpose of this meeting was to acquaint the Study Team with the overall progress and what the main areas the VE team need to focus on during this VE study. The study team included the following experts who attended or made contributions to the presentation:

Name attended VE Jan 18-21	Role	Affiliation
Alex Mabrich	BHA	BHA
Amie Goddeau	Drainage	FDOT
Ann Broadwell	Environmental	FDOT
Carmen Llerena	R/W	FDOT
Dan Lahey	Bowen Civil Eng	Bowen
Daphne Georgiadis	Prof. Eng. Trainee	FDOT
Del Younker	Co-Team Leader	PMA Consultants LLC
Dong Chen	ITS/Traffic Operations	FDOT
Eric Neunaard	RS&H	RS&H
Eduardo Cabellero	Construction	FDOT
Felix H. Delgado	ITS	FDOT
Gary Keife	VE/Utilities	FDOT
Guillermo Becerra	Roadway Design	FDOT
Hamid Ashtari	RS&H-Drainage	RS&H
Jeff Bowen	RS&H	RS&H
Jeff Weidner	FDOT Office of Modal Devpmt	FDOT
Joe Borello	FDOT	FDOT
Mary Tery Vilches	PD&E	FDOT
Mike Bone	Construction/Structures (CEC)	FDOT
Paul Lampley	FDOT	FDOT
Phil Schwab	RS&H	RS&H
Rick Johnson	Team Leader	PMA Consultants LLC
Roberto Rubio	Structures	FDOT
Roger Gunther	URS	URS
Scott Seetzurger	FDOT	FDOT
Shandra Davis Sanders	Drainage	FDOT
Steven Braun	PL&EM	FDOT
Tom Stepp	R/W	FDOT
William Leidy	FDOT-PL&EM	FDOT
Jimmy Mykytka	Noise Analysis	RS&H
Brian Kirkpatrick	Noise Analysis	RS&H
Joe Yesbeck and Reed	Transit	Carter & Burgess

3.2 PROJECT INFORMATION

The purpose of the project orientation meeting on the January 18, 2005, in addition to being an integral part of the Information Gathering Phase of the VE Study, was to bring the VE Team "up-to-speed" regarding the overall project progress, decisions that had been made and portions of the corridor that needed special attention.

3.3 LIST OF VE STUDY MATERIAL REVIEWED

1. Proposed Typical Sections No. 1-6 Jan 18, 2005 for Options 1 (At-grade), Option 2 Elevated reversible lanes (ELR) with room for Transit in the median under the ELR, Option 3 Elevated reversible lanes with general purpose lanes under the ELR with Transit on the south side within existing R/W as much as possible.
2. LPA, Option 1 & 2, Updated Plans from I-75/Sawgrass area to I-95/I-595 Interchange
3. Braided ramps at Hiatus and Pine Island – discussed options for keeping SR 84 on the outside allowing bicyclists a continuous bike lane (undesignated between Davie Road & 136th Street)
4. Greenway partial plans
5. Transit routing overall plan and station layout
6. Pond siting plans and spreadsheet for ponds located by station from Pond 1 at station 1191-1192 existing pond to Pond 24 1654 to 1699 under bridges ponds (see spreadsheet for listed ponds 1-24 with noted concerns and potential contamination comments, by RS&H).
7. Noise wall drawings and spreadsheets
8. Project VE Reports dated June 23, 2004 and December 30, 2005
9. Interstate 15 Express Lanes dated January 2002 (ref. California DOT District 11 near San Diego, CA (from Steven Braun)

3.4 SUMMARY OF GENERAL PROJECT INPUT - OBJECTIVES, POLICIES, DIRECTIVES, CONSTRAINTS, CONDITIONS & CONSIDERATIONS

The following is a summary of general project input, including the goals, objectives, directives, policies, constraints, conditions and considerations presented to the study team. Any "element" specific input is indicated by parentheses around the elements, disciplines and interests (i.e., right-of-way, roadway, environmental). Representatives from the FDOT and RSH Design team provided a project background on January 18, 2005.

3.4.1 Project Functions, Goals & Objectives (what the project should do as determined at the kickoff meeting and subsequent Workshops):

1. The primary project objective is to optimize the scope and expenditure for the intended functions
2. Meet the demanding complex design for the intended LPA improvements
3. Meet the 16 month combined PD&E and VE review process
4. Maintain consistency with the LPA
5. Integrate the updated traffic projections into the LPA
6. Meet the existing and projected traffic demands needs of the corridor by maximizing the existing corridor's potential with minimal impacts

3.4.2 *Project Policies & Directives: (documented things the project must or must not do)*

1. The project will meet economic, engineering design, environmental and social criteria requirements.
2. Meet the goals of the future development.

3.4.3 *General Project Constraints: (unchangeable project restrictions)*

1. No additional R/W over LPA identified areas
2. Environmental requirements
3. Production schedule
4. Permitting requirements

3.4.4 *General Project Conditions & Considerations:*

1. Corridor configurations
2. Previous issues listing

3.4.5 *Function Analysis for areas reviewed*

1. Mainline----------Increase Capacity
2. Turnpike Interchange Ramps------Change direction
3. Noise Walls----------Reduce Noise
4. Right of Way----------Acquire space for improvements
5. Greenway----------Accommodate Pedestrians/Bicycles
6. Braided Ramps----------Avoid Conflicts, Improve LOS
7. Reversible Lanes----------Increase Capacity, reduce delays, avoid congestion
8. Transit----------Allow space for Transit traffic in corridor
9. Environmental----------Reduce pollution, Meet NEPA regulations, treat stormwater
10. Construction Phasing----------Optimize project costs and sequencing and reduce impacts during construction

4.1 CREATIVE IDEA LISTING

This VE study phase involves the creation and listing of ideas. During this phase, the VE Team generates as many ideas as possible allowing for a productive and creative atmosphere and to help team members to "think outside the box." Judgment of the ideas is restricted at this point to insure vocal critics do not inhibit creativity. The VE Team is looking for a large quantity of ideas and association of ideas.

Ideas were generated and those developed for further consideration are shown in Section 6.

EVALUATION 5

During this phase of the workshop, the VE Team judges the ideas generated during the creative phase. Advantages and disadvantages of each idea are discussed and ideas were selected on the basis of value improvement potential and the ability to meet the project needs. Ideas found to be irrelevant or not worthy of additional study are discarded. Those that represent the greatest potential for cost savings or improvement to the project are "carried forward" for further development.

The creative listing is re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may change, or they may be combined into a single idea. For these reasons, some of the originally selected ideas may not be developed.

During the creative phase numerous ideas, alternative proposals and/or recommendations were generated for each required function using conventional brainstorming techniques and are recorded on the following pages. These ideas were discussed and evaluation criteria were determined. A list of the group's discussion and selection of the ideas is summarized on the following section.

Ideas were evaluated and those developed for further consideration are shown in Section 6.

RECOMMENDATIONS 6

During the development phase, each highly rated idea is expanded into a workable solution. The development consisted of a description of the idea, life cycle cost comparisons (not developed in this VE study due to insufficient information), where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed ideas. Each idea was written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, included in the presentation slides shown in the appendix.

TABLE 6.1 SUMMARY OF RECOMMENDATIONS

Recommendation No.	Alternative Recommendation (Idea)
TS1	Typical Section Option Summary
1A	West end direct connects
1B	East end direct connects to the Turnpike
2	Braided ramps between Hiatus and Flamingo Roads
3	Transit issues
4	Right of Way status
5	Environmental issues
6	Noise Wall considerations
7	Construction Phasing

The results of this VE study are shown as individual recommendations developed for each of the focus areas (Typical Sections, Transit, Drainage, R/W, Turnpike, Braided Ramps, Reversible Lanes, Environmental, Greenway, and Construction Phasing) of the project. These recommendations include a comparison between the VE Team's proposal and the designer's original concept. Each proposal consists of a summary of the original design, a description of the proposed change, a life cycle cost comparison (where applicable), and descriptive evaluation of the advantages and disadvantages of the proposed alternative. Sketches and calculations, if appropriate, are shown with the presentation slides in the appendices. The estimated cost comparisons reflect unit prices and quantities on a comparative basis. Value improvement is the primary basis for comparison of competing ideas. To ensure that costs are comparable within the ideas proposed by the VE Team, the FDOT average construction costs were used as the pricing basis.

6.1 EVALUATION OF RECOMMENDATIONS

Some of the VE alternatives' potential savings are interrelated, if one is accepted another one may be or may need to be added, or acceptance of one may mutually exclude another. The VE Team identified total potential savings as shown on **Table 1.6 – 1, Summary of Recommendations**. The write-ups for the individual developed recommendations are included in this section and are presented in the same order as was presented.

The FDOT and the design team to determine whether to accept or not accept the idea should evaluate each recommendation. The recommendations that are accepted should be listed for documentation purposes. For each idea that will not be accepted, the design team normally documents, in writing, the reason or reasons for the non-acceptance. The design suggestions are for consideration by FDOT and the designers. No specific action is normally required to accept or not accept the suggestions, though it is often helpful, for documentation purposes, to formally list those suggestions that will be incorporated by the designers.

6.2 CONSIDERATIONS AND ASSUMPTIONS

In the preparation of this report and the recommendations that follow, the Study Team made some assumptions with respect to conditions that may occur in the future. In addition, the Study Team reviewed the listed project documentation, relying solely upon the information provided by the designer and owner, and relying on that information as being true, complete and accurate. This value analysis and report are based on the following considerations, assumptions and conditions:

The recommendations rendered herein are as of the date of this report. The Study Team or Leaders assume no duty to monitor events after the date, or to advise or incorporate into any of the alternatives, any new, previously unknown technology.

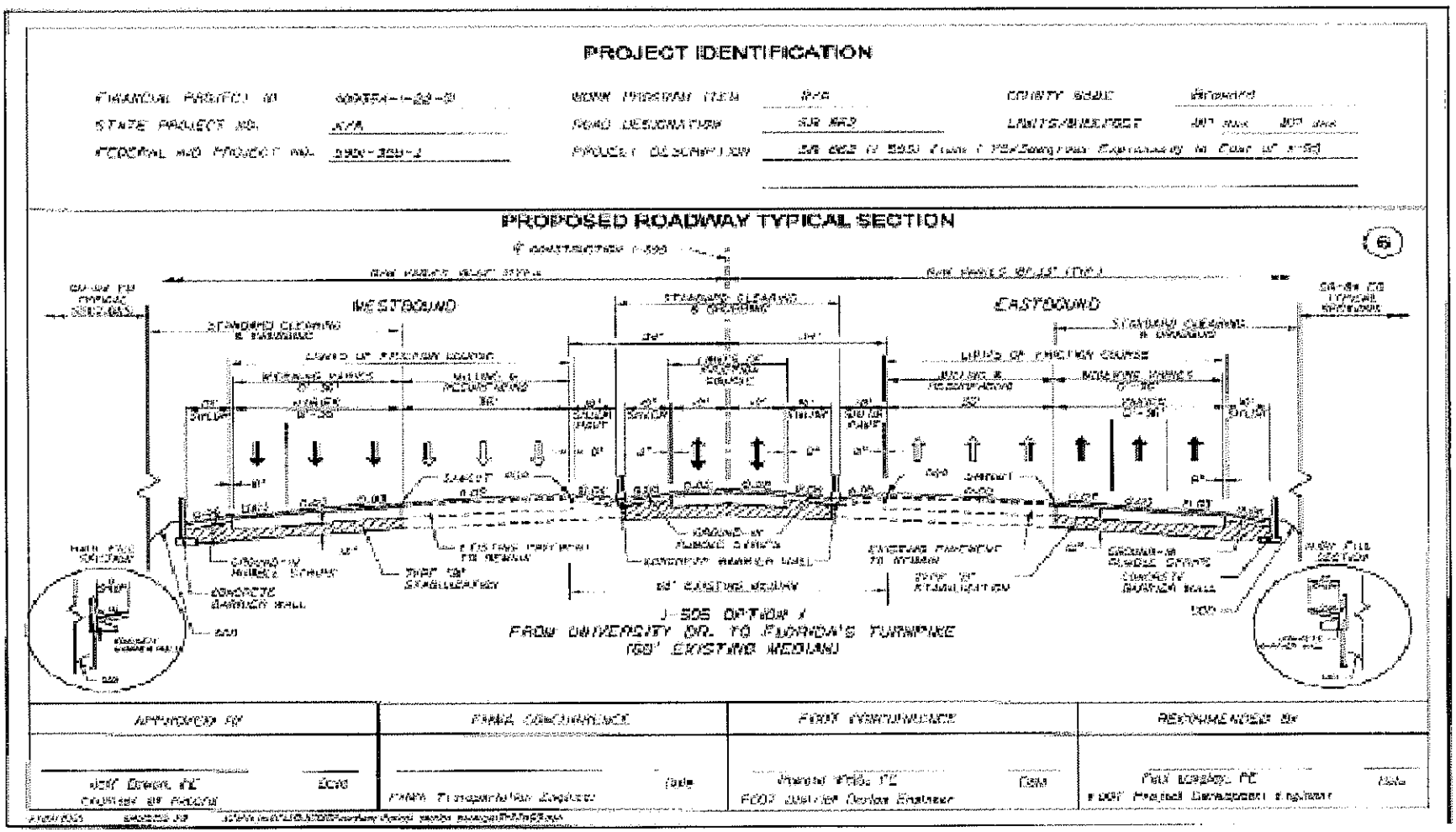
The Study Team or Leaders assume that there are no material documents affecting the design or construction costs that the Team has not seen. The existence of any such documents will necessarily alter the alternatives contained herein.

The Study Team or Leaders do not warrant the feasibility of these recommendations or the advisability of their implementation. It is solely the responsibility of the designer in accordance with the owner, to explore the technical feasibility and make the determination for implementation.

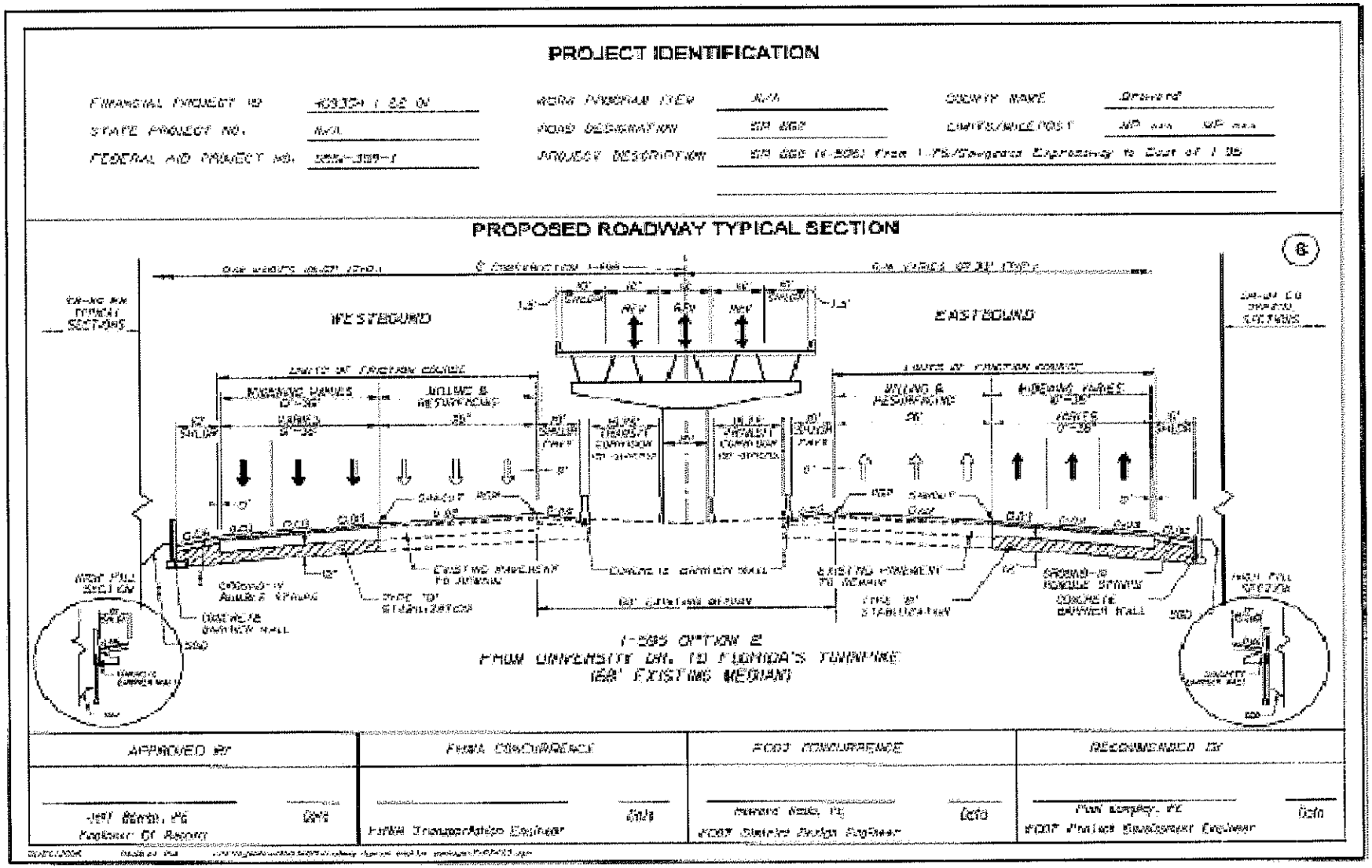
PREAMBLE TO RECOMMENDATIONS: Roadway Options

The following recommendations took into consideration the three possible options that the team is considering for a typical section of the improved roadway. The Options are the LPA Option, Option 1 and Option 2. The typical sections are shown here to help the reader understand the points of reference for each recommendation.

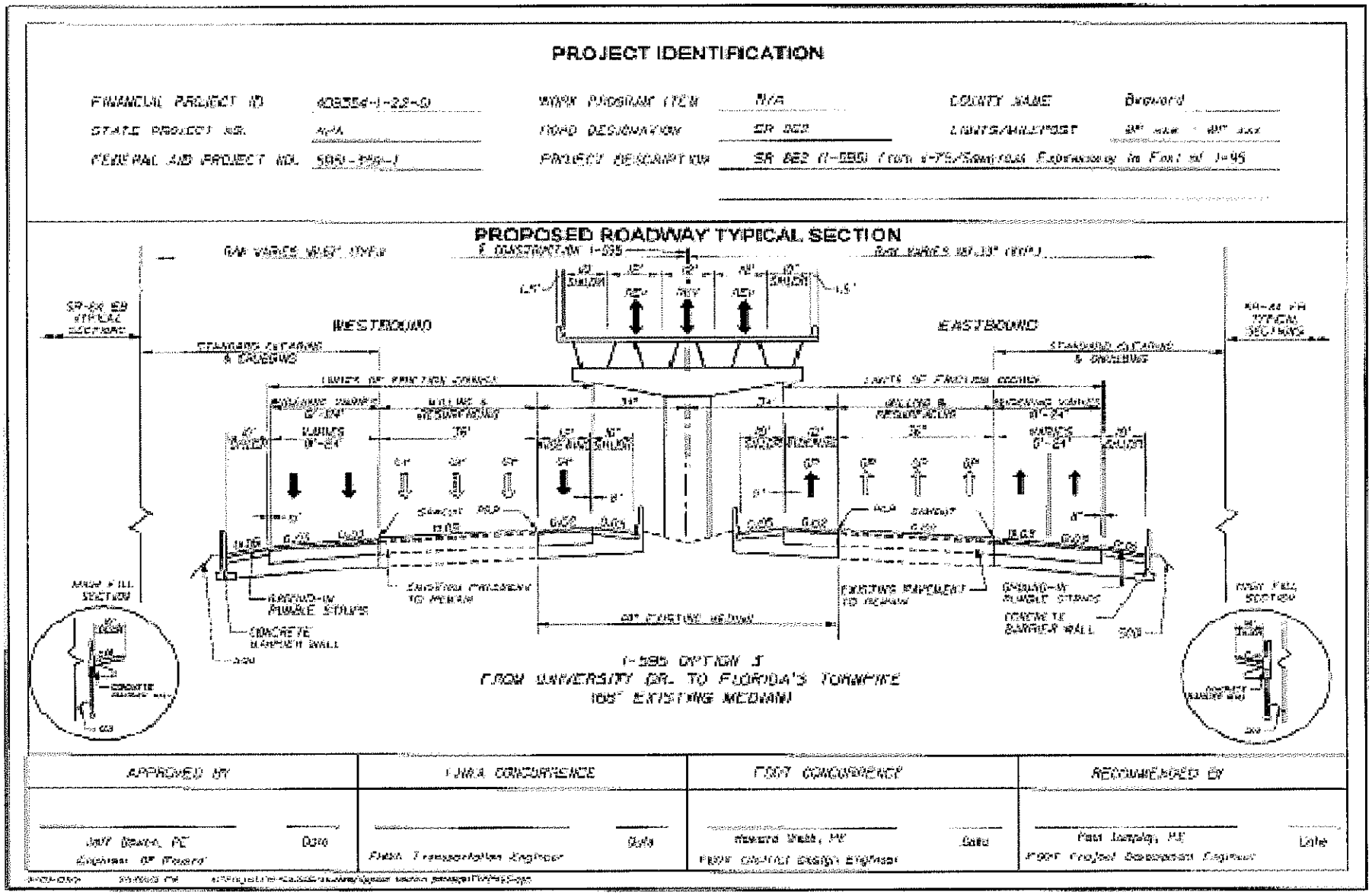
(LPA) Option Typical Section



Option 1 Typical Section



Option 2 Typical Section



RECOMMENDATION NO. 1A: Elevated Reversible Direct Connect to the West End

Original Concept: For options 1 & 2 only, have three lanes reversible on structure and can only release 2 at-grade into the I-595 median. Original concept is to carry remaining (1) lane on structure and terminate on Sawgrass Expressway, south of Sunrise Blvd.

Proposed Concept: VE team proposes to connect to the Sawgrass and I-75 at the West end per the sketches shown on the following pages. This connection allows for connection to the heaviest projected movements. Westbound I-595 to SB I-75 will have a direct-connect to the existing WB to SB Flyover and will release two lanes at grade into the median. A more expensive alternative would be to direct connect the reversible lanes to and from all directions.

Advantages:

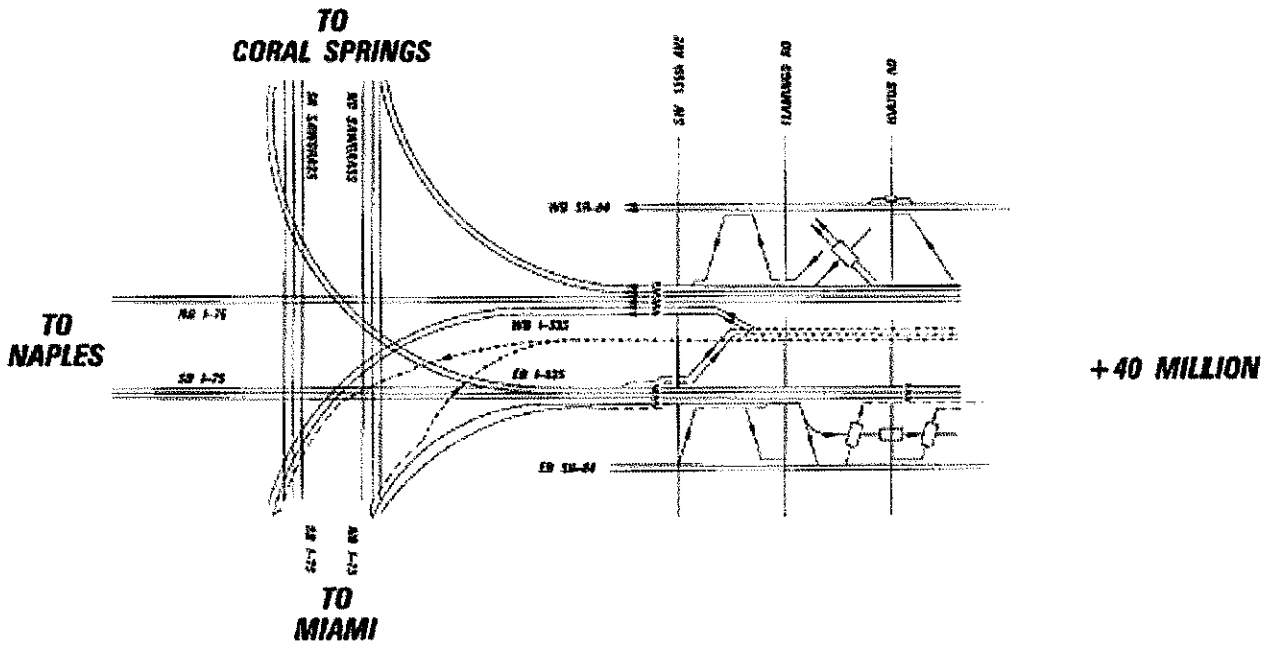
- Less Bridge cost
- Eliminates structure length going to Sawgrass and provide ramp (partial structure) to heaviest movements WB/SB or SB/EB on I-75 I/C and I-595
- Noise impacts reduced
- Visual impacts reduced
- Allows for future direct connects as traffic demand increases

Disadvantages:

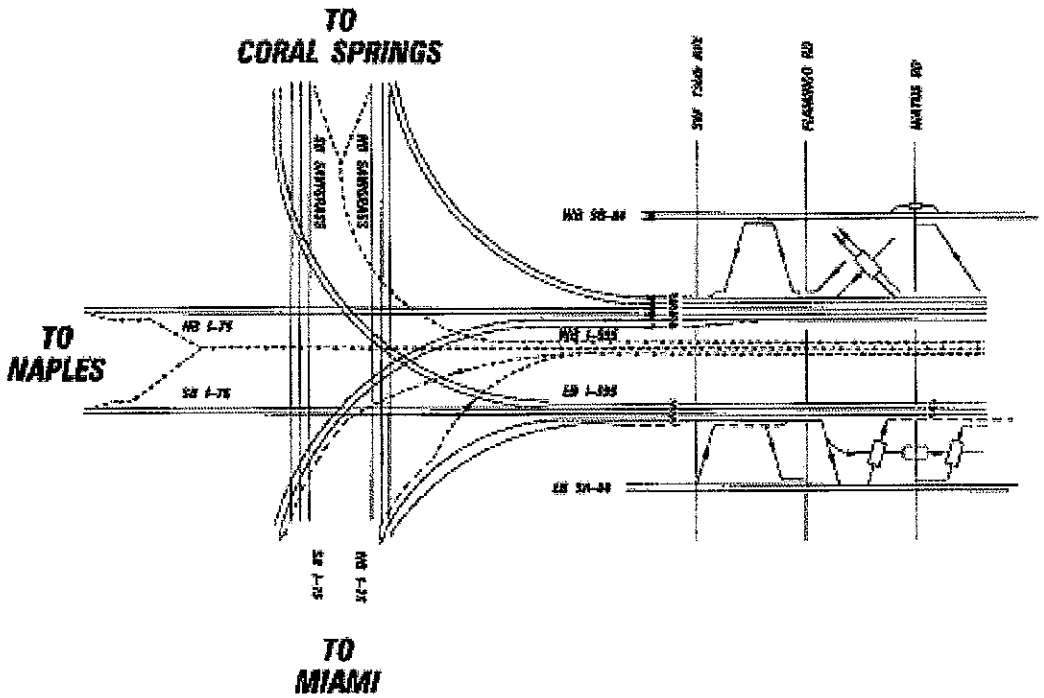
- Needs straddle bent support
- Redesign needed

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

West End Direct Connects I-75 South Only



West End Direct Connects to All Points



RECOMMENDATION NO. 1B: Elevated Reversible Lanes Direct Connect to Turnpike on East End

Original Concept: For options 1 & 2 only direct connect ramp servicing Turnpike south of I-595 extends on structure to the south of the I-595 interchange.

Proposed Concept: VE team proposes to refine the connection to the Turnpike at the East end to reduce the structure length by bringing ramp down to grade within the I-595/Turnpike Interchange

Advantages:

- Visual impacts reduced
- Noise impacts reduced
- Less cost/less structure

Disadvantages:

- Redesign needed for Turnpike/I-595 geometry

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

RECOMMENDATION NO. 2: Braided Ramp Improvements At Hiatus And Flamingo Roads

Original Concept: Enhanced braided ramps at Hiatus & Flamingo Road

Proposed Concept: VE team proposes improvements to the WB Braided ramp system at Hiatus and Flamingo Roads. These improvements propose to maintain SR 84 with accompanying bike lane along the canal. The VE team also reviewed the braided ramps at Nob Hill Road and concluded that the canal encroachment has been maximized and could not re-align SR 84 to the north to allow bike lanes to stay on the outside adjacent to the curb. If the roadway typical section Option 2 is chosen for the project, these braided ramps may be further improved.

Advantages:

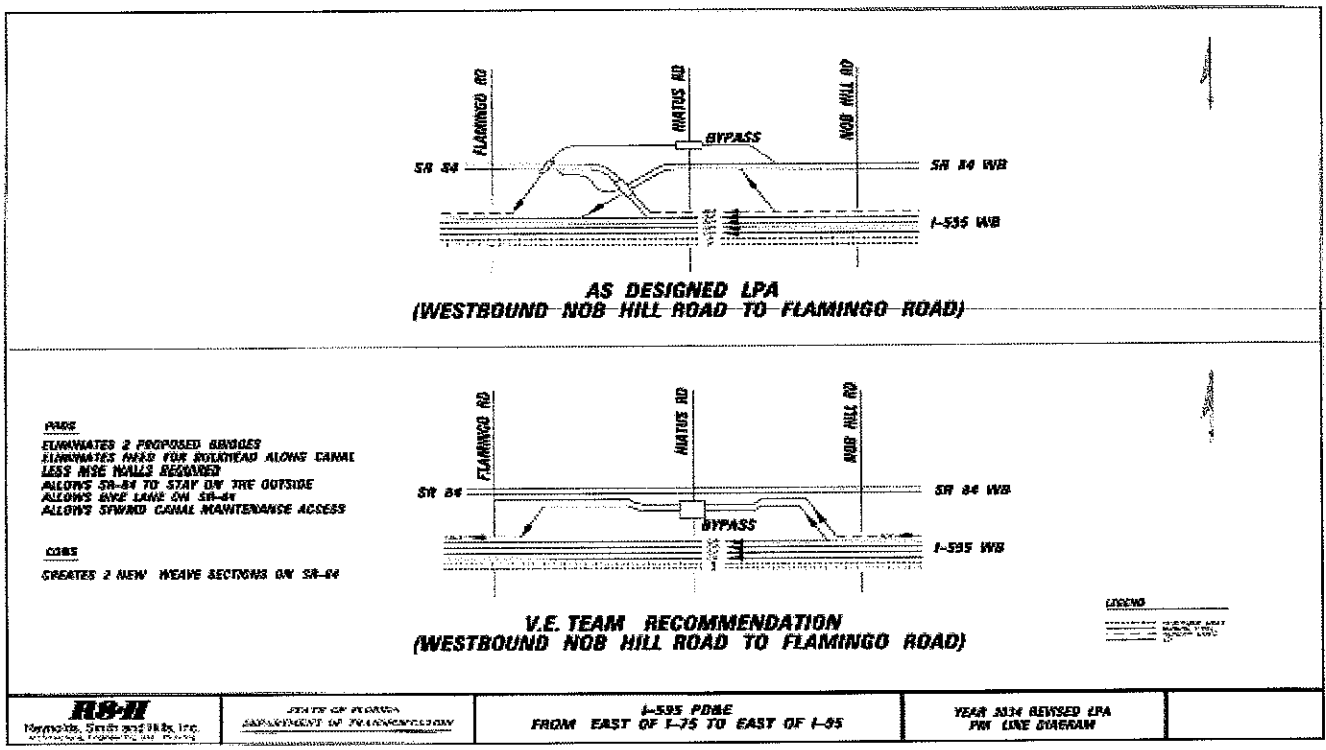
- Eliminates two braided bridges at Hiatus/Flamingo Roads
- Reduces need for bulkhead on canal
- Simpler design and provides operational improvement
- Allows for bike lanes on SR 83 in this area (keeps SR-84/bike lanes adjacent to canal)

Disadvantages:

- Creates a weave on frontage road

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

RECOMMENDATION NO. 2: Braided Ramp Improvements At Hiatus And Flamingo Roads



RECOMMENDATION NO. 3: Transit Connections to the Median

Original Concept: Option 1 only (not previously detailed) – use space freed up in the median, by elevating reversible lanes for transit.

Proposed Concept: The Transit crosses I-595 at 136th Street to the south side and runs on the south to east of Flamingo Road and enters the median at level 2 and drops to level 1. Between Davie Road and University Drive the Transit line crosses the mainline at level 2 and runs along the south side to SR 7.

Advantages:

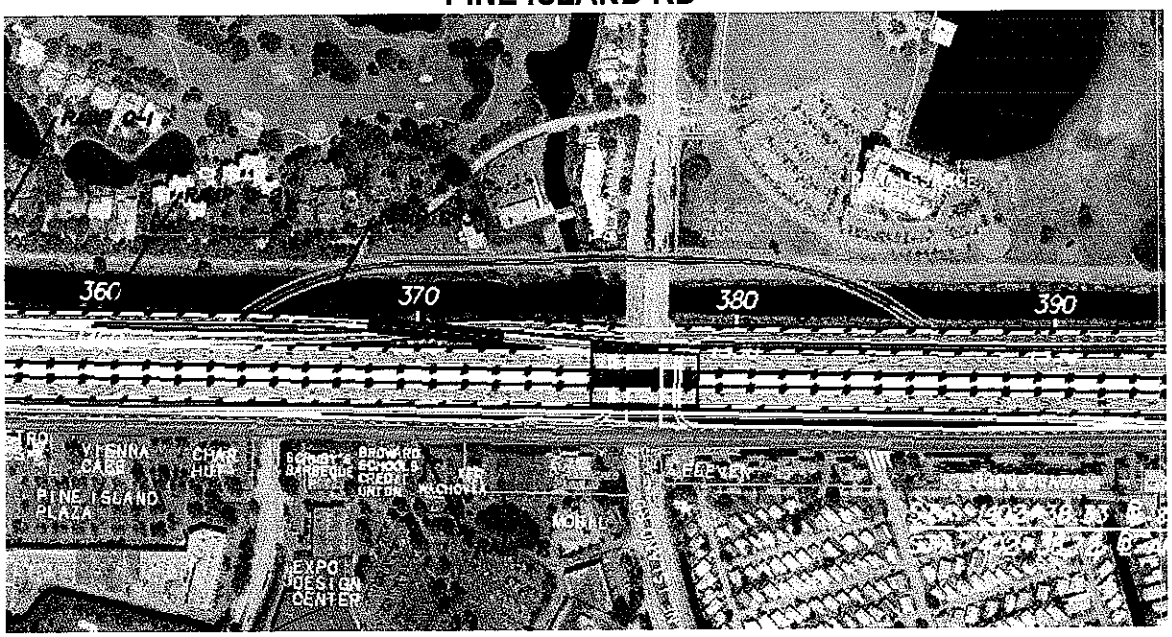
- Validates median transit concept by showing median transit concept geometry that can be accommodated

Disadvantages:

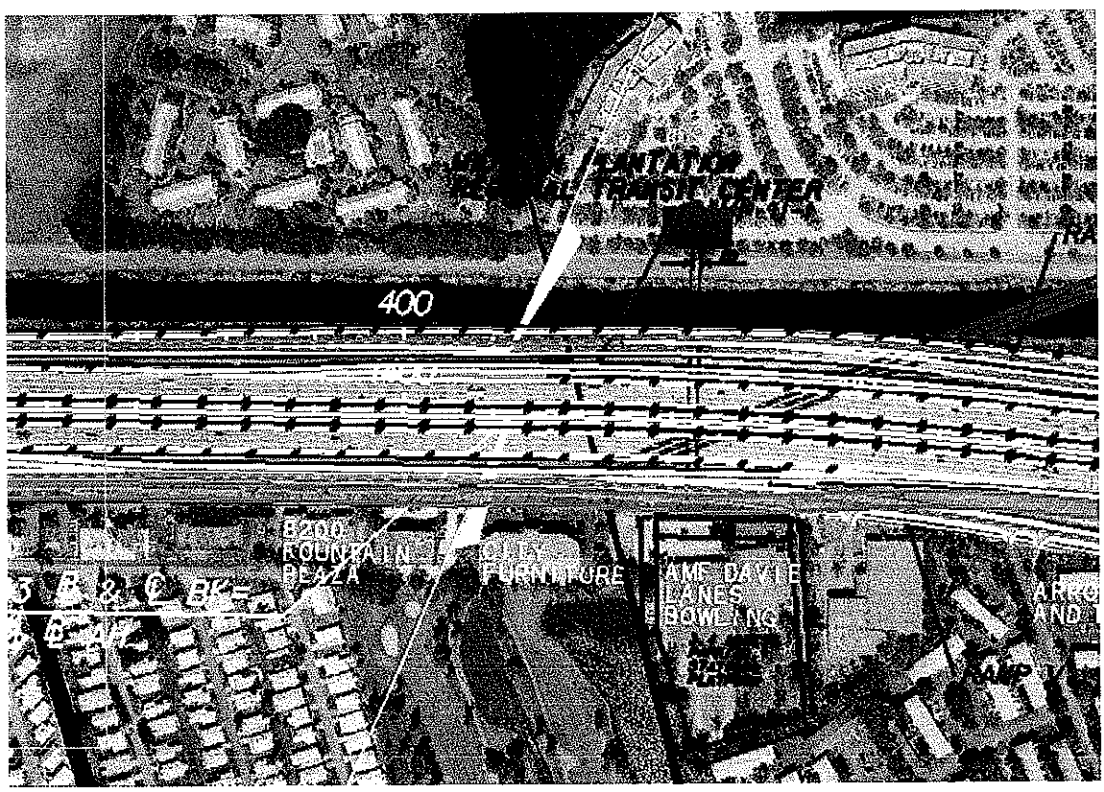
- Raises the reversible lane at the connection points

Potential Cost Savings: To be determined, cost estimates were unavailable from RS&H for comparison

PINE ISLAND RD

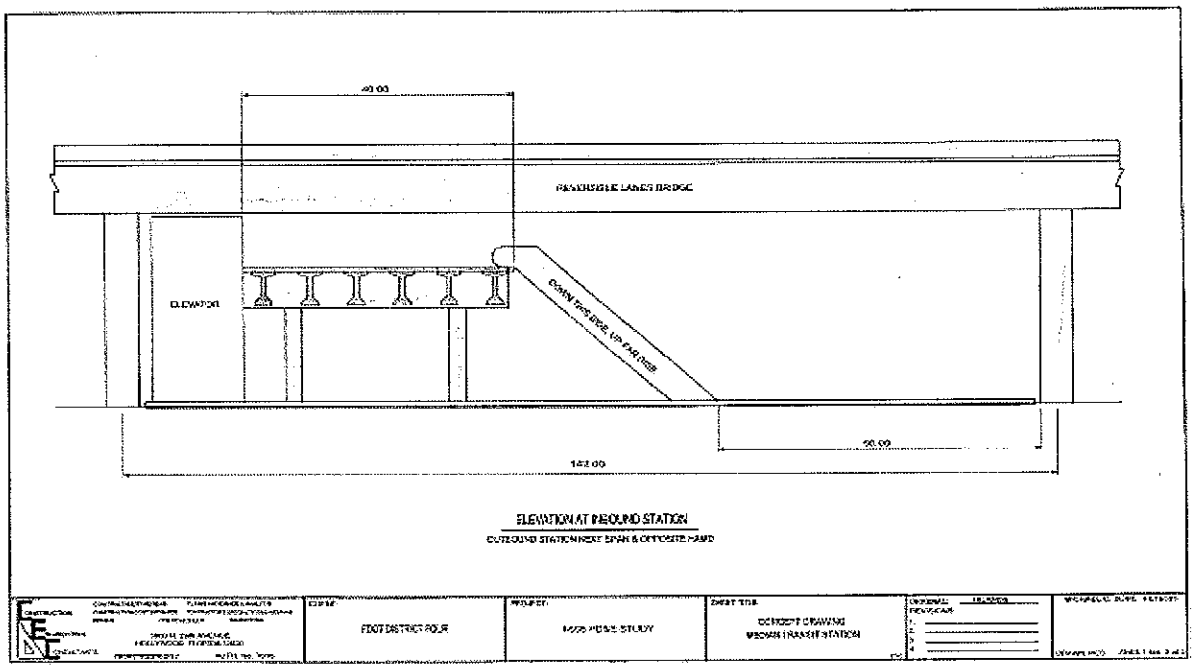


MIDTOWN REGIONAL TRANSIT CENTER

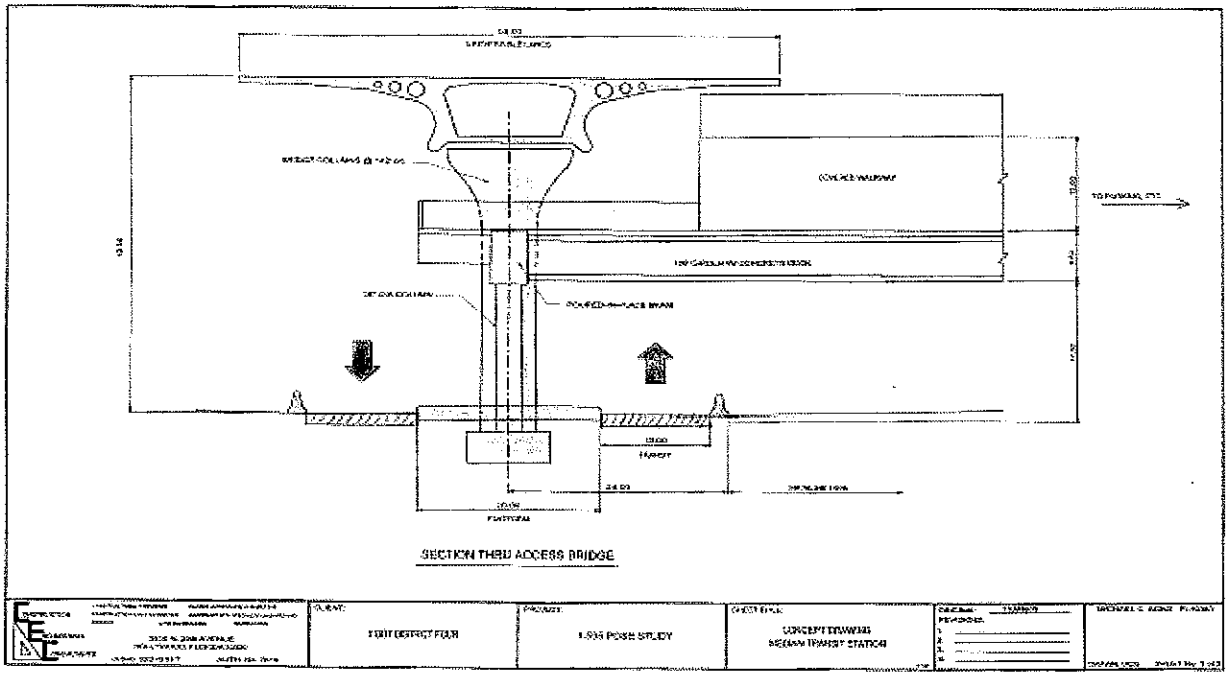


UNIVERSITY DRIVE

Median Transit Platform



Median Transit Platform



RECOMMENDATION NO. 4: R/W Issues

Original Concept: RS&H LPA Design without ponds estimated at $92 million

Proposed Concept: The LPA design considered a substantial taking for right of way to build the project. The current concepts that are going forward are reducing the acquisition requirements so the following is an example of R/W savings at one location.

An example: Location Eastbound Flamingo to Nob Hill Road

1.	11/01/04 LPA	$15,449,070
2.	12/08/04 LPA modified VE revised	$549,665

Objective for 3/31/05

- Prepare Cost estimates for 2 acquisition scenarios
- Finalize R/W cost estimates for 9 drainage basins

Potential Cost Savings:
To be determined, cost estimates were unavailable from RS&H for comparison

RECOMMENDATION NO. 5: Analysis and Documentation of Environmental Impacts I-595 PD&E

The following is a outline-narrative the Environmental Team developed regarding issues, action items, concerns and status of progress:

- **Cultural Impacts** – current work is on track
- **Section 4(f)** – continue discussion with Greenways, Parks
- **Contamination Impacts** – current work is on track
- **Noise Impacts** -Identify your audience in each section of the project and meet with them throughout the process.
- **Natural Resource Impacts** – continue to determine the temporary and permanent wetland impacts at the viaduct.**Action Items**:
    - Public Involvement - Identify your audience in each section of the project and meet with them throughout the process
    - Wetlands – develop mitigation options for the Workshop. Anticipate the need for design and construction of accelerated mitigation projects.
    - ROW/Ponds – continue to work with Drainage and ROW
    - Noise - may be the issue but the audience could be different in different sections of the corridor.
- **Drainage and Permit Update**
    - Drainage and Permit Background Work Completed
    - Permit Locations Defined
    - Basin Limits Delineated
    - Basin Storage Needs Defined
    - Potential Pond Sites Located
    - Preliminary Evaluations Completed on Sites
    - Matrix Criteria Defined for each Parcel
    - Discussion of "New" Criteria Added for this Matrix
        - Joint Use
        - Noise Abatement Opportunities
        - Mitigation Opportunities
    - SFWMD R/W Criteria Defined
    - Held Preliminary Discussions with Local Agencies
- **Outstanding Concerns**
    - Use of Compensating Storage in Basins
    - Compensating/Mitigation options to North
    - Mitigation feasible in Pond Apple
    - Use of Marinas for Mitigation/Drainage
    - Drainage/Permit Criteria at Viaduct
        - Can Existing Scuppers Remain?
        - Retrofit with Drainage Inlets/Pipes
        - Viable Storage under Viaduct
- **Action Plan**
    - Forward all Parcels to R/W Estimating
    - Include all parcels for both drainage and mitigation
    - Evaluate Marina takings with SR 84
    - Follow-up with Pond Siting Team Meeting
    - Evaluate any new parcels from R/W

- Eliminate Fatal Flaw sites
- Alternative impacts on Drainage
- Alternatives for Public Workshop
- Identify "Preferred" Pond Alternatives for Public Hearing
- Follow-up with SFWMD on Drainage/Permit Criteria
    - Permitted Treatment Remains
    - Treat 2.5" over new Impervious;
    - Concern with Viaduct Scuppers
    - Concern with Pond Apple Mitigation
- Follow-up with Broward County on Pond Apple
    - Clarify mitigation opportunities & ratio

RECOMMENDATION NO. 6: Preliminary Noise Wall Analysis

Original Concept: RS&H LPA did not indicate proposed noise wall locations.

Proposed Concept: Consider location of the noise walls per the drawings presented by RS&H at VE Study No. 4 held Thursday January 20, 2005.

Preliminary Analysis indicates the following:

- 26 communities along corridor
- 22 communities affected and being evaluated for noise barriers
- Noise barrier analysis
  - North and south of the New River Canal
    - 22-feet tall
  - Shoulder mounted noise barriers along elevated roadways on MSE walls and bridges are 8-feet tall Preliminary cost of noise barriers
  - Using SFWMD property north of the new river canal - $26.3 million
  - Within FDOT's right of way - $27.8 millionNoise barriers on the north side of the canal are less costly and more effectiveRefine noise barrier analysis
  - Assess effectiveness of 10-, 12-, and 14-feet tall shoulder mounted barriers on MSE walls and bridges
  - Request unit cost of shoulder mounted barriers greater that 8-feet tall
  - Quantify noise levels of reversible lane alternatives – elevated versus at gradeEvaluate effectiveness of 5- to 6- feet tall noise barriers on elevated structures associated with reversible lanes
  - Evaluate sound absorptive materials for noise barriers on elevated roadways
  - Refine estimated total noise barrier cost
    - Coordination activities
      - Meet with SFWMD to discuss possibility of construction of noise barriers north of new river canal
      - Coordinate with FHWA regarding commercial property and modeling of existing privacy walls
      - Request variance for shoulder mounted barriers on MSE walls and bridges greater than 8- feet tall
      - Coordinate with Broward County regarding greenway and potential conflicts
      - Public involvement and barrier aesthetics
        - Barrier aesthetics should be consistent within the corridor
        - Discuss advanced construction of noise barriers
        - Coordinate with individual communities regarding noise barrier locations and aesthetics north of the new river canal
          - Survey affected residents

RECOMMENDATION NO. 7: Construction Issues

Braids: Construction within constrained areas

- Temporary construction phasing plan for SR-84 on/off ramps
  - Establish hours of operation for construction
  - Build the new ramps first before old ramps are taken out of service
  - Consider piling versus drilled shafts

Reversible Lanes: Select the typical section to be built

- Elevated reversible lanes to be built first

Summary Action Plan:

It was determined that the draft report would be submitted on February 4, 2005
The FDOT will route the draft report for comments and send comments to PMA by February 25. PMA will incorporate the comments and issue the final VE report by March 11, 2005.

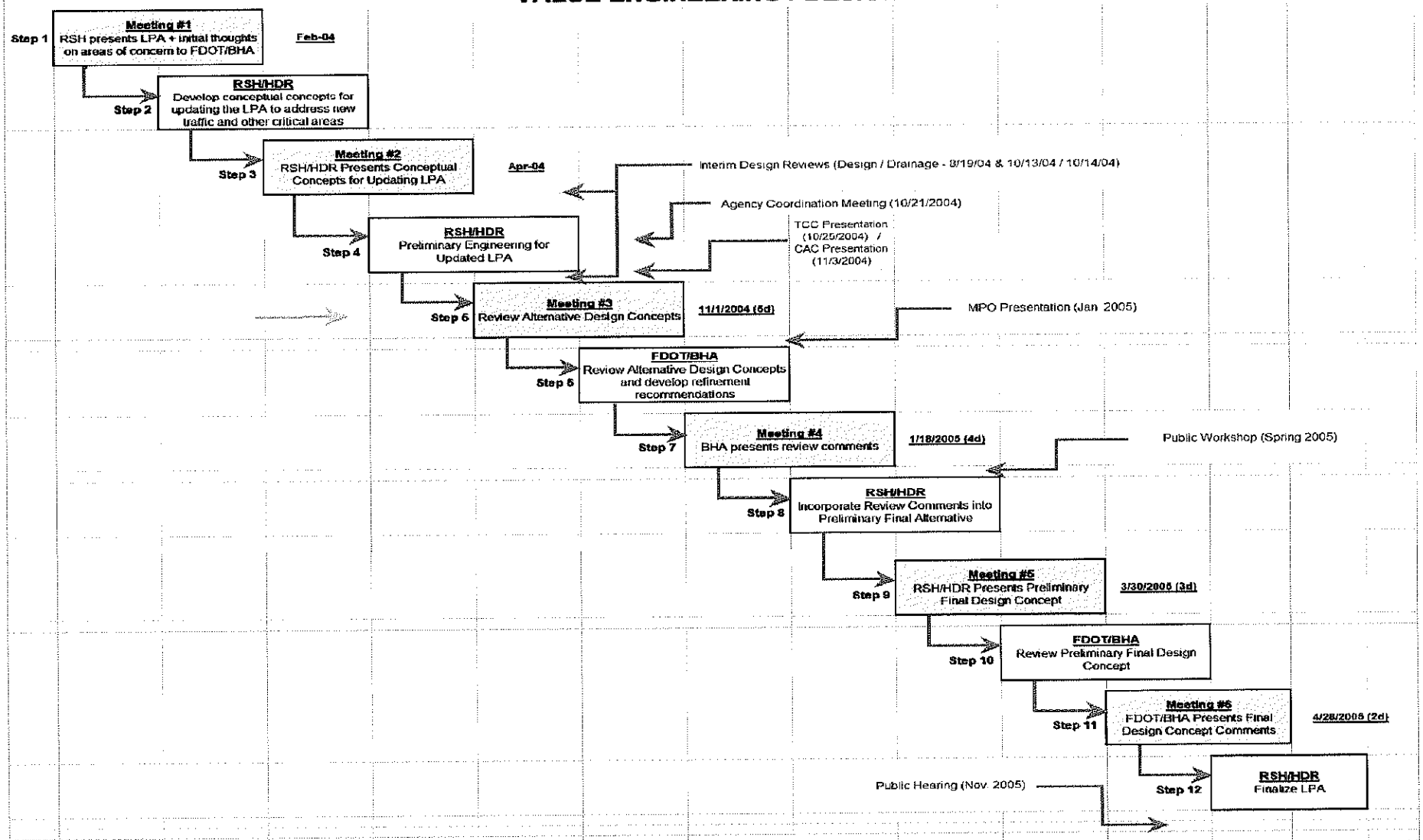
A future VE study is being planned for mid April 2005 to finalize the design issues and calculate the potential cost savings from the combined VE studies held during 2003-2005.

APPENDIX

Agenda
Schedule January 18-21, 2005

Day One	Review progress since last VE
Day Two	Drainage
Day Three	Noise Walls and finish development of presentation
Day Four	Presentation

I-595 PD&E STUDY
VALUE ENGINEERING / DESIGN REVIEW PROCESS



SLIDE PRESENTATION

Value Engineering
For Transportation Improvements

I-595 Corridor PD&E from I-75 to East of I-95

Value Engineering Study Report

FM Number: 409354-1-22-01

Fed. Aid Project: Yes

Project Description: I-595 from West of I-75 to East of I-95

Study Dates: May 16 – 20, 2005

Project Development Phase				Study Identification Number													
PD&E	Design		Other								VE Item No.						
FDOT-D4											Yr.		Dist.		No.		
											0	5	0	4	0	9	

This study has been performed in accordance with current applicable FDOT Value Engineering Procedures and Techniques

Richard L. Johnson, CVS No.20030201, PE No. 38681

Date: June 21, 2005

TABLE OF CONTENTS

SECTIONS

EXECUTIVE SUMMARY 1

1.1 INTRODUCTION

The proposed improvements are planned for Interstate 595 (I-595) from Interstate 75 (I-75)/Sawgrass Expressway Interchange to East of the Interstate 95 (I-95)/I-595 Interchange. A master plan has been completed and the identified Locally Preferred Alternative (LPA) was adopted by the Broward County Authorities and FHWA. The project begins at Weston Road on the West end and proceeds eastward to approximately 3,350 feet East of I-95, see **Figure 1.1 - 1**.

The proposed improvements were reviewed and refined during the May 16-20, 2005 VE Study and at the four previous studies held during February 2004, April 2004, November 2004 and January 2005. The purpose of the May 2005 meeting was to identify two Alternatives to take to the Public Hearing from the four that are being studied and identify a Preferred Alternative. The table below indicates the current estimated costs for the four Alternatives.

Table 1.1 Estimated Costs

	Alternatives			
Item	**1A**	**1B****	**2A****	**2B**
Roadway	$367.9M	$367.9M	$614.5M	$578.2M
Transit	$539.8M	$514.4M	$323.2M	$550.1M
R/W Transit	$32 M	$9M	$9M	$53-73M
R/W Roadway	$102M	$98M	$98M	$39M
R/W Ponds	$102M	$102M	$102M	$102M

**VE Team's Recommended Typical Sections for Public Hearing

At the last VE workshop three typical section options were developed. They were: the LPA Typical Section, Option 1 that had elevated reversible lanes in the median with Transit under the reversible lanes, and Option2 that had elevated reversible lanes in a narrower median with the general purpose lanes pulled in under the elevated lanes and Transit on the south side within the existing right of way. Those three concepts have transformed to four Alternatives. The former LPA Typical Section has changed to Alternative 1A and 1B with the difference being that 1B has the elevated Transit segment between the mainline and eastbound SR 84 on the south side of the corridor. Option 1 has been renamed, Alternative 2A, with elevated reversible lanes in the median and Transit under the reversible lanes. Option 2 has been renamed, Alternative 2B, with elevated reversible lanes in a narrower median and the general purpose lanes pulled in under the elevated lanes and elevated Transit on the south side within the existing right of way. The new Alternatives are shown in **Figure 1.1 – 2** through **Figure 1.1 – 5**.

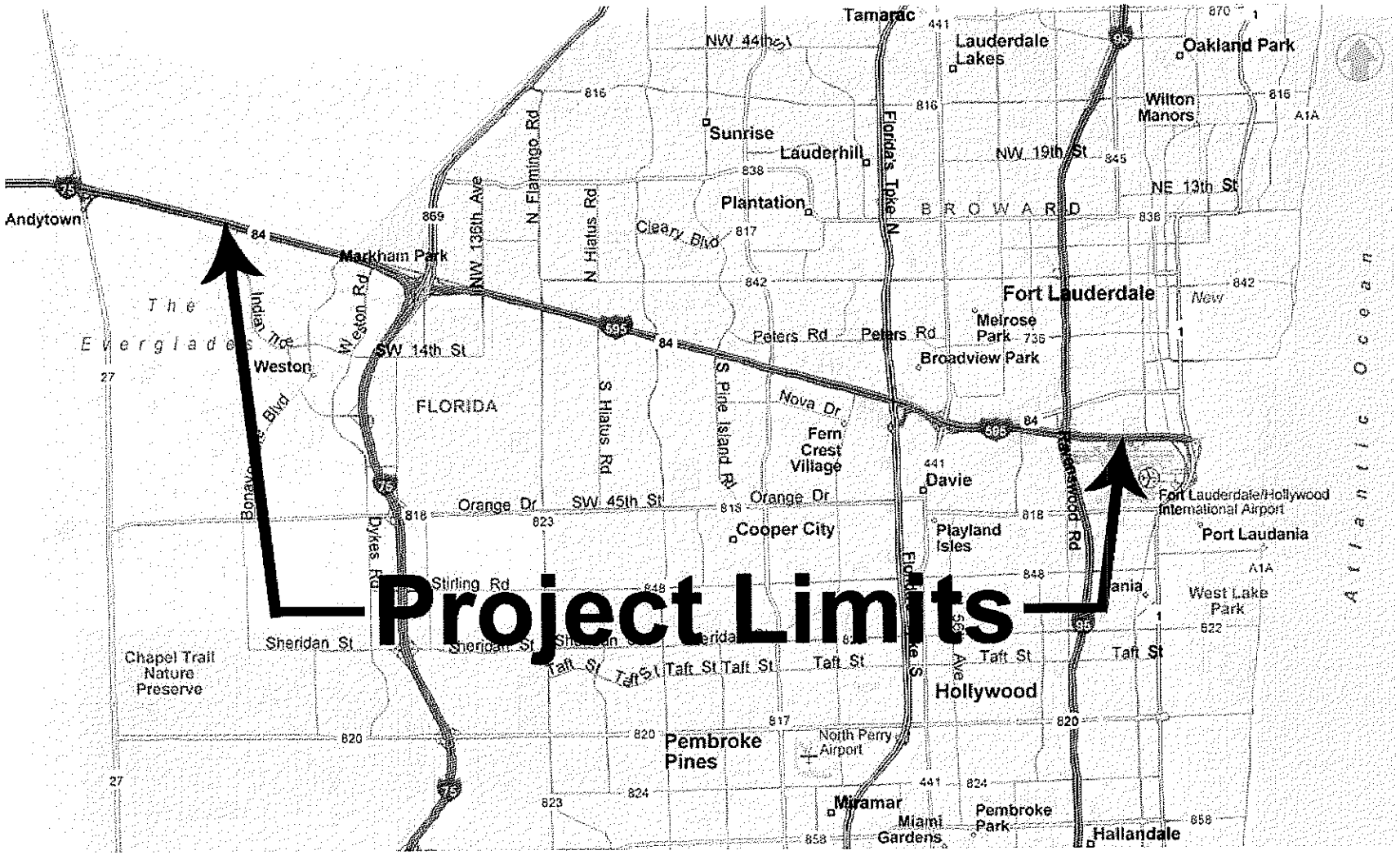
The scope of the VE Process has remained intact and on schedule through the various meetings with minor adjustments to the schedule, evidenced by the Process Schedule in the **Appendix**. The scope of the project remains:

- The FDOT has advanced the project into the PD&E phase
- Differs from normal PD&E due to complexity, size and integration with other projects
- VE effort encompasses a 16-month process defining the system geometry
- Each VE effort focused on Design Packages
- Each Design Package coordinated with the system requirements
- Consistency was maintained with the LPA intent

1.2 ORGANIZATIONAL STRUCTURE

- The VE team has had general oversight by the FDOT Management Team monitoring:
  - The PD&E Design team consisting of RS&H, HDR, Parsons, PBS&J and Wantman groups
  - PMA Consultants LLC the VE Workshop Facilitators

Figure 1.1 – 1
Project Location Map



RECOMMENDATION NO. 5: REQUEST THE TURNPIKE TO DEFER CURRENT CONTRACT TO ACCOMMODATE FUTURE TURNPIKE DIRECT CONNECTIONS AND REVISE WEST END DIRECT CONNECTION CONCEPT

Turnpike Direct Connections

Original Concept: The Turnpike's current design does not have enough space in the median for direct connections from I-595 to Turnpike for northbound and southbound traffic. Current design will only have a 28-ft wide median.

Proposed Concept: VE Team recommends deferring the letting (approximately 6 months) to revise the design to accommodate the future direct connects. Turnpike should be requested to work with the District 4 design team to redesign the section to allow for an 80-ft median.

Advantages:

- Provides a ramp lane reduction for I-595 to SB Turnpike prior to Griffin Road toll plaza
- Allows for more revenue collections to improve financial viability for Turnpike bonds
- Eliminates throw away cost and rework of this area in the future for reconstructing the Turnpike from Peters to Griffin Rd –see Turnpike for bid amount (due to be let in 3 weeks)
- VE team recommends deferring the letting (approximately 6 months) to revise the design to accommodate the future direct connection
- Allows for an additional reversible lane on I-595
- Improves LOS on I-595 GP lanes

Disadvantages

- Revision to the current plans out for bid in three weeks (~6 months)
- Redesign
- Median expansion on mainline Turnpike from 28 to 80 feet
- Major conflict with current design (Southbound only due to major gas line conflicts) on the Turnpike due to be let in 3 weeks
- Current Turnpike design (if implemented) would need to be reconstructed from Griffin to Peters Road

Potential Cost Savings: TBD

West End Connections

Original Concept: RS&H alternative concept after VE Workshop No. 3: Alternatives 2A and 2B as originally proposed provided a single lane flyover from the reversible lanes to SB I-75. This was the result of the VE team asking the RS&H team to consider a connection to the I-75 SB movement.

Proposed Concept: VE team recommends releasing all three lanes at grade and carry two lanes forward to the existing two-lane flyover SB I-75 ramp. One lane will merge into the general purpose lanes. For the EB traffic on I-75 an at-grade ramp can peal off the inside lane and merge into the express lanes.

Figure 1.1 – 2
Alternative 1A Typical Section

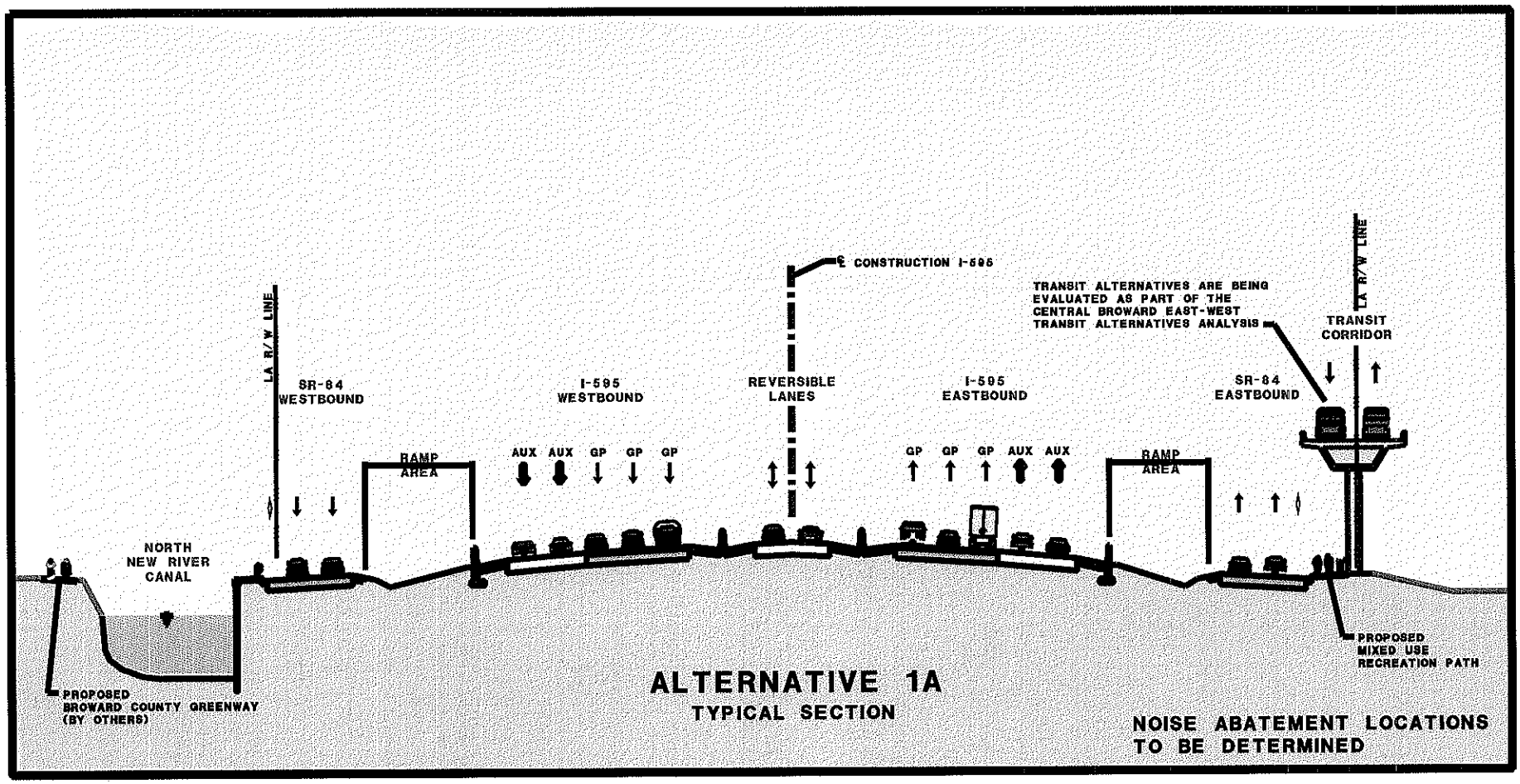


Figure 1.1 – 3
Alternative 1B Typical Section

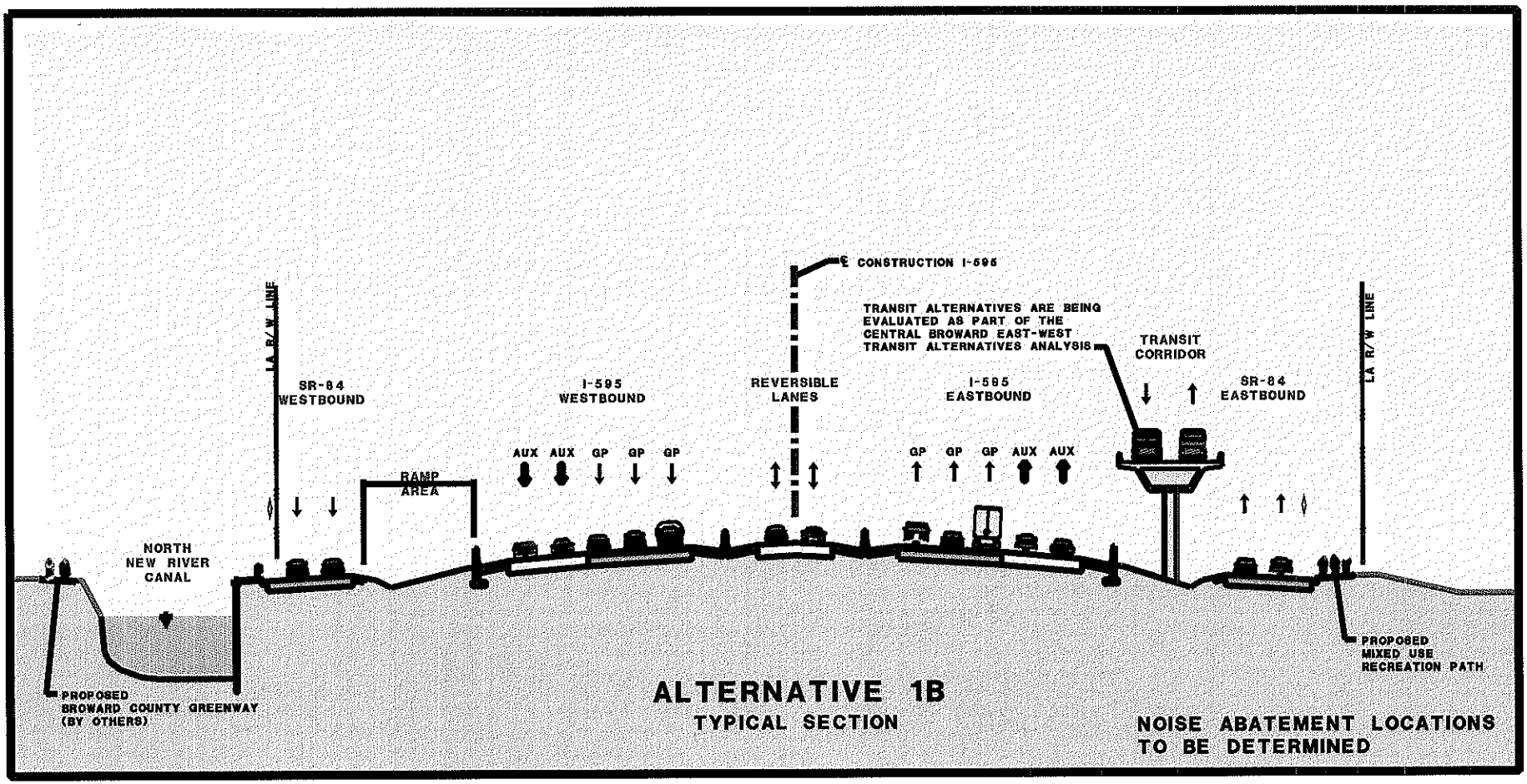


Figure 1.1 – 4
Alternative 2A Typical Section

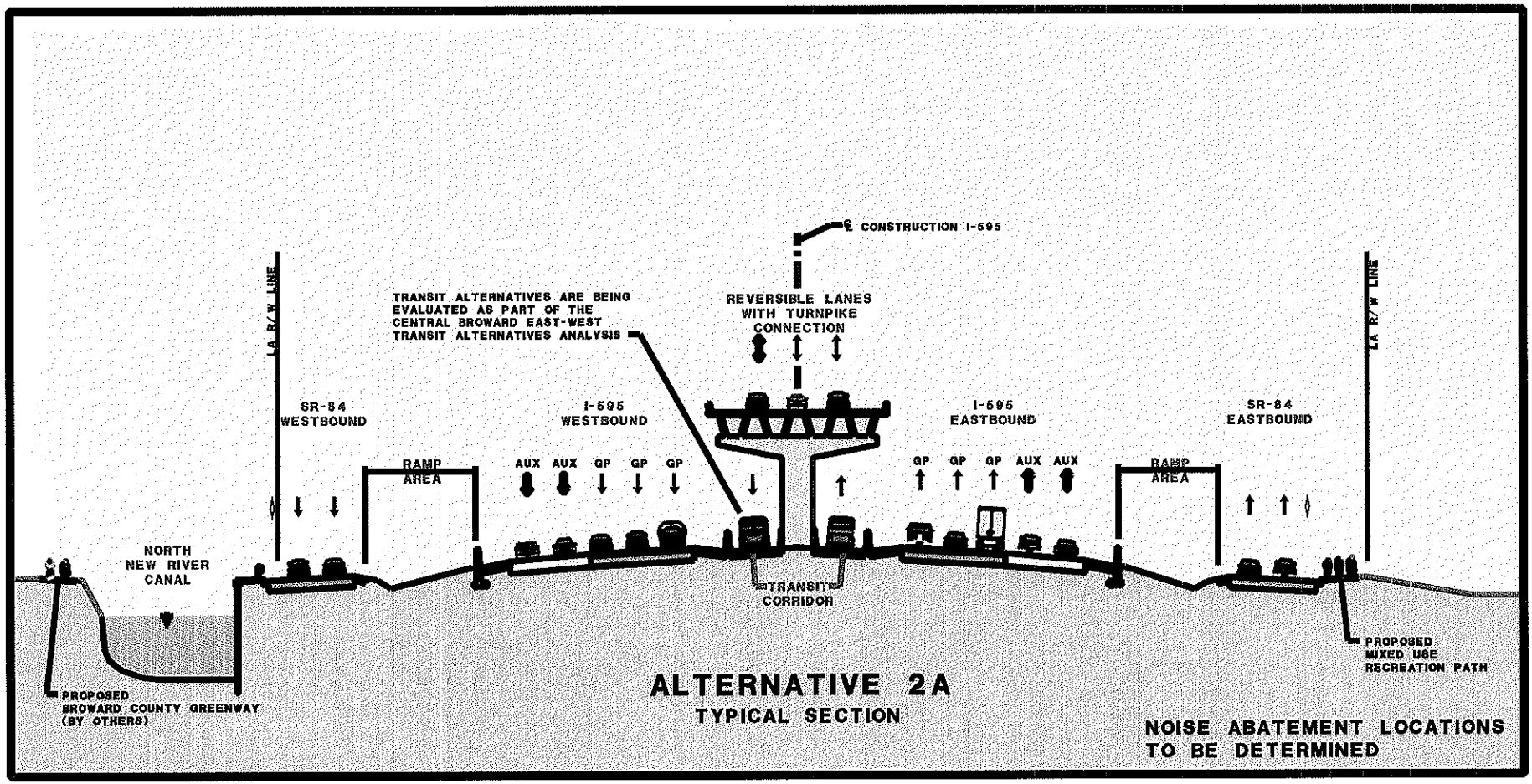
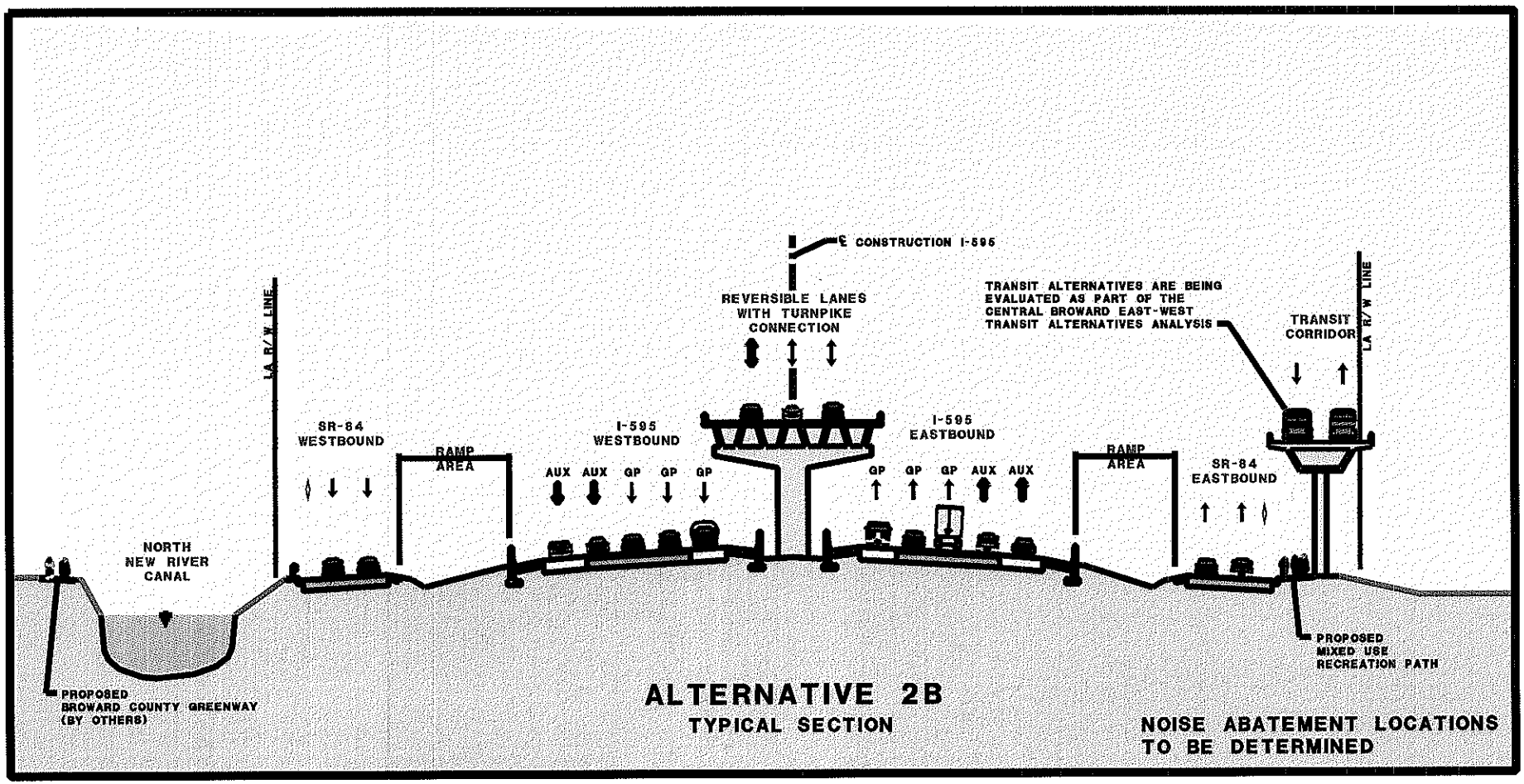


Figure 1.1 – 5
Alternative 2B Typical Section



- The FDOT Design Review team that had representation from the following areas:
  - Planning and Environmental Management
  - Design
  - Construction
  - ITS/Traffic Operations
  - Utilities
  - Structures
  - Drainage/Permitting
  - Right of Way
  - Surveying

Project Purpose
The current project purpose is to meet the existing and projected traffic demand needs of the corridor by maximizing the existing corridor's potential with minimal impacts

1.3 MASTER PLAN LOCALLY PREFERRED ALTERNATIVE

Major components of the LPA Roadway system improvements include:

- Collector-Distributor System
- Continuous westbound at SR 84 between Davie Road and SR 7
- General Purpose lanes
- Reversible lanes in the median from west of Flamingo Road to east of SR 7
- Two-lane off ramps
  - Westbound at
    - University Drive
    - Nob Hill Road
    - Pine Island Road
    - Flamingo Road
  - Eastbound at
    - Pine Island Road
    - University Drive
    - Davie Road
  - Two-lane on ramps
    - Westbound at
      - Pine Island Road
    - Eastbound at
      - University Drive
- Braided ramps
  - Westbound between
    - University Drive and Pine Island Road
    - Pine Island Road and Nob Hill Road
    - Hiatus Road and Flamingo Road
- Eastbound between
    - Flamingo Road and Hiatus Road
    - Nob Hill Road and Pine Island Road
- Flyovers at
  - Hiatus Road WB and
  - Hiatus Road and Pine Island Road EB
- Interchange efficiency improvements at:
  - Florida's Turnpike
  - SR 7
  - I-95 Interchange

- I-75 Interchange

- Transit system to be extended from I-75 to the Ft. Lauderdale Airport long-term parking, Tri-Rail, and Downtown locations with stations located along the I-595 corridor between I-75 and 136th Avenue, Hiatus Road and Nob Hill Road and between University Drive and Davie Road. (not part of the I-595 Corridor reviewed by the VE team during this VE study).

1.4 I-595 PD&E

Traffic has been updated from the 2020 to 2034 projections. Toll and congestion management has been analyzed. The original LPA was updated to a revised LPA updated to show effects of the 2034 traffic projections. The original LPA has been updated with recommendations made by the VE team after the last workshop in January 2005 and interim VE team meetings held from April through November 2004. Items shown below were noted as part of the February 2004 Kick-off meeting and VE Studies 2, 3, 4, and 5.

I-595 CORRIDOR ACTION ITEM LIST ESTABLISHED DURING FEBRUARY 2004 MEETING UPDATED JANUARY 18-21, 2005

Action Items	Assignee	Due by date	Completion date—Status as of 5/20/05
Independent drainage team to review options	Howard/Scott RS&H	Before Meeting #2	Took place with drainage group during the interim meetings, drainage, pond siting, list of pond locations
Consider limits of cross road improvements	RS&H	By Mtg #5	Identified by intersection already
Incorporate traffic mgt sys I-595 ITS corridor	RS&H	Continuous	Not fully identified yet, ongoing with Mark
Determine R/W needed for Mainline and coordinate with Transit to determine R/W needed ASAP	RS&H/FDOT	July 2004	R/W estimated per option
Update traffic for 2034 and adjust current LPA	Jeff RS&H	May 2004	Updated and incorporated
Meeting with Gus prior to March PIM to discuss noise issues and placement of walls	RS&H	Mid March 2004	Complete, meetings continue with noise wall locations, need analysis for noise walls, struct. analysis
Set schedule to meet/coordinate with Tpk and others	RS&H/FDOT/TPK	March 2004	Phasing needs established consideration continues
Obtain feedback from Paul Re: EPA regulations	FDOT	Feb 17, 2004	Consent decree submitted not signed off yet, 595 improvements covered
Obtain FHWA approval for LPA refinements	Scott/Jeff/Nick RS&H/FDOT	Feb 23, 2004	FHWA advised and up to speed
Coordinate I-595 and Tpk I/C work segments	FDOT/Turnpike	Meeting #4	Phasing established with costs (see VE study #3)
Phasing to be established, reviewed/approved	TEAM	Begin Mtg #4, finalize by Mtg #5	Phasing established with cost

Action Items	Assignee	Due by date	Completion date—Status as of 5/20/05
VE Recommendations and Design Suggestions	TEAM	RS&H to review and incorporate acceptable options prior to next meeting	3 lane NB Tpk off ramp to I-595 SR 84 behind braided ramps
Added items at November 1-5, 2004 meetings Noise walls	RS&H	RS&H to continue noise wall analysis and optimize noise wall locations and types	Presented during VE #4
Sewell Lock	RS&H	Minimize impacts to site (may need to move the braided ramp discuss with NEPA	Adjustments made to minimize or eliminate impact to the park
ITS meeting with Mark Plass	RS&H/FDOT	Special meeting to review ITS needs/wants	Ongoing
Extend Study limits to Cherry Camp	RS&H	Environmental purposes	Incorporated into project
Talk with City of Davie, Police Dept, School Board about R/W for two options at Nob Hill Braided ramps	RS&H	R/W requirements at braided ramps	Braids adjusted to minimize/eliminate impacts
Meeting with SFWMD	RS&H	Coordinate Drainage Permitting and Construction needs	Meetings were held on 12/10/04 and 1/05/05 Meeting needed to coordinate with the WMD to review maintenance access to the canal with noise wall improvements in place
Meeting with Coast Guard	RS&H	Coast Guard coordination with plan	Ongoing
Meeting with Greenway	RS&H	Coordination	Meetings held on 8/6/04 and 12/7/04
Meeting with FHWA	RS&H	FHWA	Check on walls already in place at neighborhoods, in calculating wall heights at those locations (Hawks landing area)
Survey Communities	RS&H	Public meeting needs to be planned	Hold meeting with affected communities Get data needed, i.e., location, color, texture, etc
Environmental Issues – See Section 6 Recommendation No. 5 for Action Items	RS&H/FDOT/ Others	ASAP	
Pond site selection	RS&H	Develop and follow plan by basin	Complete by end of PD&E
Redesign Mainline in area adjacent to FPL substation to avoid impacts to FPL and Sewell Lock Park	RS&H		Ongoing

Action Items	Assignee	Due by date	Completion date—Status as of 5/20/05
Redesign of 595 to Turnpike SB on-ramp from a three lane ramp to a two lane ramp (Alts 2A and 2B only)	RS&H		Ongoing
Obtain gas main relocation plans along Turnpike once they are available (2-3 weeks).	RS&H		Ongoing
Develop hybrid Transit alignments to further save R/W cost.	Carter Burgess		Ongoing
Widen turnpike mainline to make provisions for a center column for the turnpike ramp overpasses (Alts 2A and 2B only)	RS&H		Ongoing
Check if we can reroute water to South Fork of the New River Canal	RS&H		Ongoing
Coordinate/pursue existing/known vacant parcels planned for development, also golf courses along corridor	RS&H		Ongoing
Continue looking at using French drains for drainage	RS&H		Ongoing
Maximize the use of existing interchange infield areas	RS&H		Ongoing

1.5 SUMMARY OF RECOMMENDATIONS

The VE team has created, evaluated and developed a number of ideas and recommendations that have been incorporated into the I-595 Corridor Design Program. The previous reports for Studies No. 2, 3 and 4 documented the Alternatives that were recommended. **Tables 1.6 – 1 through 1.6 – 3, Summary of Recommendations**, show ideas that were presented.

TABLE 1.6 – 1
SUMMARY OF RECOMMENDATION FROM VE STUDY No. 4

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description**	**Management Action**	**Comments**	**Potential Cost Improvement (add)**	
1	Finalize evaluation and NEPA documents for Alternatives 1B and 2A			*	
2	Consider Drainage Improvements to the South of I-595			*	
3	Minimize Right of Way acquisitions			*	
4	Deflect mainline to avoid the Florida Power & Light Substation			*	
5	Request the Turnpike to defer current contract to accommodate future Turnpike direct connections and revise West End direct connection concept			*	
6	Alternative 2A as Preferred Alternative			*	
				*	

***=Costs comparisons not feasible since RS&H has not estimated the LPA and refinements yet. VE Study No. 5 will calculate the potential cost savings from all recommendations in a summary report**

TABLE 1.6 – 2
SUMMARY OF REOCOMMENDATIONS FROM VE STUDY No. 3

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description** Modified description from Original submitted report	**Management Action**	**Comments, Rec'd from RS&H Jan. 21, 2005**	**Potential Cost Improvement (add)**	
1	I-595 WB to NB Turnpike Interchange		Incorporated in PD&E	Added operational improvements, geometric improvements, less delay	
2	I-595 EB to Turnpike NB		Incorporated in PD&E	"	
3	I-595 to Turnpike SB		Incorporated in PD&E	"	
4	Turnpike SB to I-595		Incorporated in PD&E	"	
5	Turnpike NB to I-595		Incorporated in PD&E	"	
6	Reversible Lanes LPA Option 1 at grade		LPA modified	No cost difference	
7	ERL LPA modified Option 2		Incorporated in PD&E, needs refinement	No cost difference	
8	ERL LPA modified Option 3		Incorporated in PD&E, needs refinement	Approx. $100 million R/W only, to be estimated by R/W after VE #3	
9	Braided Ramps – SR 84 on outside		Incorporated in PD&E, needs refinement	$12 million	
10	Improve Entrance/Exit weaving on I-595 between 136th and Flamingo each side		**Incorporated**	**Evaluation of different Geometry**	
11	Combine ITS/TMC Center with Transit Control Center		Ongoing	Suggestion	
12	ITS Fiber Optical conduit needs incorporated with final design		Ongoing	Suggestion	
13	Coordinate with Broward County Greenway project		Ongoing	Finalized mitigation plan	
14	Minimize impacts to Sewell Lock		Incorporated	Preserved the value of historic Lock	
15	Design exceptions as noted		Incorporated	Removed four design exceptions from Project	
16	Turnpike I/C, Braided Ramps, Reversible Lanes Phasing		Part of PD&E development	No cost difference	
17	Braided Ramp phasing		Part of PD&E development	No cost difference	
18	Drainage Design & Coordination with agencies		Ongoing	No cost difference	

TABLE 1.6 – 3
SUMMARY OF RECOMMENDATIONS FROM VE STUDY No. 2

		PRESENT WORTH (PW) OF COST (FUTURE COST)			
Rec. No.	**Description**	**Management Action**	**Comments, Rec'd from RS&H on Jan. 21, 2005**	**Potential Cost Improvement (add)**	
1	Analysis and Documentation of Environmental Impacts I-595		PD&E Documents	Design Observation Suggestion	
2	Drainage/Permitting for I-595 Corridor		-	Suggestion	
3	Right of Way Scope		-	To be determined, see VE No. 4	
4	ITS Improvements		Meeting with ITS, once alternatives refined	Value increased, no estimated yet	
5	I-595 Ramp to SB Turnpike		**Implemented**	No cost difference	
6	Split WB Ramps from I-95 (after) Viaduct farther West		Discussed and eliminated	No cost difference	
7	Connector-Distributor Road Connect to SR 84		No action required	No cost difference	
8	University Flyovers		----------	No cost difference	
9	~~Auxiliary Lane~~		----------	-	
10	Braided Ramps		**Moved SR 84 behind braid**	**No cost difference**	
11	~~SW 136th Avenue Ramp~~		Out replaced by 14-1	-	
12	Elevate Reversible Lane options		Options being refined	* $25 million per mile to be verified	
14-1	Interim WB I-595 to Weston Rd Ramp		To design and construct alternate	$1.43 million To be replaced by 14.2 in future	
14-2	Ultimate WB I-595 to Weston Rd Ramp	Currently within design	Ramp to Weston Rd	$6.2 million part of original scope	
14-3	~~Creating Continuous connections WB SR 84 from SR 7 to Davie Rd~~		See No. 7 above	--	
add	I-595 EB viaduct re-striping to 5 lanes			Minimal cost, great benefit	

***=Costs not estimated, due to insufficient information**

VALUE ENGINEERING METHODOLOGY 2

2.1 GENERAL

In general a normal VE study process would include analysis during a timeframe that meets the needs of the project. In this case, the VE methodology planned will be applied during several meetings and studies during the 16-month process. The process is described in detail below.

2.2 PRELIMINARY INFORMATION GATHERING PREPARATION EFFORT-MEETINGS

A kickoff meeting was held in February 2004 and four one-week studies were conducted; one in April 2004, the second during November 2004, one in January 2005 and the last one in May 2005. Each one had pre-study preparation for the VE effort consisting of scheduling study participants and tasks; reviews of documents; gathering necessary background information and compiling project data. Information relating to the design, construction, and operation of the facility is important as it forms the basis of comparison for the study effort. Information relating to funding, project planning, operating needs, systems evaluations, cost basis, soil conditions, and construction of the facility is also a part of the analysis.

2.3 VE WORKSHOP STUDIES EFFORTS MEETINGS NO. 2, 3, 4 AND 5

Conceptual ideas were reviewed and discussed during Meeting No. 2. Alternative design concepts were reviewed, refined and revised during Meetings No. 3 and No. 4. Meeting No. 5 was to identify two Alternatives to take to Public Hearing with one of them the Preferred Alternative. Each planned VE workshop followed a study plan (an agenda for Meeting No. 5 is included in the **Appendix**).

During each workshop, the VE job plan was followed. The job plan guided the search for high value improvement areas in the Project and included procedures for developing alternative solutions for consideration while at the same time considering other efficiencies. It included these phases:

- Information Gathering Phase
- Function Identification and Cost Analysis Phase
- Creative Phase
- Evaluation Phase
- Development Phase
- Presentation, Reporting Phase

2.3.1 Information Phase

At the beginning of each study, the conditions and decisions that influence the development of the project were reviewed and we made sure everyone understood them. The Design Consultant Project Manager provided design information about the project to the VE Team during a brief update presentation. Following the presentation, the VE Team discussed the project using the documents provided.

2.3.2 Function Identification and Cost Analysis Phase

Based on preliminary Order of Magnitude cost estimates, historical and background data, the VE team was able to put some costs on elements of the project as best as possible. The VE Team identified the functions of the various project elements and subsystems.

2.3.3 Creative Phase

Each VE workshop involved the creation and listing of ideas. During this phase, the VE Team generated as many ideas as possible allowing for a productive and creative atmosphere and to help team members to "think outside the box." Judgment of the ideas was restricted at this point to insure vocal critics did not inhibit creativity. The VE Team wss looking to generate a large quantity of ideas and association of ideas.

2.3.4 Evaluation Phase

During this phase of the workshop, the VE Team judged the ideas generated during the creative phase. Advantages and disadvantages of each idea were discussed and a matrix developed to help determine the highest-ranking ideas. Ideas found to be irrelevant or not worthy of additional study were discarded. Those that represented the greatest potential for cost savings or added value improvement to the project are "carried forward" for further development.

The creative ideas were re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may have changed, or they may have been combined into a single idea. For these reasons, some of the originally high-rated ideas were not developed.

2.3.5 Development Phase

During the development phase, each highly rated idea was expanded into a workable solution. The development consisted of a description of the idea, life cycle cost comparisons, where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed ideas. Each idea was written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, were also prepared in this part of the study. The developed VE ideas are summarized in **Section 6 – Recommendations.**

2.4 POST STUDY EFFORT

The post-study portion of the VE workshops included the preparation of Value Engineering Study Reports, discussions and resolution meetings with FDOT personnel. The FDOT Management team should analyze each alternative and prepare a short response, recommending incorporating the idea into the project, offering modifications before implementation, or presenting reasons for rejection. The VE Team is available for consultation after the ideas are reviewed. Please do not hesitate to call on the VE team for clarification or further information for considerations to implement any of the presented ideas.

2.4.1 Presentation and Resolution Phase

The final phase of the VE study began with the presentation of the ideas on the last day of each workshop. The VE Team reviewed, rehearsed and presented their findings to Management. The VE team members presented the original concept, the proposed idea with its advantages and disadvantages and identified potential savings if possible.

2.4.2 Final Report

The acceptance or rejection of ideas described in this report is subject to FDOT's review and approval. The VE Team is available to address any final draft report comments for incorporation into the final report.

2.4.3 Interim and Follow-on Meetings

A final Workshop date and agenda has not be determined at this point in time, although there has been discussion of having a smaller group that would focus on developing cost estimates for drainage ponds, noise walls, right of way, contruction phasing, as well as other corridor improvements that can be quantified.

WORKSHOP PARTICIPANTS AND PROJECT INFORMATION 3

3.1 PARTICIPANTS

Throughout the process the VE Team has consisted of a multi-disciplined group of individuals that each brought their own talent and expertise to the team. The teams varied in size from 25 to 35 individuals who contributed. The 31-member study team for this workshop included the following experts who attended or made contributions to the presentation:

Name attended VE May 16-20	Role	Affiliation
Alex Barreras	Corradino Group	Corridino Group
Ann Broadwell	Environmental	FDOT
Brian Kirkpatrick	RS&H	RS&H
Chris Jackson	Drainage	FDOT
Daphne Georgiadis	Prof. Eng. Trainee	FDOT
Del Younker	Co-Team Leader	PMA/ Value Consulting
Eduardo Cabellero	Construction	FDOT
Eric Neunaard	RS&H	RS&H
Gary Keife	VE/Utilities	FDOT
Guillermo Becerra	Roadway Design	FDOT
Hamid Ashtari	RS&H	RS&H
Jack Crahan	R/W	Florida Property Consulting Group
Jeff Bowen	RS&H	RS&H
Jeff Easley	RS&H	RS&H
Jim Mykytka	RS&H	RS&H
Joe Borello	FDOT	FDOT
Joe Yesbeck	Transit	Carter Burgess
Keith Brockman	Design	RS&H
Mike Bone	CEC	CEC
Norman Bryant	Turnpike	Turnpike
Paul Lampley	FDOT	FDOT
Reed Everett Lee	Transit	Carter Burgess
Rick Johnson	Team Leader	PMA Consultants LLC
Scott Seeburger	FDOT	FDOT
Shandra Davis Sanders	Drainage	FDOT
Steve Wilson	HDR	HDR
Steven Braun	PL&EM	FDOT
Terry Denham	Turnpike	Turnpike
Tom Stepp	R/W	FDOT
Tom Bachs	Transit	Carter Burgess
Will Suero	HDR	HDR

3.2 PROJECT INFORMATION

The purpose of the project orientation meeting on May 16, 2005, in addition to being an integral part of the Information Gathering Phase of the VE Study, was to bring the VE Team "up-to-speed" regarding the overall project progress, decisions that had been made and portions of the corridor that needed special attention. Two public workshops had been conducted and comment cards were received and the results were presented to the team.

3.3 LIST OF VE STUDY MATERIAL REVIEWED

1. Alternatives 1A, 1B, 2A and 2B Typical Sections
2. I-595 Project Cost Estimates for Alternatives 1A, 1B, 2A, and 2B
3. Potential Pond sites plans, prepared by RS&H, Inc.
4. Potential Noise wall location plans, prepared by RS&H, Inc
5. I-595/Turnpike Interchange direct connection Alternatives for 1A, 1B, 2A and 2B
6. I-595 Construction phasing plans for Alternative 1A

3.4 SUMMARY OF GENERAL PROJECT INPUT - OBJECTIVES, POLICIES, DIRECTIVES, CONSTRAINTS, CONDITIONS & CONSIDERATIONS

The following is a summary of general project input, including the goals, objectives, directives, policies, constraints, conditions and considerations presented to the study team.

3.4.1 Project Functions, Goals & Objectives (what the project should do as determined at the kickoff meeting and subsequent Workshops):

1. The primary project objective is to optimize the scope and expenditure for the intended functions
2. Meet the demanding complex design for the intended LPA improvements
3. Meet the 16-month combined PD&E and VE review process
4. Maintain consistency with the LPA
5. Integrate the updated traffic projections into the LPA
6. Meet the existing and projected traffic demands needs of the corridor by maximizing the existing corridor's potential with minimal impacts

3.4.2 Project Policies & Directives: (documented things the project must or must not do):

1. The project will meet economic, engineering design, environmental and social criteria requirements.
2. Meet the goals of the future development.

3.4.3 General Project Constraints: (unchangeable project restrictions):

1. No additional purchase of right of way over LPA identified areas
2. Environmental requirements
3. Production schedule
4. Permitting requirements

3.4.4 General Project Conditions & Considerations:

1. Corridor configuration
2. Previous issues

3.4.5 Function Analysis for areas reviewed:

1. Mainline----------Increase Capacity
2. Turnpike Interchange Ramps------Change Direction
3. Noise Walls----------Reduce Noise
4. Right of Way----------Acquire Space for Improvements
5. Greenway----------Accommodate Pedestrians/Bicycles
6. Braided Ramps----------Avoid Conflicts, Improve LOS
7. Reversible Lanes----------Increase Capacity, Reduce Delays, Avoid Congestion
8. Transit----------Space for Transit
9. Environmental----------Reduce Pollution, Satisfy NEPA, Treat Stormwater
10. Construction Phasing----------Minimize Costs and Sequencing, Reduce Impacts

4.1 CREATIVE IDEA LISTING

This VE study phase involved the creation and listing of ideas. During this phase, the VE Team generated as many ideas as possible allowing for a productive and creative atmosphere that helped team members to "think outside the box." Judgment of the ideas is restricted at this point to insure vocal critics do not inhibit creativity. The VE Team is looking for a large quantity of ideas and association of ideas.

Ideas were generated and those developed for further consideration are shown in Section 6.

Ideas generated on May 16-19, 2005

1. Look at saving R/W with transit moving to green areas between SR 84 and the mainline on Alternatives 1A, 1B, 2A and 2B
2. Consider dropping one lane on ramp from EB I-595 to SB Turnpike
3. Turnpike gets greater revenue from Alternatives 2A and 2B, use 1B until additional funding available
4. Transit is less cost in median, but not a preferred location by some homeowners
5. Shift Mainline to avoid substation and Sewell Lock
6. Move braided ramp to avoid impacting Sewell Lock parking
7. Talk with the District 5 I-4 team regarding Congestion Management Tolling
8. Combine the west end direct connection WB to SB by merging the express lanes with existing bridge lanes. This eliminates a fourth level flyover (Keith stated cost savings would be about $18 million)
9. Make at-grade connections to and from I-75 for express lanes
10. Make a recommendation to improve/coordination with current Turnpike design/construction projects with direct connects. Ask that the project between Peters and Griffin Roads be postponed to accommodate the proposed corridor improvements
11. R/W requirements are less for 1B
12. Hybrid designs for 1A, 1B, 2A, or 2B may develop after matrix analysis
13. Expand existing ponds and research permits (RS&H)
14. Recommend advanced acquisition for ponds starting July 06
15. Pursue joint use ponds with golf courses and others-(need plan)
16. Consider using north side of New River Canal for wetland mitigation
17. Use Turnpike, 95, I-75, SR 7, or University ramp interchange infield areas for ponds as much as possible (coordinate with ITS for building and communication corridor needs)
18. Expand ponds that have capacity (such as 7 acres at Forman property owed to DOT)
19. Turnpike interchange design needs to consider I-595 drainage needs
20. Investigate putting compensatory treatment on the north side of the Canal
21. Design Suggestion – Offer to design ponds in existing areas that can be expanded along the corridor
22. Integrate pond with Transit stations
23. Use green areas for treatment within the existing I-595 R/W
24. Ponds under adjacent parking lots along corridor
25. Ponds under buildings – coordinate with developers
26. Investigate taking the drainage south within the Central Broward District
27. Investigate using areas further than the self-imposed 1,000 ft threshold from the corridor
28. Consider Ponds at Boat Marina after R/W purchase
29. Consider a linear pond along Pond Apple Slough – Ponds under existing viaduct?
30. Need to find out area needed under Viaduct for bridge inspection teams
31. At University consider keeping the ramps on structures (no MSE walls) in order to put ponds under the bridges

32. Comprehensive Everglades Restoration Program review needed to avoid conflicts with the Programs
33. Consider a conceptual Permit for the entire corridor
34. Need to determine the mitigation area needed for Pond Apple Slough impacts
35. Need Pre-Application meetings with SFWMD at end of PD&E
36. RS&H (Phil Schwab) needs input from VE team regarding planned construction sequencing (not finished for all alternatives)

Noise walls

1. Analyze noise walls at I-75 as needed for Option 2A and 2B (not needed for Option 1A or 1B), which will increase the noise abatement costs for the project
2. Public concerned with ground-mounted noise walls north of the New River Canal – reasons, view of canal blocked and access to the canal is blocked
3. Options 1 and 2 have limited opportunities for construction of ground mounted noise barriers within the existing or proposed FDOT R/W
4. Cannot build the most effective wall, we use 8-14 ft shoulder mounted barriers that are substantially less effective within FDOT R/W and may not provide the minimal 5 decibel.
5. RS&H met with SFWMD and determined that it is possible to build noise walls on the SFWMD R/W north of the New River Canal with certain maintenance related constraints

Spin off projects (potential)

1. Traffic Ops should do a safety study on the WB re-striping project – operational analysis
2. Is it worth doing striping on EB I-595? Ask Traffic Ops about this also
3. Punch SR 84 through from east of State Road 7 to west of the Turnpike
4. Install noise walls, in ultimate locations, where we know we will eventually have to build them

EVALUATION 5

During this phase of the workshop, the VE Team evaluated the ideas generated during the creative phase. Advantages and disadvantages of each idea are discussed and ideas were selected on the basis of value improvement potential and the ability to meet the project needs. Ideas found to be irrelevant or not worthy of additional study were discarded. Those that represent the greatest potential for cost savings or improvement to the project are "carried forward" for further development.

The creative listing was re-evaluated frequently during the process of developing ideas. As the relationship between creative ideas became more clearly defined, their importance and ratings may change, or they may be combined into a single idea. For these reasons, some of the originally selected ideas may not be developed.

During the creative phase numerous ideas, alternative proposals and/or recommendations were generated for each required function using conventional brainstorming techniques and are recorded on the following pages. These ideas were discussed and evaluation criteria were determined. A list of the group's discussion and selection of the ideas is summarized on the following section.

Ideas were evaluated and those developed for further consideration are shown in Section 6.

An evaluation matrix was developed with the four latest Alternatives and the VE Team discussed and agreed on evaluation criteria for an I-595 Roadway and Central Broward Transit matrix. The results are shown on the following Matrices and an overwhelming preferred alternative was not apparent because all of the criteria were weighted the same (i.e., no weighting). Each item was given a score of either –, 0, or + representing –1, 0, or +1 and the scores are tabulated at the bottom each Alternative.

To differentiate between the Alternatives the VE Team decided to select the most important criteria and then score the Alternatives from 1 to 4 with 4 being the most positive/favorable and 1 being the least favorable. Seven key criteria, from the Roadway Matrix were selected and agreed on by the team. The team believed that scores for the Transit and Environmental elements were basically the same for all alternatives so they focused on selecting the key criteria from the Roadway Matrix. The results indicate that the two Alternatives to take to Public Hearing are 1B and 2A with Alternative 2A being the Preferred Alternative, based on the scores. **Table 5 – 1** through **Table 5 – 3** show the matrices and how each item was scored.

Table 5 – 1
Transit Evaluation Matrix

CRITERIA	OPTION 1A - LPA At-grade, Median Rev. Lanes Transit - So. Side, Elev.	OPTION 1B - LPA At-grade, Median Rev. Lanes Transit - Revised So. Side, Elev.	OPTION 2A Elev., Median Rev. Lanes Transit - At Grade Median	OPTION 2B Elev., Median Rev. Lanes Transit - So. Side, Elev.	COMMENT/CLARIFICATION
* Transit Construction Cost	-	-	+	-	
* R/W Cost	-	+	+	-	Hybrid - 1B on the east and west end and 2A in the middle
* Ease of Constructability/MOT	+	0	-	+	Assume the roadway and transit need to be built together under one contract includes sequencing with roadway
MOT	0	-	+	0	Less impact in the median
* Minimizes geometric conflicts between highway and transit standards	+	-	0	+	Transit to the outside has less design variations and exceptions - 2B could be modified to place transit between mainline and SR 84
* Transit Ridership/Accessibility	+	+	-	+	Ridership may depend on accessibility
* TOD/Economic Development Potential	+	+	0	+	
* FTA New Starts Rating	0	0	+	0	Cost delta is the driver for decisions
* Platform Environment	0	0	-	0	
* Fire/Life Safety	-	-	+	-	
* West End of Project Direct Connections	0	0	0	0	
* TPK/ I-595 Interchange Involvement	+	+	-	-	Drives transit to the 4th level
* Height of Structure/(Braids)	+	-	-	+	1B is affected by the braids. 2A is affected by moving in and out of the median.
* Public Opinion	-	0	+	-	People adjacent to the corridor may likely oppose the elevated features
* Utility Relocates	-	0	+	-	Impacts to FPL Power Line on the South side
* FPL Substation (Braid East)	+	+	-	+	
* Drainage	0	0	+	0	Less impervious area
* FPL Substation (Braid West)	-	-	+	-	
* Business-economic Impacts	-	+	0	-	
* Aesthetics	+	+	0	0	Based on comments from the public workshop in relation to public's negative perception to elevated structures.
* Operation and Maintenance	0	0	0	0	To be determined after designed
SCORES	**1**	**1**	**3**	**-2**	

Table 5 – 2
Roadway Evaluation Matrix

CRITERIA	OPTION 1A - LPA At-grade, Median Rev. Lanes Transit - So. Side, Elev.	OPTION 1B - LPA At-grade, Median Rev. Lanes Transit - Revised So. Side, Elev.	OPTION 2A Elev., Median Rev. Lanes Transit - At Grade Median	OPTION 2B Elev., Median Rev. Lanes Transit - So. Side, Elev.	COMMENT/CLARIFICATION
Cost					
* Roadway Construction Cost	+	+	-	-	Structures costs.
* R/W Cost	-	-	-	+	Substation accounts for the majority of the R/W cost for 1A and 1B
Engineering					
* Mainline LOS	-	-	+	+	Additonal lane and better merge/ divergement
* Mainline Capacity	-	-	+	+	Additional GP and reversible lane capacity
* Constructability	+	+	0	-	Easier to construct at grade in the median.
* MOT	+	+	+	-	2B is worse because you have to shift all the traffic.
* System Linkage/ ITS Operation	0	0	+	+	Ability to connect to the TPK/Regional facility directly.
* Signing	0	0	0	0	Slightly more difficult to sign the direct connect reversibles. Grade seperated structures easier to sign.
* Phasing of Roadway Projects	+	+	-	-	Potential to build at-grade reversibles in phases. Can act as independent projects
* Design/Phasing Flexibility	0	0	+	-	Due to the uncertainty of the Transit study outcome provides additional flexibility to proceed to roadway final design.
* Sequencing with Transit	+	+	-	0	2B option requires moving SR 84 north
* Drainage	0	0	-	+	Double stacking of 2B consideration for impervious calculations.
* Reversible Lane End Point Connections	-	-	+	+	Operational Benefits are the driver. Reduces 3-lane to 2-lane SB TPK ramp. Provides on lane SB I-75.
* Height of Structures	+	+	0	-	At grade reversible at University and TPK.
* Design Exceptions/Variances	0	0	0	+	Vertical clearance at cross street structures. Provides more room for standard shoulder.
* University Flyovers	0	0	0	0	Flyovers have to be replace in all Options.
* Express Lanes Capacity	0	0	+	+	2A and 2B provide opportunity to maintain the tolls.
* Revenue Contribution	0	0	+	+	Opportunity to get revenue bonds with direct connects to the TPK.
* Pedestrian Access South SR 84	0	0	0	0	Same for all options.
* Construction Schedule	+	+	-	-	Option 2A additional transit work and additional roadway widening for 2B.
* Greenway Involvement	0	0	0	0	Same for all options.

Table 5 – 2
Roadway Evaluation Matrix (Continued)

CRITERIA	OPTION 1A - LPA At-grade, Median Rev. Lanes Transit - So. Side, Elev.	OPTION 1B - LPA At-grade, Median Rev. Lanes Transit - Revised So. Side, Elev.	OPTION 2A Elev., Median Rev. Lanes Transit - At Grade Median	OPTION 2B Elev., Median Rev. Lanes Transit - So. Side, Elev.	COMMENT/CLARIFICATION
* Canal Impacts	0	0	0	+	30% less impacts for Option 2B.
* Emergency Response	+	+	-	-	Elevated structure is a challenge.
* Utility Relocates	0	0	-	-	Gas line along TPK and overhead power at University.
* FPL Substation	-	-	-	+	2B avoids the FPL substation impacts.
* Maintenance	0	0	0	0	Maintenance of reversible lanes systems offset by repaving of at grade lanes.
* Flexibility for Future Expansion	-	-	+	0	2A provides more opportunity for future expansion
* Accommodates Transit	0	0	+	0	2A allows more transit options (other than CBEWTA).
Environmental					
* Aesthetics**	+	+	0	0	Based on comments from the public workshop in relation to public's negative perception to elevated structures.
* Noise	0	0	-	-	2A and 2B has higher noise levels and higher abatement costs.
* Wetland Impacts (Acres)	0	0	0	0	all alts are equal, no transit impact
* Historic Sewell Lock	0	0	0	0	It is anticipated that this will be delisted from the National Register. Assumes FPL impacts and shifted Braid.
* Other Section 4f Involvement	0	0	0	0	All the same
* Contamination	0	0	0	0	All the same
* Business-economic Impacts	-	-	-	0	Should be covered under Transit also.
* Socio-cultural	0	0	0	0	All the same
* Residential Relocations	0	0	0	0	All the same
* Public Opinion/Controversy Potential	0	0	+	-	People adjacent to the corridor may likely oppose the elevated features
* Secondary and Cummulative	0	0	0	0	All the same
* Other (T&E Species, EFH)	0	0	0	0	All the same
SCORES	**2**	**2**	**-1**	**1**	

**Pertains to the entire system

Table 5 – 3
Key Criteria Roadway Evaluation Matrix

CRITERIA	OPTION 1A - LPA At-grade, Median Rev. Lanes Transit - So. Side, Elev.	OPTION 1B - LPA At-grade, Median Rev. Lanes Transit - Revised So. Side, Elev.	OPTION 2A Elev., Median Rev. Lanes Transit - At Grade Median	OPTION 2B Elev., Median Rev. Lanes Transit - So. Side, Elev.	COMMENT/CLARIFICATION
Cost					
* Roadway Construction Cost	3	3	2	2	Structures costs.
* R/W Cost (Total)	1	2	2	3	Substation accounts for the majority of the R/W cost for 1A and 1B
Engineering					
* Mainline LOS/Express Lanes Capacity	2	2	3	3	Additonal lane and better merge/ divergement
* System Linkage/ ITS Operation	2	2	3	3	Ability to connect to the TPK/Regional facility directly.
* Flexibility for Future Expansion	3	3	4	1	Due to the uncertainty of the Transit study outcome provides additional flexibility to proceed to roadway final design.
* Design/Phasing Flexibility	3	3	4	1	Similalarity of key design components
* Public Opinion/Socio-cultural	1	3	3	2	Based on feedback from public workshops and elected officials indicate the elevated structure in the median is least offensive.
SCORES	**15**	**18**	**21**	**15**	

The seven most important criteria that would differentiate the options were selected and were scored from 1 to 4 to identify the most favorable options.

R/W Parcel counts are: 1A = 55; 1B = 29; 2A = 40; 2B = 44

1A 37 potential residential relocations; 2A and 2B potential for 7 each residential relocations

RECOMMENDATIONS 6

During the development phase, each highly rated idea was expanded into a workable solution. The development typically consists of a description of the idea with life cycle cost comparisons (not developed in this VE study due to insufficient information),. Sketches and design calculations, where appropriate, are included or are shown in the presentation slides in the **Appendix**.

TABLE 6 – 1 SUMMARY OF RECOMMENDATIONS

Idea No.	Alternative Recommendation (Idea)
1	Finalize Evaluation and NEPA Documents for Alternatives 1B and 2A
2	Consider Drainage Improvements to the South of I-595
3	Minimize Right of Way Acquisition
4	Deflect the mainline to avoid the Florida Power & Light Substation
5	Request the Turnpike to defer current contract to accommodate future Turnpike direct connections and revise the West End direct connection concepts
6	Advance Alternative 2A as the Preferred Alternative

The results of this VE study are shown as individual recommendations developed for each of the focus areas (Typical Sections, Transit, Drainage, R/W, Turnpike, Braided Ramps, Reversible Lanes, Environmental, Greenway, and Construction Phasing) of the project. These recommendations include a comparison between the VE Team's proposal and the designer's original concept. Each proposal consists of a narrative summary of the original design, a description of the proposed change, a life cycle cost comparison (where applicable), and descriptive evaluation of the advantages and disadvantages of the proposed alternative. Sketches and calculations, if appropriate, are shown with the presentation slides in the appendices. The estimated cost comparisons reflect unit prices and quantities on a comparative basis. Value improvement is the primary basis for comparison of competing ideas. To ensure that costs are comparable within the ideas proposed by the VE Team, the FDOT average construction costs were used as the pricing basis.

6.1 EVALUATION OF RECOMMENDATIONS

Some of the VE alternatives' potential savings are interrelated, if one is accepted another one may be or may need to be added, or acceptance of one may mutually exclude another. The VE Team identified six ideas and a strong recommendation to the Turnpike to delete a portion of work from a project that will be bid in a few weeks. These are shown on **Table 6 – 1, Summary of Recommendations.** These write-ups for the individual developed recommendations are included in this section and are presented in the same order as was presented.

The FDOT and the design team to determine whether to accept or not accept the idea should evaluate each recommendation. The recommendations that are accepted should be listed for documentation purposes. For each idea that will not be accepted, the design team normally documents, in writing, the reason or reasons for the non-acceptance. The design suggestions are for consideration by FDOT and the designers. No specific action is normally required to accept or not accept the suggestions, though it is often helpful, for documentation purposes, to formally list those suggestions that will be incorporated by the designers.

The VE Team presented six recommendations at the end of the, May 20, 2005, presentation to FDOT Management. Those recommendations are shown in Table 6 – 1, and they also suggested that the District

should consider:

- **Eliminating 1A and 2B from further consideration during PD&E**
- **Proceeding to Public Hearing with Alternative 1B and 2A**
- **Incorporating the Transit alignment into the PD&E documents to allow for joint R/W acquisition**

6.2 CONSIDERATIONS AND ASSUMPTIONS

In the preparation of this report and the recommendations that follow, the Study Team made some assumptions with respect to conditions that may occur in the future. In addition, the Study Team reviewed the listed project documentation, relying solely upon the information provided by the designer and owner, and relying on that information as being true, complete and accurate. This value analysis and report are based on the following considerations, assumptions and conditions:

The recommendations rendered herein are as of the date of this report. The Study Team or Leaders assume no duty to monitor events after the date, or to advise or incorporate into any of the alternatives, any new, previously unknown technology.

The Study Team or Leaders assume that there are no material documents affecting the design or construction costs that the Team has not seen. The existence of any such documents will necessarily alter the alternatives contained herein.

The Study Team or Leaders do not warrant the feasibility of these recommendations or the advisability of their implementation. It is solely the responsibility of the designer in accordance with the owner, to explore the technical feasibility and make the determination for implementation.

RECOMMENDATION NO. 1: FINALIZE EVALUATION AND NEPA DOCUMENTS FOR ALTERNATIVES 1B AND 2A

Original Concept: Follow the typical PD&E procedures checklist

Proposed Concept:

- Identify areas for ground mounted noise walls (Noise Study)
- EPA sign off on the Petroleum re-processor site (contamination report)
- Environmental Summit – Pond Apple Slough (Wetlands and Endangered Species)
- Industry vs. History (Section 4f)
- Provide enough information in the Categorical Exclusion to:
    - Address cumulative and secondary impacts (emphasizing the positive aspects)
    - Provide reasonable assurance that the project is clearly in the public's interest
    - Tell the story (how did we get here?)

Why is Sewell Lock Unique?

- Dredging the North New River Canal allowed for the land to drain and be available for agriculture
- The Lock kept saltwater intrusion from impacting agricultural lands
- The Lock allowed for the canal transport of goods from Lake Okeechobee to Fort Lauderdale

Potential Cost Savings: TBD

RECOMMENDATION NO. 2: CONSIDER DRAINAGE IMPROVEMENTS TO THE SOUTH OF I-595

Original Concept: Follow the typical PD&E procedures checklist

Proposed Concept: Plans are to maximize the available land in the drainage basins, existing Interchange infield areas, golf courses, and planned future developments. Consider routing the drainage to the south after pre-treatment through the South Fork of the New River Canal. Look for retention/detention areas outside of the 1,000 feet area that has presently been investigated. Also, continue to review the use of French drains along the corridor in addition to pond sites.

Potential Cost Savings: TBD

RECOMMENDATION NO. 3: MINIMIZE RIGHT OF WAY ACQUISITION

Original Concept: LPA Alternative = $132 million

Proposed Concept:

Alternative 1A = $130 million
Alternative 1B = $107 million
Alternative 2A = $107 million
Alternative 2B = $92-$114 million

Alternative	Roadway Parcels	Transit Parcels	Roadway R/W $	Transit R/W $
1A	28	30	$98M	$32M
1B	28	4	$98M	$9M
2A	28	15	$98M	$9M
2B	15	29	$39M	$53-$73M

Potential Cost Savings: Ranges from $ 2 million to $40 million

RECOMMENDATION NO. 4: DEFLECT MAINLINE TO AVOID THE FLORIDA POWER & LIGHT SUBSTATION

Original Concept: Shifting the Braid west to avoid the Sewell Lock Park would push the typical section into the FP&L Substation. Based on the Interstate 4 experience this right of way taking is estimated at $43 million.

Proposed Concept: With a slight deflection of the mainline and by constraining the typical section with 11 feet lanes on SR 84, 6 feet bike lanes on SR 84, traffic barrier cast integrally with the columns, and reducing the inside mainline shoulders from 10 to 8 feet, with other refinements to be developed during design, the entire FP&L substation can be avoided and R/W cost could be saved.

Potential Cost Savings: $43 million

RECOMMENDATION NO. 5: REQUEST THE TURNPIKE TO DEFER CURRENT CONTRACT TO ACCOMMODATE FUTURE TURNPIKE DIRECT CONNECTIONS AND REVISE WEST END DIRECT CONNECTION CONCEPT

Turnpike Direct Connections

Original Concept: The Turnpike's current design does not have enough space in the median for direct connections from I-595 to Turnpike for northbound and southbound traffic. Current design will only have a 28-ft wide median.

Proposed Concept: VE Team recommends deferring the letting (approximately 6 months) to revise the design to accommodate the future direct connects. Turnpike should be requested to work with the District 4 design team to redesign the section to allow for an 80-ft median.

Advantages:

- Provides a ramp lane reduction for I-595 to SB Turnpike prior to Griffin Road toll plaza
- Allows for more revenue collections to improve financial viability for Turnpike bonds
- Eliminates throw away cost and rework of this area in the future for reconstructing the Turnpike from Peters to Griffin Rd –see Turnpike for bid amount (due to be let in 3 weeks)
- VE team recommends deferring the letting (approximately 6 months) to revise the design to accommodate the future direct connection
- Allows for an additional reversible lane on I-595
- Improves LOS on I-595 GP lanes

Disadvantages

- Revision to the current plans out for bid in three weeks (~6 months)
- Redesign
- Median expansion on mainline Turnpike from 28 to 80 feet
- Major conflict with current design (Southbound only due to major gas line conflicts) on the Turnpike due to be let in 3 weeks
- Current Turnpike design (if implemented) would need to be reconstructed from Griffin to Peters Road

Potential Cost Savings: TBD

West End Connections

Original Concept: RS&H alternative concept after VE Workshop No. 3: Alternatives 2A and 2B as originally proposed provided a single lane flyover from the reversible lanes to SB I-75. This was the result of the VE team asking the RS&H team to consider a connection to the I-75 SB movement.

Proposed Concept: VE team recommends releasing all three lanes at grade and carry two lanes forward to the existing two-lane flyover SB I-75 ramp. One lane will merge into the general purpose lanes. For the EB traffic on I-75 an at-grade ramp can peal off the inside lane and merge into the express lanes.

Advantages:

- Eliminates a fourth level SB I-75 Flyover
- Utilizes existing flyover
- Traffic transitions are at-grade
- Less cost

Disadvantages

- Minor redesign

Potential Cost Savings: $18 million

RECOMMENDATION NO. 6: ALTERNATIVE 2A AS PREFERRED ALTERNATIVE

Original Concept: LPA as modified, Option 1 and Option 2 from VE Workshop No. 3

Proposed Concept: Develop a methodology to evaluate four new Alternatives (1A, 1B, 2A and 2B). The VE team listed all criteria without weighting, scored positive, zero, or negative based on comparison to other alternatives for Roadway and Transit. The goal was to identify two Alternatives to take to Public Hearing and identify one as a preferred multimodal alternative. After the first cut evaluation the team determined the scoring to be close, so the options were evaluated using selected key criteria with a scoring from 1 to 4 to select the best alternatives within the I-595 corridor.

See Matrices in **Section 5**

APPENDIX

Agenda
Schedule January 18-21, 2005

Monday

VE Process/Status/Intent

Overall Project status (fine tuning/outside consultants/FDOT team)

Turnpike

- Overall Concepts
- Phasing interchange
- Direct connects
- Schedule

Transit Study Update

- Public Hearing Outcome
- MPO Decision
- Future Transit Direction

I-595 Roadway Workshop Update

- Attendance
- Comment Matrix

Goals: Alternatives Matrix to establish a Preferred Alternate

- Satisfy VE Requirements
- Transit accommodations
- Finalize recommendations
  - Right of way and legal issues
  - Environmental Issues at Sewell Lock, Pond Apple Slough and other 4f locations
  - Ponds
  - Noise walls

Tuesday

Transit Involvement and evaluate the transit alternatives using the Transit Matrix

Turnpike Involvement

- Direct connections at the east and west
- Letting of Turnpike project at the east interchange

Environmental Issues

Wednesday

Drainage - Stormwater Facilities

Legal R/W and cost estimates

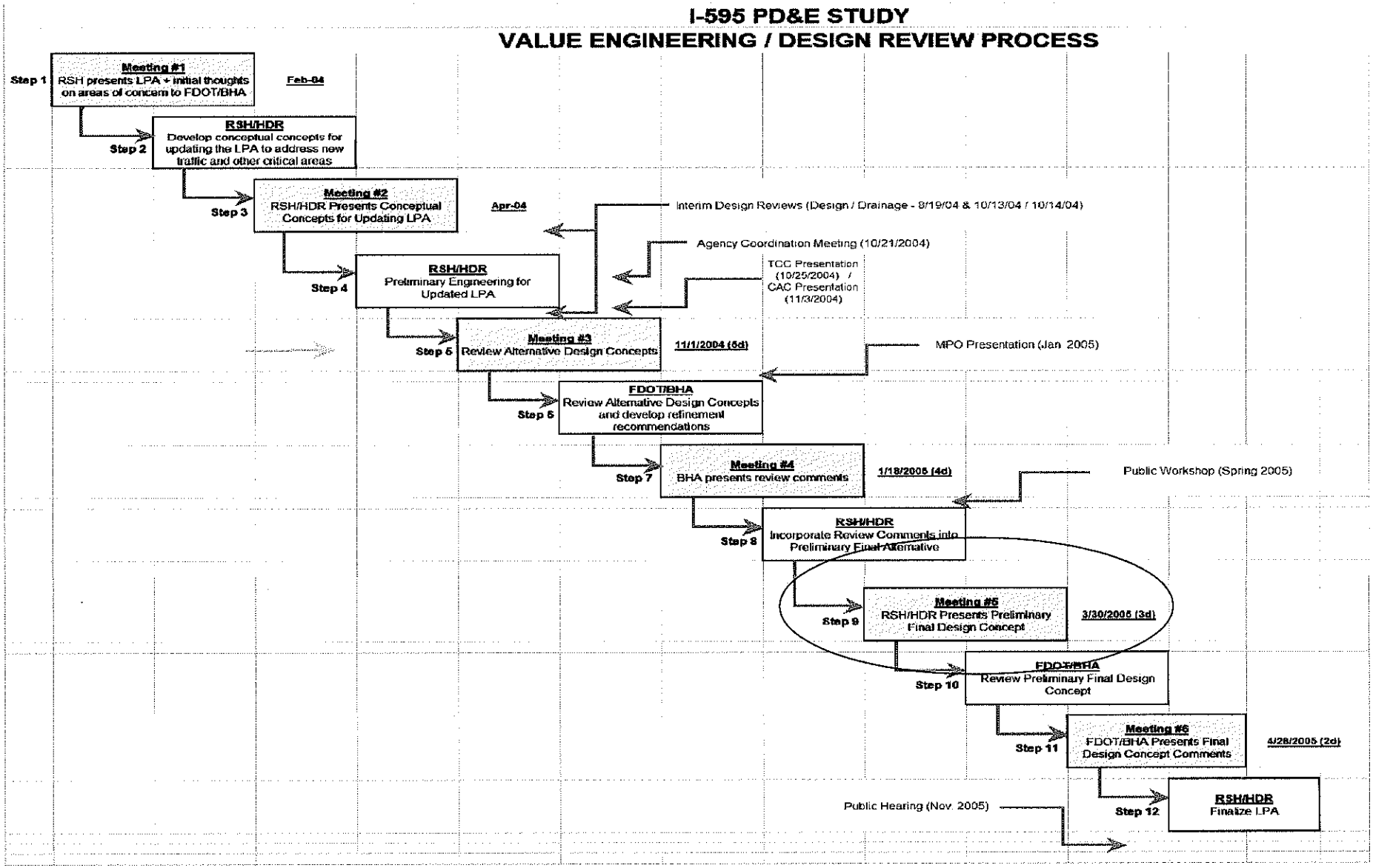
Spinoff projects

Thursday

Finalize all work and prepare for presentation

Friday

Presentation to Management at 10:00 am


I-595 PD&E STUDY
VALUE ENGINEERING / DESIGN REVIEW PROCESS
Step 1
Meeting #1
RSH presents LPA + initial thoughts on areas of concern to FDOT/BHA
Feb-04
Step 2
RSH/HDR
Develop conceptual concepts for updating the LPA to address new traffic and other critical areas
Step 3
Meeting #2
RSH/HDR Presents Conceptual Concepts for Updating LPA
Apr-04
Interim Design Reviews (Design / Drainage - 8/19/04 & 10/13/04 / 10/14/04)
Agency Coordination Meeting (10/21/2004)
TCC Presentation (10/25/2004) / CAC Presentation (11/3/2004)
Step 4
RSH/HDR
Preliminary Engineering for Updated LPA
Step 5
Meeting #3
Review Alternative Design Concepts
11/1/2004 (5d)
MPO Presentation (Jan. 2005)
Step 6
FDOT/BHA
Review Alternative Design Concepts and develop refinement recommendations
Step 7
Meeting #4
BHA presents review comments
1/18/2005 (4d)
Public Workshop (Spring 2005)
Step 8
RSH/HDR
Incorporate Review Comments into Preliminary Final Alternative
Step 9
Meeting #5
RSH/HDR Presents Preliminary Final Design Concept
3/30/2005 (3d)
Step 10
FDOT/BHA
Review Preliminary Final Design Concept
Step 11
Meeting #6
FDOT/BHA Presents Final Design Concept Comments
4/28/2005 (2d)
Public Hearing (Nov. 2005)
Step 12
RSH/HDR
Finalize LPA

SLIDE PRESENTATION

RS&H
Architectural, Engineering, Planning and Environmental Services

Reynolds, Smith and Hills, Inc.
300 South Pine Island Road, Suite 300
Plantation. Florida 33324
954.474.1304
Fax 954.474.1304

FL Cert. Nos. AAC001886 • EB0005620 • LCC000210

Date: January 10, 2006

To: Mr. Steve Braun, PE
Project Manager
Florida Department of Transportation
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309-3421

From: Phil Schwab, PE

RE: **I-595 PD&E Study: Alternative 2A / TPK Direct Connect**
Minutes of December 16, 2005 Design Review Meeting
FM NO. 409354-1-22-01
BROWARD COUNTY

A meeting was held on December 16, 2005, in District 4 Auditorium to discuss the specific impacts Alternative 2A will have on the Turnpike Interchange and Mainline with the inclusion of direct connection ramps from the proposed elevated reversible lanes. Representatives of both the FDOT's Turnpike District and District 4 and their designated consultants participated in the meeting. Attending the meeting were:

Name	Affiliation	Phone
See sign in sheet(s) attached		

The following is a summary of Issues/Concerns with the direct connect impact to the Turnpike:

Issue 1: The Turnpike Enterprise was concerned with possible impacts to the Griffin Road Toll Plaza resulting from the improvements proposed under the I-595 PD&E Study.

Response: No action taken. Alternative 2A remains as designed with no impacts to the toll plaza. Both Alternative 1B and 2A were designed to meet the Turnpike - Griffin to Sunrise Ultimate configuration. The designer assured the Turnpike that the Griffin Road toll plaza will remain intact in either of the two Alternatives and will not need to be relocated as part of the proposed improvements with or without the direct connections to the Turnpike. It should be noted that there are differences in the requirement for the design of the proposed I-595 to SB TPK ramps if the direct connection ramps are included in Alternative 2A. Specifically the ramp can be reduced to a 2-lane ramp from a 3-lane ramp due to the fact that the direct connection will serve this movement to the TPK.

Issue 2: It was requested that the designer look into additional alternatives to the Preferred Alignment Direct Connections to the Turnpike due to the close proximity to the Plantation Harbor subdivision located in the northwest quadrant of the I-595/Florida's Turnpike interchange.

Response: Two additional alternatives were developed by the design team and evaluated. The matrix below shows the results of the evaluation ranking the alignments 1-3, with three

being the best. Note that the North Alternative is the current preferred elevated reversible lane direct connect alternative.

	Construction Cost	R/W Impacts	Proximity to Neighborhood	Height of Bridge	Geometry	Overall
North Alternative	3	3	1	3	3	13
Middle Alternative	2	2	2	1	2	9
South Alternative	1	1	3	2	1	8

The VE/DR team discussed several concepts and developed an additional alternative that relocates the direct connections to the Turnpike away from the Plantation Harbor neighborhood in the northwest quadrant. The VE/DR team attempted an alignment that diverged from the I-595 reversible lanes on the south side of I-595 and spans Burris Road on a straddle bent structure. The proposed alignment concept would then split to provide direct connection ramps to the Turnpike mainline similar to the preferred alternative, but on the south side of I-595. The design team recognized this alternative as one that was looked at earlier in the PD&E Study, evaluated at a VE/DR meeting, and ultimately later discarded because of vertical geometry issues. The structures would be considerably higher than that of the preferred direct connect alternative. The VE/DR team agreed that no additional action is needed and expressed a preference for the "north" direct connection alignment.

Issue 3: The gas main along the Turnpike is being relocated for widening of the Turnpike between Griffin Road and Sunrise Boulevard. The gas main is proposed to be relocated to an offset of 25' off the east right of way line. The proposed widening of the Turnpike as proposed in the I-595 PD&E Study would place the shoulder above the utility line if modifications to the roadway and/or utility relocation plan were not made. The VE/DR team has several solutions that could be presented to the Gas Company.

Response: The VE/DR team developed the following three concepts in attempt to address the above concern:

Option A:
The VE/DR team proposes to provide MSE wall in lieu of fill slopes along the northbound Turnpike to provide additional room for Florida Gas Transmission (FGT) to access and maintain the pipe. It is also proposed that the right of way noise barrier constructed in the NB Griffin to Sunrise Project be replaced with a shoulder mounted noise wall on top of the proposed MSE wall. This will give FGT a minimum 25' wide service area between the MSE wall and the right-of-way line to access and maintain the pipe when necessary. It will be necessary for FGT to modify its proposed horizontal alignment to allow for the construction of the proposed MSE wall along the Turnpike. The Turnpike is providing a 35' wide service area for the gas main for much of the corridor. Approximately 1600' (Sta. 1814+00 to Sta. 4830+00) of the gas main would have less than the 35-foot wide service area if this proposal were accepted. All other roadway geometrics along the Turnpike are to remain as designed in the I-595 PD&E Study.

Option B:
A much less desirable solution that will be investigated is to shift the Turnpike mainline to the west in order to provide additional room (35' required by gas company) for accessing and maintaining the gas line. Care must be taken not to impact the Turnpike bridges over I-595 or the Peters Road overpass. The north approach slab will act as the departure point from the current preferred alignment. Additional alignments were considered if this could not be accomplished geometrically. The first is to widen the existing Turnpike Bridge to the west to accommodate shift. The second is to modify the alignment south of the turnpike bridges and utilizing Burris Road.

Option C:
Another option also being considered is extending the north direct connection bridge further to the north until past the "pinch point" at Station 4830+00, to minimize the widening of the mainline at this location. The "pinch point" is the location along the northbound Turnpike where the existing right of way is at its tightest, the roadway footprint is at its widest, and the FPL transmission lines are closest. Once past the "pinch point" (where current alignment is at its widest typical section, gas, electric are all in the same general area) the mainline can be widened to accommodate the additional median width needed for the reversible lane exchange area. Care must be taken not to impact the Peters Road Bridge that is due to be replaced in the next year as part of the Turnpike Mainline: Griffin to Sunrise Southbound project. This recommendation as well as the previous would provide FGT with the full 35' service area.

Summary of Action Items:

Action	Responsible	Comments
Prepare Package for the gas company explaining and showing typical section reduction to maximize area for Gas Line.	RSH- Keith Brockman to send package to the Turnpike for further coordination with FGT.	Option to be presented is relocation of noise wall and introduction of MSE wall (no alignment changes).
Coordinate design option above with FGT. Obtain either approval of concept or comments to improve concept	Turnpike District shall take the lead in Coordination and follow-up status with District 4.	TPK to aske FGT if it is possible to relocate the line 10 ft closer to the R/W line.
Develop other potential options listed in response above that will avoid or minimize the Gas Line conflict. These are less desirable and will only be pursued if FGT cannot accept the preferred option.	RSH- These are secondary priority to the preferred option and need to be available prior to January 19, 2006.	

Copy: Attendees
File

MEETING SIGN-IN

I-595 PD&E STUDY

DATE: 12/16/05
LOCATION: D4 AUDITORIUM
SUBJECT: VE/DR (TPK DIRECT CONNECTIONS)

Name:	Agency/Company:	Phone:	E-Mail:
STEVE BRAUN	FDOT - D4 (PL&EM)	(954) 777-4143	steve.braun@dot.state.fl.us
William Leidy	FDOT - D4 (PL&EM)	954 - 777 - 2284	william.leidy@dot.state.fl.us
DUSTIN DUKE	FDOT - D4 - STRUCTURES	954-777-4145	dustin.duke@dot.state.fl.us
GARY KOTFE	FDOT-D4- UTIL/VE	954-777-4689	GARY.KOTFE@DOT.STATE.FL.US
[illegible] BELL	TPK CONST.	954-610-9469	[illegible].BELL@dot.state.fl.us
Guillermo Becerra	BHA	954-334-9000	gbecerra@bhaengineers.com
LAWRENCE HAYOUK	TURNPIKE UTILITY	407-264-3423	LAWRENCE.HAYOUR @DOT.STATE.FL.US
Robert Bostian	FDOT/Dist 4	954-777-4427	Robert.Bostian@ Dot.state.fl.us
Richard Creed	FDOT/D4	" 777-4428	richard.creed@ dot.state.fl.us
Betsy Jeffers	FDOT/D4	4061	betsy.jeffers@ ...

MEETING SIGN-IN
I-595 PD&E STUDY

DATE:
LOCATION:
SUBJECT:

Name:	Agency/Company:	Phone:	E-Mail:
MIKE BONE	CEC	954 922-6917	MIBONE@CE-CONSTRUCT
Peter Kuhne	TpK	407 264-3434	peter.kuhne@dot.state.fl.us
Joe Borello	FDOT	954-777-4426	joseph.borello@dot.state.fl.us
NORMAN BRYANT	TPK	407-532-3999	NORMAN.BRYANT@DOT.STATE.FL.US
PHIL SCHWAB	RS&H	954.236.7386	phil.schwab@rsandh.com
Eduardo Caballero	FDOT	954 777-4567	eduardo.caballero@dot.state.fl.us
Jeff Bowen	RS&H	904-256-2173	jeff.bowen@rsandh.com

Florida Department of Transportation

JEB BUSH
GOVERNOR

3400 West Commercial Blvd.
Ft. Lauderdale, FL 33309-3421
Phone (954) 486-1400

DENVER J. STUTLER, JR.
SECRETARY

Date: January 31, 2006

To: Meeting Attendees (See attached)

From: Steven C. Braun, PE

Subject: **I-595 PD&E Study: Alternative 2A / Turnpike Direct Connect**
Minutes of January 12, 2006 Coordination Meeting
FP No. 409354-1-22-01
I-595 PD&E Study from I-75 to I-95
Broward County

A teleconference was held on January 12, 2006 between FDOT District 4 and the Turnpike Enterprise to discuss the I-595 PD&E alternative of direct connect ramps from the proposed elevated reversible lanes to the median of the Turnpike. The costs and impacts associated with these proposed ramps were discussed at the meeting. This meeting was a follow-up to a Design Review Meeting that was held on December 16, 2005 (meeting minutes attached).

DIRECT CONNECT ALIGNMENT OPTIONS

District 4 has developed three geometric alternatives for the direct connect ramps. These alternatives were developed in order to address the City of Plantation's concerns of the proximity of the direct connect ramp to residential communities in the area. These alternatives were presented as concept alternatives at the Public Hearing on November 29, 2005. The following are the options that were discussed at the meeting:

North Alignment - This option is the original PD&E option that minimizes bridge length but brings the structure closer to the residential community in the northwest quadrant of the interchange. This option has the lowest cost and has the most desirable geometry for the traveling public.

Center Alignment - This option extends the bridge structure by crossing over I-595 to the north and then crossing back over to the south to split the connections and then extending the connection, which will ultimately connect to the north, to the south and east in order to fit the geometry required for the design speed. This option is much more costly and creates a very long single lane structure that will need to be maintained at a 3rd level for most of its length. The geometry is much less desirable than the North Alignment.

South Alignment - This option extends the bridge structure by crossing over I-595 to the south and then splitting and then following similar geometry as the center alignment. This option is more costly and also requires the acquisition of right of way. The geometry is better than the Center Alignment but is still undesirable for the same reasons as the Center Alignment.

The Design Review team recommended that the North Alignment should be the preferred option to provide the direct connect ramp to the Turnpike from PD&E Alternative 2A, the elevated reversible

lane alternative. The Design Review team also recommended that the other alignment options should not be considered further. The estimated costs for these alternatives are included as an attachment.

TURNPIKE CONNECTION CONCERNS

It was discussed by the group that the Public Hearing comments received were not conclusive as to a preferred alternative. There was relatively equal support for both alternatives. Several concerns were evaluated at the Design Review meeting in an effort to provide District 4 and the Turnpike the information needed to collaborate on the selection of a preferred alternative. The following is a summary of the evaluation completed by the project team based on the Design Review meeting:

Griffin Road ramp connection/toll plaza- The direct connect ramps will not impact the toll plaza at Griffin Road or the Bridges over Griffin Road.

Utility Impacts- The main utility concern is the gas main for which FGT is currently finalizing plans to relocate the line along the east side of the Turnpike. FGT is proposing to replace two gas lines with one 36" line. The current proposed location of the gas main would place it under the outside edge of a future travel lane. There is an area of constrained R/W that is of concern and is approximately 1600 feet in length. The gas main is currently proposed to be placed by open cut in this area which is adjacent to two separate directional bore locations one to the north and another to the south. Three options were developed to maximize the space allotted to the gas company in this area:

Option A - This option keeps the Turnpike centered along its current alignment but places the northbound travel lanes and shoulder on retaining wall. This option also moves the proposed noisewall from the R/W line to the shoulder. These proposed changes allow for a minimum of +/-24 feet between the R/W line and the retaining wall. Drainage would be piped and contained in the wall section and the offsite flow appears to be minimal and can be handled by a shallow conveyance ditch above the gas line. The gas company would have the option to place their line anywhere within the +/- 24 feet. This option adds approximately $3 Million to the cost of the direct connection.

Option B - This option is the same as Option A but shifts the Turnpike alignment approximately 10 feet to the west. This allows approximate +/- 35 feet between the R/W line and the retaining wall. This option adds approximately $5 Million to the cost of the direct connection.

Option C - This option moves the direct connection touchdown point to the north and in turn the median expansion moves to the north. This option potentially impacts the Peters Road Bridge and potentially the Bridges over Broward Boulevard and was dropped from further evaluation.

The group discussed the impacts that could occur to the gas main with the potential for temporary sheeting and pile driving activities in its vicinity, but felt that these considerations could adequately be addressed during design and construction. Questions regarding the appropriate factors used to

establish MOT cost estimates were raised. These questions related to the complexity of the construction sequencing at this location.

The Turnpike is coordinating Option A with the gas company. Initial indication is that the gas company has concerns but did not say the gas main could not be moved to the area that is proposed in Option A. It was mentioned that the utility relocation would have to be completed prior to both the Turnpike mainline project and the I-595 / Turnpike interchange projects. A meeting took place on January 19th, 2006, with FGT where this option was presented to the utility company and more details were discussed regarding the relocation plan.

The Turnpike agreed that is was in the best interest of the projects to make accommodations for receiving the direct connection from the reversible lanes. District 4 agreed that one of the reasons Alternative 2A is likely to be the preferred alternative is because it provides that direct connection to the Turnpike. Nancy Clements made a commitment to advance the design of the Turnpike mainline project with the assumption that Alternative 2A advances from the PD&E Study. She felt that designing the Turnpike project to accommodate the new ramp would allow for the ability to construct the ramp in the future. The ultimate option for the mainline Turnpike will be developed as coordination with the gas company continues. It was also noted that the gas company has purchased materials for their gas line and it will be delivered during the summer of 2006.

ACTION ITEMS/COMMITMENTS

- District 4 will finalize their PD&E Documents with Alternative 2A reflecting the North Alignment of the direct connection to the Turnpike. The District will also include Option B for the Turnpike mainline connection, which would represent a worst-case scenario in terms of impacts (costs and noise). The documents should be complete by the end of February in order to keep the schedule of achieving LDCA in June of 2006.
- District 4 will follow up with their construction office regarding the cost estimates for the Turnpike, MOT factor used, constructability of span lengths as well as appropriate costs.
- Nancy Clements made a commitment to design the Turnpike mainline project to accommodate Alternative 2A from the PD&E Study and to accommodate the direct connect ramps to the Turnpike.
- The Turnpike made a commitment to continue coordination with FGT regarding the relocation of the utility line to a location that best accommodates the potential direct connect ramps to the Turnpike from the I-595 Reversible Lanes.
- Gerry O'Reilly and Nancy Clements will meet together with Jim Wolfe and Jim Ely to provide a project update and discuss project funding.

Attachments: (Agenda, Design Review Minutes, Turnpike Cost Estimates)

Copy: Attendees
File

MEETING ATTENDEES
(Via Teleconference)

Turnpike Headquarters Location:
Nancy Clements - TPK
Norman Byrant - TPK
Terry Denham - TPK
Peter Kuhne - TPK
Kathleen Joest - TPK
Keith Brockman - RS&H

Turnpike Pompano Location:
Kent Rice - TPK

FDOT District 4 Location:
Gerry O'Reilly – FDOT D4
Gus Schmidt – FDOT D4
Richard Creed – FDOT D4
Joe Borello – FDOT D4
Ron Wallace – FDOT D4
Steve Braun– FDOT D4
Jeff Bowen - (RS&H)
Phil Schwab - (RS&H)