VALUE ENGINEERING REPORT

Florida Department of Transportation

District 6

SR 994/SW 200th Street/Quail Roost Drive PD&E Study

From West of SW 137th Avenue to East of SW 127th Avenue

Miami-Dade County, Florida

Financial Management Number: 445804-1-22-01

ETDM Number: 14429

JUNE 2023

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

Value Engineering Study Report

SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue

Florida Department of Transportation

Miami-Dade County, FL

June 12-16, 2023

Prepared by:

HDR Engineering, Inc.
315 E Robinson Street
Suite 400
Orlando, FL, 32801

Engineer's Certification

I, hereby certify that I am a registered professional engineer in the State of Florida, practicing with HDR Engineering Inc., a Florida Corporation under Section 471.023, Florida Statutes, to offer engineering services to the public through a Professional Engineer, duly licensed under Chapter 471, Florida Statues, Certificate of Authorization (CA) Number 4213, by the State of Florida, Department of Professional Regulation, Board of Professional Engineers, and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

Project	FPID No.: 445804-1 Project Description: SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue Document Description: Value Engineering Study Report
Location:	Pinellas County, Florida
Report Prepared for:	Florida Department of Transportation District 6 1000 N.W. Avenue Miami, FL 33172
Report Prepared by:	Jose Theiler, P.E., CVS HDR Engineering, Inc. 440 S. Church St. - Suite 1000 Charlotte, NC 28202-2075 Certificate of Authorization No. 4213 Vendor No. VF-470680568

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

Electronically Signed and Sealed by Jose Theiler, PE, CVS on 08/10/2023 using a Digital Signature.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Digitally signed by Jose Theiler
Date: 2023.08.10 07:24:24 -04'00'

Disclaimer

The information contained in this report is based on the professional opinions of the Value Engineering (VE) team members as developed during the study. These opinions are based on the information that was provided to the team at the time of the study. As the project continues to develop, recommendations and findings should be reevaluated as new information is received.

All costs displayed in the report are based on best available information at the time of the study and, unless otherwise noted, used the estimate as provided to the VE team. All drawings, graphics, maps, photos, etc., used in the report were supplied by the study sponsor or developed during the study.

The disposition of recommendations is based on the information in this report; it is independent of the resolutions generated after the study. HDR has no participation, direct or indirect, in such decisions.

For any recommendations that are accepted by the owner and design team as a result of this VE study, the responsibility for implementation into the design rests with the designer of record.

Study Statistics	
Baseline Cost:	$36,890,274
Number of Recommendations:	16
Total Number of Team Members:	10
FDOT Employees:	7
Others:	3
Facilitator Consultant:	HDR

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Tables

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Acronyms and Abbreviations

ATCS	adaptive traffic control system
CCTV	closed circuit television
CVS	Certified Value Specialist
CY	cubic yard
DMS	dynamic message sign
FAST	Function Analysis System Technique
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FPL	Florida Power & Light
FSB	Florida slab beam
IMR	Interchange Modification Report
ITS	Intelligent Traffic System
LDCA	Location and Design Concept Acceptance
LF	linear feet
LRE	long range estimate
MOT	maintenance of traffic
MSE	mechanically stabilized earth
MVDS	microwave vehicle detection sensor
PD&E	Project Development and Environment
SF	square feet
SIS	strategic intermodal system
SR	State Road
SY	square yard
TSM&O	Traffic System Management and Operation
UPS	uninterrupted power supply
VE	value engineering
VMA	Value Methodology Associate

Executive Summary

Introduction

This report summarizes the events and results of the VE study conducted by HDR Engineering, Inc. for The Florida Department of Transportation (FDOT) on the SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue project in Miami-Dade County, FL. The VE study consisted of an in person 5-day workshop conducted with a multidisciplinary team June 12-16, 2023 at FDOT's District 6 Headquarters in Miami, Florida and HDR's office in Doral, Florida. The team used Microsoft Teams as a platform to share content and collaborate throughout the workshop.

Project Overview

The purpose of this project is to address traffic operations, safety issues and capacity constraints on SR 994 from west of SW 137th Avenue to east of SW 127th Avenue in unincorporated Miami-Dade County to accommodate 2045 traffic. Other goals of the project are to improve multimodal safety conditions along the corridor, including emergency evacuation and response times, and to enhance mobility options and multimodal access.

Project improvements include widening SR 994 from a 2-lane urban minor collector to a 4-lane divided urban typical section, with 11-ft, 16.5-ft raised median with exclusive left turns throughout the corridor. The facility features one 10-ft shared use path in each direction with a 4.5-ft back of curb buffer. Three intersections will be signalized, two (SW 137th and SW 127th Avenues) will be upgraded and one new at SW 134th Ave. The bridge over Black Creek Canal will be replaced, raising the profile to accommodate a 10-ft shared use path (SUP) under the bridge and accommodate pedestrians and bicyclists along the Black Creek Trail.

At the time of the VE study, the total remaining cost of the project, including construction and right-of-way, was estimated at $36.89 million.

Scope of VE Study

The primary objectives of the study, through execution of the Value Methodology Job Plan (Appendix A), were to:

- Verify or improve on the various design concepts for the identified section of the SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue project.
- Conduct a thorough review and analysis of the key project functions using an independent, multidiscipline, cross-functional team.
- Improve the value of the project through innovative measures aimed at improving the performance while reducing costs of the project.

VE Recommendations

The VE team generated 51 ideas for the project. These concepts were compared against the baseline developed by the project team. The concepts that resulted in improved performance were further developed by the VE team and resulted in 16 recommendations (Table 1).

Table 1. Summary of Recommendations

#	Recommendation Title	Cost Savings/ (Cost Added) ($M)	Performance Improvement (%)
1	Develop Alternative Drainage Solution	$1.00	+6.2
2	Identify County & FDOT Property for Staging and Drainage Purposes	$0.00	0.0
3	Modify Median Design	$0.44	+4.8
4	Use Preemption Technology	($0.22)	+10.5
5	Modify Median Access	($0.04)	+10.5
6	Modify SFWMD Canal Access	($0.01)	+15.7
7	Remove Buffer along Bridge	$0.33	+1.2
8	Modify Pedestrian & Bicyclist Accommodations	$0.88	+1.9
9	Advance Safety Improvements at Critical Locations	($4.45)	+23.6
10	Eliminate Trail Underpass	$3.39	+21.6
11	Implement TSMO Strategies	($0.77)	+16.7
12	Reduce Limits of Projects along SW 127th, SW 134th & SW 137th	$0.52	0.0
13	Reduce Bridge Width	$0.71	+3.8
14	Install ITS Infrastructure Prior to Construction	($0.28)	+2.8
15	Remove 196th St Connector Improvements	$0.18	+8.3
16	Seek ROW Cost Reimbursement of County Encroachments to Private Owners	$0.33	0.0

The individual recommendations are summarized below; the detailed information about each recommendation is included in Section 7.

1— Develop Alternative Drainage Solution – The recommendation to develop alternative drainage solutions is to reduce the reliance on French drains and increase the pervious areas along the project limits.

2— Identify County & FDOT Property for Staging and Drainage Purposes – This recommendation identifies parcels that could be used to treat water.

3— Modify Median Design – The VE team recommends reducing the median width to meet AASHTO minimum widths.

4— Use Preemption Technology – The use of preemption technology improves emergency operations and reduces emergency response times. The use of backup generators and uninterrupted power supply units will offer uninterrupted emergency operations.

5— Modify Median Access – To improve safety, the VE team recommends using median directional triangular raised islands to channelize vehicular traffic and improve traffic flow.

6— Modify SFWMD Canal Access – The VE team recommends removing maintenance access for South Florida Water Management District (SFWMD) from the structure crossing Black Creek Cana to remove conflicts from travel lanes and to redirect maintenance crews to 130th and 132nd Avenues left turn bays,

7— Remove Buffer along Bridge – This recommendation is to reduce the structure width to fit within the current ROW footprint.

8— Modify Pedestrian & Bicyclist Accommodations – The VE team recommends using a shared use path (SUPP) on one side and a sidewalk on the opposite direction to reduce the footprint and ROW requirements.

9— Advance Safety Improvements at Critical Locations – The recommendation is to advance a separate project to immediately address safety issues at high-crash locations by adding turn lanes, extending WB merge lane west of SW 127th Ave, adding a traffic signal within existing footprint at SW 134th Ave. and using adaptive signal controls with Q-loops at SW 137th and SW 127th Ave.

10— Eliminate Trail Underpass – The VE team recommends removing the trail crossing under the structure at the Black Creek Canal and improve at grade traffic crossing.to reduce the bridge profile, reduce wall structures, and reduce neighboring homes intrusions.

11— Implement TSMO Strategies –. The VE team recommends using adaptive control system with Q-loops, dynamic message signs and video cameras to improve operations along the corridor and approaches at key locations.

12— Reduce Limits of Projects along SW 127th, SW 134th & SW 137th – The VE team recommends reducing project limits along SW 127th, SW 134th & SW 137th Avenues as prescribed by minimum taper standards.

13— Reduce Bridge Width – To reduce bridge width, the VE team recommends constructing two bridges and eliminating the median and buffers, while maintaining a straight alignment.

14— Install ITS Infrastructure Prior to Construction – Installing ITS infrastructure and components ahead of the project or during the first stage of construction will improve operations while reducing user delay costs during construction.

15— Remove 196th St Connector Improvements– This recommendation is to remove the proposed 196th Street improvements from the project as it is outside of the project limits.

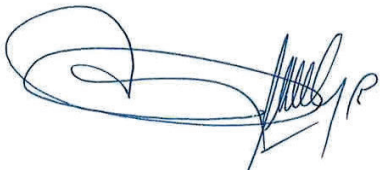
16— Seek ROW Cost Reimbursement of County Encroachments to Private Owners – The intent of the recommendation is to seek County's funding participation to normalize the County's encroachment along SE edge of 134th Avenue.

Implementation of Recommendations

To facilitate implementation, a Value Engineering Recommendation Approval Form is included as Appendix B. If the state elects to reject or modify a recommendation, please include a brief explanation of the decision.

The VE team wishes to express its appreciation to the project design managers for the excellent support they provided during the study. We hope that the recommendations and design considerations provided will assist in the management decisions necessary to move the project forward through the project delivery process.

Sincerely,



Jose Theiler, PE, CVS®
Principal East Region
Project Risk Management and Value Engineering

1 Introduction

This VE report summarizes the events of the VE study conducted for The Florida Department of Transportation and facilitated by HDR. The subject of the study was SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue. The VE study was conducted in person on June 12-16, 2023 while the project was in the PD&E phase.

Scope of VE Study

Value is expressed as the relationship between functions and resources, where function is measured by the performance attributes defined by the customer, and resources are measured in materials, labor, price, and time required to accomplish that function. VE focuses on improving value by identifying the most resource-efficient way to reliably accomplish a function that meets the performance expectations of the customer.

The primary objectives of the study, through execution of the Value Methodology Job Plan (Appendix A), were to:

- Verify or improve on the various concepts for the identified section of the SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue.
- Conduct a thorough review and analysis of the key project functions using a multidiscipline, cross-functional team.
- Improve the value of the project through innovative measures aimed at improving the performance while reducing costs of the project.

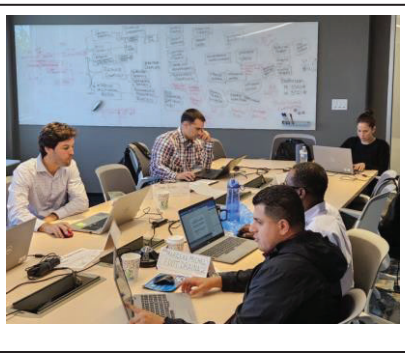
With this process, the VE team identified the essential project functions and alternative ways to achieve those functions; the team then selected the optimal recommendations to develop into workable solutions for value improvements.

VE Team Members

The VE study was facilitated by a Certified Value Specialist (CVS) from HDR. Multiple representatives and members of the FDOT project team also participated in the VE process to provide insight into the project's background and design development, as well as their requirements for the project and expectations for the VE study. Their support of this study is greatly appreciated, and the results provided herein reflect the information they provided throughout the study.

The VE team included the following. See Appendix C for details of attendees.

- Mark Alvarez (FDOT)
- Christopher Bacallao (FDOT)
- Alejandro Gomez (CTS)
- Claudia Gutierrez (FDOT)
- Christopher Johnson (HDR)
- Marceau Michel (FDOT)
- Carmen Negron (FDOT)
- Mario Perez (FDOT)
- Ryan Raghunandan (FDOT)
- Jose Theiler (HDR)



2 Information Phase

The VE team received the documentation and drawings from the project design team as shown in Table 2. The design team also introduced the project and its characteristics on the first day of the study. Project details and challenges as presented by the design team are summarized below.

Information Provided to VE Team

Table 2 lists the project documents provided to the VE team for use during the study.

Table 2. Information Provided to the VE Team

Document/Drawing/Schematic	Document Date
Draft Preliminary Engineering Report (PER)	02/24/2023
Drone Aerial Views Images	06/06/2023
Long Range Estimate (LRE) by Component	06/06/2023
LRE by Version	06/06/2023
Project Photos	06/06/2023
Quail Roost Design Files	60/14/2023
Quail Roost Schedule	04/05/2023
PSM Schedule	06/06/2023
Project Presentation for VE (FDOT)	06/12/2023
Roll Plot Alt 2	06/09/2023
Quail Roost PDE Build KMZ File	06/12/2023
HAWK Controller - Miami-Dade County Directive	06/12/2023
QR Alt 2 PER Plan-Profile at Bridge with Underpass	06/12/2023
Future Crash Analysis workbooks	03/08/2023
Traffic simulation Synchro files	03/08/2023

Project History, Location and Purpose and Need

The SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue project is in southwest unincorporated Miami-Dade County, primarily within the Miami Urbanized Area. It provides local east-west multimodal access and connects to two Strategic Intermodal System Highway Corridors. Within the project limits, SR 994 is classified primarily as an urban minor arterial composed of two-lane undivided roadway without designated bicycle accommodations and sidewalks are noncontinuous. The right-of-way width ranges from 30 to 100 feet.

The project's purpose and need is to address traffic operations and capacity constraints on SR 994, from west of SW 137th Avenue to east of SW 127th Avenue. It aims to meet the

anticipated increase in travel demand due to population and employment growth in the area. The project also seeks to enhance multimodal safety, including emergency response times, and provide improved mobility options and access to multimodal transportation.

Capacity/ Transportation demands:

The purpose of the proposed project is to meet the estimated travel demands in 2045. The county population is expected to grow by 33% by 2045 and employment growth is expected to grow from 1.4 million workers to 1.7 million workers.

Safety:

The project identified needs to address the deficiencies in LOS and crashes along the corridor. The following are locations that are proposed to be addressed.

- SR 994 at SW 137th Avenue
- SR 994 at SW 134th Avenue
- SR 994 at SW 132nd Avenue
- Segment- SR 994 from SW 137th Avenue to west of SW 127th Avenue

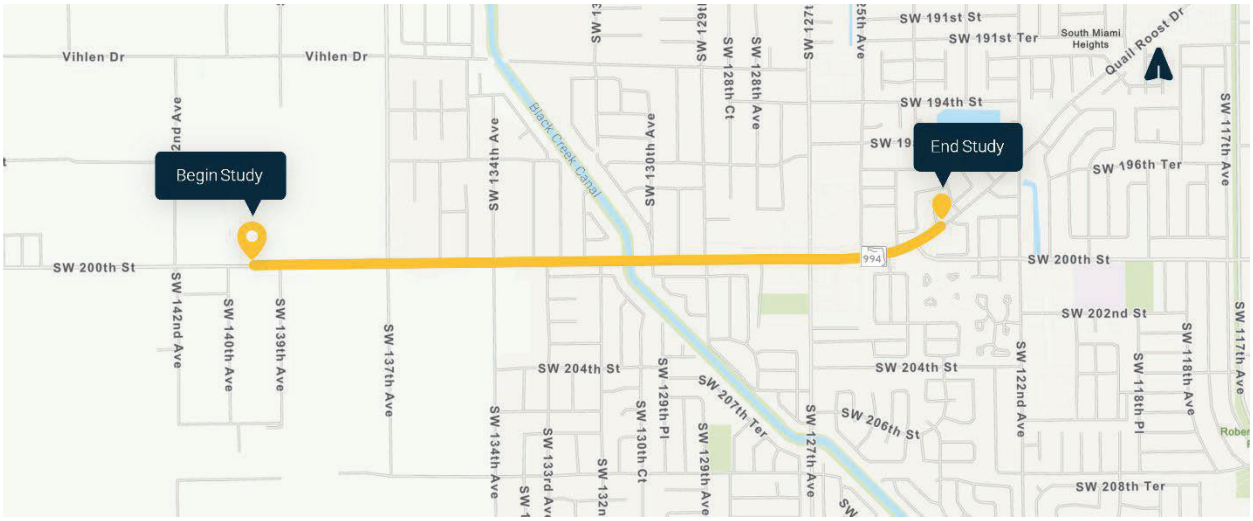
Multimodal:

There are no existing designated bicycle lanes within the project limits. The Black Creek Trail crosses SR 994 at Black Creek Canal and utilizes a flashing beacon for crossing pedestrians. Sidewalks along the facility are non-continuous and are generally located at residential subdivisions.

Evacuation Routes / Emergency Services:

SR 994 connects into two emergency evacuation routes that are a part of the Strategic Intermodal System (SIS). The eastern connection is at SR 994/Heft and the western connection is at SR 994/Krome. SR 997/Krome Avenue provides regional connectivity to US 1, which is a major evacuation route for the Florida Keys.

Figure 1. Project Location



Proposed Improvements

Alternative 2 proposes one additional travel lane in each direction, for two 11-ft lanes in each direction, and a 16.5-ft raised median with exclusive left turn lanes along SR 994. Curb and Gutter Type F is proposed on the outside of the travel lanes while Type E curb is the typical

condition on the median. This alternative also proposes a 10-ft Shared Use Path (SUP) along both sides of the corridor. A minimum 4.5-ft buffer is proposed from the back of curb to the front of the SUP. A 2-ft buffer is proposed behind the SUPs. A new traffic signal is proposed at the intersection of SR 994/Quail Roost Drive and SW 134th Avenue, while upgrading existing signals at SW 137th and SW 134th Avenues.

The existing concrete three-spans bridge will be replaced by a wider three-spans concrete bridge. The new bridge will accommodate five lanes of traffic. The new bridge will be 110'-9-in long, and 99'-8-in wide.

The proposed project's drainage systems have been designed to ensure no impact on the surrounding areas. The self-contained French drains will not overflow into adjacent water bodies. The systems meet local regulations for water quality and quantity. The system is designed to prevent any overflow onto private properties.

Constraints and Controlling Decisions

As part of the project briefing, the VE team received the following project constraints and controlling factors that needed to be considered when evaluating ideas:

- Avoid additional 4F impacts to the proposed design. Currently there is one 4F impact to half of a 14-ft wide linear park along SR 994 on the south side of the project.

Risk Identification

A risk analysis was not completed as part of this VE project; however, during the VE study, the team identified a few risks:

- The utility relocation is scheduled to complete by 11/13/2025. Florida Power and Light relocation is an ongoing concern due to past experience.
- This project grew in scope from the original safety project to address intersection congestion and accidents along the corridor. Additional scope creep is possible as the project continues to evolve to address issues in surrounding areas.
- There are a large number of parcels to acquire and limited resources available for appraisal, appraisal reviews, negotiation and condemnation procedures, including court dockets availability. While the schedule includes significant float, there is still a risk that letting may be delayed due to right-of-way delays.

Site Visit Observations

As part of the project overview, the VE team, project team, and stakeholders visited the project site. The following observations were made as a result of the site visit:

- The walls labeled as historic were in state of disrepair. Note: A follow-up conversation with the project team seemed to indicate that owners were not too concerned about the historic nature of the walls.
- Mid-day traffic congestion was apparent and that the current facility is highly utilized.

- There are large landscape trees used at various neighborhood entrances and that are within the FDOT ROW.
- The proposed SUP on both sides of the roadway appears optimistic in the current design. Utilizing one side for SUP could be an opportunity to reduce ROW acquisition totals.
- The buffer zone in the bridge seems unnecessary.
- The median maintenance cut/ crossover on the bridge creates a left turn from the eastbound mainlane and an unusual traffic movement creating additional turning conflicts along through lanes.
- The Black Creek Canal is accessible on all four corners of the bridge for SFWMD from structure.
- The intersection of SR994 and SW 130th Ave is missing N/S crossing for pedestrians.
- The Northbound SW 132nd Ave to WB SR 994 (Quail Roost Drive) turning movement does not have an acceleration lane.
- If needed, a construction detour will be 1+ miles using state-maintained roadways. It is not advised to use local County roadways for traffic detours.
- The intersections are designed to cater to county projects' needs.
- The proposed structure spans have different lengths, non-typical symmetry and will need to meet grade in 120-ft before intersections at SW 130th Avenue and SW 132nd Avenue Possible driveway access impacts along SW 130th Avenue due to bridge profile.
- The design team should validate driveway access opportunities and review permits for multi access parcels.
- There appears to be the possibility to include transit opportunities such as designated bus pick up and drop off locations.
- The bridge retaining walls containing the embankment on the adjacent properties are going to be significantly higher than in design examples.
- The use of median barriers or railings may be required to prevent pedestrian crossings.
- The pavement condition seems to be in fair condition and reusing the material may be an option during construction phase.

Project Schedule

The current schedule is shown in Table 3. It was assumed that the project will be constructed using the design bid build (DBB) delivery method. The project was in the PD&E phase with the DBB procurement anticipated to occur in early 2028 with construction starting in mid-2028.

Table 3. Project Schedule

Project Phase (Bolded Activities are Milestones)	Start	Finish
Value Engineering	6/12/2023	6/16/2023

Table 3. Project Schedule

Project Phase (Bolded Activities are Milestones)	Start	Finish
Design Consultant Advertise	12/4/2023	12/4/2023
Public Hearing	12/6/2023	12/6/2023
Consultant Longlisting	1/3/2024	1/3/2024
Consultant Shortlisting	1/8/2024	1/8/2024
PE Begin	1/9/2024	1/9/2024
Geotechnical Request	1/18/2024	1/18/2024
Final Selection	2/19/2024	2/19/2024
Location Design Concept Acceptance (LDCA) Approval	**4/5/2024**	**4/5/2024**
Public Notice	4/8/2024	4/8/2024
Pe Consultant Contract Encumbrance	4/10/2024	4/10/2024
Pe Consultant Contract Execution	4/30/2024	4/30/2024
Roadway Plans	5/13/2024	11/13/2025
Notice To Proceed	5/13/2024	5/13/2024
Utility Contact	6/11/2024	6/11/2024
Project Kick-Off Meeting Fy-24	6/11/2024	6/11/2024
Design Documents Submittal	7/24/2024	7/24/2024
Permit Involvement Form Submittal	8/14/2024	8/14/2024
60% Plans Submittal	8/22/2024	8/22/2024
Permitting Agencies Coordination Mtg	9/19/2024	9/19/2024
Cultural Resource Review	9/23/2024	6/20/2025
Contamination Review	9/23/2024	6/20/2025
Noise Review	9/23/2024	6/20/2025
60% Plans Review Meeting	9/23/2024	9/23/2024
Wetland / EFH Review	9/23/2024	6/20/2025
Section 4(F) Review	9/23/2024	6/20/2025
Species/ Habitat Review/ Survey	9/23/2024	6/20/2025
Determination Of Landscape Estimate	9/23/2024	9/23/2024
File Permits	9/24/2024	9/24/2024
ROW Coordination Mtg 60%	10/22/2024	10/22/2024
Determination Of Local Government Off System Project Agreement	10/22/2024	10/22/2024
ROW Requirements To ROW Eng	11/6/2024	11/6/2024

Table 3. Project Schedule

Project Phase (Bolded Activities are Milestones)	Start	Finish
MOA/Off System Agreement Coordination And Review By FDOT	11/21/2024	1/14/2025
Final ROW Map/Sketches & Legal To Row Admin.	1/9/2025	3/6/2025
Final MOA/Off-System Agreement Transmitted To Locals For Execution	1/15/2025	1/15/2025
90% Plans Submittal	1/23/2025	1/23/2025
90% Plans Review Meeting	2/21/2025	2/21/2025
ROW Coordination Mtg 90%	3/24/2025	3/24/2025
Documents To R/W Administration	4/4/2025	4/4/2025
Appraisals	4/16/2025	4/13/2026
MOA/Off-System Agreement Executed	5/13/2025	5/13/2025
100% Plans Submittal	5/20/2025	5/20/2025
Appraisals Review	6/12/2025	6/9/2026
USFWS/ NMFS Coordination	6/19/2025	8/14/2025
DHR Approval	6/19/2025	8/14/2025
100% Plans Review Meeting	6/19/2025	6/19/2025
Plans Completed	7/21/2025	7/21/2025
Relocation Work	8/8/2025	3/12/2027
Negotiations	10/6/2025	12/15/2026
Contamination Clear	10/15/2025	10/15/2025
All Utilities Clear	**11/13/2025**	**11/13/2025**
Railroad Clear	**11/13/2025**	**11/13/2025**
Construction Clear	11/13/2025	11/13/2025
Production Date	**11/13/2025**	**11/13/2025**
All Permits Clear	**11/13/2025**	**11/13/2025**
Environmental Clear	11/13/2025	11/13/2025
Landscape Estimate Due To Estimate Office	11/13/2025	11/13/2025
Condemnation	3/3/2026	3/12/2027
ROW Demo & Clear Work	4/28/2026	7/27/2027
Final ROW Order Of Taking	3/12/2027	3/12/2027
ROW Certified	**7/27/2027**	**7/27/2027**
Final Landscape Cost Estimate To DLA	1/14/2028	1/14/2028
DLA Concurrence On Landscape	1/24/2028	1/24/2028

Table 3. Project Schedule

Project Phase (Bolded Activities are Milestones)	Start	Finish
PS&E Review(s)	1/24/2028	2/21/2028
PS&E Submittal(s)	1/24/2028	1/24/2028
Transmit PS&E Package (District)	2/21/2028	2/21/2028
Advertise District Contract	**3/16/2028**	**3/16/2028**
Letting Date	**4/27/2028**	**4/27/2028**
CEI Consultant Contract Executed	7/25/2028	7/25/2028

Project Cost Estimate

At the time of the study, the VE team was provided with the most recent cost estimate. An abbreviated estimate is shown in table below. See Appendix D for a detailed estimate.

Cost Item	Cost
Estimated ROW	$ 8,438,713
Pavement	$ 5,994,644
Earthwork	$ 5,465,907
Drainage	$ 3,917,399
MOT	$ 2,422,156
Mobilization	$ 2,131,497
Clear & Grubbing	$ 2,096,256
Signalization	$ 1,333,031
Lighting	$ 1,211,046
Curb & Gutter	$ 1,138,957
Bridges	$ 470,901
Sidewalk	$ 378,920
Miscellaneous	$ 366,812
Estimated Relocation	$ 344,750
Concrete Block	$ 343,108
Signs	$ 236,014
Erosion Control	$ 190,827
Landscaping	$ 189,136
Retaining Walls	$ 63,728
Pavement Markings	$ 56,855

Cost Item	Cost
Fencing	$ 53,720
Barrier Wall	$ 43,440
Maintenance	$ 2,458

3 Project Analysis

VE Focus Points

Prior to the VE study and during the Information Phase, a number of activities were conducted to better understand the baseline concept. The following summarizes key focus points identified during these sessions and during the VE team's initial analysis.

- Identify alternatives to address safety issues along the SR 994 corridor.
- Review opportunities to improve capacity and implement improved traffic operations.
- Consider alternatives for the Black Creek Trail that crosses SR 994 near the Black Creek Canal.
- Evaluate opportunities to reduce ROW impacts.
- Noise walls and associated cost and ROW impacts.
- Evaluate alternative pedestrian/bicyclist accommodations and multimodal mobility opportunities.
- Review and analyze the intersection design around the Talbott Estate and MacDonnell Residence historic properties.

Cost Model

The VE facilitator prepared a cost model from the cost estimate provided by the project team. The model was organized to identify major construction elements or trade categories, the design team's estimated costs, and the percent of total project cost for the significant cost items (Table 4).

The cost model allows the team to focus on project elements with the highest degree of impact and utilize their time most effectively.

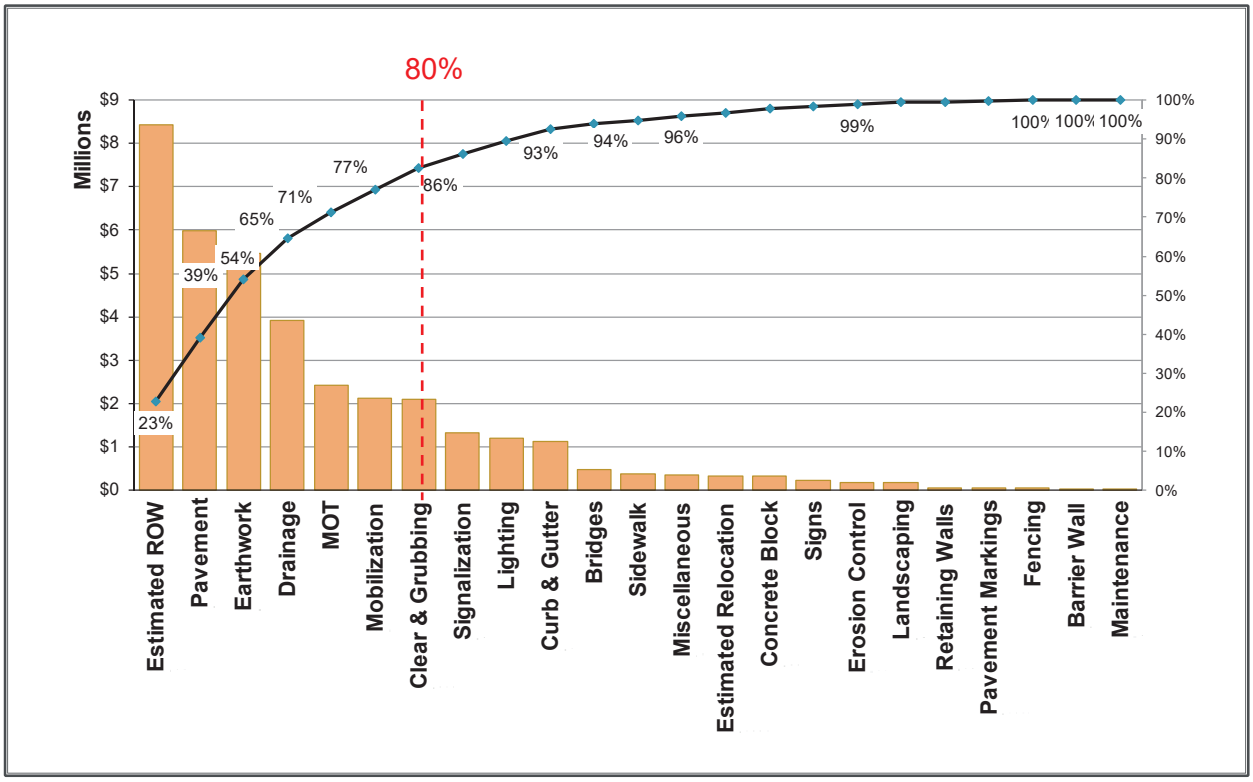
Table 4. Pareto Cost Analysis– Baseline Concept

Cost Item	Cost	Percent of Total	Cumulative Percentage
Estimated ROW	$8,438,713	22.9	23
Pavement	$5,994,644	16.2	39
Earthwork	$5,465,907	14.8	54
Drainage	$3,917,399	10.6	65
MOT	$2,422,156	6.6	71
Mobilization	$2,131,497	5.8	77
Clear & Grubbing	$2,096,256	5.7	83
Signalization	$1,333,031	3.6	86

Table 4. Pareto Cost Analysis– Baseline Concept

Cost Item	Cost	Percent of Total	Cumulative Percentage
Lighting	$1,211,046	3.3	89
Curb & Gutter	$1,138,957	3.1	93
Bridges	$470,901	1.3	94
Sidewalk	$378,920	1.0	95
Miscellaneous	$366,812	1.0	96
Estimated Relocation	$344,750	0.9	97
Concrete Block	$343,108	0.9	98
Signs	$236,014	0.6	98
Erosion Control	$190,827	0.5	99
Landscaping	$189,136	0.5	99
Retaining Walls	$63,728	0.2	100
Pavement Markings	$56,855	0.2	100
Fencing	$53,720	0.1	100
Barrier Wall	$43,440	0.1	100
Maintenance	$2,458	0.0	100
Total	**$36,888,277**		

Figure 2. Cost Model



Value Metrics

The value metrics process was used as an analysis tool to evaluate the baseline project and the VE recommendations. Value metrics is a system of techniques predicated on the theory that value is an expression of the relationship between the performance of a function and the cost of acquiring it. It provides a standardized means of identifying, defining, evaluating, and measuring performance. Performance is quantified in terms of how well a set of attributes contribute to the overall functional purpose of a given project.

The basic equation used for calculating value is:

$$Value = \frac{Performance}{Cost + Time}$$

In other words, value is equivalent to the relationship of the resources needed to provide a certain level of performance for a given function. Performance is defined as a set of requirements and attributes of a project's scope that are pertinent to the project's purpose and need. Participant responses are elicited for a series of paired comparisons in which the performance of alternatives are compared, with consideration of the project purpose and need, while taking into account the relative intensity of preference of one criterion over another. The following pages describe the steps in the value metrics process.

Performance Attributes

Performance attributes are an integral part of the value analysis process. The performance of each project must be properly defined and agreed on by the project team, VE team, and representatives at the beginning of the study. These attributes represent those aspects of a project's scope and schedule that possess a range of potential values.

Performance attributes can generally be divided between project scope components (highway operations, environmental impacts, maintainability, and system preservation) and project delivery components. It is important to make a distinction between performance *attributes* and performance *requirements*. Performance requirements are mandatory and binary in nature. All performance requirements must be met by any VE alternative concept being considered. Performance attributes possess a range of acceptable levels of performance. For example, if the project was the design and construction of a new bridge, a performance requirement might be that the bridge must meet all current seismic design criteria. In contrast, a performance attribute might be project schedule, which means that a wide range of alternatives could be acceptable that had different durations.

The VE team, along with the project team, identified and defined the performance attributes for this project and then defined the baseline concept as it pertains to these attributes. The performance attributes shown in Table 5 were used throughout the study to identify, evaluate, and document ideas and recommendations. The performance measures for each recommendation can be found in Section 7, Individual Recommendations.

Table 5. Performance Attributes and Description

Performance Attribute	Description of Attribute	Baseline Concept
Main Line Operations	An assessment of traffic operations and safety on the main line within the project limits. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.	• Four 11-ft lanes • A 16.5-ft raised median with exclusive left turn lanes • Urban typical section • Landscaping area within the raised islands. • A 10-ft SUP along both sides • A 4.5-ft buffer from the back of curb • A 2-ft buffer behind the SUPs • Design speed: 45 MPH

Table 5. Performance Attributes and Description

Performance Attribute	Description of Attribute	Baseline Concept
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Local Operations include frontage roads as well as crossroads. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations and access.	• Traffic signal at SR 994 and SW 134th, SW137th Ave and 127th Ave • New sidewalk on missing segments • 5-ft outside paved shoulder along the study limits • Black Creek trail underpass to accommodate pedestrians and bicyclists across SR 994
Maintainability	An assessment of the long-term maintainability of the facilities and equipment. Maintenance considerations include the overall durability, longevity, and maintainability of structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.	• 10-ft SUP underpass • 8-ft clearance under structure • Concrete Flat slab bridge superstructure • Asphalt SUPs • 4-way access to SFWMD maintenance crews
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to existing utilities; impacts to businesses and residents relative to access, visual effects, noise, vibration, dust, and construction traffic; environmental impacts.	• Bridge phased approach • No closures, maintains traffic throughout • Pavement nighttime pavement operations, others not likely

Table 5. Performance Attributes and Description

Performance Attribute	Description of Attribute	Baseline Concept
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts; impacts to shore edge; impacts to cultural, recreational, and historic resources.	• No wildlife impacts • No wetland impacts • 4f Impacts to 14-ft linear park • Historic property impacts (walls)
Project Schedule	An assessment of the total project delivery from the time as measured from the time of the VE Study to completion of construction.	• LDCA 4/5/2024 • ROW Clear 7/27/2027 • Utilities cleared 11/13/2025 • Production 11/13/2025 • Let 04/27/28

Performance Attribute Matrix

The performance attribute matrix was used to determine the relative importance of the performance attributes for the project. The project and VE team evaluated the relative importance of the performance attributes that would be used to evaluate the creative ideas.

These attributes were compared in pairs Figure 3, asking the question: “Which one is more important to the purpose and need of the project?” (e.g., A or B, A or C, A or D, etc.) The letter code (e.g., “A”) was entered into the matrix for each pair. After all pairs were discussed, they were tallied (after normalizing the scores by adding a point to each attribute) and the percentages calculated. These scores were then used to calculate the value of each recommendation during the VE team’s performance evaluation scoring (Section 6).

Figure 3. Performance Attribute Matrix

Performance Attributes Criteria Matrix									
Paired Comparison								Total points	% of Total
Main Line Operations	A	A	A	A	A	A/F		5.5	26%
Local Operations		B	B	B	B	B/F		4.5	21%
Maintainability			C	C	E	C/F		2.5	12%
Construction Impacts				D	E	D/F		1.5	7%
Environmental Impacts					E	E		4.0	19%
Project Schedule						F		3.0	14%
							Total	21.0	100%

4 Function Analysis Phase

Overview

Function analysis results in a unique view of the project. It transforms project elements into functions, which help guide the VE team in considering the functional concepts of the project–independent of the current design. Functions are defined in verb-noun statements to reduce the needs of the project to their most elemental level (Table 6). Identifying the functions of the major design elements of the project allows a broader consideration of alternative ways to accomplish the functions.

Table 6. Random Function Identification

Project Element	Functions
Project Objective	Accommodate Future Traffic Improve Operations Add Capacity Reduce Conflicts Accommodate Pedestrians/Bicyclists Add Lanes Manage Access Minimize ROW Meet Standards Accommodate (2045) Traffic Introduce Traffic Improve Connectivity Reduce (Response) Times
One-Time Functions	Phase Construction Mobilize Resources Sequence Work Secure Resources
All The Time Functions	Reduce Risk Reduce Uncertainty Remove Utility Conflicts Protect Workers Protec Drivers Create (Work) Zone Direct Traffic
ROW	Create Space Create (Emergency) Space
Pavement	Support Loads Remove Runoff
Bridges	Span Distance Support Loads
Pedestrian	Separate Modes Inform Users Remove Water Introduce Traffic Improve Connectivity

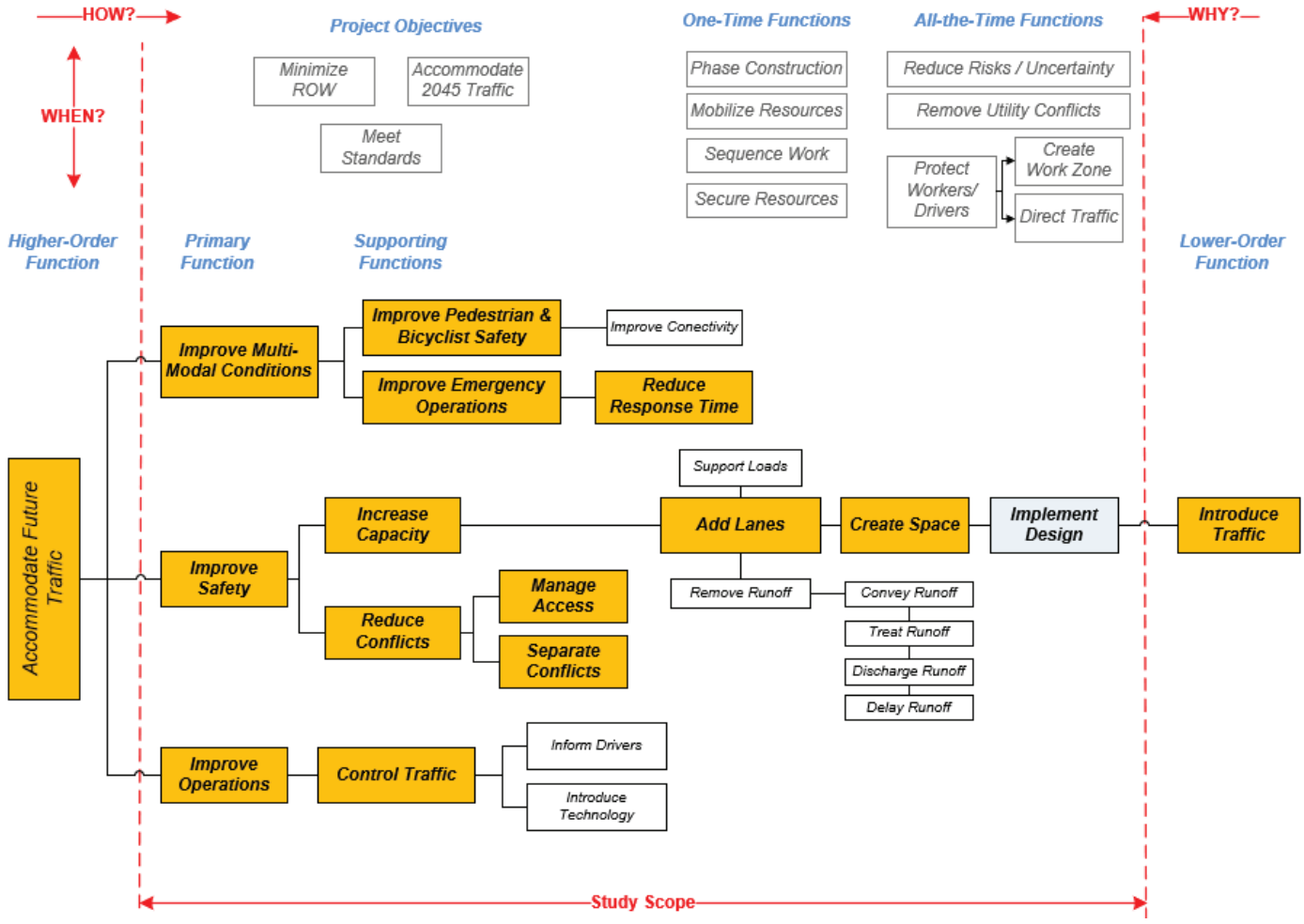
Table 6. Random Function Identification

Project Element	Functions
Traffic Control	Separate Traffic Separate Modes Maintain Traffic Monitor Traffic Direct Traffic Inform Drives

Function Analysis System Technique Diagram

The Function Analysis System Technique or "FAST" diagram arranges the functions in logical order so that when read from left to right, the functions answer the question "How?" If the diagram is read from right to left, the functions answer the question "Why?" Functions connected with a vertical line are those that happen at the same time as, or are caused by, the function at the top of the column. The FAST diagram (Figure 4) provided the VE team with an understanding of which functions offer the best opportunity for cost or performance improvement.

Figure 4. FAST Diagram



5 Creativity Phase

During the Creativity Phase, the VE team generated ideas on how to perform the various functions. The idea list was grouped by function or major project element. All the ideas generated are recorded in Table 7. The final disposition of each idea is included at the end of Section 6.

Table 7. Creative Idea List

Idea No.	Description
Function: Accommodate (Future) Traffic	
29	Reduce the limits of the project along crossing roads, transfer the scope to county project
Function: Accommodate Pedestrians/Bicyclists	
2	Eliminate trail under the bridge and use a signal
3	Use a HAWK (High-Intensity Activated crossWalK)
21	Use pedestrian crossing over structure
37	Use bike buffer lane, sharrows
Function: Add Capacity	
18	Extend the limits of the project to Chrome Ave.
50	No build -196th Street extension
Function: Attenuate Noise	
45	Re-run the noise wall benefit cost analysis to include updated prices
46	Build noise walls first to accommodate longer daily work durations
47	Landscape to abate noise
Function: Create Space	
10	Remove left turn lane from structure
12	Increase one SUP to 12-ft and convert other SUP to sidewalk (eliminate 4-ft buffer for sidewalk/ move sidewalk adjacent to roadway)
16	Revisit the number of lanes at SW127th Ave
20	Identify County and DOT property that could be used for drainage and staging areas
30	Reduce lane width to 10'
31	Reduce median width
32	Use sidewalks on each side of the road and incorporate a bike lane
33	Eliminate landscaping
34	Reduce bridge width and use median barriers in lieu of 16-ft median and buffers
35	Reduce SUP width on bridge to 8-ft each

Table 7. Creative Idea List

Idea No.	Description
36	Use traffic separators throughout the project
48	Align ROW to avoid critical ROW (Snake alignment)
51	Seek reimbursement from County to cover for County Road encroachment along 134th Ct. east side, south of Quail Roost
Function: Implement Design	
38	SPEC - Recycle bridge materials for riprap
39	Reuse asphalt for shoulder areas and other projects
Function: Improve (Emergency) Operations	
4	Use preemption technology for emergency operation vehicles
5	Install backup generators / UPS for emergency operations (signal operations)
Function: Improve (Traffic) Operations	
27	Implement ITS/ TSMO technology strategies
Function: Improve Safety	
6	Install solar apparatus on signals - (beacons, pedestrian signals, signal heads)
8	Right out only at SW 132nd Ave
17	Implement a series of safety improvements at critical locations aligning with future improvements to minimizes throwaway
22	Implement median control access strategies (reduce left outs from side streets)
49	Add continuous lighting through the corridor ((LED) cobra-head luminaires mounted on conventional aluminum light poles)
Function: Minimize ROW	
1	Realign the road to impact one side or the other, not both
9	Remove 5'2" buffer from each side of structure
Function: Mitigate Risk	
43	Advance utility relocation activities
Function: Protect Workers/Users	
44	Install ITS infrastructure prior to construction
Function: Reduce Conflicts	
7	Eliminate the left turn on structure for maintenance access (SFWMD)
28	Use a 1x1 roundabout at SW 134th Ave (interim design)
Function: Reduce Schedule	
40	Use ABC method (slide in bridge)
41	Use incentives / disincentives for early construction

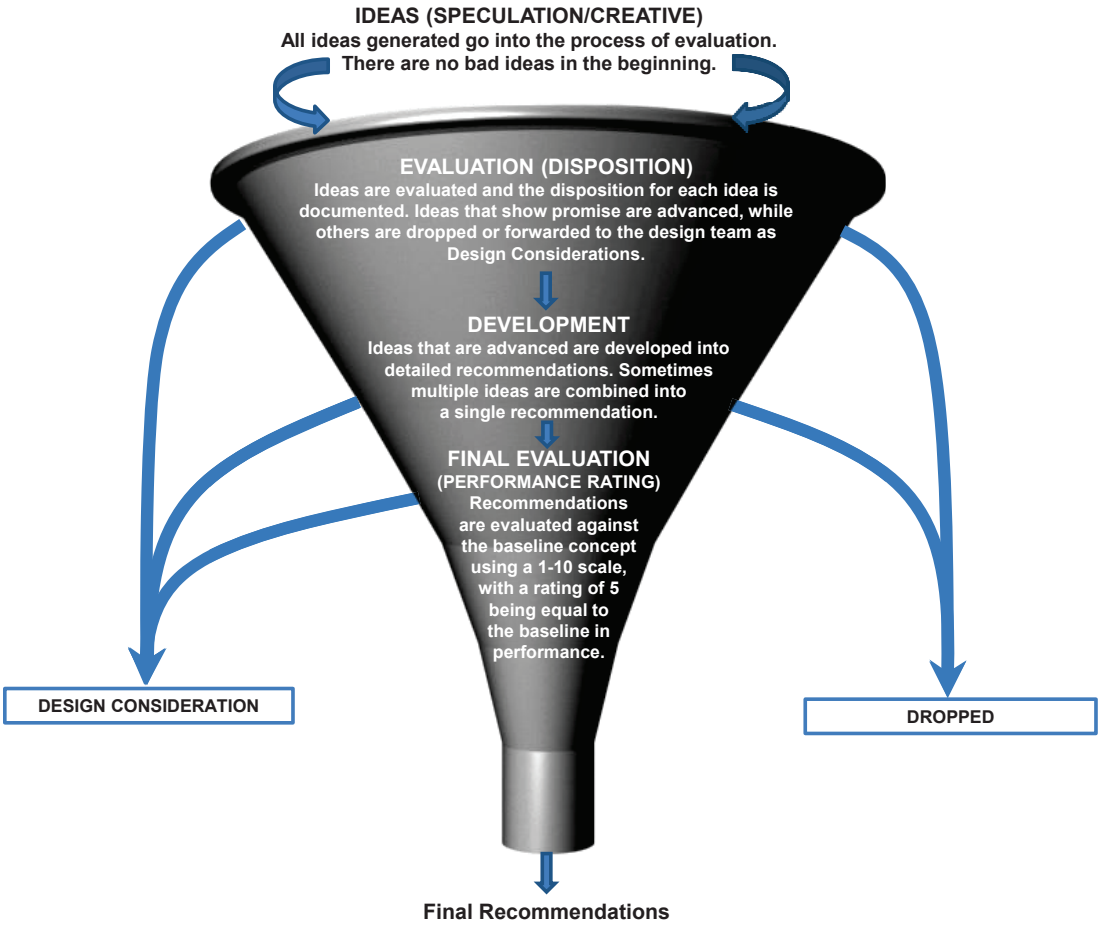
Table 7. Creative Idea List

Idea No.	Description
42	Adjust design schedule to accelerate allowable ROW activities before 60% design milestone and reduce duration from 36 months to 24 months
Function: Remove Water	
15	Convert striped median areas to grassy medians
Function: Span Distance	
11	Widen structure in lieu of replacement
26	Modify the bridge pier configuration to one/ two span(s)
Function: Support Loads	
23	Use concrete pavement
24	Evaluate alternative pavement design
25	Reuse existing pavement in final configuration in lieu of full reconstruction
Function: Treat Water	
13	Use swales instead of French drain where possible
14	Use grassy median areas for water treatment
19	Identify ponds for shared use runoff treatment

6 Evaluation Phase

Although each project is different, the evaluation process for each VE effort can be thought of in its simplest form as a way of combining, evaluating, and narrowing ideas until the VE team agrees on the recommendations to be forwarded. Figure 5 depicts the typical information flow for this part of the Value Methodology Job Plan.

Figure 5. VE Process Information Flow



Evaluation Process

The evaluation process begins by going through the ideas brainstormed during the Creativity Phase. Considering the information provided to the VE team at the time of the study and the constraints and controlling decisions that were also given to them, the team discussed the ideas and documented their advantages and disadvantages based on their relationship to the baseline concept.

The VE team also compared each idea with its baseline concept to determine whether the performance of the attribute (as introduced in Section Performance Attributes) was better than, equal to, or worse than the baseline concept.

Each idea was then carefully evaluated, with the VE team reaching consensus on the overall ranking of the idea (ranking values 0 through 3, as defined below).

3 = Advance for further development

2 = Design consideration; include as a comment or consideration for design team

1 = Poor Opportunity/dropped from further development

0 = Unacceptable impact/fatal flaw

This ranking resulted in the initial disposition of the idea. Those ideas ranked as a 3 were developed further; low-ranking ideas (those ranked 0 or 1) were dropped from further consideration; and those that were ranked 2 were brought forward as ideas the design team should pursue.

Evaluation Summary

All of the ideas that were generated during the Creativity Phase using brainstorming techniques are detailed in Table 8.

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
Function: Accommodate (Future) Traffic					
29	Reduce the limits of the project along crossing roads, transfer the scope to county project	• Reduce costs • Reduce construction duration • Transfers some ROW to county for acquisition	• May not operate as desired	*3*	*Move forward to Development*
Function: Accommodate Pedestrians/Bicyclist					
2	Eliminate trail under the bridge and use a signal	• Reduces structure footprint • Keep structure elevation lower • Decreases construction duration • Simplifies structures design • Reduces costs • Reduce schedule duration	• Creates potential conflict	*3*	*Combine 2,3* *Move forward to Development*
3	Use a HAWK (High-Intensity Activated crossWalK)	• Stops traffic for pedestrians	• Increase scope • Increase maintenance costs	*3*	*Combine 2,3* *Move forward to Development*
21	Use pedestrian crossing over structure	• Reduce costs • Reduces construction duration	• Increased costs • Privacy issues • Increased ROW • Traffic count doesn't justify cost	*1*	
37	Use bike buffer lane, sharrows	• Not feasible	• Not feasible	*1*	
Function: Add Capacity					
18	Extend the limits of the project to Chrome Ave.	• Outside of the scope	• Outside of the scope	*1*	

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
50	No build -196th Street extension	• Reduce cost • Reduce construction duration	• Non discussed	*0*	
Function: Attenuate noise					
45	Re-run the noise wall benefit cost analysis to include updated prices	• Accurate benefit cost ratio • May eliminate need of noise walls	• May have public outcry	*2*	
46	Build noise walls first to accommodate longer daily work durations	• Shelters construction noise from adjacent properties • Extend work hours	• Reduces work space • May conflict with utility locations	*1*	
47	Landscape to abate noise	• Landscape does not abate noise	• Landscape does not abate noise	*1*	
Function: Create Space					
10	Remove left turn lane from structure	• Reduces width of bridge • May reduce costs • May reduce ROW needs	• Does not align with safety study results • Reduce bay length capacity	*2*	
12	Increase one SUP to 12-ft and convert other SUP to sidewalk (eliminate 4-ft buffer for sidewalk/ move sidewalk adjacent to roadway)	• May reduces ROW footprint • Increased width of SUP • Reduce 6-ft from typical section • May reduce construction costs	• Not accommodating bicyclist on one side of the roadway • Increase conflict	*3*	*Combine 12, 32 Move forward to Development*
16	Revisit the number of lanes at SW127th Ave	• May reduce conflict at SB SW127th lane (Merge)	• Reducing amount of cars during phase • May affect through traffic due to lack of storage	*3*	*Move forward to Development*

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
20	Identify County and DOT property that could be used for drainage and staging areas	• Able to stage closer to site • May reduce ROW • Enhanced project coordination • Natural stormwater management	• None discussed	*3*	*Combine 19,20 Move forward to Development*
30	Reduce lane width to 10'	• Not feasible	• Requires design variations	*1*	
31	Reduce median width	• Reduces typical section size • Reduce ROW footprint	• Reduce treatment area • Reduce landscaping	*3*	*Combine 31,36 Move forward to Development*
32	Use sidewalks on each side of the road and incorporate a bike lane	• Reduce typical section • May reduce ROW • May reduce asphalt costs	• Reduce separation between traffic • May impact drainage design • May increase concrete costs	*3*	*Combine 12, 32 Move forward to Development*
33	Eliminate landscaping	• Reduce costs • Reduce ROW	• Reduce aesthetics • Public push back	*1*	
34	Reduce bridge width and use median barriers in lieu of 16-ft median and buffers	• Reduce ROW • Reduce bridge costs • Reduce impervious	• Introduce horizontal curve • Reduce construction options	*3*	
35	Reduce SUP width on bridge to 8-ft each	• Reduce ROW • Reduce bridge costs • Reduce impervious	• Introduce horizontal curve • Reduce construction options • Inconsistent typical section	*1*	

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
36	Use traffic separators throughout the project	• Reduces typical section size • Reduce ROW footprint	• Reduce treatment area • Reduce landscaping	*3*	*Combine 31,36* *Move forward to Development*
48	Align ROW to avoid critical ROW (Snake alignment)	• May reduce ROW costs • May calm traffic	• Introduce horizontal curves • Reduces the opportunity to use existing pavement	*3*	*Combine 1,48* *Move forward to Development*
51	Seek reimbursement from County to cover for County Road encroachment along 134th Ct. east side, south of Quail Roost	• Reduces cost of ROW • Normalizes Property encroachment • Allocates cost to County	• Requires funds transfer • Requires LFA	*0*	
Function: Implement Design					
38	SPEC - Recycle bridge materials for riprap	• May reduce costs of rip rap	• Contractor choice • Current practice on most projects	*2*	
39	Reuse asphalt for shoulder areas and other projects	• May reduce costs of rip rap	• Contractor choice • Current practice on most projects	*2*	
Function: Improve (Emergency) oOperations					
4	Use preemption technology for emergency operation vehicles	• Improves emergency response times • Improves evacuation times • Improves agency coordination	• Increased coordination • Increase costs	*3*	*Combine 4,5* *Move forward to Development*
5	Install backup generators / UPS for emergency operations (signal operations)	• Continuous operations • Potentially reduces conflicts • Reduces to dependency on emergency personnel	• Increased construction cost • Increase noise	*3*	*Combine 4,5* *Move forward to Development*

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
Function: Improve (Traffic) Operations					
27	Implement ITS/ TSMO technology strategies	• Improves operations • Improves emergency response • More efficient signal timing • Able to monitor and control traffic •	• Cost increase • Maintenance cost	*3*	*Move forward to Development*
Function: Improve Safety					
6	Install solar apparatus on signals - (beacons, pedestrian signals, signal heads)	• Doesn't rely on secondary energy source	• Limitations on materials by county • Requires ample supply if sunlight	*2*	
8	Right out only at SW 132nd Ave	• Reduce conflicts	• Increase travel times • Reduces access • Decrease storage	*3*	*Combine 8,22* *Move forward to Development*
17	Implement a series of safety improvements at critical locations aligning with future improvements to minimizes throwaway	• Reduces conflicts • Address safety concerns earlier in project delivery	• Increase rework	*3*	*Move forward to Development*
22	Implement median control access strategies (reduce left outs from side streets)	• Reduce conflicts	• Increase travel times • Reduces access • Decrease storage	*3*	*Combine 8,22* *Move forward to Development*
49	Add continuous lighting through the corridor ((LED) cobra-head luminaires mounted on conventional aluminum light poles)	• Increase visibility • May reduce nighttime conflicts	• Baseline	*2*	*Design team to include lighting design plans (not currently in drawings but included in cost estimate)*

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
Function: Minimize ROW					
1	Realign the road to impact one side or the other, not both	• Reduce number of parcels • Reduce cost • Reduce schedule duration • Reduces utility impact • Improves MOT	• Increase the impact to ROW parcels acquired •	*3*	*Combine 1,48* *Move forward to Development*
9	Remove 5'2" buffer from each side of structure	• Reduce width of bridge • May reduce costs • May reduce ROW need	• Requires design variation • Typical section continuity • Reduces distance between pedestrian and vehicles	*3*	*Move forward to Development*
Function: Mitigate Risk					
43	Advance utility relocation activities	• Identifies risks earlier in the project	• Common practice	*1*	
Function: Protect Workers/Users					
44	Install ITS infrastructure prior to construction	• Improves MOT during construction • Improves emergency response during construction	• Some rework may be necessary	*3*	*Move forward to Development*
Function: Reduce Conflicts					
7	Eliminate the left turn on structure for maintenance access (SFWMD)	• Reduces conflict • Reduces driver confusion • Reduce structure width • Reduce costs • Prevents illegal U-turn	• Reduce access	*3*	*Move forward to Development*

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
28	Use a 1x1 roundabout at SW 134th Ave (interim design)	• Reduce conflict points • Calms traffic • May reduce costs • Allows for landscaping	• Addition ROW required • Rework costs	*1*	
Function: Reduce Schedule					
40	Use ABC method (slide in bridge)	• Reduce construction duration • Improves MOT	• May increase cost • Requires specialized equipment • Requires specialized contractor	*3*	*Move forward to Development*
41	Use incentives / disincentives for early construction	• Reduces construction duration	• May increase costs • May not align with project goals	*2*	
42	Adjust design schedule to accelerate allowable ROW activities before 60% design milestone and reduce duration from 36 months to 24 months	• Reduce overall schedule duration	• May require additional ROW resources • Construction funding may not be available • Introduces risk for changes to ROW	*2*	*Due to known limitations on resources and construction funding availability, the VE team asks the design team to further investigate and develop a compressed project schedule*
Function: Remove Water					
15	Convert striped median areas to grassy medians	• May reduce costs	• None discussed	*3*	*Combine 13,14,15 Move forward to Development*
Function: Span Distance					
11	Widen structure in lieu of replacement	• Reduce costs • Reduces construction duration	• Does not meet minimum clearance • Reduce life of the bridge	*1*	

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

Table 8. Idea Evaluation Summary Table

Idea #	Description	Advantages	Disadvantages	Rating	Comments
26	Modify the bridge pier configuration to one/ two span(s)	• Reduce construction duration • Simplifies construction • Less evasive to canal	• Visual obstruction (I-Beam) • Tie in may increase in length • Complex design	*3*	*Move forward to Development*
Function: Support Loads					
23	Use concrete pavement	• Less maintenance • Improve service life • May help district meet concrete commitments	• Increase capital costs	*1*	
24	Evaluate alternative pavement design	• May reduce costs • May improve friction • May improve durability • May reduce maintenance costs	• None discussed	*3*	*Combine 24,25* *Move forward to Development*
25	Reuse existing pavement in final configuration in lieu of full reconstruction	• May reduce costs	• None discussed	*3*	*Combine 24,25* *Move forward to Development*
Function: Treat Water					
13	Use swales instead of French drain where possible	• May reduce costs • Improves maintenance • Easier to construct • Improves resiliency	• May require additional space	*3*	*Combine 13,14,15* *Move forward to Development*
14	Use grassy median areas for water treatment	• May reduce costs	• None discussed	*3*	*Combine 13,14,15* *Move forward to Development*
19	Identify ponds for shared use runoff treatment	• Reduce need for French drain • May reduce costs	• None discussed	*3*	*Combine 19,20* *Move forward to Development*

Ranking Scale: 3 = Advance for further development
2 = Design consideration; include as a comment or consideration for design team
1 = Dropped from further development

= Advanced as recommendation
= Forwarded as design consideration
= Dropped from further development

7 Development Phase

This phase of the Value Methodology Job Plan takes the ideas that ranked the highest in the Evaluation Phase and further develops them into full VE recommendations. In many cases, it is possible that one or more ideas were combined to form an overall recommendation, which was then evaluated further by the VE team.

In the case of this project, of the 51 ideas that were generated during the Creativity Phase, 31 of those ideas were evaluated high enough to be taken forward, combined, and developed further. Some of the ideas were deemed more appropriate as a design consideration for the project team, rather than developed into a VE recommendation (Section 7). For the Development Phase, narratives, drawings, calculations, and cost estimates were prepared for each recommendation.

The VE recommendation documents in this section are presented as written by the team during the VE study. While they have been edited from the draft VE report to correct errors or better clarify the recommendation, they represent the VE team's findings during the VE study.

Each recommendation consists of a summary of the baseline concept, a description of the suggested change, a listing of its advantages and disadvantages, discussion of schedule and risk impacts (if applicable), a cost comparison, change in performance, and a brief narrative comparing the baseline design with the recommendation. Sketches, calculations, and performance measure ratings are also presented. The cost comparisons reflect a comparable level of detail as in the baseline estimate.

Summary of Recommendations

The recommendations developed by the VE team are shown in Table 9. The table summarizes each recommendation's cost impact and performance improvement.

Table 9. Summary of Recommendations

#	Recommendation Title	Cost Savings/ (Cost Added) ($M)	Performance Improvement (%)
1	Develop Alternative Drainage Solution	$1.00	+6.2
2	Identify County & FDOT Property for Staging and Drainage Purposes	$0.00	0.0
3	Modify Median Design	$0.44	+4.8
4	Use Preemption Technology	($0.22)	+10.5
5	Modify Median Access	($0.04)	+10.5
6	Modify SFWMD Canal Access	($0.01)	+15.7
7	Remove Buffer along Bridge	$0.33	+1.2
8	Modify Pedestrian & Bicyclist Accommodations	$0.88	+1.9

Table 9. Summary of Recommendations

#	Recommendation Title	Cost Savings/ (Cost Added) ($M)	Performance Improvement (%)
9	Advance Safety Improvements at Critical Locations	($4.45)	+23.6
10	Eliminate Trail Underpass	$3.39	+21.6
11	Implement TSMO Strategies	($0.77)	+16.7
12	Reduce Limits of Projects along SW 127th, SW 134th & SW 137th	$0.52	0.0
13	Reduce Bridge Width	$0.71	+3.8
14	Install ITS Infrastructure Prior to Construction	($0.28)	+2.8
15	Remove 196th St Connector Improvements	$0.18	+8.3
16	Seek ROW Cost Reimbursement of County Encroachments to Private Owners	$0.33	0.0

FHWA Functional Benefit Criteria

Each year, state departments of transportation are required to report on VE recommendations to the Federal Highway Administration (FHWA). In addition to cost implications, FHWA requires state departments of transportation to evaluate each approved recommendation in terms of the project features that recommendation benefits. If a specific recommendation can be shown to provide benefit to more than one feature described below, count the recommendation in each category that is applicable. These same criteria can be found on each of the individual recommendations that follow.

- **Safety:** Recommendations that mitigate or reduce hazards on the facility.
- **Operations:** Recommendations that improve real-time service and/or local, corridor, or regional levels of service of the facility.
- **Environment:** Recommendations that successfully avoid or mitigate impacts to natural and or cultural resources.
- **Construction:** Recommendations that improve work zone conditions or expedite the project delivery.
- **Right-of-way:** Recommendations that lower the impacts or costs of right-of-way.

Value Engineering Recommendation Approval

The resolution or disposition of recommendations is based on the information in this report and is independent of the proceeding of the VE study. HDR has no participation, direct or indirect, in such decisions. The VE Recommendation Approval Form shown in Appendix B is intended to aid the project manager in tracking and informing the state Value Engineer in

annual reporting of VE activities to FHWA. Resolution and disposition of recommendations contained in Appendix B are pending.

Individual Recommendations

Based on the evaluation process, individual recommendations were developed. Each recommendation consists of a summary of the baseline concept, a description of the recommendation, a listing of its advantages and disadvantages, and a brief narrative that includes justification, sketches, photos, assumptions, and calculations as developed by the VE team. Final recommendations can be found beginning on page 7-5. The markup used during this VE study of 31% includes 10% MOT, 8.8% Mobilization and 11.9% for Project Unknows.

VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15

Baseline Concept

The baseline concept consists of widening SR 994/ Quail Roost Drive from 2 lanes to 4 lanes and proposes to use French drain for water quality and attenuation.

Recommendation Concept

Convert paved medians to grassy medians and maximize use of grassy areas for water treatment.

Advantages	Disadvantages
• Provides efficient treatment • May provide effective infiltration process • Cost efficiency • Better erosion control • Enhance landscape • Reduces impervious area • Natural drainage solution	• Increases maintenance • Seasonal drainage limitation due heavy rain (potential high-water table)

Cost Summary	Construction	Right-of-Way	Total
Baseline Concept	$2,534,194	$192,425	$2,726,619
Recommendation Concept	$1,725,516	$-	$1,725,516
Cost Avoidance/ (Added Value)	$808,677	$192,425	$1,001,102

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
		✓	✓	

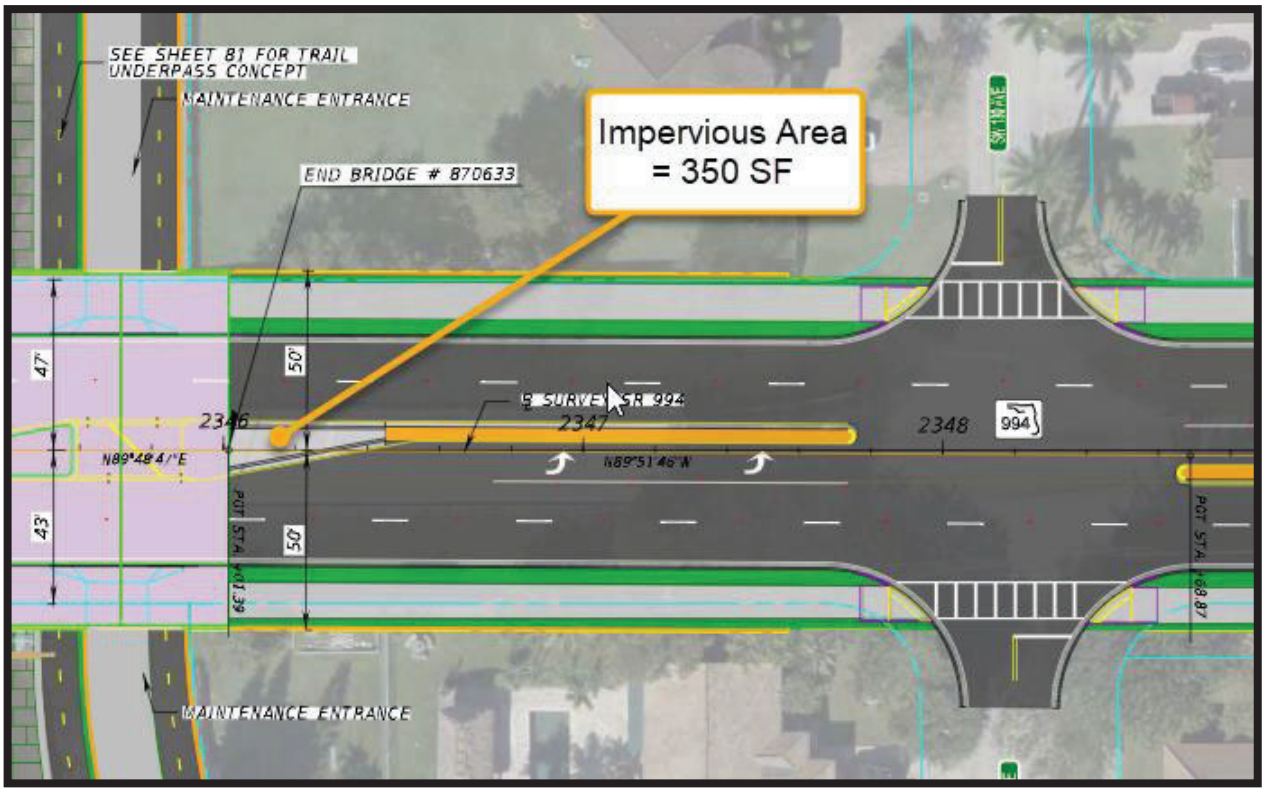
VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15

Discussion/Sketches/Photos/Calculations

The VE team's recommendation is to explore the usage of swale areas as much as possible to reduce the French drain trunk line system. Additionally, the idea is to remove impervious medians throughout the corridor and replace them with grassy pervious medians. The intent is to stay within the baseline footprint while reducing impervious drainage area.

For example, on the baseline survey of SR 994/Quail Roost at Sta. 2346+00, the baseline concept proposes concrete separator. The VE team calculated the area of the concrete separator at the end of the bridge to be approximately 350 SF. If a grassy median at this area is utilized, the amount of impervious surface will be minimized. See Baseline Figure 1.

Baseline Figure 1

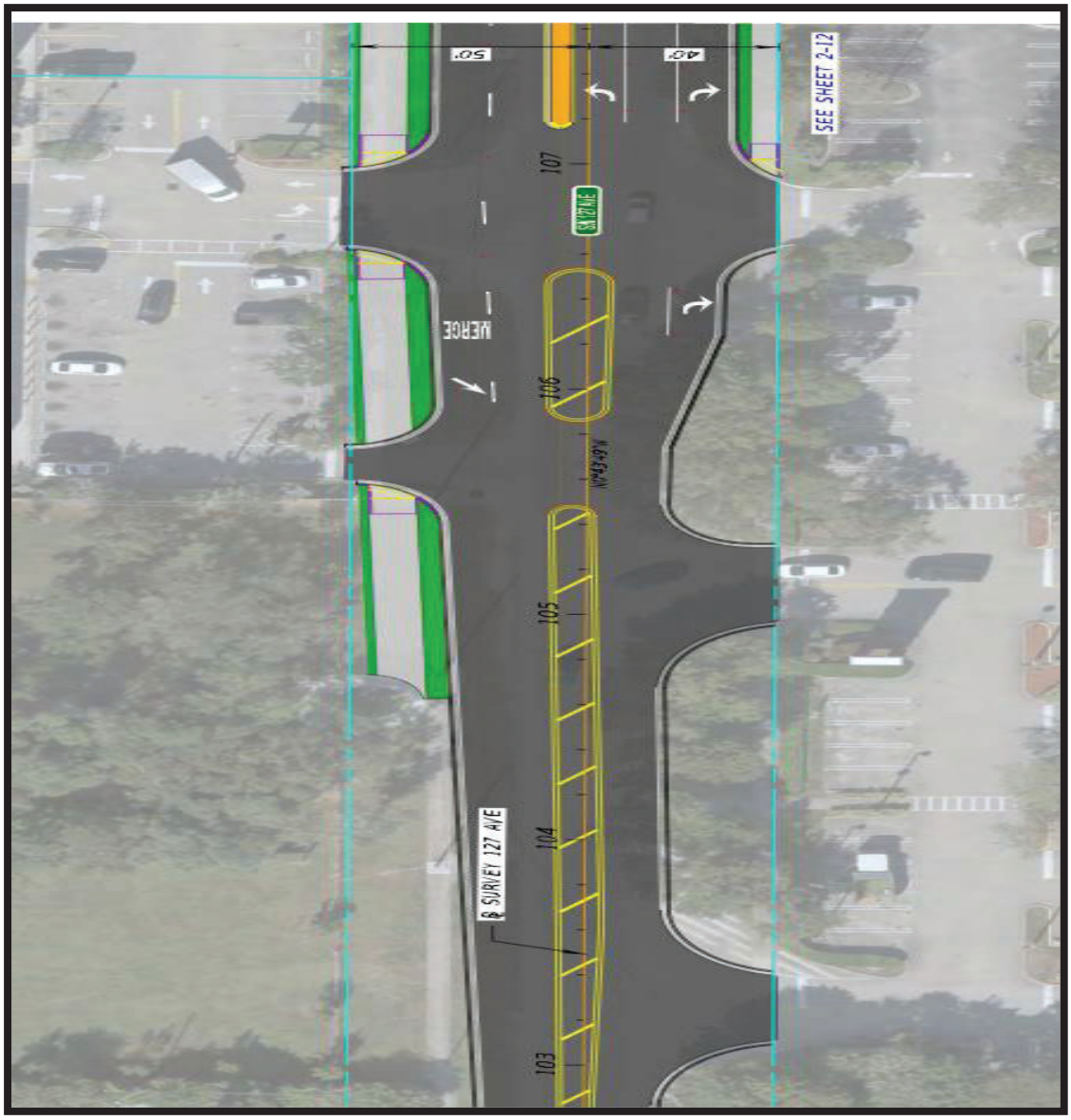


Reduction in impervious area: 350 SF approximately

Volume of treatment reduced: 2.5-inch x 350 SF/ 12 = 72.92 cubic feet.

At SW127 Ave from STA. 102+00 to STA. 106+00, the baseline concept proposes the construction of a concrete separator (average width of 10-ft and approximate length of 300'). See Baseline Figure 2.

VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15



Baseline Figure 2

By utilizing a gassy median separator at this area the total impervious area will be reduced. Therefore, the treatment volume will be reduced.

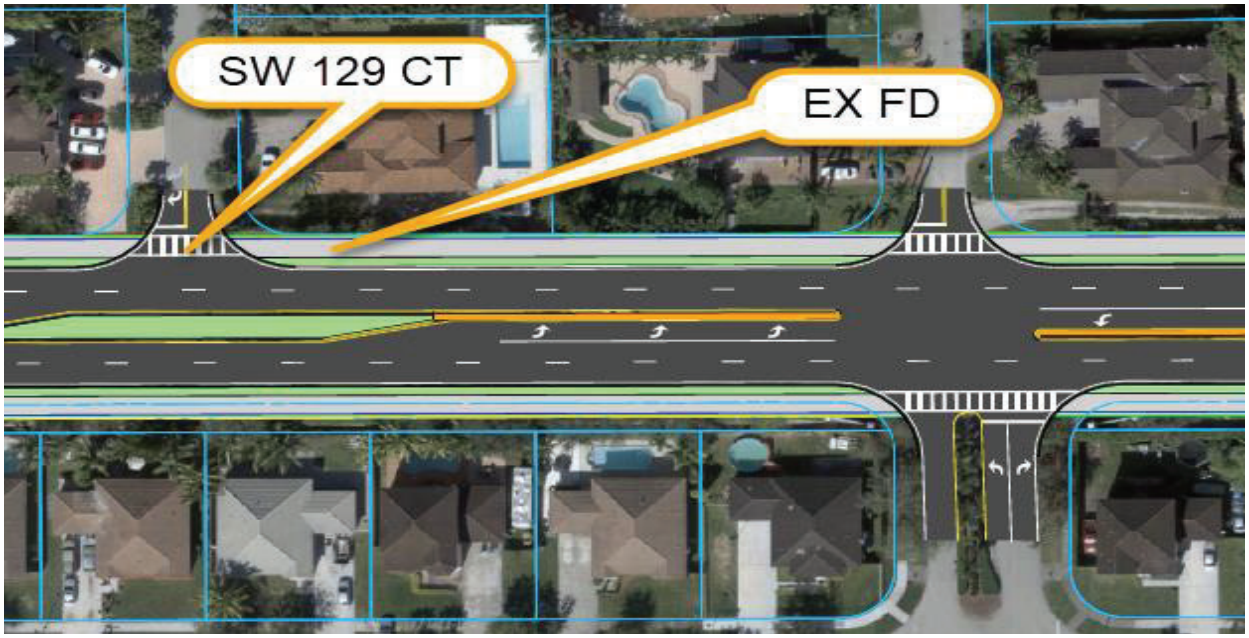
Reduction in impervious area: 10-ft x 300-ft = 3,000 SF approximately

Volume of treatment reduced: 2.5-inch x 3,000 SF/ 12 = 625 cubic feet.

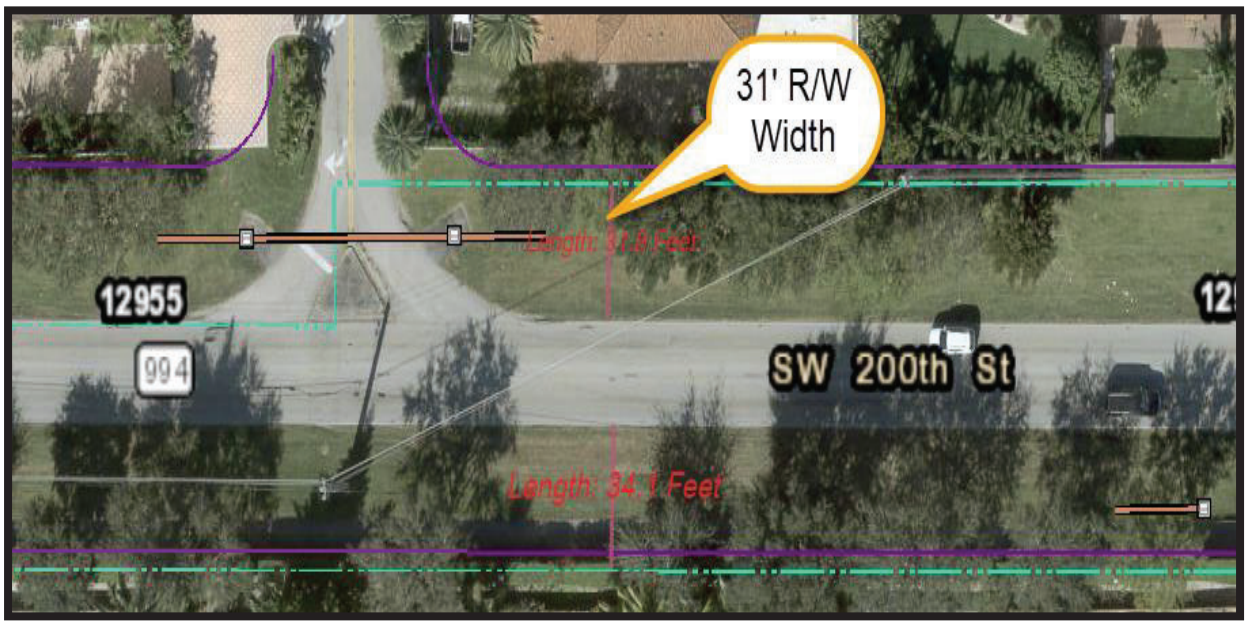
At SW 129th Ct, existing French drains are on the northern side of SR 994/ Quail Roost, see Baseline Figure 3. The available northern right-of-way width from edge of pavement is 31-ft and the other side 34-ft approximately. The proposed baseline concept keeps the existing alignment and widens in both sides, see Baseline Figure 4.

VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15

It would be ideal to shift the alignment to the South to utilize more swale area in the northern side. Ditch bottom inlet would be used at low point within the swale to connect proposed French drains to existing ones for water quality and quantity.



Baseline Figure 3



Baseline Figure 4

Along the project corridor at the intersection of SW 129th Ave, the VE team found that the County owns 2 vacant parcels (see below Recommended Figure 1). The total area of the properties is 17,916 square

VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15

feet. If the project team seeks donation from the County or a combined use of these shoulder parcels as swales for runoff treatment, this will greatly reduce the quantity of design French drains for water quality and attenuation.

This will bring some benefit to the project by reducing the cost of French drains which are more expensive to install compared to swale, as they require specialized materials and often involve excavation work.

French drains have limited natural filtration and groundwater recharge as effectively as swales. As French drains pores get clogged with sediment, they become ineffective and don't dissipate stormwater into the ground.

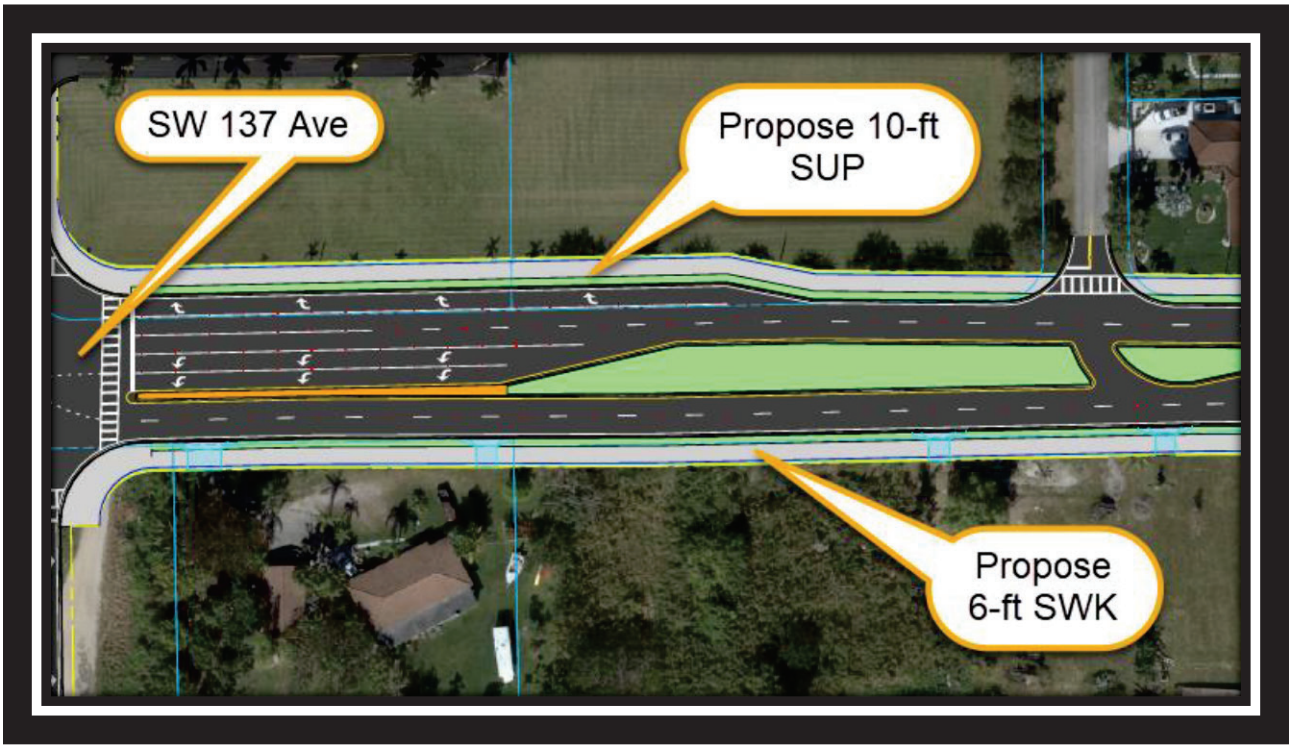
Recommended Figure 1

Another opportunity is with parcels 38 and 39, where the baseline design proposes to purchase from the County, about 50% of their property. The idea in this location is to seek the donation of their ROW in its entirety and use the remainder for drainage purposes. The total Baseline Concept impact: 3,885 + 3,812 = 7,697 SF, while the recommended use is 9,104 + 8,812 = 17,916 SF

Total potential shared use value is: 17,916 – 7,697 = 10,219 SF

The baseline alternative proposes a shared use path of 10-ft on each side of SR 994/ Quail Roost. To reduce impervious area and French drains and the capital cost of the project, the VE study recommends one (1) shared use path of 10-ft and one (1) sidewalk of 6-ft along the other side. This will save the project 4-ft of impervious area throughout the corridor.

VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15



Recommended Figure 2

Cost Estimate:

The volume calculations for French drains were not able to be calculated without additional design work. The calculations below represent the medians, shared use path (SUP), and sidewalk costs.

Estimated impervious area from crossed road: 3,000 SF

Estimated impervious area from median: 72.92 SF

Estimated impervious area along project length for a 10-ft SUP:

10 ft* 1.67 mi *5280 ft/mi = 88, 176.40 SF

Average cost estimate of French drain per area in acre.

VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
Raised median	SY	8.02	$ 51.90	$ 416		$ 51.90	$ -
Striped median seperator	TN	63.5	$ 143.06	$ 9,084		$ 143.06	$ -
Traffic concrete separator	SY	402.92	$ 92.70	$ 37,351		$ 92.70	$ -
2 SUP (Traffic C)	TN	12785.52	$ 148.01	$ 1,892,385	6392.5	$ 148.01	$ 946,154
				$ -		$ -	$ -
Area of proposed 6' concrete sidewalk (6" thick)	SY		$ 64.31	$ -	5819.62	$ 64.31	$ 374,260
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				*$ 1,939,236*			*$ 1,320,413*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ 594,958			$ 405,103
Total Construction				**$ 2,534,194**			**$ 1,725,516**
Utility Costs				$ -		$ -	$ -
Right of Way Costs	SF	7697.00	$ 25.00	$ 192,425.00	0.00	$ 25.00	$ -
TOTAL CAPITAL COST				***$ 2,726,619***			***$ 1,725,516***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ 1,001,102**

VE RECOMMENDATION NO. 1: DEVELOP ALTERNATIVE DRAINAGE SOLUTIONS	Idea No(s). 13, 14, 15

VE RECOMMENDATION NO. 1	IDEA NO.		
Develop Alternative Drainage Solution			
PERFORMANCE MEASURES Attributes and Rating Rationale for Recommendation	Performance	Baseline	Recommendation
Main Line Operations No Change	Rating	5	5
	Weight	26.1	
	Contribution	130.5	130.5
Local Operations No Change	Rating	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability Requires mowing Reduces French drain maintenance	Rating	5	6
	Weight	11.9	
	Contribution	59.5	71.4
Construction Impacts No Change	Rating	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts Adding pervious areas	Rating	5	6
	Weight	19.0	
	Contribution	95	114
Project Schedule	Rating	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	529
	Net Change in Performance		6%

VE RECOMMENDATION NO. 2: IDENTIFY COUNTY & FDOT PROPERTY FOR STAGING AND DRAINAGE PURPOSES	Idea No(s). 19, 20

Baseline Concept

Baseline concept is to use existing or acquired right of way (ROW) for staging areas during construction. Additionally, all alternatives propose new French Drains throughout the project.

Recommendation Concept

Recommended concept would be to identify County and FDOT property in the area for staging and drainage purposes. This would help to identify opportunities throughout the corridor that can be shared for runoff treatment and minimize French drain designs. Additionally, the VE team would propose that the County donate parcels 58 and 59.

Advantages	Disadvantages
• Able to stage closer to site • May reduce ROW • Enhanced project coordination • Natural stormwater management.	• Interagency coordination challenges • Ownership and liability concerns • May require Interagency coordination for maintenance • Political concerns may arise depending on potential impacts to stakeholders

Cost Summary	Construction Cost	Right-of-Way Costs	Total Cost
Baseline Concept			
Recommendation Concept			
Cost Avoidance/ (Added Value)		Not Assessed	

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
				✓

VE RECOMMENDATION NO. 2: IDENTIFY COUNTY & FDOT PROPERTY FOR STAGING AND DRAINAGE PURPOSES	Idea No(s). 19, 20

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

This recommendation is to identify County and FDOT property in the area for staging and drainage purposes. The advantages include cost savings, collaboration and resource sharing, enhanced project coordination, and potential environmental benefits. However, challenges may arise in terms of interagency coordination, ownership and liability concerns, limited control over maintenance, and potential political considerations. It is important to engage in open communication, establish clear agreements, and assess the specific circumstances to determine the feasibility and suitability of these options for this project.

The VE team would propose the County donate parcels 58 and 59. The total requested donation would be 10,219 square feet.

Assumptions/Calculations

The County's total property size (parcels 58 and 59) that would be used for staging, is 17,916 square feet.

Baseline Concept

It would be beneficial to utilize the whole parcel since the VE team is already proposing to acquire half of the parcel with the baseline concepts. And a donation by the county would increase staging areas and improve drainage opportunities for the project. This can be beneficial to the project by saving upfront costs.

VE RECOMMENDATION NO. 2: IDENTIFY COUNTY & FDOT PROPERTY FOR STAGING AND DRAINAGE PURPOSES	Idea No(s). 19, 20

Recommended Concept

The project team is in the process of acquiring several private properties within the corridor. Some of these are open lots that may be used for staging during construction. It may be beneficial to add an additional temporary easement for any extra staging areas. As shown in Figure 1 and Figure 2 below. The VE team did not identify any costs associated with the donation of property.

OFFICE OF THE PROPERTY APPRAISER

Summary Report

Generated On : 6/14/2023

Property Information	
Folio:	30-6911-001-0011
Property Address:	12740 SW 200 ST Miami, FL 33177-4818
Owner	POINTE QUAIL INVESTMENTS LLC
Mailing Address	1132 KANE CONCOURSE 2FL BAY HARBOR ISLAND, FL 33154 USA
PA Primary Zone	6200 COMMERCIAL - ARTERIAL
Primary Land Use	1081 VACANT LAND - COMMERCIAL : VACANT LAND
Beds / Baths / Half	0 / 0 / 0
Floors	0
Living Units	0
Actual Area	0 Sq.Ft
Living Area	0 Sq.Ft
Adjusted Area	0 Sq.Ft
Lot Size	79,714 Sq.Ft
Year Built	0

Assessment Information			
Year	2022	2021	2020
Land Value	$797,140	$797,140	$797,140
Building Value	$0	$0	$0
XF Value	$12,600	$12,768	$12,936
Market Value	$809,740	$809,908	$810,076
Assessed Value	$809,740	$809,908	$810,076

Taxable Value Information			
	2022	2021	2020
County			
Exemption Value	$0	$0	$0
Taxable Value	$809,740	$809,908	$810,076
School Board			
Exemption Value	$0	$0	$0
Taxable Value	$809,740	$809,908	$810,076
City			
Exemption Value	$0	$0	$0
Taxable Value	$0	$0	$0
Regional			
Exemption Value	$0	$0	$0
Taxable Value	$809,740	$809,908	$810,076

Benefits Information				
Benefit	Type	2022	2021	2020

Note: Not all benefits are applicable to all Taxable Values (i.e. County, School Board, City, Regional).

Short Legal Description
11 56 39 1.83 AC
TROPICO PB 2-57
BEG ON N/L & 241.69FT W OF NE COR
LOT 1 S409.3FT W212.84FT
N409.52FT E212.84FT TO POB LESS

Sales Information			
Previous Sale	Price	OR Book-Page	Qualification Description
02/27/2018	$100	30940-0560	Corrective, tax or QCD; min consideration
02/27/2018	$100	30924-1711	Corrective, tax or QCD; min consideration
01/19/2018	$100	30840-2061	Corrective, tax or QCD; min consideration
01/19/2018	$955,000	30840-2063	Qual by exam of deed

The Office of the Property Appraiser is continually editing and updating the tax roll. This website may not reflect the most current information on record. The Property Appraiser and Miami-Dade County assumes no liability, see full disclaimer and User Agreement at http://www.miamidade.gov/info/disclaimer.asp

Version:

Figure 1

VE RECOMMENDATION NO. 2: IDENTIFY COUNTY & FDOT PROPERTY FOR STAGING AND DRAINAGE PURPOSES	Idea No(s). 19, 20

OFFICE OF THE PROPERTY APPRAISER

Summary Report

Generated On : 6/14/2023

Property Information	
Folio:	30-6912-037-0040
Property Address:	
Owner	109 OAK PARK ESTATES DADE LLC
Mailing Address	1550 MADRUGA AVE SUITE 403 CORAL GABLES, FL 33146 USA
PA Primary Zone	6200 COMMERCIAL - ARTERIAL
Primary Land Use	1081 VACANT LAND - COMMERCIAL : VACANT LAND
Beds / Baths / Half	0 / 0 / 0
Floors	0
Living Units	0
Actual Area	0 Sq.Ft
Living Area	0 Sq.Ft
Adjusted Area	0 Sq.Ft
Lot Size	34,848 Sq.Ft
Year Built	0

Assessment Information			
Year	2022	2021	2020
Land Value	$564,538	$564,538	$564,538
Building Value	$0	$0	$0
XF Value	$0	$0	$0
Market Value	$564,538	$564,538	$564,538
Assessed Value	$564,538	$564,538	$564,538

Benefits Information				
Benefit	Type	2022	2021	2020

Note: Not all benefits are applicable to all Taxable Values (i.e. County, School Board, City, Regional).

Short Legal Description
OAK PARK ESTATES SEC 3 PB 127-19 LOCATED IN SEC 1 TR C LOT SIZE .8 AC M/L OR 18891-2945 11995

Taxable Value Information	2022	2021	2020
County			
Exemption Value	$0	$0	$0
Taxable Value	$564,538	$564,538	$564,538
School Board			
Exemption Value	$0	$0	$0
Taxable Value	$564,538	$564,538	$564,538
City			
Exemption Value	$0	$0	$0
Taxable Value	$0	$0	$0
Regional			
Exemption Value	$0	$0	$0
Taxable Value	$564,538	$564,538	$564,538

Sales Information			
Previous Sale	Price	OR Book-Page	Qualification Description
11/16/2018	$100	31246-0943	Corrective, tax or QCD; min consideration
06/26/2017	$1,050,100	30591-4240	Federal, state or local government agency
09/01/1992	$0	15653-0712	Sales which are disqualified as a result of examination of the deed
01/01/1988	$335,000	13551-0940	Sales which are qualified

The Office of the Property Appraiser is continually editing and updating the tax roll. This website may not reflect the most current information on record. The Property Appraiser and Miami-Dade County assumes no liability, see full disclaimer and User Agreement at http://www.miamidade.gov/info/disclaimer.asp

Figure 2

VE RECOMMENDATION NO. 2: IDENTIFY COUNTY & FDOT PROPERTY FOR STAGING AND DRAINAGE PURPOSES

Idea No(s). 19, 20

VE RECOMMENDATION NO. 2	IDEA NO.		
Identify County & FDOT Property for Drainage			
PERFORMANCE MEASURES Attributes and Rating Rationale for Recommendation	Performance	Baseline	Recommendation
Main Line Operations No change	Rating	5	5
	Weight	26.1	
	Contribution	130.5	130.5
Local Operations No change	Rating	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability Slight increase of area to maintain	Rating	5	5
	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts No change	Rating	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts Further impacts County linear park (4f) Improves drainage area	Rating	5	5
	Weight	19.0	
	Contribution	95	95
Project Schedule No change	Rating	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	499
	Net Change in Performance		0%

VE RECOMMENDATION NO. 3: MODIFY MEDIAN DESIGN	Idea No(s). 31,36

Baseline Concept

The baseline design proposes 16.5-ft standard median width throughout the corridor.

Recommendation Concept

The recommended concept is to reduce median widths to 10-ft where possible, meeting the AASHTO minimums and to use traffic separators rather than grassy medians.

Advantages	Disadvantages
• Reduces typical section size • Reduces ROW footprint • May reduce construction duration • May reduce MOT	• Reduces treatment area • Reduces landscaping

Cost Summary	Construction	Right-of-way	Total
Baseline Concept		$8,438,713	$8,438,713
Recommendation Concept		$7,996,713	$7,996,713
Cost Avoidance/ (Added Value)	Negligible	$442,000	$442,000

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
			✓	✓

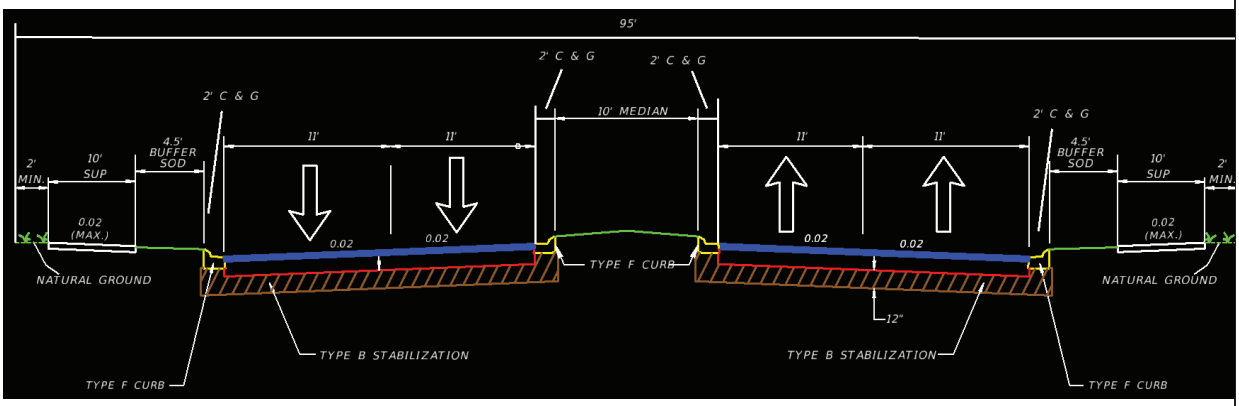
VE RECOMMENDATION NO. 3: MODIFY MEDIAN DESIGN	Idea No(s). 31,36

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The current median design uses 16.5-ft standard median widths, while the FDM recommends 22-ft and 16.5-ft median widths where severely constrained. AASHTO minimum median width is 10'.

Baseline



Recommendation

The recommended concept is to reduce median widths to 10-ft where possible meeting the AASHTO minimums and to use traffic separators rather than grassy medians.

The reduction in median widths will reduce right-of-way impacts and possibly eliminate them in certain locations. The VE team recognizes that this strategy will require a design variation.

Assumptions/Calculations

- Construction costs are assumed similar to the baseline
- Assuming a design variation is approved for purposed median width.

VE RECOMMENDATION NO. 3: MODIFY MEDIAN DESIGN	Idea No(s). 31,36

- A reduction from 16.5-ft to 10.0-ft would represent an approximate 40% reduction.
- There will be 6.5-ft less ROW acquisition required throughout the entire corridor where a median is being proposed.
- Assume cost of ROW is $25 per sq ft.
- Assume a uniform 3,400 ft of median width.
- Assume 50% of median reduction results in ROW improvements.
- 3400 x 6.5 x 80% = 17,680
- Then: ($25/square foot) *(17,680) = $ 442,000

VE RECOMMENDATION NO. 3: MODIFY MEDIAN DESIGN	Idea No(s). 31,36

VE RECOMMENDATION NO. 3	IDEA NO.		
Modify Median Design			
PERFORMANCE MEASURES / **Attributes and Rating Rationale for Recommendation**	**Performance**	**Baseline**	**Recommendation**
Main Line Operations Reduces shy distance (reduced median width) Requires a design variation	**Rating**	5	4
	Weight	26.1	
	Contribution	130.5	104.4
Local Operations No change	**Rating**	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability Less area to maintain	**Rating**	5	6
	Weight	11.9	
	Contribution	59.5	71.4
Construction Impacts No change	**Rating**	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts Less impervious Less ROW required	**Rating**	5	7
	Weight	19.0	
	Contribution	95	133
Project Schedule No change	**Rating**	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	522
	Net Change in Performance		5%

VE RECOMMENDATION NO. 4: USE PREEMPTION TECHNOLOGY	Idea No(s). 4,5

Baseline Concept

Preemption technology for emergency operation vehicles and backup generators was not considered in the baseline design.

Recommendation Concept

The VE team recommends the use of preemption technology for emergency operation vehicles and Install backup generators or uninterrupted power supply (UPS) backup for emergency signal operations

Advantages	Disadvantages
• Improves emergency response times • Improves evacuation times • Improves agency coordination • Improves resiliency	• Requires additional coordination • Increases construction cost

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$-		$-
Recommendation Concept	$224,719		$224,719
Cost Avoidance/ (Added Value)	($224,719)		($224,719)

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
✓	✓			

VE RECOMMENDATION NO. 4: USE PREEMPTION TECHNOLOGY	Idea No(s). 4,5

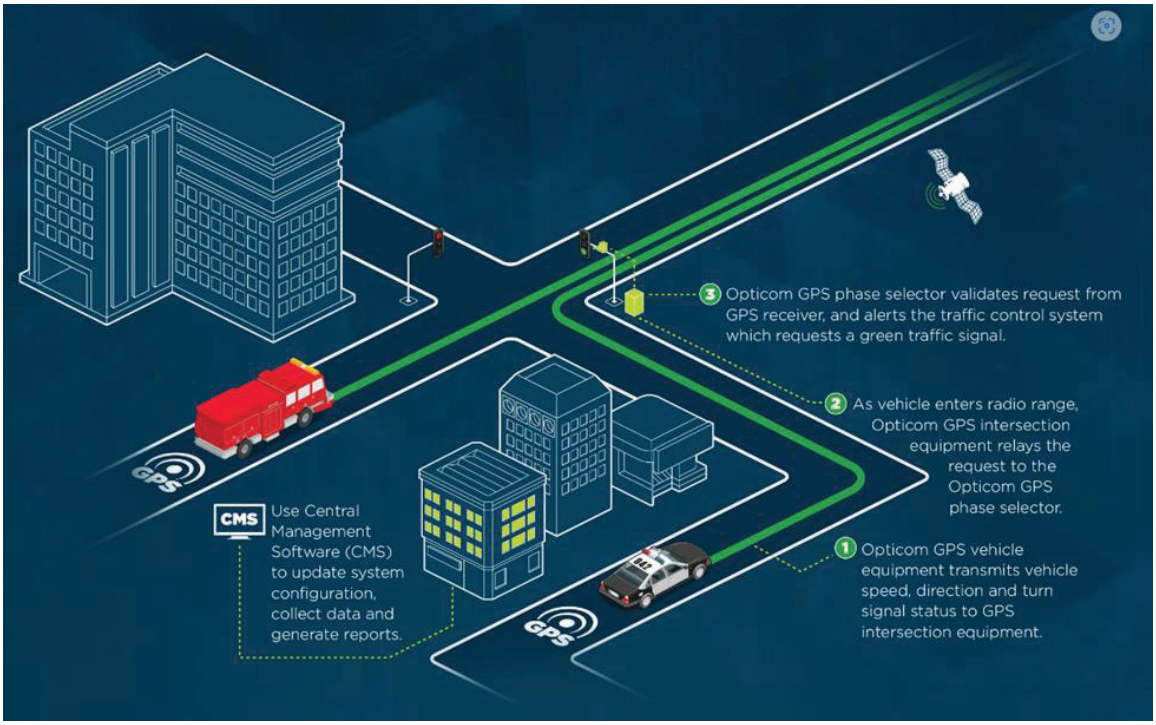
Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The objective of this recommendation is to improve emergency operations and responses times along the project corridor and improve emergency evacuation. SR994/Quail Roost connects with two highway corridors, SR997/Krome Ave and SR821/Turnpike, designated as emergency evacuation routes that also connects with SR5/US-1 which is a major evacuation for the Florida Keys. The intent is to add new technology along the project corridor to enhance emergency evacuation process and interagency coordination during an emergency event.

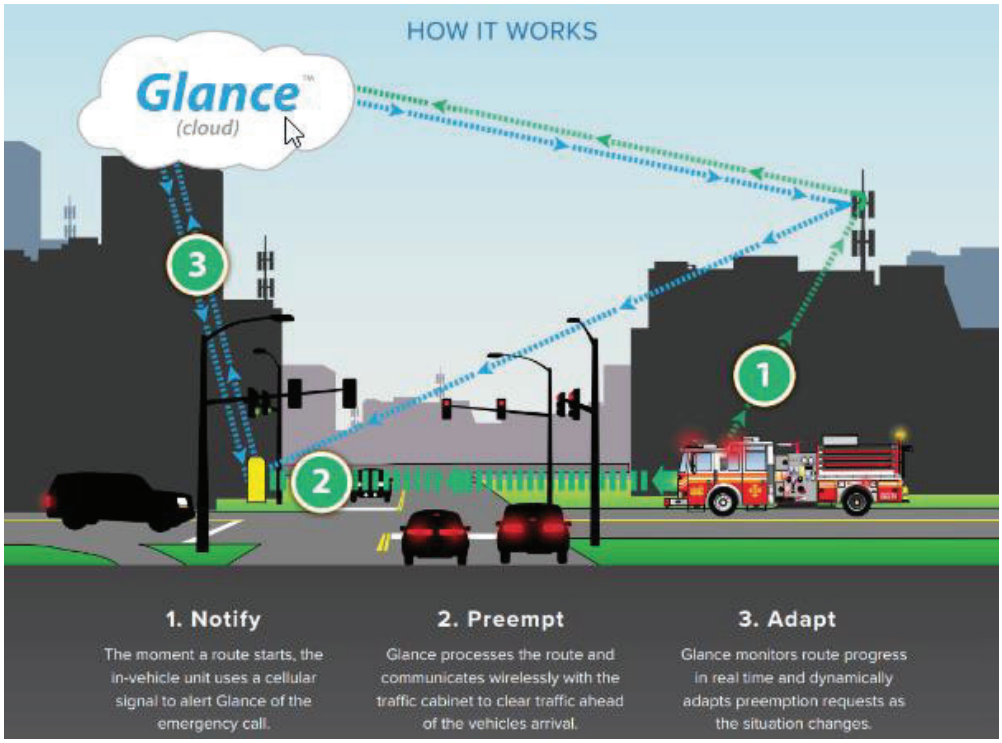
Preemption systems are used to transfer the normal operation of a traffic control signal to a special control mode of operation. They are designed to give to certain types of vehicles the right of way at and through a signalized intersection. Emergency vehicles using pre-emption send a pre-emption call to the traffic signal when responding to an emergency. Traffic is then able to move out of the way for the emergency vehicles while cross traffic is stopped from entering the responders' path.

The baseline design shows 3 signalized intersections: SW 137 Ave, SW 134 Ave, SW 127 Ave, which will carry this technology in the recommended concept.



Recommendation 1- Preemption systems

VE RECOMMENDATION NO. 4: USE PREEMPTION TECHNOLOGY	Idea No(s). 4,5



Recommendation 2 - Uninterruptible Power Supply (UPS):

This device provides temporary power when commercial AC power is interrupted and prevents failure of normal operations in a signalized intersection. See figure 1

Figure 1

Manual Transfer Switch:

Manual transfer switch is an externally mounted enclosure attached to the traffic control cabinet with an emergency generator interface. The purpose of this device is to provide temporary power when commercial AC power is interrupted.

Assumptions/Calculations

- Similar efforts have been done within D6 and have positive results.
- The proposed equipment for the preemption system is listed in the FDOT Approved Product List (APL) and MDC Qualified Product List (QPL).
    - OPTICOM EVP-GPS

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
SIGNAL PRIO & PREEMP, F&I, OPT, CABLE	EA		$ 6,245	$ -	3	$ 6,245	$ 18,735
SIGNAL, PRIO & PREEMP, F&I, GPS, DETECTOR	EA		$ 6,777	$ -	12	$ 6,777	$ 81,320
SIGNAL PRIO & PREEMP, F&I, CABINET EQUIPMENT	EA		$ 10,500		3	$ 10,500	$ 31,500
CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF		$ 34	$ -	800	$ 34	$ 26,912
PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA			$ -	12	$ 1,125	$ 13,494
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				$ -			$ *171,961*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ -			$ 52,758
Total Construction				**$ -**			**$ 224,719**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ -***			***$ 224,719***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ (224,719)**

VE RECOMMENDATION NO. 4: USE PREEMPTION TECHNOLOGY	Idea No(s). 4,5

VE RECOMMENDATION NO. 4	IDEA NO.		
Use Preemption Technology			
PERFORMANCE MEASURES	Performance	Baseline	Recommendation
Attributes and Rating Rationale for Recommendation			
Main Line Operations	Rating	5	7
Improves emergency response times Improves emergency evacuation	Weight	26.1	
	Contribution	130.5	182.7
Local Operations	Rating	5	5
No change	Weight	21.4	
	Contribution	107	107
Maintainability	Rating	5	5
No change	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts	Rating	5	5
No change	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts	Rating	5	5
No change	Weight	19.0	
	Contribution	95	95
Project Schedule	Rating	5	5
No change	Weight	14.2	
	Contribution	71	71
	Total Performance	499	551
	Net Change in Performance		10%

VE RECOMMENDATION NO. 5: MODIFY MEDIAN ACCESS	Idea No(s). 8, 22

Baseline Concept

In the baseline condition the median openings near side streets allow movements from all directions.

Recommendation Concept

The VE team recommends the addition of medians within median openings to assist with separating traffic in addition to providing a clear path for vehicles to traverse, including right-out only at SW 132nd Ave and reduction of EB and WB left turns.

Advantages	Disadvantages
• Reduces conflicts	• Increases travel times • Reduces access • Decreases storage

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$0		$0
Recommendation Concept	$41,414		$41,414
Cost Avoidance/ (Added Value)	($41,414)		($41,414)

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
✓	✓			

VE RECOMMENDATION NO. 5: MODIFY MEDIAN ACCESS	Idea No(s). 8, 22

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

Within the corridor, the side streets were observed to see if a median opening was needed in addition to methods on how to reduce the possibility of conflicts between the vehicles. The following was reviewed:

- Traffic counts per specific leg movements.
- Viability of separating traffic while not restricting movements.

The following was observed:

> The EBL movement from SW 134th CT. has 8 movements. (Considering 2045 and AM hours). It seems that most vehicles use SW 135th Ave. Therefore, with the goal of removing possible conflicts, it is recommended to not allow the SBL movement from SW 134th Ct. to Quail Roost Drive. This could be accomplished by signing and/or re-designing the median to block the EBL movement.

The following median opening near the side streets were reviewed.:

Westbound

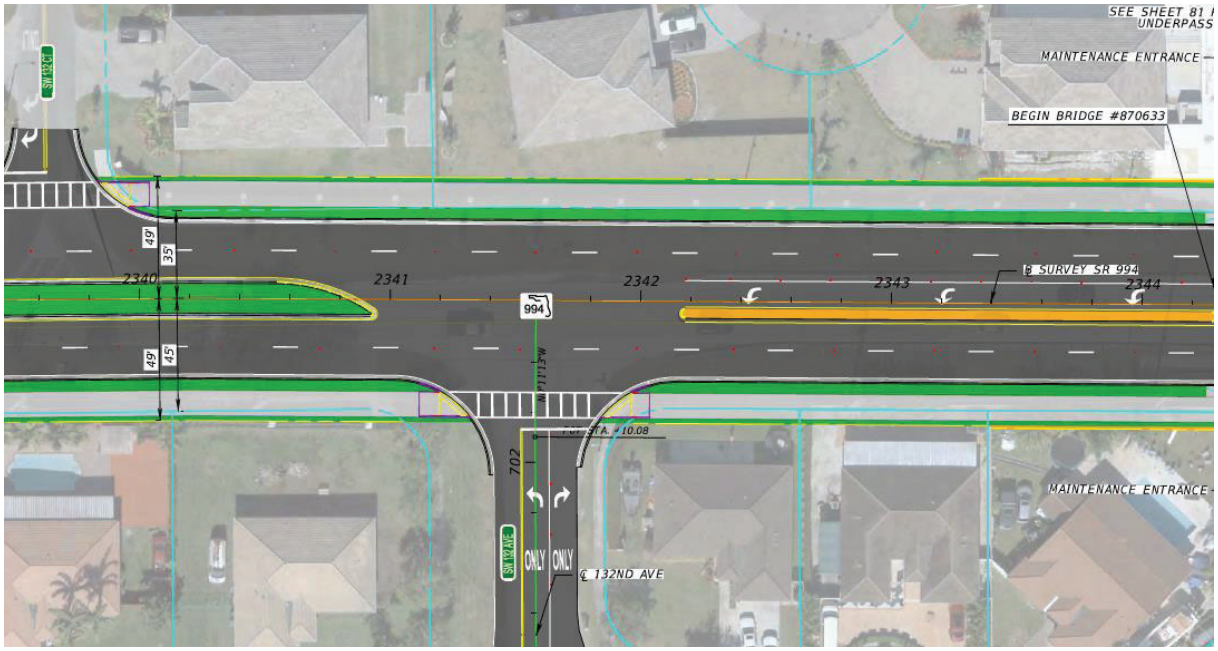
- SW 133rd Ct.
- SW 130th Ave.
- SW 129th Ave.

Eastbound

- SW 133rd Ave.
- SW 132nd Ave.
- SW 130th Ave.

Except for SW 130th Ave., all other median openings could install a directional median to assist with separating the conflict of turning vehicles. Below is an example of SW 132nd Ave baseline and recommendation.

VE RECOMMENDATION NO. 5: MODIFY MEDIAN ACCESS	Idea No(s). 8, 22



Baseline

Recommendation

Assumptions/Calculations: For the estimate the VE team considers the construction of concrete directional medians in five (5) intersections, SW 133rd Ct. (WB), SW 130th Ave. (WB), SW 129th Ave. (WB), SW 133rd Ave. (EB), and SW 132nd Ave. (EB).

VE RECOMMENDATION NO. 5: MODIFY MEDIAN ACCESS	Idea No(s). 8, 22

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
CONCRETE CURB TYPE D	LF		$ 30	$ -	473	$ 30	$ 14,006
CONCRETE SIDEWALK, 6"	SY		$ 64	$ -	275	$ 64	$ 17,685
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				$ -			*$ 31,691*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ -			$ 9,723
Total Construction				**$ -**			**$ 41,414**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ -***			***$ 41,414***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ (41,414)**

VE RECOMMENDATION NO. 5: MODIFY MEDIAN ACCESS	Idea No(s). 8, 22

VE RECOMMENDATION NO. 5	IDEA NO.		
Modify Median Access			
PERFORMANCE MEASURES	**Performance**	**Baseline**	**Recommendation**
Attributes and Rating Rationale for Recommendation			
Main Line Operations	**Rating**	5	7
Improves operations Reduces conflicts Reduces risks of accidents	**Weight**	26.1	
	Contribution	130.5	182.7
Local Operations	**Rating**	5	5
Reduces access Improves sight distance Improves conflict type Longer trip for drivers	**Weight**	21.4	
	Contribution	107	107
Maintainability	**Rating**	5	5
No Change	**Weight**	11.9	
	Contribution	59.5	59.5
Construction Impacts	**Rating**	5	5
No Change	**Weight**	7.1	
	Contribution	35.5	35.5
Environmental Impacts	**Rating**	5	5
No Change	**Weight**	19.0	
	Contribution	95	95
Project Schedule	**Rating**	5	5
No Change	**Weight**	14.2	
	Contribution	71	71
	Total Performance	499	551
	Net Change in Performance		10%

VE RECOMMENDATION NO. 6: MODIFY SFWMD CANAL ACCESS	Idea No. 7

Baseline Concept

The base design shows left turn access on the bridge structure crossing Black Creek Canal to provide canal maintenance access to both the north and south sides.

Recommendation Concept

The recommended concept is to eliminate the left turn into the North and South side maintenance access South Florida Water Management District (SFWMD) on the structure to reduce conflict.

Advantages	Disadvantages
• Reduces conflict • Reduces driver confusion • Prevents illegal U-turn	• Reduce access

Cost Summary	Construction	Right-of-way	Total
Baseline Concept			
Recommendation Concept	Negligible		Negligible
Cost Avoidance/ (Added Value)	Negligible		Negligible

FHWA Function Benefit

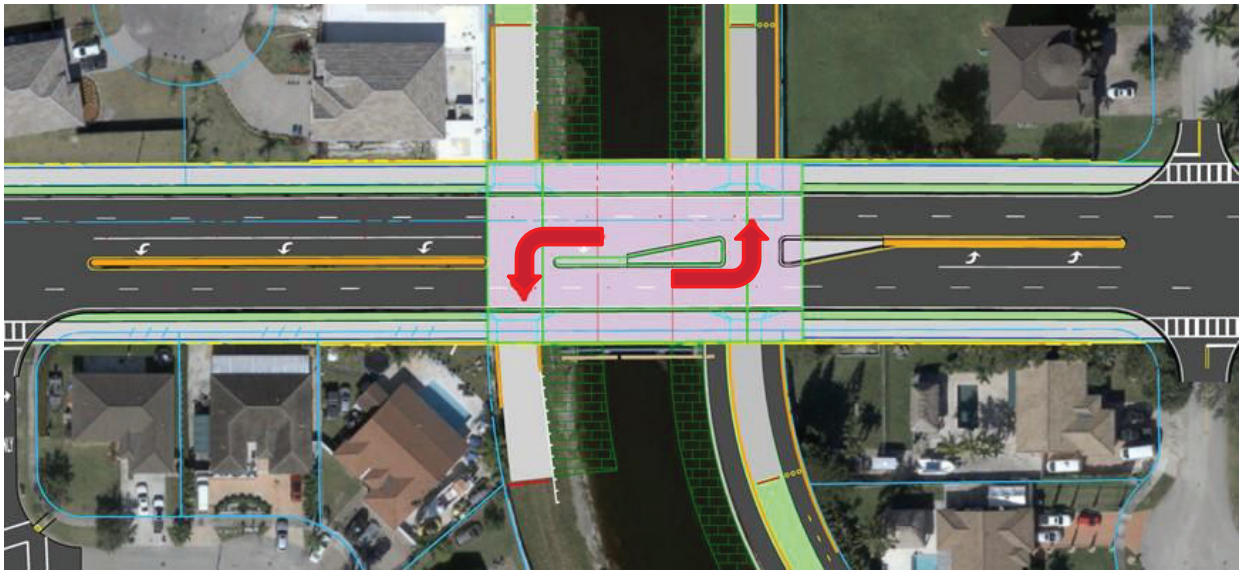
Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
✓	✓			

VE RECOMMENDATION NO. 6: MODIFY SFWMD CANAL ACCESS	Idea No. 7

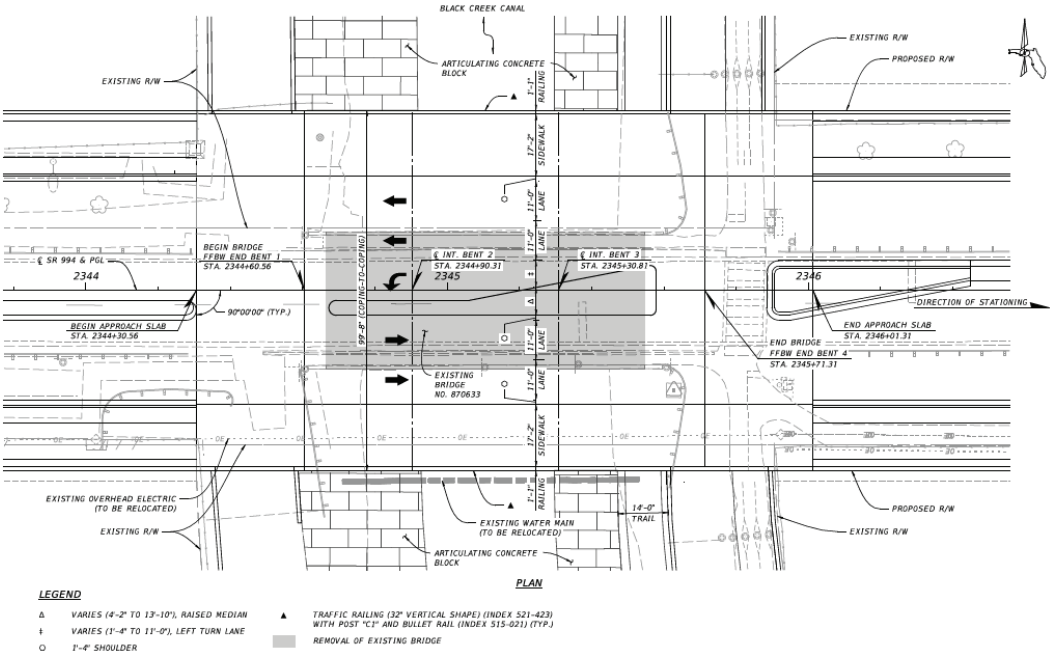
Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The objective of this recommendation is to address left turns on the bridge intended only for maintenance access. The left turn without a designated left turn can create conflicts and confusion for the public, and proposed configuration introduces unnecessary conflict points from the main lanes. The provided left turns are unnecessary since there are designated left turns in each direction less than 300 ft away where maintenance vehicles can make U-Turns.



Baseline Figure 1



Baseline Figure 2

VE RECOMMENDATION NO. 6: MODIFY SFWMD CANAL ACCESS	Idea No. 7

Recommended Concept Figure 1

Figure 2 Similar treatment on 47th Ave @ NW 207th.

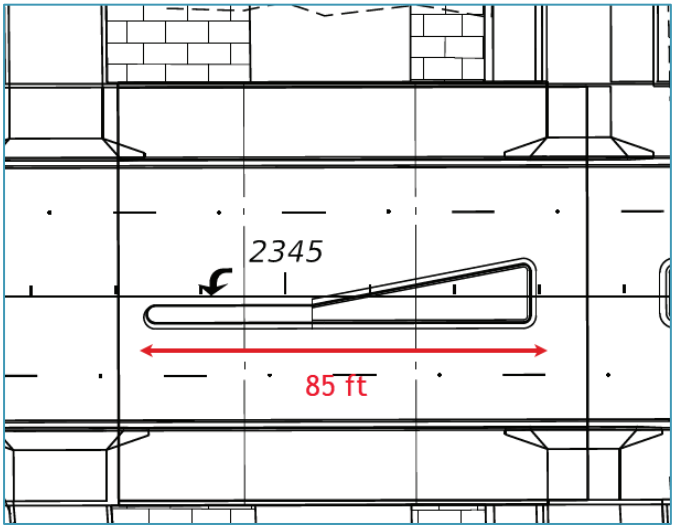
VE RECOMMENDATION NO. 6: MODIFY SFWMD CANAL ACCESS	Idea No. 7

Assumptions/Calculations

Concrete quantities for traffic separator are calculated in linear feet.

Baseline design:

Length = 85 ft

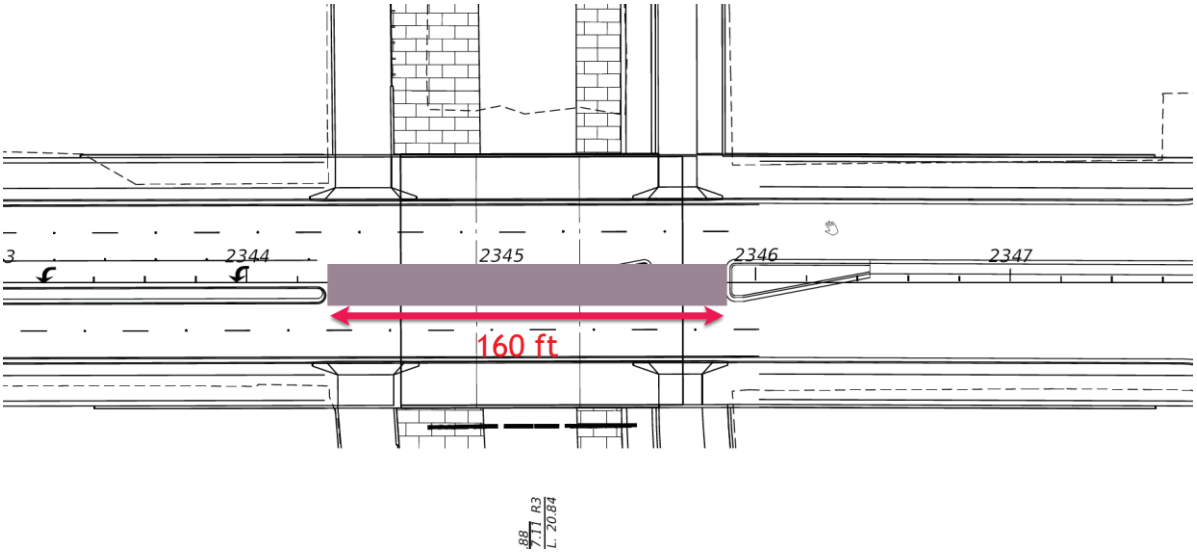


Baseline Measurement

Proposed:

Length = 160 ft

Recommended



Recommended Concept Measurement

VE RECOMMENDATION NO. 6: MODIFY SFWMD CANAL ACCESS	Idea No. 7

VE RECOMMENDATION NO. 6	IDEA NO.		
Modify SFWMD Canal Access			
PERFORMANCE MEASURES	Performance	Baseline	Recommendation
Attributes and Rating Rationale for Recommendation			
Main Line Operations	Rating	5	8
Prevents iligal U-turn Reduces conflicts from through lanes Improves driver expectancy	Weight	26.1	
	Contribution	130.5	208.8
Local Operations	Rating	5	5
No change	Weight	21.4	
	Contribution	107	107
Maintainability	Rating	5	5
No change	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts	Rating	5	5
No change	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts	Rating	5	5
No change	Weight	19.0	
	Contribution	95	95
Project Schedule	Rating	5	5
No change	Weight	14.2	
	Contribution	71	71
	Total Performance	499	577
	Net Change in Performance		16%

VE RECOMMENDATION NO. 7: REMOVE BUFFER ALONG BRIDGE	Idea No. 9

Baseline Concept

The current baseline concept recommends a typical section that is 99'-8" wide and contains a 5'2" buffer between the shared use path and travel lane. The bridge typical section contains a median that varies from 4'2" to 13'10".

Recommendation Concept

Remove 5'2" buffer from each side of structure and replace with curb and gutter barriers. Shrink the median as much as needed in order to fit within the ROW.

Advantages	Disadvantages
• Reduces width of bridge • May reduce construction costs • May reduce ROW need	• Requires design variation • Enables typical section continuity • Reduces distance between pedestrian and vehicles

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$1,209,247	$8,438,713	$9,647,960
Recommendation Concept	$1,069,485	$8,247,463	$9,316,948
Cost Avoidance/ (Added Value)	$139,762	$191,250	$331,012

FHWA Function Benefit

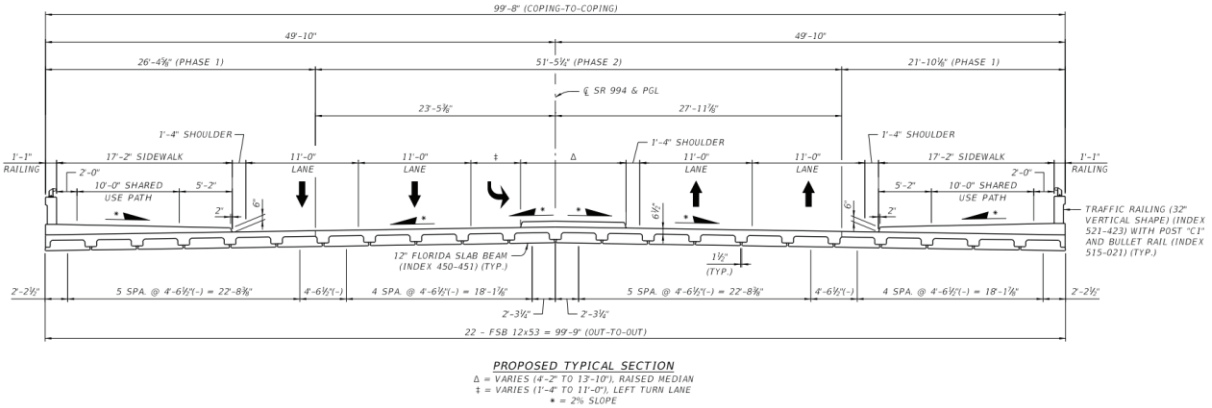
Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
			✓	✓

VE RECOMMENDATION NO. 7: REMOVE BUFFER ALONG BRIDGE	Idea No. 9

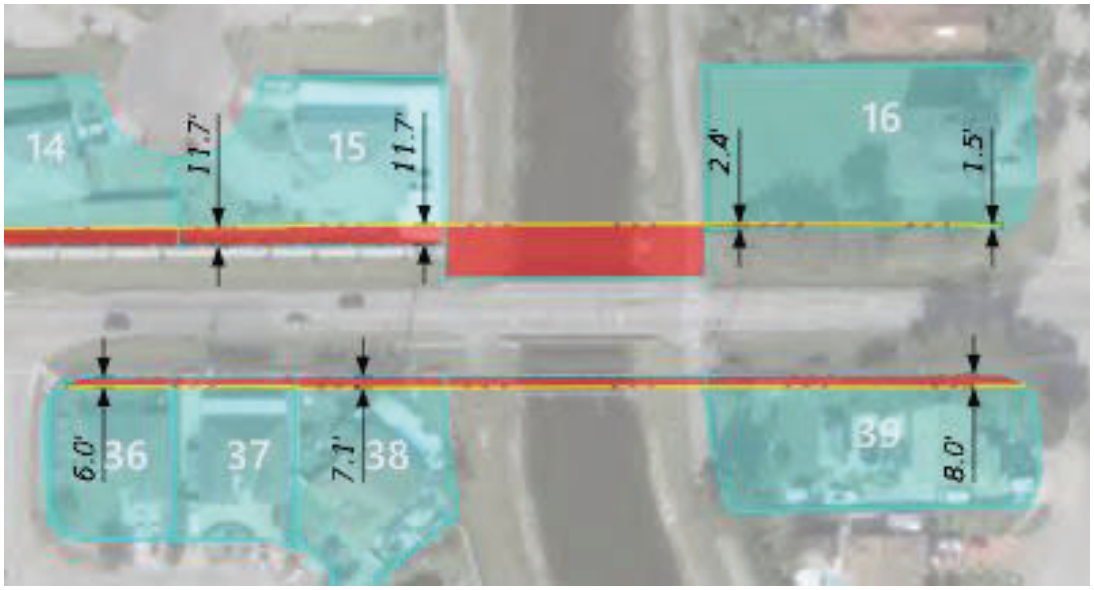
Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The bridge typical section is currently designed to be 99-ft 8” wide. The existing ROW is only 90-ft wide. The existing bridge typical is shown below with 5’2” buffers and a median that varies between 4’2” to 13’10”. The typical section extends 9’8” outside the existing ROW.



Baseline Typical Section

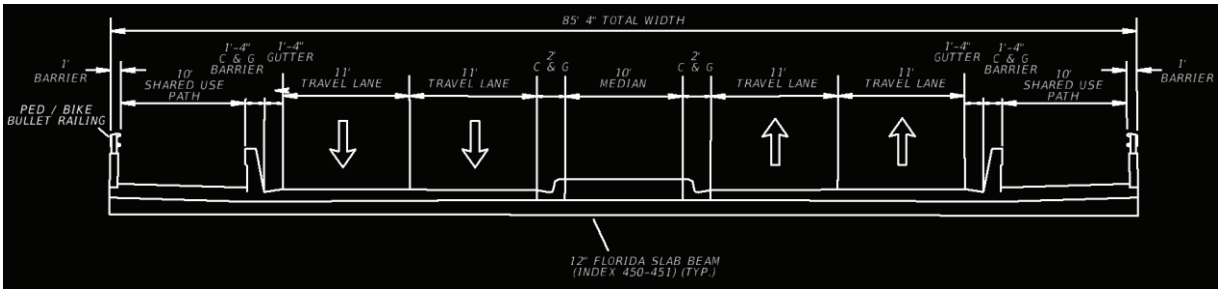


Baseline ROW acquisition

This recommendation is to shrink the typical section by installing concrete barriers in the buffer zone to reduce the width of the bridge. The example below shows barrier replacement and a 10-ft median. This design may be modified to accommodate the left turn lane in the median area and provide sufficient shoulder /gutter area as needed. Replacing the 5’2” buffers on each side with a 1’4” barrier.

This recommendation should reduce the bridge typical by 11’6” to 88’2” width. This will reduce the ROW required. An example typical section is shown below but can be modified as needed. This recommendation would reduce or eliminate slivers of ROW and reduce bridge construction cost.

VE RECOMMENDATION NO. 7: REMOVE BUFFER ALONG BRIDGE	Idea No. 9



Recommended Concept

Assumptions/Calculations

Baseline bridge width 99'8" – (5'2" buffers *2) = 89'4"
89'4" – (baseline max median width 13'10" – recommended 10-ft median width) = 85-ft 6"
85'6" + (1'4" barriers *2) = 88'2" recommended bridge width
99'8" – 88'2" = 11'6" width reduction
(110-ft length *11'6") =1,265 SF.

NW corner Mean width SQFT =1'9" * 250-ft length to intersection =250 SF

SW corner Mean width SQFT = 8-ft * 250-ft length to intersection =2000 SF

SE corner Mean width = 6'5" * 300-ft length to intersection =1920 SF

NE corner Mean width =11'7" *300-ft length to intersection =3480 SF
Total ROW saved = 7,650 SQFT * $25 = $191,250

VE RECOMMENDATION NO. 7: REMOVE BUFFER ALONG BRIDGE	Idea No. 9

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
Bridge FL slab (110'x11' 6"reduction)	SF	9253.5	$ 100	$ 925,350	8,184	$ 100	$ 818,400
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				*$ 925,350*			*$ 818,400*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ 283,897			$ 251,085
Total Construction				**$ 1,209,247**			**$ 1,069,485**
Utility Costs				$ -		$ -	$ -
Right of Way Costs		337,549	$ 25.00	$8,438,713.00	329,899	$ 25.00	$8,247,463.00
TOTAL CAPITAL COST				***$ 9,647,960***			***$ 9,316,948***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ 331,012**

VE RECOMMENDATION NO. 7: REMOVE BUFFER ALONG BRIDGE	Idea No. 9

VE RECOMMENDATION NO. 7	IDEA NO.		
Remove Buffer along Bridge			
PERFORMANCE MEASURES Attributes and Rating Rationale for Recommendation	Performance	Baseline	Recommendation
Main Line Operations Introduces minor deflection	Rating	5	4.5
	Weight	26.1	
	Contribution	130.5	117.5
Local Operations No change	Rating	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability Less structure	Rating	5	5
	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts No change	Rating	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts Reduces ROW impacts along the canal property	Rating	5	6
	Weight	19.0	
	Contribution	95	114
Project Schedule No change	Rating	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	505
	Net Change in Performance		1%

VE RECOMMENDATION NO. 8: MODIFY PEDESTRIAN & BICYCLIST ACCOMMODATIONS	Idea No(s). 12, 32,

Baseline Concept

The baseline concept provides two 10-ft shared use path (SUP) along the corridor, one on each side of the roadway. The SUPs are design to have a 4.5-ft buffer to the back of curb and a 2-ft buffer to the ROW line.

Recommendation Concept

The VE team recommends to increase one SUP to 12-ft and convert the other SUP to a 6-ft sidewalk. Additionally, the VE team recommends to eliminate the 4'5" buffer for the sidewalk by moving the sidewalk adjacent to roadway. Lastly, the VE team recommends to add mid block crossings at locations determined by analyzing bicycle and pedestrian traffic data and warrant analysis.

Advantages	Disadvantages
• Increased width of SUP • Reduce 6-ft from typical section • May reduce construction costs • Reduce typical section • May reduce ROW • May reduce asphalt costs • No variation required • Increase permiable area	• Not accommodating bicyclist on one side of the roadway • Increase conflict • Reduce separation between traffic • May impact drainage design • May increase concrete costs

Cost Summary	Construction	Right-of-way	Total
Baseline Concept		$8,438,713	$8,438,713
Recommendation Concept		$7,556,953	$7,556,953
Cost Avoidance/ (Added Value)		$881,760	$881,760

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
		✓	✓	✓

VE RECOMMENDATION NO. 8: MODIFY PEDESTRIAN & BICYCLIST ACCOMMODATIONS	Idea No(s). 12, 32,

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The baseline typical section design provides a 97.5-ft typical section width which slightly clips several ROW parcels throughout the corridor. This baseline design has a 10-ft SUP on both sides of the roadway with a 4.5-ft buffer between the back of curb and the proposed SUPs. Also, there is a 2-ft buffer between the SUPs and edge of ROW. The baseline uses the 2-ft buffer along the South side of the project for utility poles. The 2-ft buffer behind a shared use path should not have any obstructions or signage within it so this would require variation as currently designed.

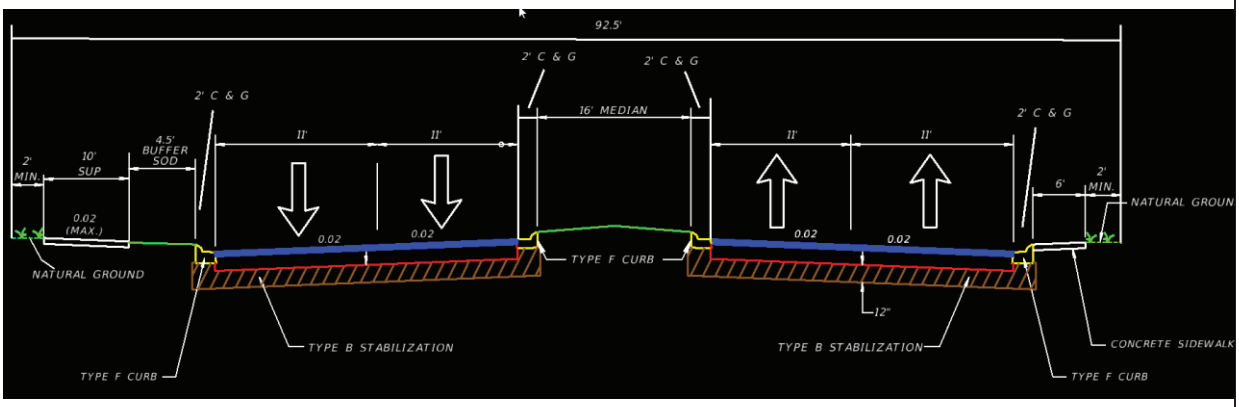
Baseline

The VE team's recommendation to convert the South side SUP to a sidewalk increases the space for utility location outside the 2-ft buffer zone, eliminating the need for a variation. Our recommendation also shrinks the typical section by approximately 5-ft throughout the corridor. Additionally, the design team could reduce the typical section even more by reducing the median size.

Further analysis should be done to determine which of the two shared use paths should be reduced to a sidewalk and whether the remaining shared use path should be widened to 12'. The recommended SUP is also allowed to pinch down to 8-ft in certain areas where ROW acquisition may be extremely difficult or impossible such as near the two historic walls within the project limits. This recommendation shrinks the project typical width, reduces cost of ROW acquisition, and increases permeable area for drainage.

During the presentation of results, the management team suggested the use of signalized mid-block crossings; the Design team should further evaluate mid-block crossing warrants and incorporate into the final design as appropriate.

VE RECOMMENDATION NO. 8: MODIFY PEDESTRIAN & BICYCLIST ACCOMMODATIONS	Idea No(s). 12, 32,



Recommended Concept Figure 1

Assumptions/Calculations

Assume cost of the new 6-ft sidewalk offsets the savings of the 4-ft SUP reduction.

Potentially a 5-ft reduction in ROW width required throughout the entire corridor.

Will be assuming only 80% of the corridor will require ROW acquisition.

Cost of ROW is $25 per sq ft.

Project Length is 1.67 miles = 8817.6’

Calculation for reduction in cost of ROW:

7054 * 5-ft = 35,270 SF

$25 * 35,270 SF = $881,760

VE RECOMMENDATION NO. 8: MODIFY PEDESTRIAN & BICYCLIST ACCOMMODATIONS	Idea No(s). 12, 32,

VE RECOMMENDATION NO. 8	IDEA NO.		
Modify Pedestrian & Bicyclist Accommodations			
PERFORMANCE MEASURES	**Performance**	**Baseline**	**Recommendation**
Attributes and Rating Rationale for Recommendation			
Main Line Operations	**Rating**	5	5
No change	**Weight**	26.1	
	Contribution	130.5	130.5
Local Operations	**Rating**	5	4
Increases bicyclist conflicts Reduces bicyclist capacity	**Weight**	21.4	
	Contribution	107	85.6
Maintainability	**Rating**	5	6
Less SUP to maintain	**Weight**	11.9	
	Contribution	59.5	71.4
Construction Impacts	**Rating**	5	5
No change	**Weight**	7.1	
	Contribution	35.5	35.5
Environmental Impacts	**Rating**	5	6
Reduces impervious Reduces ROW requirements	**Weight**	19.0	
	Contribution	95	114
Project Schedule	**Rating**	5	5
No change	**Weight**	14.2	
	Contribution	71	71
Total Performance		499	508
Net Change in Performance			2%

VE RECOMMENDATION NO. 9: ADVANCE SAFETY IMPROVEMENTS AT CRITICAL LOCATIONS	Idea No. 17

Baseline Concept

Baseline concept is to implement safety improvements with the current design and construct as one project.

Recommendation Concept

The VE team recommends implementing a series of safety improvements as a separate project at critical locations. These safety improvements would be designed to align with future improvements and minimize throwaway.

Advantages	Disadvantages
• Reduces conflicts • Addresses safety concerns before proposed project delivery • Improves operations earlier	• Would need to add a safety project in the short term • Safety funds may not be available • May lead to rework • Some safety improvements may affect user experience. • Design variations needed

Cost Summary	Construction	Right-of-Way	Total
Baseline Concept	$459,194		$459,194
Recommendation Concept	$4,909,736		$4,909,736
Cost Avoidance/ (Added Value)	($4,450,542)		($4,450,542)

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
✓	✓			

VE RECOMMENDATION NO. 9: ADVANCE SAFETY IMPROVEMENTS AT CRITICAL LOCATIONS	Idea No. 17

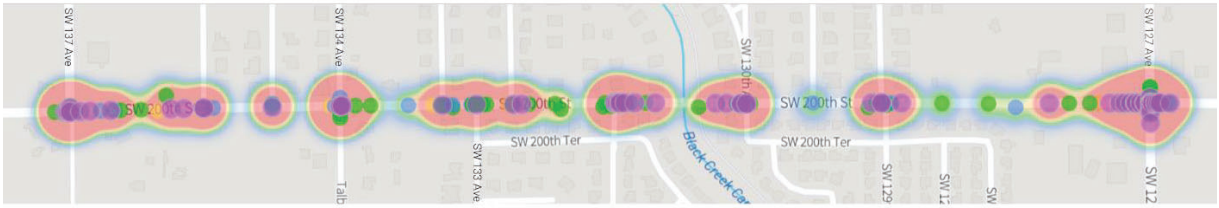
Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

When considering safety improvements for a roadway design, several options can be implemented to enhance safety at critical locations. Examples include:

- Replacing traditional intersections with roundabouts to reduce high-speed collisions,
- Adding marked pedestrian crossings and sidewalks to prioritize pedestrian safety
- Implementing traffic calming measures like raised medians to reduce speeding
- Placing advanced warning signs and signals to provide critical information to drivers
- Installing median barriers to prevent head-on collisions or to reduce the number of conflict points

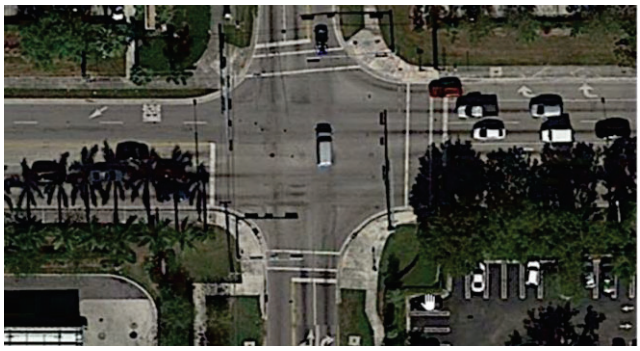
For medians at the intersections, protected left-turn lanes and signalization upgrades can prove beneficial. The selection of specific safety improvements should be based on careful analysis of road characteristics, traffic patterns, and accident data. Each improvement is tailored to improve visibility, reduce conflicts, manage speeds, and optimize traffic flow to enhance overall safety in high crash areas. Accelerating the following safety improvements can improve operations sooner.



Baseline Figure 1 Crash Data

The VE team recommends the following safety improvements to be designed and constructed as a preceding and separate project.

137th: Configure intersection as shown in Recommendation Figure 1 and add adaptive signal control system with Q-detection technology. Modify the signal cabinet to adapt green light along Quail Roost. Also, add Q-loop SB to EB left turn queue to adapt green signal and improve throughput. Extend queue lanes approaching the intersection to maximum length.

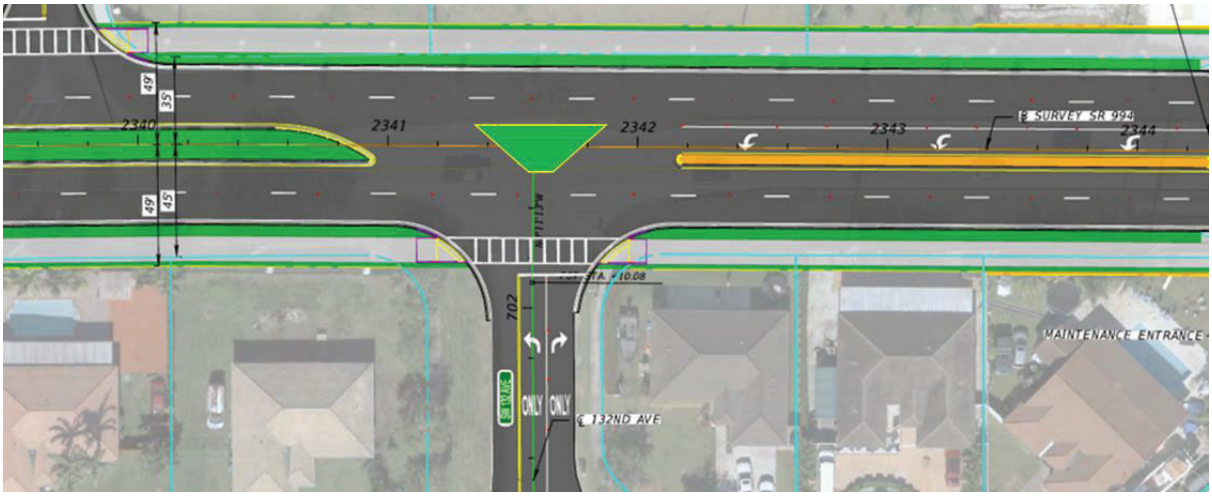


Recommendation Figure 1

134th: Signalize the intersection at 134th within existing ROW, Recommendation Figure 2 shows an example of a 78-ft mast arm placed diagonally within ROW.

Recommendation Figure 2

132nd Ave, 133rd Ave, 133rd Ct, 130th Ave, 129th Ave: provide left turn lanes where ROW allows and provide directional bays to improve turning movements and prevent other movements, similarly as shown in Recommendation Figure 3 but one lane in each direction instead.



Recommendation Figure 3

127th: Extend the merge lane west of 127th Ave to increase the merge distance and increase capacity through 130th Ave.

Recommendation Figure 4

Assumptions/Calculations

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
SIGNALIZED INTERSECTION	EA	1	$ 280,000	$ 280,000	1	$ 150,000	$ 150,000
TYPE B STABILIZATION	SY		$ 9	$ -	24,000	$ 9	$ 221,760
OPTIONAL BASE, GROUP 9	SY		$ 37	$ -	24,000	$ 37	$ 894,000
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TNS		$ 143	$ -	8332	$ 143	$ 1,191,976
ASPHALT CONCRETE FRICTION COURSE,TRAFFIC C, FC-12.5, PG 76-22	TNS		$ 192	$ -	6249	$ 192	$ 1,202,183
CONCRETE SIDEWALK, 4"	SY		$ 45	$ -	287	$ 45	$ 12,901
CONCRETE CURB & GUTTER, TYPE F	LF		$ 24	$ -	287	$ 24	$ 6,785
LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	EA	47	$ 326	$ 15,303	51	$ 326	$ 16,606
LOOP ASSEMBLY, F&I, TYPE F	AS	47	$ 1,193	$ 56,085	51	$ 1,193	$ 60,858
Subtotal Construction				*$ 351,388*			*$ 3,757,068*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ 107,806			$ 1,152,668
Total Construction				**$ 459,194**			**$ 4,909,736**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ 459,194***			***$ 4,909,736***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ (4,450,542)**

VE RECOMMENDATION NO. 9: ADVANCE SAFETY IMPROVEMENTS AT CRITICAL LOCATIONS	Idea No. 17

VE RECOMMENDATION NO. 9	IDEA NO.		
Advance Safety Improvements at Critical Locations			
PERFORMANCE MEASURES	**Performance**	**Baseline**	**Recommendation**
Attributes and Rating Rationale for Recommendation			
Main Line Operations	**Rating**	5	7.5
Improves traffic control Increases capacity from SW127th to the bridge Reduces conflicts	**Weight**	26.1	
	Contribution	130.5	196
Local Operations	**Rating**	5	8
Improves queuing conditions Reduces conflicts Improves traffic control	**Weight**	21.4	
	Contribution	107	171
Maintainability	**Rating**	5	4
Increases traffic signals Increases pavement area	**Weight**	11.9	
	Contribution	59.5	48
Construction Impacts	**Rating**	5	5
No change	**Weight**	7.1	
	Contribution	35.5	36
Environmental Impacts	**Rating**	5	5
No change	**Weight**	19.0	
	Contribution	95	95
Project Schedule	**Rating**	5	5
No change	**Weight**	14.2	
	Contribution	71	71
Total Performance		499	617
Net Change in Performance			24%

VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26

Baseline Concept

The baseline design proposes a trail crossing underneath span 3 of the bridge on Quail Roost over the Black Creek Canal.

Recommendation Concept

The recommendation concept is to eliminate the trail crossing under the bridge and keep at grade crossing with improved signalization alternatives.

Advantages	Disadvantages
• Reduces structure footprint • Keeps structure at a lower elevation • Decreases construction duration and MOT complexity. • Simplifies structures design (1 span FIB bridge) • Reduces costs • Reduces ROW impact • Reduces pile operations • Less intrusive to neighboring properties • Reduces noise	• Trail users crossing at grade • Introduces controlled conflict • Increases user trip duration • Increases user delay costs

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$4,422,062	$191,250	$4,613,312
Recommendation Concept	$1,219,933	$0	$1,219,933
Cost Avoidance/ (Added Value)	$3,202,130	$191,250	$3,393,380

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
	✓	✓	✓	✓

VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

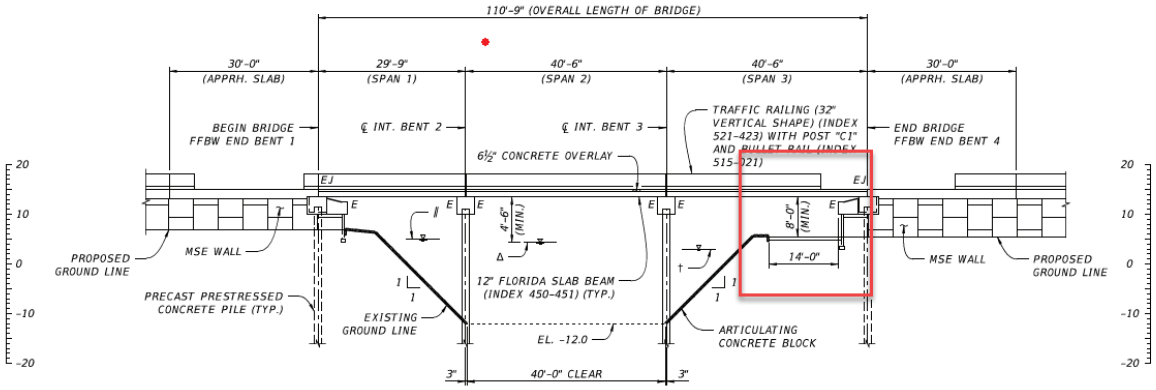
This recommendation addresses the proposed trail crossing under the bridge that crosses Black Creek Canal.

To accommodate the 8-ft minimum clearance required for the trail; the proposed ground level is approximately 8-ft higher than the existing which introduces the need for retaining walls around the bridge end bents parallel to the Black Creek Canal, and parallel to the four (4) adjacent residential properties . The proposed profile will significantly impact the profile of the side streets at the adjacent intersections.

The baseline profile shows an increase of 3-ft at the intersection, severely impacting the adjacent residential properties driveways. Although the baseline configuration provides the option of using the trail under the bridge, it does not eliminate the possibility of trail users crossing at grade since the trail has proposed extension on both ends that meet with the proposed shared use path (SUP) and the opening for the maintenance access of South Florida Water Management District (SFWMD).

Due to the proposed trail under the bridge, only shallow superstructures such as Florida Slab Beams (FSB) were considered viable which eliminates the possibility of a one span Florida I Beam (FIB) bridge.

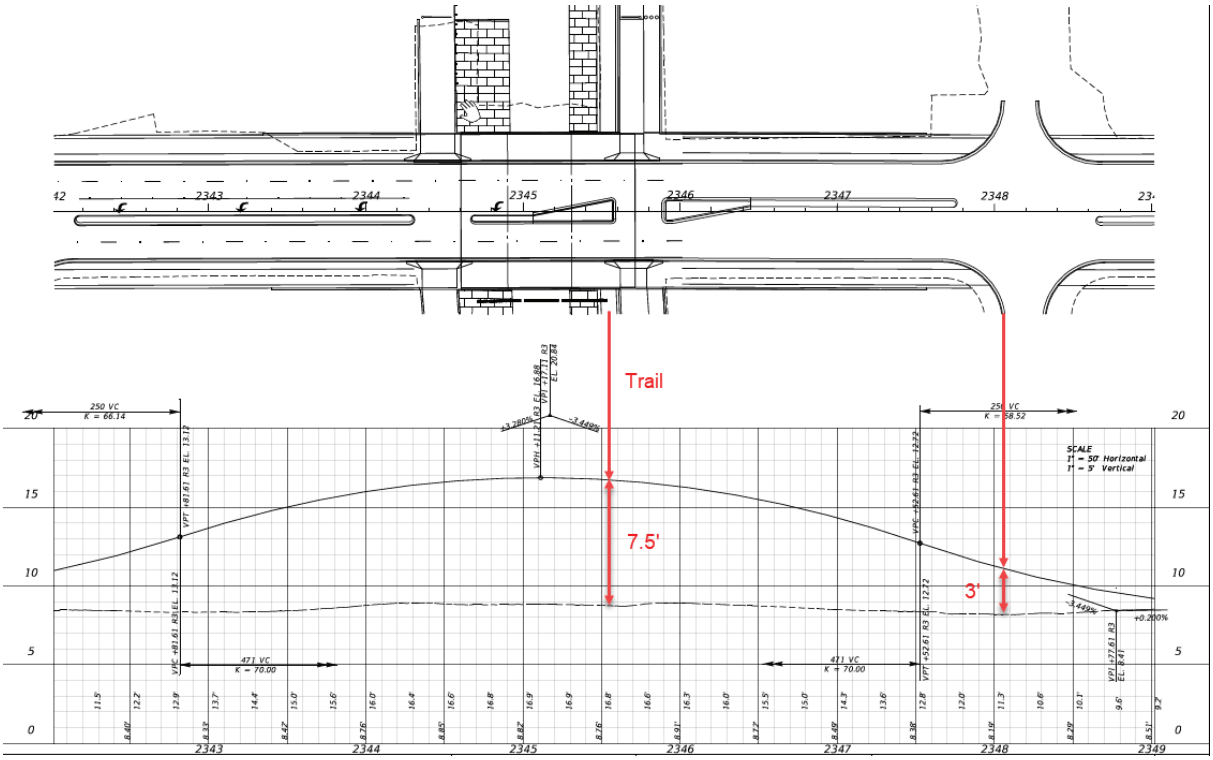
The proposed recommendation is to leave trail crossing at grade with similar or improved signalization alternatives. Currently the pedestrian crossing is equipped with rectangular rapid flash beacon (RRFB) and pavement markings to facilitate pedestrian/bicycle crossing and alert drivers of the pedestrian traffic. From the information provided there is no data indicating that pedestrian or bicycle accidents have occurred at this crossing. Keeping the bridge at grade will reduce the ROW impact to the adjoining residents.



ELEVATION
(BULLET RAIL AND POST NOT SHOWN FOR CLARITY)

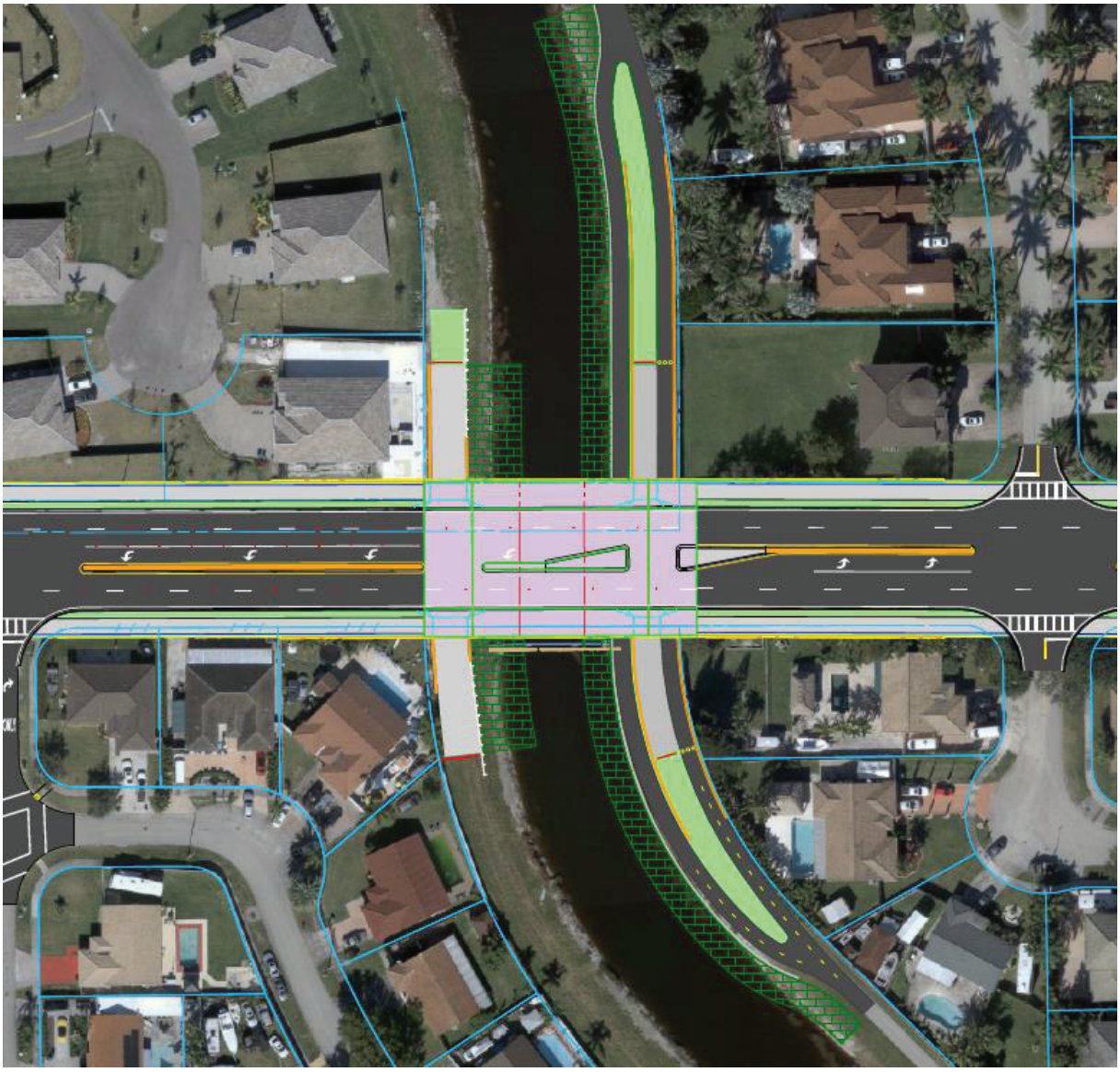
VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26

Baseline Figure 1



Baseline Figure 2

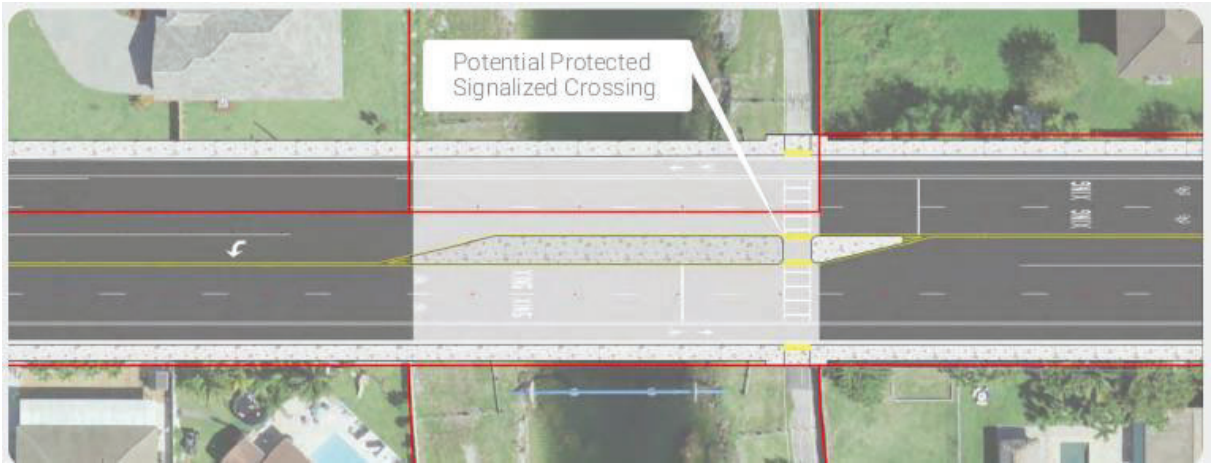
VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26



Baseline Figure 3

VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26

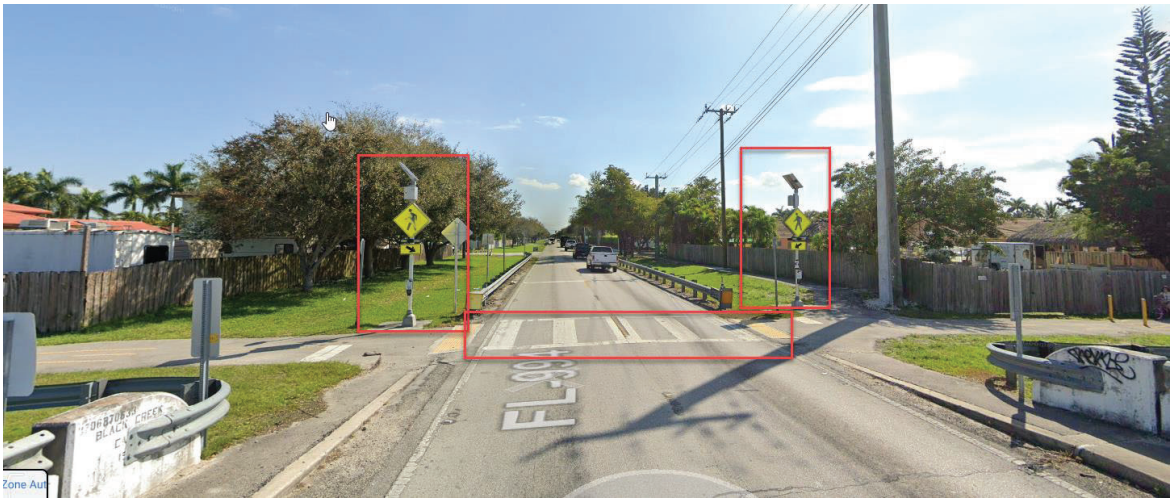
Baseline Figure 4



Recommended Concept Figure 1

Recommended Concept Figure 2

VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26



Recommended Concept Figure 3

Assumptions/Calculations

This recommendation assumes a one span bridge using FIB 36” at 8-ft spacing.

The length of the bridge is assumed to be like the existing bridge length 88-ft = 90’.

For the bridge width assume same as baseline bridge width = 100’.

Cost per linear feet of FIB 36” = $ 240

Minimum deck thickness is 8.”

Deck concrete class II cost per cubic yard = $750

New Bridge Cost =

(Round up 100’/8’) *90’*240 + (100’*90’*8”/12) / 27 * 750 = 280,800 + 166,667 = $447,467

Midblock crossing cost assumption: Use a 78-ft mast arm assembly ($80,000) plus pedestrian pedestals, cabinets, striping, and incidentals, assumed $150,000.

NW corner Mean width SQFT =1’9” * 250-ft length to intersection =250 SF

SW corner Mean width SQFT = 8-ft * 250-ft length to intersection =2000 SF

SE corner Mean width = 6’5” * 300-ft length to intersection =1920 SF

NE corner Mean width =11’7” *300-ft length to intersection =3480 SF

Total ROW saved = 7,650 SQFT * $25 = $191,250

VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
Bridge Baseline	SF	11038	$ 252	$ 2,781,576	0	$ 252	$ -
Bridge Recomendation FIB 36"	LF	0	$ 240	$ -	1,170	$ 240	$ 280,800
Bridge Recomendation Deck	CY	0	$ 750	$ -	222	$ 750	$ 166,667
Approach Slab Concrete	CY	222	$ 400	$ 88,800	222	$ 400	$ 88,800
Approach Slab Reinforcing	LB	44400	$ 1	$ 46,620	44400	$ 1	$ 46,620
Existing Bridge Demo	SF	3344	$ 60	$ 200,640	3344	$ 60	$ 200,640
East Side MSE Walls	SF	6600	$ 30	$ 198,000	0	$ 30	$ -
East Side MSE Walls	SF	2275	$ 30	$ 68,250	0	$ 30	$ -
Signalized Pedestrian Crossing, mast arm, cabinet, pedestrian pedestals, furnished & installed	AS	0	$ 150,000	$ -	1	$ 150,000	$ 150,000
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				*$ 3,383,886*			*$ 933,527*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ 1,038,176			$ 286,406
Total Construction				**$ 4,422,062**			**$ 1,219,933**
Utility Costs				$ -		$ -	$ -
Right of Way Costs	SF	7650.00	$ 25	$ 191,250.00	0	$ 25	$ -
TOTAL CAPITAL COST				***$ 4,613,312***			***$ 1,219,933***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ 3,393,380**

VE RECOMMENDATION NO. 10: ELIMINATE TRAIL UNDERPASS	Idea No(s). 2,3,26

VE RECOMMENDATION NO. 10	IDEA NO.		
Eliminate Trail Underpass			
PERFORMANCE MEASURES	Performance	Baseline	Recommendation
Attributes and Rating Rationale for Recommendation			
Main Line Operations	Rating	5	4
Introduces controlled conflict	Weight	26.1	
	Contribution	130.5	104
Local Operations	Rating	5	4.5
Removes free-flow pedestrian traffic	Weight	21.4	
	Contribution	107	96
Maintainability	Rating	5	7
Less walls Shorter structure	Weight	11.9	
	Contribution	59.5	83
Construction Impacts	Rating	5	8
Less intrusive to neighborhoods Reduces noise Reduces pile operations	Weight	7.1	
	Contribution	35.5	57
Environmental Impacts	Rating	5	8
Improves aesthetics External obsolescence Less intrusive to neighborhoods Reduces ROW impacts	Weight	19.0	
	Contribution	95	152
Project Schedule	Rating	5	8
Reduces pile operations Less embankment Reduces number of MSE walls	Weight	14.2	
	Contribution	71	114
	Total Performance	499	606
	Net Change in Performance		22%

VE RECOMMENDATION NO. 11: IMPLEMENT TSMO STRATEGIES	Idea No. 27

Baseline Concept

ITS components are being incorporated in the baseline design. However, it does not identify these components to be a part of a Traffic System Management and Operations plan.

Recommendation Concept

Use Traffic System Management and Operations (TSMO) strategies.

Advantages	Disadvantages
• Improves operations by adapting real-time traffic • Informs public of better/faster routes • Notifies public of delays • Provides platform for regional operations	• Slight cost increase for technology and maintenance • Requires coordination with County/City operator

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$0		$0
Recommendation Concept	$766,022		$766,022
Cost Avoidance/(Added Value)	($766,022)		($766,022)

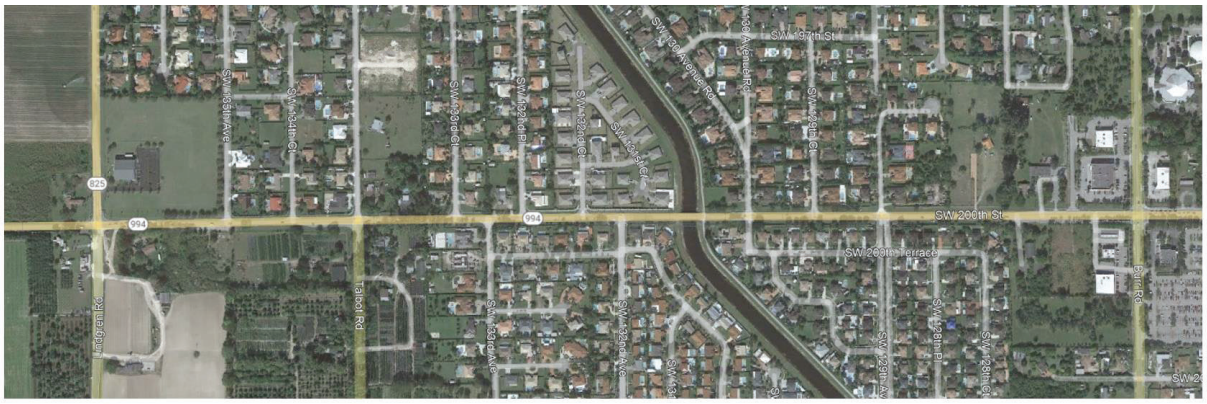
FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
✓	✓			

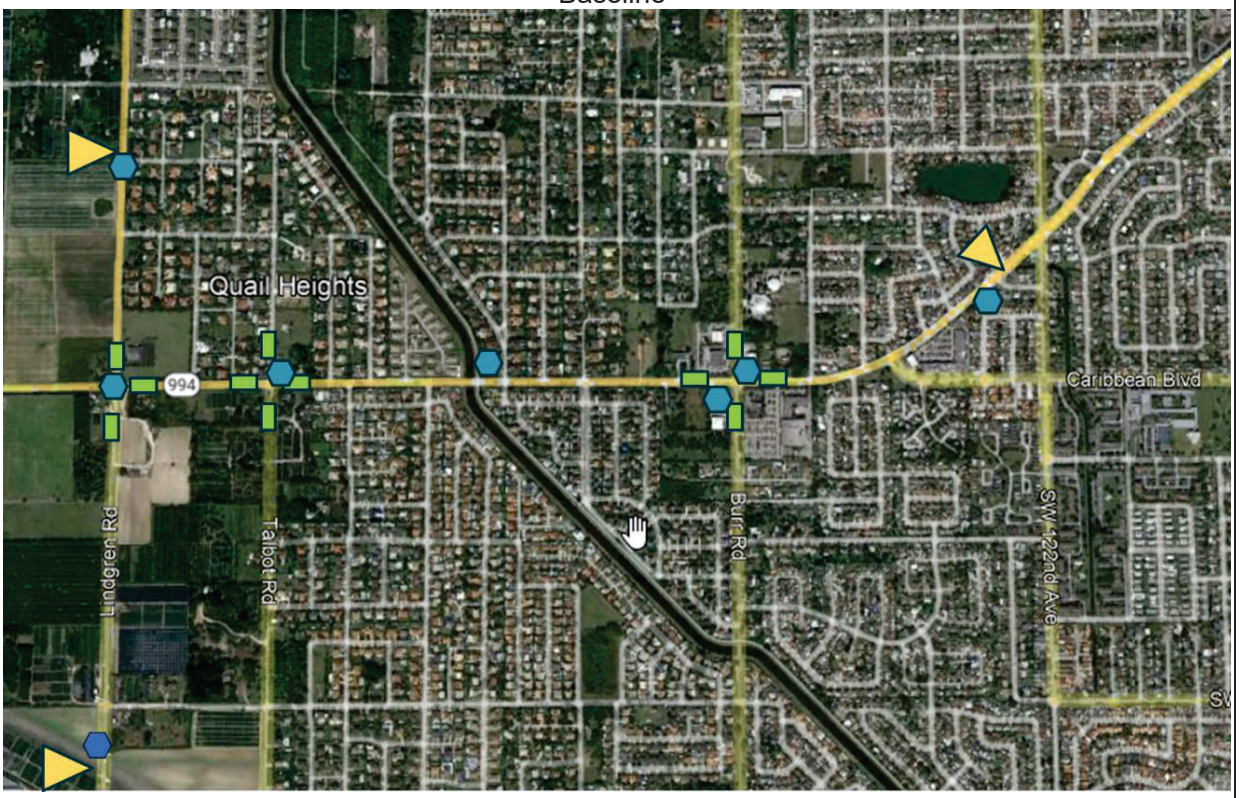
VE RECOMMENDATION NO. 11: IMPLEMENT TSMO STRATEGIES	Idea No. 27

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches



Baseline



Queue Loop Detector
Dynamic Message Sign (DMS)
Video Cameras

Recommended Concept

VE RECOMMENDATION NO. 11: IMPLEMENT TSMO STRATEGIES	Idea No. 27

The VE team recommends the installation and deployment of a single, centralized adaptive traffic control system (ATCS). To accomplish this, fiber optic cable communications to intersections that are not currently on fiber should also be installed, and Integrated Corridor Management (ICM) approach should be deployed into existing regional traffic operations and management. These strategies will manage traffic approaching the intersections and thus be able to improve operations along the entire corridor.

Adaptive Traffic Control Systems (ATCSs) adjusts traffic signal timing in real-time based on the current traffic conditions, volume/demand and system capacity. TSP, under the new ATCS, is an option to optimize bus operations, and would become a scalable module.

Signal timings and travel times for both transit and general traffic along the proposed corridor would be adjusted in real-time and optimized.

Assumptions/Calculations

Evaluate the 9 intersections/segments along the corridor to validate that they have Synchro Green Adaptive (SGA) technology and are in good condition and do not need to be upgraded. The estimate assumes replacing all 9.

The intersections/segments were as follows:

Signalized Intersections:

- SW 137th Avenue
- SW 127th Avenue
- SW 134th Avenue (Proposed)

Unsignalized Intersections:

- SW 133rd Avenue
- SW 132nd Place
- SW 132nd Avenue
- SW 130th Avenue
- SW 129th Avenue

The following intersections and segments are considered high crash locations and unsignalized, for which ITS components are recommended.

Intersection:

1. SW 134th Avenue (MP 4.30 to MP 4.36),
2. SW 132nd Avenue: (MP 4.58 to MP 4.59),

Segment

1. From SW 137th Avenue to east of SW 129th Avenue: (MP 4.075 to 4.961)

ITS Assets needed:

A. Field Equipment
   a. Inductive loop detectors

VE RECOMMENDATION NO. 11: IMPLEMENT TSMO STRATEGIES	Idea No. 27

Installed beneath the road surface to detect the presence of vehicles. These detectors generate an electromagnetic field and measure disturbances caused by passing vehicles, providing real-time traffic information such as vehicle presence, occupancy, and speed.

b. Video imaging
Video imaging systems employ cameras and computer vision algorithms to analyze live or recorded video footage of roadways. They can detect various traffic parameters, including vehicle count, speed, and lane occupancy. Additionally, video imaging systems are used for license plate recognition, incident detection, and surveillance purposes.

c. DMS boards communicate real-time information to users for improved decision options.

B. Communication

a. Wired communication
Wired communication infrastructure forms the backbone of an intelligent transport system. It includes fiber optic cables, Ethernet connections, and other wired networks that facilitate data transmission between various components of the system. Wired communication ensures high-speed and reliable data exchange.

b. Wireless communication
Wireless communication plays a vital role in ITS, enabling real-time connectivity between field devices, traffic management centers, and vehicles. Technologies such as cellular networks, Wi-Fi, and dedicated short-range communications (DSRC) allow for seamless data transmission and communication in both urban and remote areas.

C. Traffic management center

a. Basic facility
It includes workstations, servers, network infrastructure, and control systems necessary for system operation.

b. Incident detection
Transportation Management Centers (TMC) employ advanced algorithms and data analytics to detect traffic incidents such as accidents, congestion, or road hazards. Early detection enables prompt response, improving safety and minimizing the impact on traffic flow.

c. Incident response
Once an incident is detected, TMC facilitate quick and effective incident response. They coordinate emergency services, provide real-time information to drivers, and implement traffic diversions to ensure the safety of road users and minimize disruptions.

VE RECOMMENDATION NO. 11: IMPLEMENT TSMO STRATEGIES	Idea No. 27

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
Queue Loop Detector	EA	0	$381.52	$ -	19	$ 381.52	$ 7,249
Queue Loop Detector Assembly	EA	0	$1,529.65	$ -	19	$ 1,529.65	$ 29,063
UPS Power Supply	EA	0	$13,665.00	$ -	1	$ 13,665.00	$ 13,665
Dynamic Message Sign (DMS)	EA	0	$143,797.50	$ -	3	$ 143,797.50	$ 431,393
Video Cameras	EA	0	$8,881.50	$ -	8	$ 8,881.50	$ 71,052
Wired Communication	LS	0	$ 30,000.00	$ -	1	$ 30,000.00	$ 30,000
Wireless Communication	LS	0	$3,760.00	$ -	1	$ 3,760.00	$ 3,760
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				$ -			$ *586,182*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ -			$ 179,841
Total Construction				**$ -**			**$ 766,022**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ -***			***$ 766,022***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ (766,022)**

VE RECOMMENDATION NO. 11: IMPLEMENT TSMO STRATEGIES	Idea No. 27

VE RECOMMENDATION NO. 11 Implement TSMO Strategies	IDEA NO.		
PERFORMANCE MEASURES **Attributes and Rating Rationale for Recommendation**	**Performance**	**Baseline**	**Recommendation**
Main Line Operations Improve traffic operations Improve emergency operations Improves communications with drivers Traffic control adapts to demand	**Rating**	5	7
	Weight	26.1	
	Contribution	130.5	182.7
Local Operations Improves traffic operations Improves emergency operations	**Rating**	5	7
	Weight	21.4	
	Contribution	107	149.8
Maintainability Increases number of assets to maintain	**Rating**	5	4
	Weight	11.9	
	Contribution	59.5	47.6
Construction Impacts No change	**Rating**	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts No change	**Rating**	5	5
	Weight	19.0	
	Contribution	95	95
Project Schedule No change	**Rating**	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	582
	Net Change in Performance		17%

VE RECOMMENDATION NO. 12: REDUCE LIMITS OF PROJECTS ALONG SW 127TH,134TH, SW 137TH	Idea No. 29

Baseline Concept

The baseline concept shows extensive improvements along side streets that are maintained by Miami-Dade County. The roads are SW 137 Ave (1350-ft North of intersection, 1550-ft South of intersection), SW 134 Ave (700-ft South of intersection, 500-ft North of intersection) and SW 127 Ave (500-ft North of intersection, 850-ft South of intersection).

Recommendation Concept

Reduce the limits of the proposed baseline project along crossing roads and transfer the scope to Miami-Dade County . This includes reducing the limits of the project along SW 137th Ave, SW 134th Ave, and SW 127th Ave.

Advantages	Disadvantages
• Reduce costs • Reduce construction duration • Transfers some ROW to county for acquisition	• May not operate as desired

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$7,869,583		$7,869,583
Recommendation Concept	$7,344,869		$7,344,869
Cost Avoidance/ (Added Value)	$524,714		$524,714

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
			✓	✓

VE RECOMMENDATION NO. 12: REDUCE LIMITS OF PROJECTS ALONG SW 127TH,134TH, SW 137TH	Idea No. 29

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

Below is an excerpt of the FDOT Design Manual (FDM), section 210 Arterials and Collectors.

210.2.5 Lane Tapers

The minimum merging roadway transition length (L) is calculated as follows:

(1) Use $L = (W*S^2)/60$ for design speeds ≤ 40 mph

(2) Use $L = W*S$ for design speeds ≥ 45 mph

Where: L = length of taper, feet

W = width of lateral transition, feet

S = design speed, mph

Exhibit 210-1 through ***210-6*** illustrate standard roadway transitions. For conditions not addressed in these figures, use the following minimum taper lengths:

- Merging Taper = L
- Shifting Taper = L/2
- Shoulder Taper = L/3

Where an abrupt change in roadway typical (e.g., 4-lane section to a 6-lane section) a striped lane transition may be considered when all the following conditions are met:

- New pavement widths are not substantially greater than the joining pavement,
- Grade differentials are slight, and
- Future widening is expected.

The work on the side streets is needed to connect the project back to the existing configuration along 137th Ave, 134th Ave and 127th Ave. The section shown above from the FDOT Design Manual (FDM) was used to determine the appropriate taper length for the corridor. With:

$$L = \frac{W * S^2}{60}$$

W1= 11

W2 = (SW 137th Ave. ½ north side median) = 11.25-ft

W3 = (SW 137th Ave. ½ south side median) = 8.5-ft

S = 40 mph

The Final Taper lengths are:

L1= (Length of Taper to merge lane) = 295-ft

L2 = (Length of North side lane turn divided to undivided) = 300-ft

L3 = (Length of North side lane turn divided to undivided) = 227-ft

VE RECOMMENDATION NO. 12: REDUCE LIMITS OF PROJECTS ALONG SW 127TH,134TH, SW 137TH	Idea No. 29

With these numbers it was determined that the lengths needed to merge the roads on SW 137th Ave. on the North side are 295-ft + 300 = 595-ft and on the South side 295-ft + 227-ft = 522-ft

Using the numbers calculated above the VE team chose a realistic approximate start point for this merge on both sides of SW 137th Avenue. When measuring out it was determined that the tapers are longer than necessary: on the North side approximately 445-ft and on the South side 695'. The calculated lengths needed to tie in include 50-ft of roadway to match existing conditions on both ends. The VE team did not learn of reasons that the taper lengths were started further away or were longer, and by FDM Standards there is about 1140-ft of extra roadway being constructed on a road that has upcoming projects from the County.

Looking at SW 127th Ave. the taper lengths seem appropriate, although there is an observation about the introduction of the right turn lane being unusual. This is something that may need to be reviewed by the contractor.

At SW 134th Ave. the taper lengths appeared to be appropriate to tie into the existing roadway.

Assumptions/Calculations

Reduction							
North					L	445	ft
Asphalt	342.65	ton	Assume similar pavement design as mainline		W	36	ft
Stabilization	1780	sy	Assume 3 Lanes - Reconstruction				
OBG	1780	sy					
Curb E	1278	lf					
South					L	695	ft
Asphalt	535.15	ton			W	36	ft
Stabilization	2780	sy					
OBG	2780	sy					
Curb E	640	lf					

VE RECOMMENDATION NO. 12: REDUCE LIMITS OF PROJECTS ALONG SW 127TH,134TH, SW 137TH	Idea No. 29

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
Type B Stabilization	SY	94312.34	$ 9.24	$ 871,446	89752.3	$ 9.24	$ 829,312
Optional Base, Base Group 9	SY	61419.92	$ 37.25	$ 2,287,892	56859.9	$ 37.25	$ 2,118,032
Superpave SP	TON	9241.4	$ 143.06	$ 1,322,079	8739.6	$ 143.06	$ 1,250,291
Asphalt FC	TON	5842	$ 192.38	$ 1,123,863	5466	$ 192.38	$ 1,051,461
Curb and Gutter - Type Curb E	LF	17628.83	$ 23.64	$ 416,746	15710.8	$ 23.64	$ 371,404
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				*$ 6,022,025*			*$ 5,620,500*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ 1,847,557			$ 1,724,369
Total Construction				**$ 7,869,583**			**$ 7,344,869**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ 7,869,583***			***$ 7,344,869***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ 524,714**

VE RECOMMENDATION NO. 12: REDUCE LIMITS OF PROJECTS ALONG SW 127TH,134TH, SW 137TH	Idea No. 29

VE RECOMMENDATION NO. 12 Reduce Limits of Projects along SW 127th, SW 134th & SW 137th	IDEA NO.		
PERFORMANCE MEASURES Attributes and Rating Rationale for Recommendation	Performance	Baseline	Recommendation
Main Line Operations No change	Rating	5	5
	Weight	26.1	
	Contribution	130.5	130.5
Local Operations Reduces transition length to FDM requirements	Rating	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability No change	Rating	5	5
	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts No change	Rating	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts No change	Rating	5	5
	Weight	19.0	
	Contribution	95	95
Project Schedule No change	Rating	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	499
	Net Change in Performance		0%

VE RECOMMENDATION NO. 13: REDUCE BRIDGE WIDTH	Idea No. 34

Baseline Concept

The baseline concept shows a median on the bridge that varies from 4'-2" to 13'-10" and a 5'-2" buffer on both sides.

Recommendation Concept

The VE team recommends reducing the bridge width by constructing two (2) separate bridges, eastbound and westbound, in lieu of the 13'10" median and eliminating the 5'2" buffers on both sides.

Advantages	Disadvantages
• Reduce ROW • Reduce bridge costs • Reduce impervious area	• Introduce horizontal curves • Eliminate maintenance access

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$3,634,964		$3,634,964
Recommendation Concept	$2,924,305		$2,924,305
Cost Avoidance/ (Added Value)	$710,659		$710,659

FHWA Function Benefit

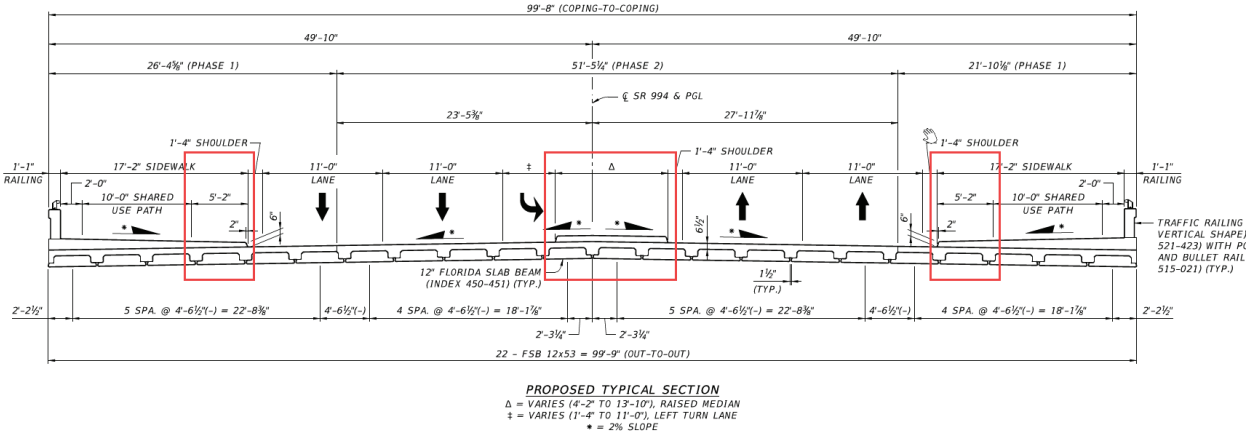
Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
	✓		✓	✓

VE RECOMMENDATION NO. 13: REDUCE BRIDGE WIDTH	Idea No. 34

Discussion/Sketches/Photos/Calculations

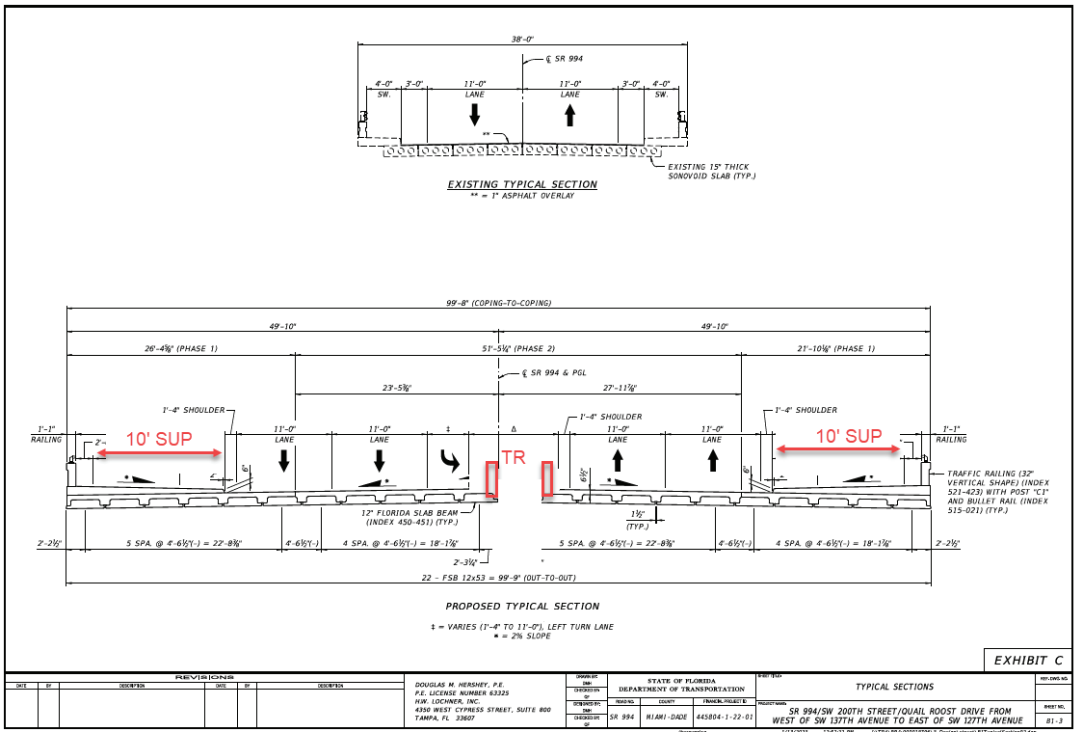
Technical Discussion/Sketches

The objective of this recommendation is to eliminate the 13'-10" median/traffic separator and the 5'-2" buffers from both sides. By building two separate bridges and removing the buffers the total area of the bridge portion will be reduced to about 8,880 sf (80-ft * 111') compared to the baseline design area 11,038 sf.



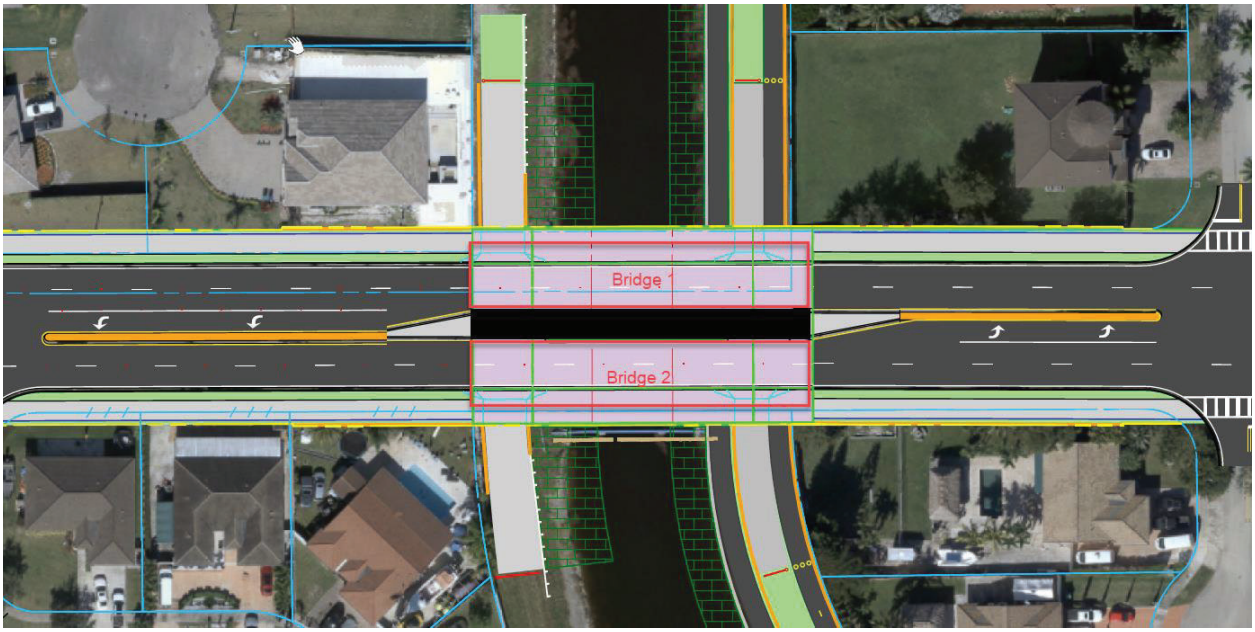
PROPOSED TYPICAL SECTION
Δ = VARIES (4'-2" TO 13'-10"), RAISED MEDIAN
‡ = VARIES (1'-4" TO 11'-0"), LEFT TURN LANE
* = 2% SLOPE

Baseline Figure 1



Recommended Concept Figure 1

VE RECOMMENDATION NO. 13: REDUCE BRIDGE WIDTH	Idea No. 34



Recommended Concept Figure 2

Splitting the bridge in two will help with constructability and may reduce construction duration.

Assumptions/Calculations

Assume ROW is donated by South Florida Water Management (SFWM)

Assumed 2 bridges with 40-ft width and 111-ft length

Area Bridge 1 = 40-ft * 111-ft =4440 sf

Area Bridge 2 = 40-ft * 111-ft =4440sf

Other costs related to designing and building two bridges not included

VE RECOMMENDATION NO. 13: REDUCE BRIDGE WIDTH	Idea No. 34

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
New Bridge Baseline	SF	11038	$ 252	$ 2,781,576		$ 252	$ -
Recommendation Bridge 1	SF	0	$ 252	$ -	4,440	$ 252	$ 1,118,880
Recommendation Bridge 2	SF	0	$ 252	$ -	4,440	$ 252	$ 1,118,880
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				*$ 2,781,576*			*$ 2,237,760*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ 853,388			$ 686,545
Total Construction				**$ 3,634,964**			**$ 2,924,305**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ 3,634,964***			***$ 2,924,305***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ 710,659**

VE RECOMMENDATION NO. 13: REDUCE BRIDGE WIDTH	Idea No. 34

VE RECOMMENDATION NO. 13 Reduce Bridge Width	IDEA NO.		
PERFORMANCE MEASURES Attributes and Rating Rationale for Recommendation	Performance	Baseline	Recommendation
Main Line Operations No change	Rating	5	5
	Weight	26.1	
	Contribution	130.5	130.5
Local Operations No change	Rating	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability No change	Rating	5	5
	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts No change	Rating	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts Less impervious Less ROW requirement	Rating	5	6
	Weight	19.0	
	Contribution	95	114
Project Schedule No change	Rating	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	518
	Net Change in Performance		4%

VE RECOMMENDATION NO. 14: INSTALL ITS INFRASTRUCTURE PRIOR TO CONSTRUCTION	Idea No. 44

Baseline Concept

It is assumed that there is no ITS planned during the construction phase of this project.

Recommendation Concept

Install ITS infrastructure prior to construction to monitor work zones during construction.

Advantages	Disadvantages
• Improves MOT during construction • Improves emergency response during construction • Improves public perception during construction by providing real-time travel information • Actively manages traffic and events (such as lane closure, crashes, etc.) • Creates safer work zones for both highway construction workers and motorists	• Some rework may be necessary • Operation and maintenance cost • Additional coordination with outside agencies

Cost Summary	Construction	Right-of-way	Total
Baseline Concept	$0		$0
Recommendation Concept	$278,871		$278,871
Cost Avoidance/ (Added Value)	($278,871)		($278,871)

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
✓			✓	

VE RECOMMENDATION NO. 14: INSTALL ITS INFRASTRUCTURE PRIOR TO CONSTRUCTION	Idea No. 44

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The objective of this recommendation is the installation of ITS devices to collect real-time traffic and roadway conditions data, provide real-time traveler information to motorists in a visual format in advance of and within construction work zone zones, provide real-time alerts concerning traffic and roadway conditions to project stakeholders, enable stakeholders the ability to access real-time traffic and roadway conditions data, and coordinate deployment with general construction contractors for seamless MOT strategies within construction work zones.

Real-time traffic and roadway conditions data will be collected throughout the construction work zone limits, utilizing a variety of ITS equipment. Data collection-capable devices will be deployed at regular intervals to collect all pertinent traffic data and provide end-to-end coverage for the current construction limits. Devices proposed for data collection may include:

CCTV cameras are used to determine the details of traffic events along monitored arterial corridors. In addition, they are useful tools for detecting and verifying incidents and damage to the roadway infrastructure.

Recommended Concept Figure 1

Bluetooth receivers are capable of determining information about real-time traffic conditions, including average travel time and travel speed, as well as planning level information, such as origin-destination.

Recommended Concept Figure 2

VE RECOMMENDATION NO. 14: INSTALL ITS INFRASTRUCTURE PRIOR TO CONSTRUCTION	Idea No. 44

Microwave vehicle detection system (MVDS) is a technology subsystem utilized to collect raw traffic conditions data, including vehicle presence, travel speed, volume, lane occupancy, and more.

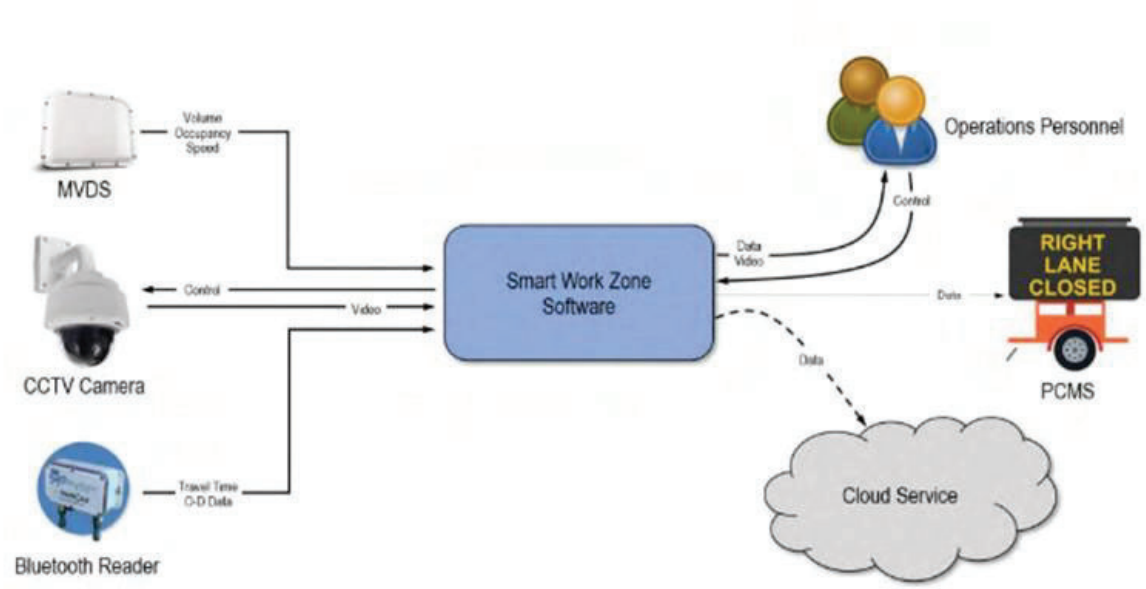
Recommended Concept Figure 3

To alert the roadway users about traffic conditions within the work zone, the use of Portable Changeable Message Signe (PCMS) is proposed. The PCMS is a traffic control device capable of displaying a variety of messages to inform motorists of upcoming driving conditions.

Recommended Concept Figure 4

VE RECOMMENDATION NO. 14: INSTALL ITS INFRASTRUCTURE PRIOR TO CONSTRUCTION	Idea No. 44

The use of these technologies during the construction phase will determine real-time traffic conditions and relay pertinent information to motorists in advance of and within the work zone limits. Raw traffic condition data (volume, lane occupancy, and speed) will be collected using vehicle detection systems and provided to the software for processing. The software will analyze the date and determine the information to be disseminated to the travelling public via PCMS. Operational staff will be provided the ability to monitor traffic and roadway conditions in real-time using CCTV cameras.



- Queue Detection and Warning:

  Provide ability to identify anomalies in traffic patterns (queues) and communicate to the travelling public in advance of the work zone limits and alert the drivers of these anomalies and reduce incoming speeds.

- Advanced Incident Warning:

  Identify roadway events (crashes, debris on roadway, stalled vehicle) and notify motorists ahead of the incident utilizing information displayed on PCMS. Operational staff will use CCTV cameras to verify incidents prior to enacting the appropriate response (notifying emergency responders, updating PCMS, and coordinating with local stakeholders).

- Advanced Detour Routing Information:

  Provide upstream notification of detours prior to entering the work zone. This information will offer motorists the opportunity to select alternative routes and/or prepare for the approaching detour accordingly.

Assumptions/Calculations

- Similar efforts have been done within D6 and have positive results.
- Existing video detection cameras at SW 127 Ave will be used. Only the Bluetooth devices and the Microwave Vehicle Detection Systems will be installed at this location.
- If the Districts elects to use TSMO strategies in the base cost, the cost of this recommendation should be eliminated.

VE RECOMMENDATION NO. 14: INSTALL ITS INFRASTRUCTURE PRIOR TO CONSTRUCTION

Idea No. 44

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
VEHICLE DETECTION SYSTEM- VIDEO, FURNISH & INSTALL CABINET EQUIPMENT	EA		$5,758	$ -	1	$ 5,758	$ 5,758
VEHICLE DETECTION SYSTEM- VIDEO, FURNISH & INSTALL ABOVE GROUND	EA		$3,826	$ -	4	$ 3,826	$ 15,305
SIGNAL CABLE- REPAIR/REPLACE/OTHER, FURNISH & INSTALL	LF		$12	$ -	250	$ 12	$ 3,015
CONDUIT, FURNISH & INSTALL, DIRECTIONAL BOR	LF		$34	$ -	200	$ 34	$ 6,728
PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA		$1,125	$ -	4	$ 1,125	$ 4,498
PORTABLE CHANGEABLE MESSAGE SIGN, TEMPORARY	ED		$11	$ -	250	$ 11	$ 2,660
VEHICLE DETECTION SYSTEM- MICROWAVE, FURNISH & INSTALL CABINET EQUIPMENT	EA		$10,793	$ -	2	$ 10,793	$ 21,586
VEHICLE DETECTION SYSTEM- MICROWAVE, FURNISH & INSTALL, ABOVE GROUND EQUIPMENT	EA		$15,023	$ -	8	$ 15,023	$ 120,180
BLUETOOTH DATA COLLECTION DEVICES	EA		$4,209	$ -	8	$ 4,209	$ 33,670
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				$ -			*$ 213,400*
Mark-Up (MOT, Mob., PE, CEI)	31%			$ -			$ 65,471
Total Construction				**$ -**			**$ 278,871**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ -***			***$ 278,871***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ (278,871)**

VE RECOMMENDATION NO. 14: INSTALL ITS INFRASTRUCTURE PRIOR TO CONSTRUCTION

Idea No. 44

VE RECOMMENDATION NO. 14 Install ITS Infrastructure Prior to Construction	IDEA NO.		
PERFORMANCE MEASURES Attributes and Rating Rationale for Recommendation	Performance	Baseline	Recommendation
Main Line Operations No change	Rating	5	5
	Weight	26.1	
	Contribution	130.5	130.5
Local Operations No change	Rating	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability No change	Rating	5	5
	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts Improves mobility during construction Improves accident response times Improves communications with drivers in a crash event	Rating	5	7
	Weight	7.1	
	Contribution	35.5	49.7
Environmental Impacts No change	Rating	5	5
	Weight	19.0	
	Contribution	95	95
Project Schedule No change	Rating	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	513
	Net Change in Performance		3%

VE RECOMMENDATION NO. 15: REMOVE 196TH STREET CONNECTOR	Idea No. 50

Baseline Concept

Provide 196th Street connector between SW 134th Ave to SW 133 Court

Remove SW 196th Ave Connector

Remove 196th Street connector from project

Advantages	Disadvantages
• Reduces costs • Reduces construction duration • Reduces ROW costs	• County opposition • Reduces access to local roads (not Quail)

Cost Summary	Construction	Right-of-way	Total Cost
Baseline Concept	$177,812		$177,812
Recommendation Concept	$0		$0
Cost Avoidance/ (Added Value)	$177,812		$177,812

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
			✓	

VE RECOMMENDATION NO. 15: REMOVE 196TH STREET CONNECTOR	Idea No. 50

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The VE team discussed the need to whether add a county road into this State project is warranted and determined it was unnecessary. This proposed 196th Street connector is not mentioned in the Preliminary Engineering Report (PER) and only found in Appendix Q-Preferred Alternative Concept Plans PDF. There are no commitments in the PER related to the 196th Street connector. The VE identified a reduction in construction cost if the 196th Street connector was removed from the SR 994/Quail Roost project.

Baseline Concept

Recommended Concept

VE RECOMMENDATION NO. 15: REMOVE 196TH STREET CONNECTOR	Idea No. 50

Assumptions/Calculations

22-ft wide roadway x 483-ft roadway length = 10,867.5 SY (22'*483'=10,626 SF, 1181 SY)

Asphalt FC 1.5-ft = 99.62 TN

Asphalt SP 2.0-ft = 132.82 TN

VE Study Cost Calculations

SR 994 / SW 200thSt / Quail Roost Drive Project

		Baseline Concept			VE Recommended Concept		
Component	**Unit**	**Qty**	**Cost/Unit**	**Total**	**Qty**	**Cost/Unit**	**Total**
TYPE B STABILIZATION	SY	3542	$ 9.24	$ 32,728	0	$ 9.24	$ -
OPTIONAL BASE,BASE GROUP 01	SY	3542	$ 18.40	$ 65,173	0	$ 18.40	$ -
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TON	133	$ 143.06	$ 19,001	0	$ 143.06	$ -
ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	TON	100	$ 192.38	$ 19,165		$ 192.38	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
				$ -		$ -	$ -
Subtotal Construction				*$ 136,067*			$ -
Mark-Up (MOT, Mob., PE, CEI)	31%			$ 41,745			$ -
Total Construction				**$ 177,812**			**$ -**
Utility Costs				$ -		$ -	$ -
Right of Way Costs				$ -		$ -	$ -
TOTAL CAPITAL COST				***$ 177,812***			***$ -***
COST CAPITAL SAVINGS / (VALUE ADDED)							**$ 177,812**

VE RECOMMENDATION NO. 15: REMOVE 196TH STREET CONNECTOR	Idea No. 50

VE RECOMMENDATION NO. 15 Remove 196th St Connector Improvements	IDEA NO.		
PERFORMANCE MEASURES **Attributes and Rating Rationale for Recommendation**	**Performance**	**Baseline**	**Recommendation**
Main Line Operations No change	**Rating**	5	5
	Weight	26.1	
	Contribution	130.5	130.5
Local Operations Removing scope of work that shouldn't have been included No change overall	**Rating**	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability No new road to maintain	**Rating**	5	6
	Weight	11.9	
	Contribution	59.5	71.4
Construction Impacts Eliminates construction impacts in that street	**Rating**	5	6
	Weight	7.1	
	Contribution	35.5	42.6
Environmental Impacts Eliminates impervious in that street/area	**Rating**	5	6
	Weight	19.0	
	Contribution	95	114
Project Schedule Reduce permits requirements Reduce construction duration (not in critical path)	**Rating**	5	5.25
	Weight	14.2	
	Contribution	71	74.6
	Total Performance	499	540
	Net Change in Performance		8%

VE RECOMMENDATION NO. 16: SEEK ROW COST REIMBURSEMENT OF COUNTY ENCROACHMENTS TO PRIVATE OWNERS	Idea No. 26

Baseline Concept

The baseline concept shows the purchase of land along 134th Ave, south of Quail Roost, to normalize an encroachment by the County onto private owners.

Recommendation Concept

Seek reimbursement from County of cost of land to normalize the encroachment.

Advantages	Disadvantages
• Reduces cost of ROW • Normalizes property encroachment • Allocates cost to County	• Requires funds transfer • Requires Local Funding Agreement (LFA)

Cost Summary	Construction	Right-of-way	Total
Baseline Concept		$330,000	$330,000
Recommendation Concept		$0	$0
Cost Avoidance/(Added Value)		$330,000	$330,000

FHWA Function Benefit

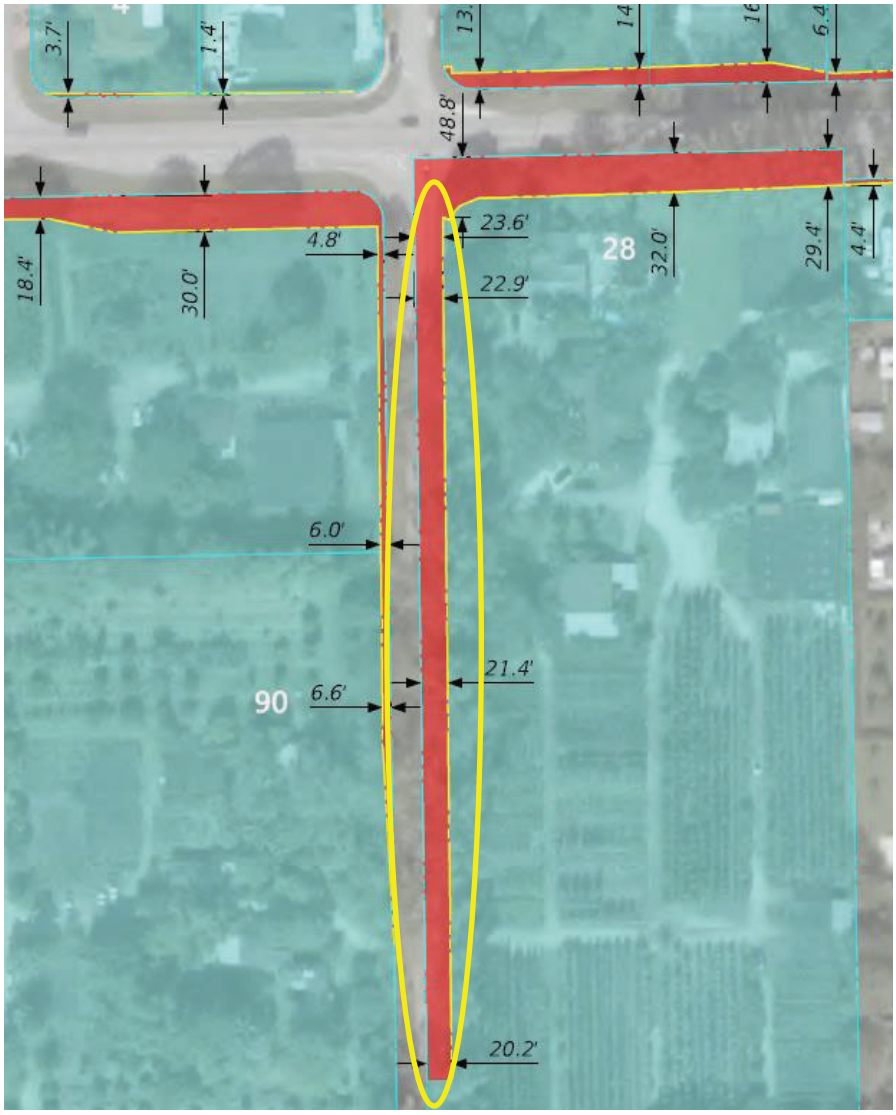
Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
				✓

VE RECOMMENDATION NO. 16: SEEK ROW COST REIMBURSEMENT OF COUNTY ENCROACHMENTS TO PRIVATE OWNERS	Idea No. 26

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The baseline design shows the normalization of County's encroachment to private owners along the east side of 134th Ave, south of Quail Roost. Below the affected area is circled in yellow.



Recommend Concept Figure 1

Assumptions/ Calculations

The properties encroached sum a total of 600-ft long by an average of 22-ft wide = 13,200 SF, at unit cost of $25/SF = $330,000.

VE RECOMMENDATION NO. 16: SEEK ROW COST REIMBURSEMENT OF COUNTY ENCROACHMENTS TO PRIVATE OWNERS	Idea No. 26

Seek ROW Cost Reimbursement along SW 134th South of Quail Roost			
PERFORMANCE MEASURES Attributes and Rating Rationale for Recommendation	Performance	Baseline	Recommendation
Main Line Operations No change	Rating	5	5
	Weight	26.1	
	Contribution	130.5	130.5
Local Operations No change	Rating	5	5
	Weight	21.4	
	Contribution	107	107
Maintainability No change	Rating	5	5
	Weight	11.9	
	Contribution	59.5	59.5
Construction Impacts No change	Rating	5	5
	Weight	7.1	
	Contribution	35.5	35.5
Environmental Impacts No change	Rating	5	5
	Weight	19.0	
	Contribution	95	95
Project Schedule No change	Rating	5	5
	Weight	14.2	
	Contribution	71	71
	Total Performance	499	499
	Net Change in Performance		0%

Performance Assessment

As the VE team developed recommendations, the performance of each was compared to the baseline for potential value improvement. For this exercise, the baseline was given a score of 5. Table 10 shows the criteria used to evaluate the performance of the alternative concepts relative to the baseline concept.

Table 10. Performance Attribute Rating Scale

Rating	Performance Attribute Scales
10	Alternative concept is extremely preferred
9	Alternative concept is very strongly preferred
8	Alternative concept is strongly preferred
7	Alternative concept is moderately preferred
6	Alternative concept is slightly preferred
5	***Concepts are equally preferred***
4	Baseline concept is slightly preferred
3	Baseline concept is moderately preferred
2	Baseline concept is strongly preferred
1	Baseline concept is very strongly preferred
0	Baseline concept is extremely preferred

Performance Rating

The performance matrix (Table 11) permits the comparison of various recommendations against the baseline concept by organizing the data developed for the performance attributes into a matrix format to yield value indices.

The matrix is essential for understanding the performance and value of the baseline and VE concepts. Comparing the performance suggest which recommendations are potentially as good as, or better than, the baseline concept, in terms of overall value. Comparison at the value index level suggest which recommendations have the best functionality or provides the project with the best value.

The performance rating and rationale for each alternative generated by the VE team is located on the individual recommendation forms in Section 7.

Table 11. Performance Matrix

Attribute	Attribute Weight	Concept	Performance Rating	Total Performance
Main Line Operations	26.1	Baseline	5	130.5
		1	5	130.5
		2	5	130.5
		3	4	104.4
		4	7	182.7
		5	7	182.7
		6	8	208.8
		7	4.5	117.5
		8	5	130.5
		9	7.5	195.8
		10	4	104.4
		11	7	182.7
		12	5	130.5
		13	5	130.5
		14	5	130.5
		15	5	130.5
		16	5	130.5
Local Operations	21.4	Baseline	5	107.0
		1	5	107.0
		2	5	107.0
		3	5	107.0
		4	5	107.0
		5	5	107.0
		6	5	107.0
		7	5	107.0
		8	4	85.6
		9	8	171.2
		10	4.5	96.3
		11	7	149.8
		12	5	107.0
		13	5	107.0
		14	5	107.0
		15	5	107.0

Table 11. Performance Matrix

Attribute	Attribute Weight	Concept	Performance Rating	Total Performance
		16	5	107.0
Maintainability	11.9	Baseline	5	59.5
		1	6	71.4
		2	5	59.5
		3	6	71.4
		4	5	59.5
		5	5	59.5
		6	5	59.5
		7	5	59.5
		8	6	71.4
		9	4	47.6
		10	7	83.3
		11	4	47.6
		12	5	59.5
		13	5	59.5
		14	5	59.5
		15	6	71.4
		16	5	59.5
Construction Impacts	7.1	Baseline	5	35.5
		1	5	35.5
		2	5	35.5
		3	5	35.5
		4	5	35.5
		5	5	35.5
		6	5	35.5
		7	5	35.5
		8	5	35.5
		9	5	35.5
		10	8	56.8
		11	5	35.5
		12	5	35.5
		13	5	35.5
		14	7	49.7

Table 11. Performance Matrix

Attribute	Attribute Weight	Concept	Performance Rating	Total Performance
		15	6	42.6
		16	5	35.5
Environmental Impacts	19.0	Baseline	5	95.0
		1	6	114.0
		2	5	95.0
		3	7	133.0
		4	5	95.0
		5	5	95.0
		6	5	95.0
		7	6	114.0
		8	6	114.0
		9	5	95.0
		10	8	152.0
		11	5	95.0
		12	5	95.0
		13	6	114.0
		14	5	95.0
		15	6	114.0
		16	5	95.0
Project Schedule	14.2	Baseline	5	71.0
		1	5	71.0
		2	5	71.0
		3	5	71.0
		4	5	71.0
		5	5	71.0
		6	5	71.0
		7	5	71.0
		8	5	71.0
		9	5	71.0
		10	8	113.6
		11	5	71.0
		12	5	71.0
		13	5	71.0

Table 11. Performance Matrix

Attribute	Attribute Weight	Concept	Performance Rating	Total Performance
		14	5	71.0
		15	5.25	74.6
		16	5	71.0

Compare Value

Understanding the relationship of cost, performance, and value of the project baseline and VE concepts is essential in evaluating VE recommendations. Comparing the performance and cost suggests which recommendations are potentially as good as or better than the project baseline concept in terms of overall value.

Table 12. Value Index

	Recommendations	Performance (P)	% Change Performance	Cost (C) $ millions	Cost Change $ millions	% Change Cost	Value Index	% Value Improvement
	Baseline	499	---	$37.7	---	---	13.22	---
1	Develop Alternative Drainage Solution	529	+6.2%	$36.7	($1.00)	-2.7%	14.42	+9%
2	Identify County & FDOT Property for Staging and Drainage Purposes	499	0.0%	$37.7	$0.00	0.0%	13.22	0%
3	Modify Median Design	522	+4.8%	$37.3	($0.44)	-1.2%	14.02	+6%
4	Use Preemption Technology	551	+10.5%	$37.9	$0.22	+0.6%	14.52	+10%
5	Modify Median Access	551	+10.5%	$37.7	$0.04	+0.1%	14.59	+10%
6	Modify SFWMD Canal Access	577	+15.7%	$37.7	$0.00	0.0%	15.30	+16%
7	Remove Buffer along Bridge	505	+1.2%	$37.4	($0.33)	-0.9%	13.50	+2%
8	Modify Pedestrian & Bicyclist Accommodations	508	+1.9%	$36.8	($0.88)	-2.3%	13.80	+4%
9	Advance Safety Improvements at Critical Locations	616	+23.6%	$42.2	$4.45	+11.8%	14.62	+11%
10	Eliminate Trail Underpass	606	+21.6%	$34.3	($3.39)	-9.0%	17.67	+34%
11	Implement TSMO Strategies	582	+16.7%	$38.5	$0.77	+2.0%	15.12	+14%
12	Reduce Limits of Projects along SW 127th, SW 134th & SW 137th	499	0.0%	$37.2	($0.52)	-1.4%	13.41	+1%
13	Reduce Bridge Width	518	+3.8%	$37.0	($0.71)	-1.9%	13.99	+6%
14	Install ITS Infrastructure Prior to Construction	513	+2.8%	$38.0	$0.28	+0.7%	13.50	+2%

Table 12. Value Index

Recommendations		Performance (P)	% Change Performance	Cost (C) $ millions	Cost Change $ millions	% Change Cost	Value Index	% Value Improvement
15	Remove 196th St Connector Improvements	540	+8.3%	$37.5	($0.18)	-0.5%	14.39	+9%
16	Seek ROW Cost Reimbursement of County Encroachments to Private Owners	499	0.0%	$37.4	($0.33)	-0.9%	13.34	+1%

Design Considerations

The VE team generated the following design suggestions for the project design team's consideration. These items represent ideas that are general in nature and are listed below in Table 13. Additional details can be found in the evaluation form in Section 6.

Table 13. Design Considerations

Idea No.	Description
6	Install solar operated signals - (beacons, pedestrian signals, signal heads)
10	Shorten left turn queue length to remove it from structure
38	Recycle bridge materials for riprap
39	Reuse asphalt for shoulder areas and other projects
41	Use incentives / disincentives for early construction
42	Adjust design schedule to accelerate allowable ROW activities before 60% design milestone and reduce duration from 36 Mo to 24 Mo
45	Re-run the noise wall benefit cost analysis to include updated prices
49	Add continuous lighting through the corridor ((LED) cobra-head luminaires mounted on conventional aluminum light poles) (not currently in drawings but included in cost estimate)

Design Validations

Several ideas the VE team initially brought forward as recommendations were dropped from consideration after it was determined the baseline design was more economical and feasible. These write-up justifications can be found in Appendix E.

Appendix A. Value Methodology Process

Value Methodology is a systematic process using a multidisciplinary team to improve the value of a project through the analysis of its functions. This process incorporates, to the extent possible, the values of design, construction, maintenance, contractor, state, local, and federal approval agencies, other stakeholders, and the public.

The primary objective of a Value Engineering (VE) study is value improvement. Value improvements might relate to scope definition, functional design, constructability, coordination (both internal and external), or the schedule for project development. Other possible value improvements are reduced environmental impacts, reduced public (traffic) inconvenience, or reduced project cost.

The VE team employed the eight-phase Value Methodology in analyzing the project. This process is recommended by SAVE International® and is composed of the following phases:

Pre-VE Study

Preparation Phase – Prior to the start of a VE study, the Project Manager, and the VE facilitator carry out the following activities:

- Initiate study – Identify study project and define study goals
- Organize study – Conduct pre-VE study meeting and select team members
- Prepare data – Collect and distribute data and prepare cost models.

All the information gathered prior to the VE study is given to the team members for their use.

Workshop Phases

Information – The team reviews and defines the current conditions of the project and identifies the goals of the study.

Function Analysis – The team defines the project functions using a two-word active verb/ measurable noun context. The team reviews and analyzes these functions to determine which need improvement, elimination, or creation to meet the project's goals.

Creativity – The team employs creative techniques to identify other ways to perform the project's function(s).

Evaluation – The team follows a structured evaluation process to select those ideas that offer the potential for value improvement while delivering the project's function(s) and considering performance requirements and resource limits.

Development – The team develops the selected ideas into alternatives (or proposals) with a sufficient level of documentation to allow decision makers to determine if the alternative should be implemented.

Presentation – The VE facilitator develops a report and/or presentation that documents and conveys the adequacy of the alternative(s) developed by the team and the associated value improvement opportunity.

Post-Study

Implementation Phase – The project team is then charged with reviewing the report and may hold a Disposition Meeting with management and other stakeholders, to determine which recommendations will be implemented in the design. The project team then tracks their implementation into the plans.

Performance-Based Value Engineering

The following is a general discussion and overview of the Performance-Based VE process. Ideas that have been introduced and warrant further consideration, will be documented with their advantages and disadvantages; each idea will then be carefully evaluated against project-specific attributes.

Performance measures an integral part of the VE process. It provides the cornerstone of the VE process by giving a systematic and structured way of considering the relationship of a project's performance and cost as they relate to value. Project performance must be properly defined and agreed on by the stakeholders at the beginning of the VE study. The performance attributes and requirements that are developed are then used throughout the study to identify, evaluate, and document alternatives.

Introduction

Value engineering has traditionally been perceived as an effective means for reducing project costs. This paradigm only addresses one part of the value equation, oftentimes at the expense of overlooking the role that VE can play related to improving project performance. Project costs are relatively easy to quantify and compare through traditional estimating techniques. Performance is not so easily quantifiable.

The VE facilitator will lead the team and external stakeholders through the methodology, using the power of the process to distill subjective thought into an objective language that everyone can relate to and understand. The dialogue that develops forms the basis for the VE teams understanding of the performance requirements of the project and to what degree the current design concept is meeting those requirements. From this baseline, the VE team can focus on developing alternative concepts that will quantify both performance and cost and contribute to overall project value.

Performance-based VE yields the following benefits:

- Builds consensus among project stakeholders (especially those holding conflicting views)
- Develops a better understanding of a project's goals and objectives
- Develops a baseline understanding of how the project is meeting performance goals and objectives
- Identifies areas where project performance can be improved through the VE process
- Develops a better understanding of a VE alternative's effect on project performance
- Develops an understanding of the relationship between performance and cost in determining value
- Uses value as the true measurement for the basis of selecting the right project or design concept
- Provides decision-makers with a means of comparing costs and performance (i.e., costs vs. benefits) in a way that can assist them in making better decisions.

Methodology

The application of Performance-based VE consists of the following steps:

1. Identify key project (scope and delivery) performance attributes and requirements for the project.
1. Establish the hierarchy and impact of these attributes on the project.
2. Establish the baseline of the current project performance by evaluating and rating the effectiveness of the current design concepts.
3. Identify the change in performance of alternative project concepts generated by the study.
4. Measure the aggregate effect of alternative concepts relative to the baseline project's performance as a measure of overall value improvement.

The primary goal of value engineering is to improve the value of the project. A simple way to think of value in terms of an equation is as follows:

$$Value = \frac{Performanœ}{Cost}$$

Assumptions

Before embarking on the details of this methodology, some assumptions need to be identified. The methodology described in the following steps assumes the project functions are well established. Project functions are defined as what the project delivers to its users and stakeholders; a good reference for the project functions can be found in the environmental document's purpose and need statement. Project functions are generally well defined prior to the start of the VE study. If project functions have been substantially modified, the methodology must begin anew (Step 1).

Step 1 – Determine the Major Performance Attributes

Performance attributes can generally be divided between project scope components (highway operations, environmental impacts, and system preservation) and project delivery components. It is important to make a distinction between performance *attributes* and performance *requirements*. Performance requirements are mandatory and binary in nature. All performance requirements MUST be met by any VE alternative concept being considered. Performance attributes possess a range of acceptable levels of performance. For example, if the project was the design and construction of a new bridge, a performance requirement might be that the bridge meets all current seismic design criteria. In contrast, a performance attribute might be project schedule, which means that a wide range of alternatives could be acceptable that had different durations.

The VE facilitator will initially request representatives from project team and external stakeholders identify performance attributes that they feel are essential to meeting the overall need and purpose of the project. Usually, four to seven attributes are selected. It is important that all potential attributes be thoroughly discussed. The information that comes out of this discussion will be valuable to both the VE team and the project owner. It is important that each attribute be discretely defined and be quantifiable in some form. Most performance attributes that typically appear in transportation VE studies have been standardized. This standardized list can be used "as is" or adopted with minor adjustments as required.

Typical standardized project performance attributes are shown below. Specific definitions of each attribute can be found below.

- Main Line Operations
- Local Operations
- Maintainability
- Construction Impacts
- Environmental Impacts
- Project Schedule

PERFORMANCE ATTRIBUTE AND DEFINITIONS	
Performance Attribute	**Description of Attribute**
Main Line Operations	An assessment of traffic operations and safety on the main line. Operational considerations include level of service relative to the 20-year traffic projections as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane widths; bicycle and pedestrian operations and access, including shared use path.
Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity, and maintainability of pavements, structures, and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust, and construction traffic. Temporary environmental impacts related to water quality, air quality, soil erosion, and local flora and fauna.
Environmental Impacts	An assessment of the permanent impacts to the environment, including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.
Project Schedule	An assessment of the total project delivery as measured from the time of the VE study to completion of construction.

Step 2 – Determine the Relative Importance of the Attributes

Once the group has agreed on the project's performance attributes, the next step is to determine their relative importance in relation to each other. This is accomplished using an evaluative tool termed in this report as the "Performance Attribute Matrix." This matrix compares the performance attributes in pairs, asking the question: "An improvement in which attribute will provide the greatest benefit to the project relative to purpose and need?"

A letter code (e.g., "A") is entered into the matrix for each pair, identifying which of the two is more important. If a pair of attributes is of essentially equal importance, both letters (e.g., "A/B") are entered into the appropriate box. This, however, should be discouraged, as it has been found that in practice a tie usually indicates that the pairs have not been adequately discussed. When all pairs have been discussed, the number of "votes" for each is tallied and percentages (which will be used as weighted multipliers later in the process) are calculated. It is not uncommon for one attribute to not receive any "votes." If this occurs, the attribute is given a token "vote," as it made the list in the first place and should be given some degree of importance.

An example of this exercise is shown below.

PERFORMANCE ATTRIBUTE MATRIX

[Project Name]

Which attribute is more important to the project?						**TOTAL**	**%**
Main Line Operations	A	B	A	A	A	5.0	**23.8%**
Local Operations		B	B	B	B/F	5.5	**26.2%**
Maintainability			C	E	F	2.0	9.5%
Construction Impacts				D	E	D/F	1.5	7.1%
Environmental Impacts					E	E	4.0	19.0%
Project Schedule						F	3.0	14.3%
						Total	21.0	100%

Without emphasis on preference

A = A is of greater importance

A/B = A and B are of equal importance

For the example project above, the project owner, design team, and stakeholders determined that Main Line Operations, followed by Environmental, gave the greatest improvement relative to the projects purpose and need, while Construction Impacts and Project Schedule gave the least improvement.

Step 3 – Establish the Performance Baseline for the Original Design

The next step in the process is to document the project-specific elements for the performance attributes developed in Step 1. This step establishes a baseline against which the VE alternative concepts can be compared. An example of project-specific elements is shown below.

Evaluation of Baseline Project		
Standard Performance Attribute	**Description of Attribute**	**Baseline Design Rating Rational**
Main Line Operations	An assessment of traffic operations and safety on the project. Operational considerations include level of service relative to the 20-year traffic projections as well as geometric considerations such as design speed, sight distance, lane widths, and shoulder widths.	Design Speed - __ MPH Bridge – __' Lanes, __' shoulders Roadway - __' Lanes, __' shoulders Bridge ___ Loading
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20 year traffic projections; geometric considerations such as design speed, sight distance, lane widths; bicycle and pedestrian operations and access.	Revisions will need to be made to the existing streets and private approaches due to vertical alignment
Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity, and maintainability of pavement structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel	Baseline design assumes a replacement bridge Bridge design – low slump overlay on a 7" deck Steel welded plate girder 100' - 150' - 250' - 250' - 150' - 100' spans
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.	Maintain traffic across river Noise permit required Short term detour to construct tie-ins to existing highways
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.	In-water window Considered a navigable body of water Existing bridge is under consideration for historical significance
Project Schedule	An assessment of the total project delivery from the time as measured from the time of the study to completion of construction.	Advertisement date ____ Construction start of ____ 26-month overall construction duration

Once the baseline definitions for the various attributes have been established, their total performance should be calculated by multiplying the attribute's weight (which was developed in Step 2) by its rating. While one could assign a 0 to 10 rating for each attribute, using the definitions and scales developed in Step 1, a baseline rating of 5 is typically used as a mid-point so that alternatives can be evaluated – better than or worse than the baseline.

Total baseline performance is calculated by multiplying the attribute's weight (which was developed in Step 2) by its rating (5). The baseline design's total performance of 500 points can be calculated by adding all of the scores for the attributes. This numerical expression of the original designs performance forms the baseline against which all alternative concepts will be compared.

Step 4 – Evaluate the Performance of the VE Alternative Concepts

Once the performance of the baseline has been established for the original design concept, it can be used to help the VE team develop performance ratings for individual VE alternative concepts as they are developed during the study. The Performance Measures Form is used to capture this information. This form allows a side-by-side comparison of the original design and VE alternative concepts to be performed.

It is important to consider the alternative concept's impact on the entire project (rather than on discrete components) when developing performance ratings for the alternative concept.

Proposals are evaluated against the baseline for all attributes to compare the potential for value improvement. As discussed in Step 3, the baseline is given a rating of 5. The following ratings were used to evaluate the performance of the alternative concepts relative to the baseline concept.

Rating	Performance Attribute Scale
10	Alternative concept is extremely preferred
9	Alternative concept is very strongly preferred
8	Alternative concept is strongly preferred
7	Alternative concept is moderately preferred
6	Alternative concept is slightly preferred
5	*Baseline*
4	Baseline concept is slightly preferred
3	Baseline concept is moderately preferred
2	Baseline concept is strongly preferred
1	Baseline concept is very strongly preferred
0	Baseline concept is extremely preferred

Step 5 – Compare the Performance Ratings of Alternative Concepts to the Baseline Project

As the VE team develops alternatives, the performance of each is rated against the original design concept (baseline). Changes in performance are always based on the overall impact to the total project. Once performance and cost data have been developed by the VE team, the net change in value of the VE alternatives can be compared to the baseline design concept. The resulting "Value Matrix" provides a summary of these changes and allows a way for the Project Team to assess the potential impact of the VE recommendations on total project value.

The VE team groups the VE alternatives into a strategy (or strategies) to provide the decision-makers a clear picture of how the alternatives fit together into possible solutions. At least one strategy is developed to present the VE team's consensus of what should be implemented. Additional strategies are developed as necessary to present other combinations to the decision-makers that should be considered. The strategy(s) of VE alternatives are rated and compared against the baseline concept. The performance ratings developed for the VE strategies are entered into the matrix, and the summary portion of the Value Matrix is completed. The summary provides details on net changes to cost, performance, and value, using the following calculations:

- % Performance Improvement = ∆ Performance VE Strategy/Total Performance Original Concept

Performance Attribute Ratings				
Attribute	**Attribute Weight**	**Concept**	**Performance Rating**	**Total Performance**
Main Line Operations	28.9	Baseline	5	144.5
		1	7	202.3
		2	7	202.3
		3	5	144.5
Local Operations	14.2	Baseline	5	71.0
		1	5	71.0
		2	5	71.0
		3	8	113.6
Maintainability	14.2	Baseline	5	71.0
		1	3	42.6
		2	6	85.2
		3	4.5	63.9
Environmental Impacts	16.6	Baseline	5	83.0
		1	6.5	107.9
		2	5	83.0
		3	4.5	74.7
Construction Impacts	14.2	Baseline	5	71.0
		1	4	56.8
		2	6	85.2
		3	5	71.0
Project Schedule	11.9	Baseline	5	59.5
		1	5	59.5
		2	5	59.5
		3	5	59.5

- Value Index = Total Performance/Total Cost (in Millions)
- % Value Improvement = ∆Value Index VE Strategy/Value Index Original Concept.

The following is an example of a Value Matrix worksheet.

Recommendation Summary								
Recommendations		**Performance (P)**	**% Change Performance**	**Cost (C) $ millions**	**Cost Change $ millions**	**% Change Cost**	**Value Index**	**% Value Improvement**
	Baseline	500	---	$46.1	---	---	10.85	---
1	Recommendation No. 1 - Title	540	+8.0%	$46.6	$0.5	+1.2%	11.58	+6.8%
2	Recommendation No. 2 - Title	586	+17.2%	$46.5	$0.4	+0.9%	12.60	+16.2%
3	Recommendation No. 3 - Title	527	+5.4%	$46.1	$0.0	+0.0%	11.43	+5.4%
			Total		$3.9			

Appendix B. VE Recommendation Approval Form

Project: SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue
VE Study Date: June 12-16, 2023

			FHWA Functional Benefit						
	Recommendation	Approved Y/N	Safety	Operations	Environment	Construction	Right-of-way	VE Team Estimated Cost Avoidance or Cost Added ($M)	Actual Estimated Cost Avoidance or Cost Added
1	Develop Alternative Drainage Solution				✓	✓		$0.81	
2	Identify County & FDOT Property for Staging and Drainage Purposes						✓	$0.00	
3	Modify Median Design					✓	✓	$0.44	
4	Use Preemption Technology		✓	✓				($0.22)	
5	Modify Median Access		✓	✓				($0.04)	
6	Modify SFWMD Canal Access		✓	✓				($0.01)	
7	Remove Buffer along Bridge					✓	✓	$0.62	
8	Modify Pedestrian & Bicyclist Accommodations				✓	✓	✓	$1.02	
9	Advance Safety Improvements at Critical Locations		✓	✓				($4.45)	
10	Eliminate Trail Underpass			✓	✓	✓	✓	$3.39	
11	Implement TSMO Strategies		✓	✓				($0.77)	
12	Reduce Limits of Projects along SW 127th, SW 134th & SW 137th					✓	✓	$0.52	
13	Reduce Bridge Width			✓		✓	✓	$0.71	

14	Install ITS Infrastructure Prior to Construction		✓			✓		$0.28	
15	Remove 196th St Connector Improvements					✓		$0.18	
16	Seek ROW Cost Reimbursement of County Encroachments to Private Owners						✓	$0.33	
	TOTALS		6	7	3	9	8		

Please provide justification if the value engineering study recommendations are **not** approved or are implemented in a modified form.

Florida DOT is required to report Value Engineering results annually to FHWA. To facilitate this reporting requirement, the Value Engineering Recommendation Approval Form is included herein. If the Department elects to reject or modify a recommendation, please include a brief explanation of why. Please complete the form and return it to Florida DOT State Value Engineer.

_____ _____

Signature – Project Manager Date

_____

Name (please print)

FHWA Functional Benefit Criteria

Each year, State DOTs are required to report on VE recommendations to FHWA. In addition to cost implications, FHWA requires the DOTs to evaluate each approved recommendation in terms of the project feature or features that recommendation benefits. If a specific recommendation can be shown to provide benefit to more than one feature described below, count the recommendation in *each category that is applicable*.

Safety: Recommendations that mitigate or reduce hazards on the facility.

Operations: Recommendations that improve real-time service and/or local, corridor, or regional levels of service of the facility.

Environment: Recommendations that successfully avoid or mitigate impacts to natural and/or cultural resources.

Construction: Recommendations that improve work zone conditions or expedite the project delivery.

Right-of-way: Recommendations that lower the impacts or costs of right-of-way.

Appendix C. VE Study Memo, Agenda, and Attendees

Memo

Date: Monday, June 05, 2023

Project:	SR 994/SW 200 St/Quail Roost Drive from West of SW 137 to East of SW 27 Ave
To:	VE Team Members
From:	Jose Theiler, PE, CVS®
Subject:	Value Engineering Study

Congratulations!!! You have been chosen to participate in this Value Engineering (VE) study because of your expertise and valuable contributions to the project.

This memo is to introduce some of the expectations for the upcoming VE study. I'm looking forward to working with you on this endeavor. My hope is that this memo will provide information about the project and expectations on working together.

If you have any questions, please contact me, Jose Theiler, at 561-386-3879 (cell), or e-mail: jose.theiler@hdrinc.com.

VE Study Dates and Location

The VE study will be in person as follows:

June 12 and June 16, 2023 at District 6 Headquarters (Conference Room B Adam Leigh Cann Bldg.)

June 13 through 15, 2023 at HDR Office located at 8333 NW 53rd ST, Doral - Magic City Conference Room

What to Bring

Be sure to bring your normal tools of the trade (e.g., calculator, laptop computer, scale, etc.). Bring a creative and open mind. VE studies are a lot of work, but if you bring your creativity and sense of humor you will have a good time and a rewarding experience.

Ground Rules

A VE study follows a prescribed process that has been proven over many years to produce the best results. This process requires the team members be fully engaged and have an open mind to "step" outside of the box throughout the week.

To maintain our schedule and provide the best results to the project team, I ask that we follow some basic ground rules:

a. We will use MS-Teams as a holding place for conversations, notes, documentation, etc. Follow the link (Quail Roost Drive VE Study) to make sure you have access and become familiar with the site.

b. Please be prepared to attend the entire duration of the workshop. You were selected to assist on this team based on your expertise. If you cannot be in attendance for the entire time, then please notify me prior to the study. When team members leave part way through, or come and go frequently, the VE team can lose its momentum and cohesiveness. We understand that conducting business virtually is different and typical interruptions or noise

background is expected at times. Please minimize disruptions by muting your phone or asking for a break.

c. Avoid multitasking during the study. Unless it is information to assist the team, please try to wait until breaks to return phone calls, check on messages, or sort through e-mails.

d. Dress code. I want everyone to be comfortable. Some of us will attend from our homes; please dress appropriately (business casual).

e. A laptop is required for the workshop. We will develop recommendations using templates in Word format and will exchange and share files throughout the workshop.

Our success will be evaluated based on the level of contribution that we bring to the project. Remember that the goal of any VE study is to add value to the project; saving money is just a byproduct. We want to make recommendations based on solid engineering judgment that will result in an improved project.

Value Engineering Job Plan

The VE team will employ the basic eight-phase VM job plan in analyzing the project. This process is recommended by SAVE International® and AASHTO, and is composed of the following phases:

Preparation Phase – Prior to the VE study, the Project Manager and the VE facilitator carry out the following activities:

- Initiate study – identify study project and define study goals
- Organize study – conduct pre-VE study meeting to establish team members, logistics and parameters to analyze the project
- Prepare data – Collect and distribute data and prepare cost models

Information Phase – The objective of this phase is to obtain a thorough understanding of the project's design criteria and objectives by reviewing the project's documents and drawings, cost estimates, and schedules.

Function Analysis Phase – Identifying each of the key functions of the project is the most important phase of value engineering, as it is the basis for unlocking the creativity of team members. As part of this phase, the team performs the following tasks with the assistance of the VE Facilitator:

- Defines project and risk functions and assigns them to key project components.
- Classifies functions as either "basic" or "secondary."
- Sequence functions to understand their relationships using the Function Analysis System Technique (FAST).
- Establishes performance measures.
- Creates the project's cost model.

Creativity Phase – During this phase the team will employ creative techniques such as team brainstorming to develop a number of alternative concepts that satisfy the project's basic and supporting functions and mitigate project risks.

Evaluation Phase – The purpose of this phase is to evaluate the alternative concepts developed by the VE team during the brainstorming sessions. To that purpose, the team discusses advantages and disadvantages, and uses a number of tools to determine the qualitative and quantitative merits of each concept.

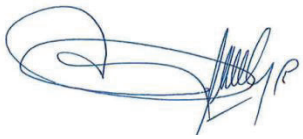
Mid-point Review With Management Team: At this point, the VE team holds a meeting with the project team, management, and other stakeholders, to validate the direction of the team and that ideas moving forward to the development phase do not step outside the boundaries set forth by project constraints.

Development Phase – Those concepts that ranked highest in the evaluation are further developed into VE recommendations. Recommendation narratives, additional advantages and disadvantages, drawings, calculations, and life cycle cost analysis are prepared for each recommendation.

Presentation Phase – The VE team presents their finding during an oral presentation to the owner and the project team. Following the workshop, a written report is submitted that summarizes the study, its findings, and recommendations.

Implementation Phase – The project team is then charged with reviewing the report and may hold a Disposition Meeting with management and other stakeholders, to determine which recommendations will be implemented in the design. The project team then tracks their implementation into the plans.

I look forward to working with you on this VE study and appreciate each of you blocking time out of your busy schedules to participate. Please call or e-mail me with any questions.
Sincerely,



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Project Risk Management and Value Engineering
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Charlotte, NC 28202-2075
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Agenda

Day 1	Monday, June 12, 2023 Objective for the day: Learn about VE and the project	
8:00	• **Welcome and Team Introductions** • **Value Engineering Process Overview**	**All audiences** Project owner, PMs, designers, VE team
9:00 *Information Phase*	**Project Overview** • Purpose and need of the project • Goals and objectives of the project • Constraints • Basis of design • Risks • Focus for VE team • Questions and answers	**All Audiences facilitated by** Project team/designer
10:00	**Break**	
10:15 *Information Phase*	**Define and Prioritize Performance Attributes**	**All Audiences facilitated by** Jose Theiler, PE, CVS
11:00 *Information Phase*	**Site Visit** • Plan stops • Travel to site area • Lunch	**All Audiences facilitated by** Jose Theiler, PE, CVS
12:00	**Lunch**	
2:00 *Information Phase*	**Project Documentation Review** • Site visit observations • Review plans/schematics, cross sections, typical sections, traffic control plans, construction constraints • Cost estimate, including construction, right-of-way, utilities, railroad, environmental, etc. • Project schedule, including construction phasing/sequencing, work windows	**VE team facilitated by** Jose Theiler, PE, CVS
3:15	**Break**	
3:30 *Function Analysis Phase*	**Function Analysis** • Review project cost model • Define key project functions using “verb + noun” expressions	**VE team facilitated by** Jose Theiler, PE, CVS
5:00	**Adjourn**	

Day 2	**Tuesday June 13, 2023** **Objective for the day: Brainstorming Ideas, Evaluate Ideas**	
8:00	**Function Analysis (continues)** • Day 1 Recap • Finalize function analysis	**VE team facilitated by** Jose Theiler, PE, CVS
9:00 *Creative Phase*	**Creative Phase** • Brainstorm alternative ways to perform key functions • Brainstorm ways to improve value of key functions • Brainstorm ideas to mitigate risks	**VE team facilitated by** Jose Theiler, PE, CVS
12:00	**Lunch**	
1:00 *Evaluation Phase*	**Evaluate Ideas** • Discuss advantages and disadvantages for each idea • Score ideas based on predetermined criteria to develop further into recommendations	**VE team facilitated by** Jose Theiler, PE, CVS
5:00	**Adjourn**	

Day 3	**Wednesday June 14, 2023** **Objective for the day: Evaluate Ideas and Begin Developing**	
8:00 *Evaluation Phase*	**Evaluate Ideas continues** • Discuss advantages and disadvantages for each idea • Score ideas based on predetermined criteria to develop further into recommendations	**VE team facilitated by** Jose Theiler, PE, CVS
10:45	**Break**	
11:00	Roll Call **Mid-point review**	**Facilitator, Value Engineer, PMs, Managers**
12:00	**Lunch**	

1:00
Development Phase
	Develop Ideas into Recommendations
	• Individual/team assignments
	• Development of recommendations:
	  ○ Test design feasibility
	  ○ Design analysis
	  ○ Technical narratives
	  ○ Further discussion on advantages and disadvantages
	  ○ Cost analysis (life cycle cost comparison)
		VE team facilitated by
		Jose Theiler, PE, CVS

5:00	**Adjourn**	

Day 4	**Thursday June 15, 2023** **Objective for the day: Develop and Review Recommendations**	
8:00 *Development Phase*	**Develop Ideas into Recommendations** • Individual/team assignments • Development of recommendations: ○ Test design feasibility ○ Design analysis ○ Technical narratives ○ Further discussion on advantages and disadvantages ○ Cost analysis (life cycle cost comparison)	**VE team facilitated by Jose Theiler, PE, CVS**
12:00	**Lunch**	
1:00 *Development Phase*	**Develop Ideas into Recommendations** • Individual/team assignments • Development of recommendations: ○ Test design feasibility ○ Design analysis ○ Technical narratives ○ Further discussion on advantages and disadvantages ○ Cost analysis (life cycle cost comparison)	**VE team facilitated by** Jose Theiler, PE, CVS
3:00 *Development Phase*	**Peer Review of Recommendations**	**VE team facilitated by** Jose Theiler, PE, CVS
4:00 *Development Phase*	**Evaluate Performance Attributes of Recommendations**	**VE team facilitated by** Jose Theiler, PE, CVS
5:00	**Adjourn**	

Day 5	**Friday June 16, 2023** **Objective for the day: Deliver Close-out Presentation**	
8:00 *Development Phase*	• **Evaluate Performance Attributes of Recommendations**	**VE team facilitated by** Jose Theiler, PE, CVS
10:00	**Break**	
10:15 *Presentation Phase*	**Finalize Close-out Presentation** Team Rehearsal	**VE team facilitated by** Jose Theiler, PE, CVS
12:00	**Lunch**	
1:00 *Presentation Phase*	**Presentation of VE Findings** • Team presents recommendations to management • Questions and answers	**All Audiences:** Project owner, management, stakeholders, designers, etc.
2:30	**Adjourn**	

VE Study Attendees
SR 994/SW 200 St/Quail Roost Drive from West of SW 137 to East of SW 27 Ave

June 2023					NAME Core VE Team in Yellow	ORGANIZATION – POSITION / DISCIPLINE	EMAIL	PHONE
12	13	14	15	16				
✓					Abuhamid, Maal	FDOT	maal.abuhamid@dot.state.fl.us	
✓	✓	✓	✓	✓	Alvarez, Mark	FDOT	mark.alvarez@dot.state.fl.us	
✓	✓	✓	✓	✓	Bacallao, Christopher	FDOT	christopher.bacallao@dot.state.fl.us	
				✓	Badri, Dru	FDOT	dru.badri@dot.state.fl.us	305-401-1560
✓		✓		✓	Bull, Bobby	FDOT	bobby.bull@dot.state.fl.us	
✓		✓		✓	Cejas, Carlos M.	GANNETT FLEMING	ccejas@gfnet.com	
					Defrant, Jacques	FDOT	jacques.defrant@dot.state.fl.us	
✓		✓		✓	Fernandez, Alina	GANNETT FLEMING	afernandez@gfnet.com	
	✓	✓	✓	✓	Gomez, Alejandro	CTS	agomez@ctsinc.com	787-312-0389
✓	✓	✓	✓	✓	Gutierrez, Claudia	FDOT	claudia.gutierrez@dot.state.fl.us	
				✓	Hoffman, George	FDOT	george.hoffman@dot.state.fl.us	305-962-4928
✓	✓	✓		✓	Huynh, Dat	FDOT	dat.huynh@dot.state.fl.us	
				✓	Iglesias, Daniel	FDOT	daniel.inglesis@dot.state.fl.us	305-470-5464

VE Study Attendees
SR 994/SW 200 St/Quail Roost Drive from West of SW 137 to East of SW 27 Ave

June 2023					NAME Core VE Team in Yellow	ORGANIZATION – POSITION / DISCIPLINE	EMAIL	PHONE
12	13	14	15	16				
✓	✓	✓	✓	✓	Johnson, Christopher	HDR	christopher.johnson@hdrinc.com	704-915-7810
				✓	Louis, Carla	FDOT	carla.louis@dot.state.fl.us	
				✓	Marrero, Renato	FDOT	renato.marrero@dot.state.fl.us	305-470-5359
✓	✓	✓	✓	✓	Michel, Marceau	FDOT Drainage Engineer	marceau.michel@dot.state.fl.us	
				✓	Miller, Stacy	FDOT	stacy.miller@dot.state.fl.us	
✓					Miranda, Jessica	FDOT	jessica.miranda@dot.state.fl.us	
✓	✓	✓	✓	✓	Negron, Carmen	FDOT	carmen.negron@dot.state.fl.us;	
✓	✓	✓	✓	✓	Perez, Mario	FDOT	mario.perez@dot.state.fl.us	
✓	✓	✓	✓	✓	Raghunandan, Ryan	FDOT	ryan.raghunandan@dot.state.fl.us	
✓		✓		✓	Riverol, Elsa	FDOT	elsa.riverol@dot.state.fl.us	
				✓	Solaun, Heidi	FDOT	heidi.solaun@dot.state.fl.us	305-962-4612
✓				✓	Tavella, Christopher	FDOT	chris.tavella@dot.state.fl.us	
✓	✓	✓	✓	✓	Theiler, Jose	HDR Facilitator	jose.theiler@hdrinc.com	561-386-3879
✓	✓	✓		✓	Uribe, Alejandro	GANNETT FLEMING	auribe@gfnet.com	787-845-9540

VE Study Attendees
SR 994/SW 200 St/Quail Roost Drive from West of SW 137 to East of SW 27 Ave

June 2023					NAME Core VE Team in Yellow	ORGANIZATION – POSITION / DISCIPLINE	EMAIL	PHONE
12	13	14	15	16				
				✓	Valido, Raymond	FDOT	raymond.valido@dot.state.fl.us	305-470-5266
✓					White, Dongming	FDOT	dongming.white@dot.state.fl.us	
✓					Zhang, Hailing	FDOT	hailing.zhang@dot.state.fl.us	

Appendix D. Project Estimate

FDOT Long Range Estimating System - Production

R4: Project Details Composite Report

By Component

Project: 445804-1-52-01 **Letting Date:** 04/2028

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE

District: 06 **County:** 87 MIAMI-DADE

Project Manager: RIVEROL, ELSA

Version 3 Project Grand Total **$28,925,210.55**

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE. BUILD 2 ALTERNATIVE.

EARTHWORK COMPONENT

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
110-1-1	CLEARING & GRUBBING	27.18	AC	$77,124.93	$2,096,255.60
120-1	REGULAR EXCAVATION	770.00	CY	$20.68	$15,923.60
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	1,327.81	CY	$27.62	$36,674.11
120-6	EMBANKMENT	202,745.67	CY	$26.70	$5,413,309.38
	Earthwork Component Total				$7,562,162.69

ROADWAY COMPONENT

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
160-4	TYPE B STABILIZATION	94,312.34	SY	$9.24	$871,446.03
285-701	OPTIONAL BASE,BASE GROUP 01	13,318.50	SY	$18.40	$245,060.40
285-709	OPTIONAL BASE,BASE GROUP 09	61,419.92	SY	$37.25	$2,287,892.02
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	17,648.05	SY	$2.76	$48,708.62
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	9,241.43	TN	$143.06	$1,322,078.96
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	5,841.89	TN	$192.38	$1,123,862.79
515-2-111	PED/BICYCLE RAILING,NS, 42" TYPE 1	350.00	LF	$82.03	$28,710.50
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	222.00	LF	$63.72	$14,145.84
521-72-60	SHLDR CONC BARRIER,38" WALL SHIELD BARR	200.00	LF	$217.20	$43,440.00
550-10-120	FENCING, TYPE A, 5.1-6.0, STANDARD	4,000.00	LF	$13.43	$53,720.00
706-1-3	RAISED PAVMT MARK, TYPE B	1,155.00	EA	$3.78	$4,365.90
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	13.82	GM	$920.95	$12,727.53

FDOT Long Range Estimating System - Production

R4: Project Details Composite Report

By Component

Project: 445804-1-52-01 **Letting Date:** 04/2028

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE

District: 06 **County:** 87 MIAMI-DADE

Project Manager: RIVEROL, ELSA

Version 3 Project Grand Total **$28,925,210.55**

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE. BUILD 2 ALTERNATIVE.

710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	5.68	GM	$373.96	$2,124.11
710-11-231	PAINTED PAVT MARK,STD,YELLOW,SKIP,6"	0.87	GM	$382.85	$333.08
711-15-101	THERMOPLASTIC, STD-OP, WHITE, SOLID, 6"	0.63	GM	$5,486.63	$3,456.58
711-15-131	THERMOPLASTIC, STD-OP, WHITE, SKIP, 6"	0.32	GM	$1,807.75	$578.48
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	6.66	GM	$4,222.32	$28,120.65
711-16-131	THERMOPLASTIC, STD-OTH, WHITE, SKIP, 6"	3.98	GM	$1,293.64	$5,148.69
	Roadway Component Total				$6,095,920.18

SHOULDER COMPONENT

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
104-10-3	SEDIMENT BARRIER	30,392.16	LF	$2.07	$62,911.77
104-11	FLOATING TURBIDITY BARRIER	597.41	LF	$14.79	$8,835.70
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	597.41	LF	$13.91	$8,309.97
104-15	SOIL TRACKING PREVENTION DEVICE	10.00	EA	$2,826.29	$28,262.90
104-18	INLET PROTECTION SYSTEM	122.00	EA	$117.43	$14,326.46
107-1	LITTER REMOVAL	52.70	AC	$18.94	$998.13
107-2	MOWING	52.70	AC	$27.70	$1,459.79
285-704	OPTIONAL BASE,BASE GROUP 04	2,377.58	SY	$14.59	$34,688.90
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	181.57	TN	$143.06	$25,975.41
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	181.57	TN	$192.38	$34,930.44
520-1-10	CONCRETE CURB & GUTTER, TYPE F	24,598.48	LF	$29.36	$722,211.36
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	8,429.81	SY	$44.95	$378,919.96
530-4-6	ARTICULATING CONC BLOCK REVET SYS, 6"	1,870.00	SY	$183.48	$343,107.60

FDOT Long Range Estimating System - Production

R4: Project Details Composite Report

By Component

Project: 445804-1-52-01 **Letting Date:** 04/2028

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE

District: 06 **County:** 87 MIAMI-DADE

Project Manager: RIVEROL, ELSA

Version 3 Project Grand Total **$28,925,210.55**

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE. BUILD 2 ALTERNATIVE.

570-1-1	PERFORMANCE TURF	13,388.89	SY	$2.39	$31,999.44
	Shoulder Component Total				$1,696,937.83

MEDIAN COMPONENT

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	17,628.83	LF	$23.64	$416,745.54
520-5-11	TRAF SEP CONC-TYPE I, 4' WIDE	2,730.00	LF	$63.72	$173,955.60
570-1-1	PERFORMANCE TURF	14,200.71	SY	$2.39	$33,939.70
	Median Component Total				$624,640.84

DRAINAGE COMPONENT

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	91.00	EA	$6,611.89	$601,681.99
425-1-451	INLETS, CURB, TYPE J-5, <10'	30.00	EA	$7,419.98	$222,599.40
425-1-521	INLETS, DT BOT, TYPE C, <10'	15.00	EA	$5,664.97	$84,974.55
425-2-41	MANHOLES, P-7, <10'	32.00	EA	$4,843.54	$154,993.28
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	576.00	LF	$185.68	$106,951.68
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	10,040.00	LF	$124.04	$1,245,361.60
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	2,312.00	LF	$237.63	$549,400.56
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	240.00	LF	$613.46	$147,230.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	2.00	EA	$1,947.99	$3,895.98
443-70-6	FRENCH DRAIN, 36"	3,700.00	LF	$216.30	$800,310.00
570-1-1	PERFORMANCE TURF	937.54	SY	$2.39	$2,240.72
	Drainage Component Total				$3,919,640.16

SIGNING COMPONENT

FDOT Long Range Estimating System - Production

R4: Project Details Composite Report

By Component

Project: 445804-1-52-01 **Letting Date:** 04/2028

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE

District: 06 **County:** 87 MIAMI-DADE

Project Manager: RIVEROL, ELSA

Version 3 Project Grand Total **$28,925,210.55**

Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE. BUILD 2 ALTERNATIVE.

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
700-1-11	SINGLE POST SIGN, F&I GM,	59.00	AS	$359.59	$21,215.81
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	32.00	AS	$1,114.91	$35,677.12
700-1-50	SINGLE POST SIGN, RELOCATE	3.00	AS	$287.77	$863.31
700-1-60	SINGLE POST SIGN, REMOVE	15.00	AS	$23.22	$348.30
700-2-13	MULTI- POST SIGN, F&I GM, 21-30 SF	2.00	AS	$4,672.57	$9,345.14
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00	AS	$5,512.64	$11,025.28
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	7.00	AS	$7,584.95	$53,094.65
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	5.00	AS	$10,804.94	$54,024.70
700-2-60	MULTI- POST SIGN, REMOVE	3.00	AS	$653.31	$1,959.93
	Signing Component Total				$187,554.24

LIGHTING COMPONENT

Pay Items

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	12,299.24	LF	$15.85	$194,942.96
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	2,304.61	LF	$23.72	$54,665.35
635-2-11	PULL & SPLICE BOX, F&I, 13" X 24"	79.00	EA	$771.13	$60,919.27
639-1-111	ELECTRICAL POWER SRV,F&I,OH,M,FURNISHED	1.00	AS	$4,313.81	$4,313.81
639-3-11	ELEC SERV DISCON, F&I, POLE MNT	1.00	EA	$1,831.97	$1,831.97
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	44,396.20	LF	$3.45	$153,166.88
715-4-13	LIGHT POLE COMPLETE, F&I- STD, 40'	49.00	EA	$6,106.25	$299,206.25
715-7-12	LOAD CENTER, F&I, PRIMARY VOLTAGE	1.00	EA	$10,785.92	$10,785.92

FDOT Long Range Estimating System - Production					
R4: Project Details Composite Report					
By Component					
Project: 445804-1-52-01				**Letting Date:** 04/2028	
Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE					
District: 06	**County:** 87 MIAMI-DADE				
Project Manager: RIVEROL, ELSA					
Version 3 Project Grand Total					**$28,925,210.55**
Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE. BUILD 2 ALTERNATIVE.					
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	30.00	EA	$11,736.51	$352,095.30
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	79.00	EA	$1,001.50	$79,118.50
	Lighting Component Total				$1,211,046.21
SIGNALIZATIONS COMPONENT					
Pay Items					
Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,150.00	LF	$15.85	$34,077.50
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	850.00	LF	$23.72	$20,162.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	3.00	PI	$6,325.75	$18,977.25
635-2-11	PULL & SPLICE BOX, F&I, 13" X 24"	60.00	EA	$771.13	$46,267.80
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	3.00	AS	$4,707.82	$14,123.46
639-2-1	ELECTRICAL SERVICE WIRE, F&I	180.00	LF	$5.92	$1,065.60
641-2-11	PREST CNC POLE,F&I,TYP P-II,PEDESTAL	2.00	EA	$1,459.29	$2,918.58
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	20.00	EA	$1,387.10	$27,742.00
646-1-12	ALUMINUM SIGNALS POLE, PED DETECT POST	20.00	EA	$1,292.86	$25,857.20
649-21-6	STEEL MAST ARM ASSEMBLY, F&I, 50'	2.00	EA	$45,186.33	$90,372.66
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	14.00	EA	$57,830.80	$809,631.20
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	52.00	AS	$999.20	$51,958.40
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	24.00	AS	$806.55	$19,357.20
660-1-102	LOOP DETECTOR INDUCTIVE, F&I, TYPE 2	47.00	EA	$325.60	$15,303.20
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	47.00	AS	$1,193.30	$56,085.10
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	24.00	EA	$270.67	$6,496.08

FDOT Long Range Estimating System - Production					
R4: Project Details Composite Report					
By Component					
Project: 445804-1-52-01				**Letting Date:** 04/2028	
Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE					
District: 06	**County:** 87 MIAMI-DADE				
Project Manager: RIVEROL, ELSA					
Version 3 Project Grand Total					**$28,925,210.55**
Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE. BUILD 2 ALTERNATIVE.					
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	3.00	AS	$30,878.48	$92,635.44
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	24.00	EA	$391.28	$9,390.72
700-5-22	INTERNAL ILLUM SIGN, F&I OM, 12-18 SF	12.00	EA	$3,255.78	$39,069.36
	Signalizations Component Total				$1,381,490.75
LANDSCAPING COMPONENT					
	Landscaping Lump Sum Cost Total				$189,136.25
	Landscaping Component Total				$189,136.25
BRIDGES COMPONENT					
Bridge Type: Medium Level					
Pay Items					
Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
400-2-10	CONC CLASS II, APPROACH SLABS	206.67	CY	$577.42	$119,335.39
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES	8,184.00	SF	$37.08	$303,462.72
415-1-9	REINF STEEL- APPROACH SLABS	36,167.25	LB	$1.33	$48,102.44
Bridge No. 01	**Type=MLB**	**Length=88 FT**		**Width=93 FT**	
Bridge Basic Cost based on Factored Cost $100.00 SF					$818,400.00
Bridge Final Cost Per SF $120.46					
	Bridges Component Total				$1,289,300.55
RETAINING WALLS COMPONENT					
Pay Items					
Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,600.00	SF	$39.83	$63,728.00
	Retaining Walls Component Total				$63,728.00

FDOT Long Range Estimating System - Production

R4: Project Details Composite Report

By Component

Project: 445804-1-52-01				**Letting Date:**	04/2028
Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE					
District: 06	**County:** 87 MIAMI-DADE				
Project Manager: RIVEROL, ELSA					
Version 3 Project Grand Total					**$28,925,210.55**
Description: SR 994/SW 200 ST/QUAIL ROOST DR FR W OF SW 137 AVE TO E OF SW 127 AVE. BUILD 2 ALTERNATIVE.					
Project Sequences Subtotal					**$24,221,557.70**
102-1	MAINTENANCE OF TRAFFIC	10.00			$2,422,155.77
101-1	MOBILIZATION	8.00			$2,131,497.08
Project Sequences Total					**$28,775,210.55**
Project Unknowns			0.00	%	$0.00
Design/Build			0.00	%	$0.00
Non-Bid Components:					

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	1.00	LS	$150,000.00	$150,000.00
Project Non-Bid Subtotal					$150,000.00
Version 3 Project Grand Total					**$28,925,210.55**

Appendix E. Design Validations

DESIGN VALIDATION NO. 1: REDUCE NUMBER OF TURN LANES AT SW 127TH	**Idea No. 16**

Baseline Concept

The baseline consists of an additional left-turn lane to address the queue back-up along Quail Roost Drive and SW 127th Ave. The additional left-turn lane leads to a lane which merges and provides enough distance to reduce the amount of traffic spilled onto the intersection.

Recommendation Concept

Revisit the number of lanes at SW127th Ave.

Advantages	Disadvantages
• May reduce conflict at SB SW127th lane (Merge)	• Reducing amount of cars during phase • May affect through traffic due to lack of storage

Cost Summary	Construction	Right-of-way	Total
Baseline Concept			
Recommendation Concept			
Cost Avoidance/ (Added Value)			

FHWA Function Benefit

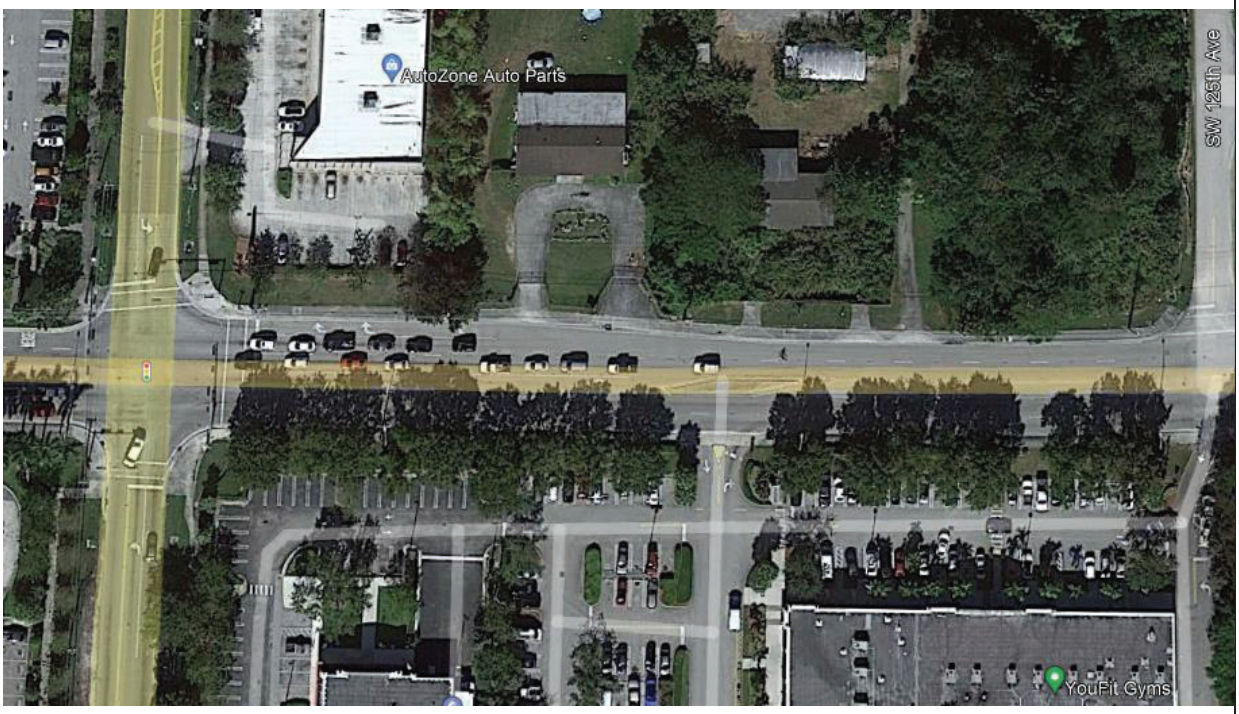
Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
	✓			✓

DESIGN VALIDATION NO. 1: REDUCE NUMBER OF TURN LANES AT SW 127TH	Idea No. 16

Discussion/Sketches/Photos/Calculations

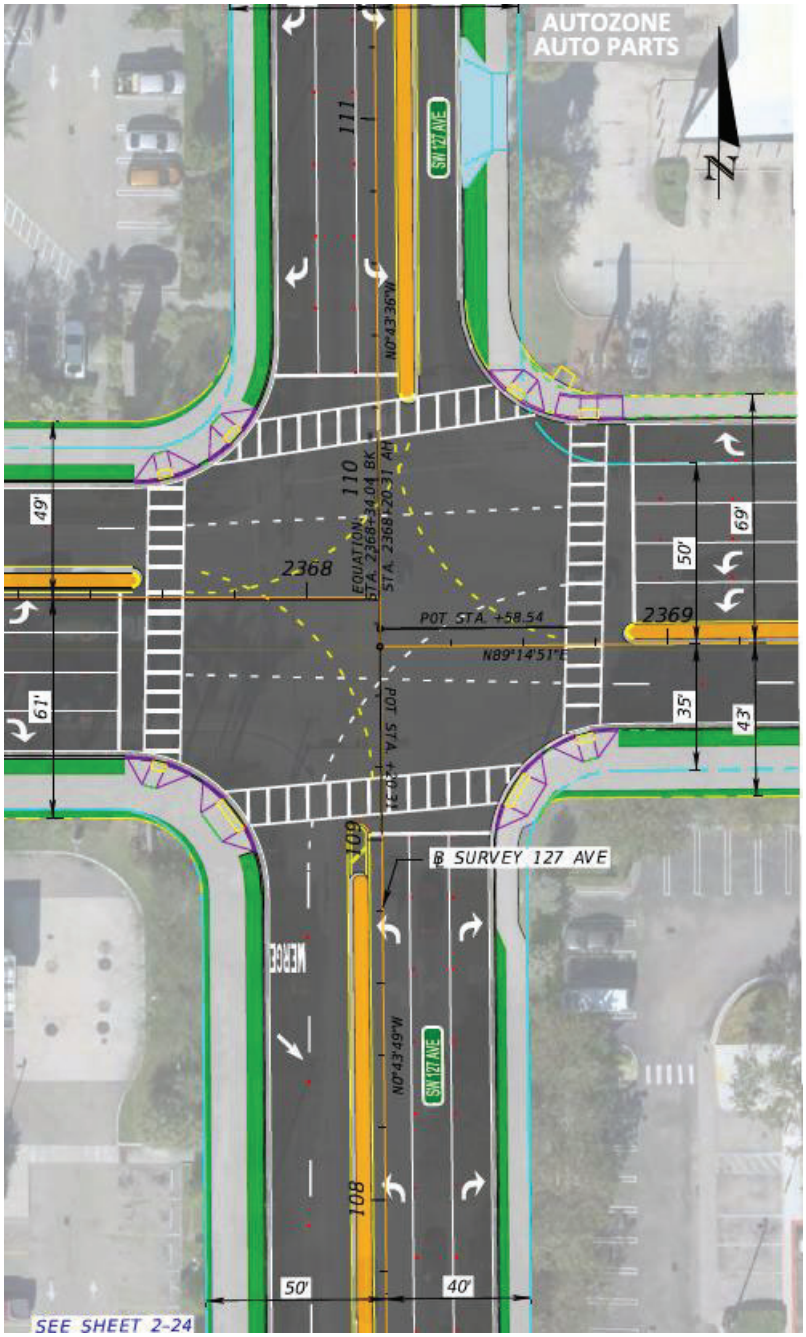
Technical Discussion/Sketches

The exercise completed was done with the intention of removing the Southbound additional lane at the intersection of Quail Roost and SW 127th Avenue.



Baseline Figure 1

DESIGN VALIDATION NO. 1: REDUCE NUMBER OF TURN LANES AT SW 127TH	Idea No. 16



Baseline Figure 2

The first step needed was to find the traffic counts expected to be received by the left-turn lanes within the baseline model.

DESIGN VALIDATION NO. 1: REDUCE NUMBER OF TURN LANES AT SW 127TH	Idea No. 16

Timings
127: SW 127 AVE & SR 994 01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	1106	150	271	701	164	210	180	294	84	195	47
Future Volume (vph)	179	1106	150	271	701	164	210	180	294	84	195	47

Figure 3. AM Traffic

Timings
127: SW 127 AVE & SR 994 01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	938	193	357	801	130	168	172	175	117	247	71
Future Volume (vph)	92	938	193	357	801	130	168	172	175	117	247	71

Figure 4. PM Traffic

According to FDM 232.2, "… (4) Where left turn volumes exceed 300 VPH, a double left turn should be considered."

Extension of the existing left-turn lane is possible; however, this would involve reconstruction and the additional amount of storage is not significant. The value exceeds 300 VPH.

Based on this information the VE team validates the design team's configuration.

DESIGN VALIDATION NO. 2: MODIFY PAVEMENT DESIGN	Idea No(s). 24, 25

Baseline Concept

The PER does not show a pavement design at this stage of development. The LRE shows pavement quantities and pay items automatically generated by the system.

Recommendation Concept

The VE team recommends an in depth evaluation of the pavement design to use an alternative pavement design, including the reuse of existing pavement in final configuration in lieu of full reconstruction

Advantages	Disadvantages
• May reduce costs • May improve friction • May improve durability • May reduce maintenance costs	• None discussed

Cost Summary	Construction	Right-of-way	Total
Baseline Concept			
Recommendation Concept			
Cost Avoidance/ (Added Value)			

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
			✓	

DESIGN VALIDATION NO. 2: MODIFY PAVEMENT DESIGN	Idea No(s). 24, 25

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The VE team reviewed the typical sections (Existing & Proposed) shown below in Figure 1 & Figure 2 respectively.

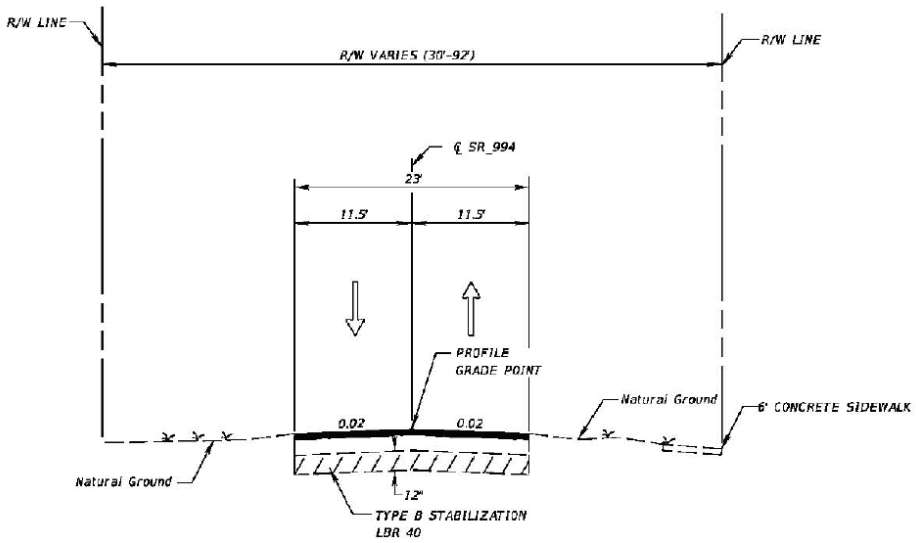


Figure 1. Existing Typical from SW 137th ST. to SW 127th ST.

Figure 2. Proposed Typical Section SW 137th ST. to SW 127th ST.

DESIGN VALIDATION NO. 2: MODIFY PAVEMENT DESIGN	Idea No(s). 24, 25

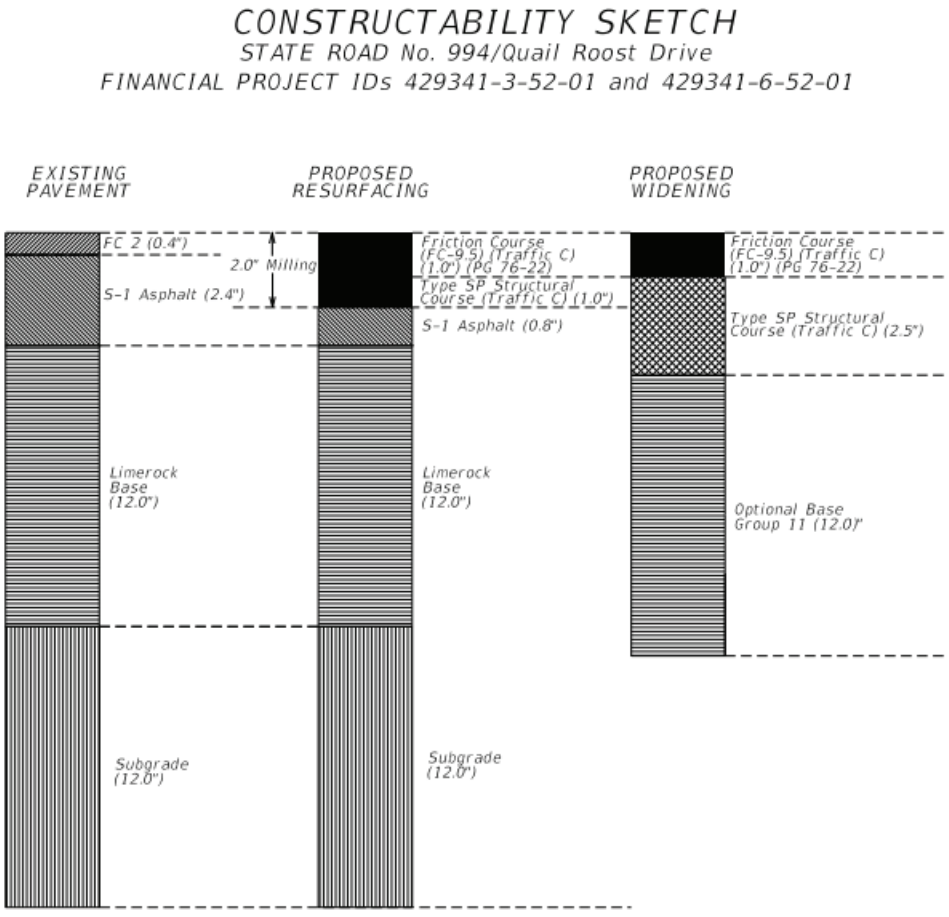


Figure 3. Existing Pavement Design on East Project (429341-3)

DESIGN VALIDATION NO. 2: MODIFY PAVEMENT DESIGN	Idea No(s). 24, 25

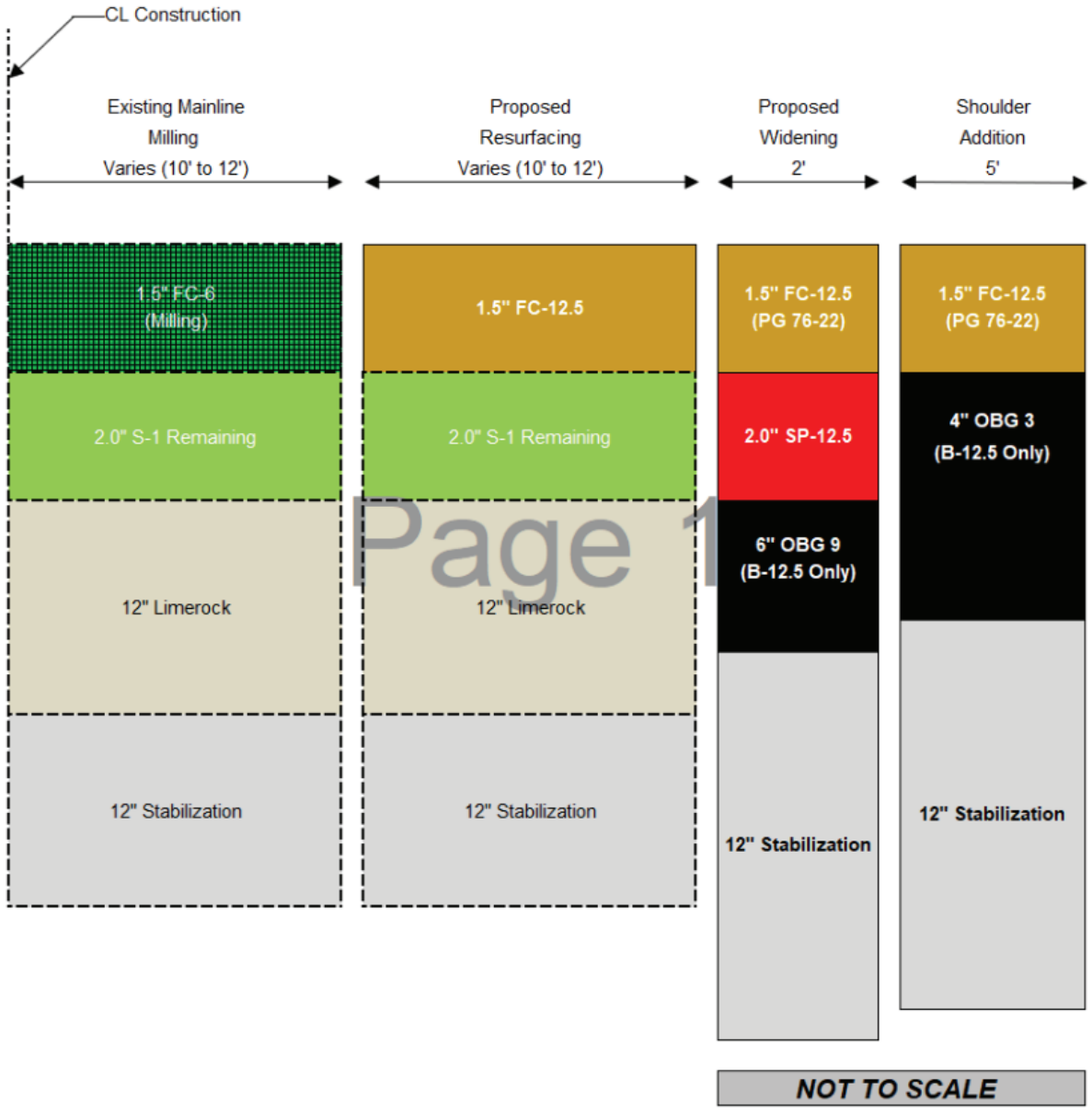


Figure 4. Pavement Design on West project. (443907-1)

After review of the information available, the LRE quantifies a pavement design equal to adjacent project to the west and likely the final pavement will be a comparable section. Therefore, the VE team validates the LRE quantified pavement design.

In addition, considering that the design includes a 16’ median, and how the alignment is in relation to the existing pavement, the only pavement that could be reused is a small strip of about 1-ft per direction. Therefore, there is no advantage in reusing pavement for this project. The VE team notes though, that the estimate contains resurfacing pay items; then the design team should validate the quantities applicable for tie ins and other minor pavement areas.

DESIGN VALIDATION NO. 3: REALIGN ROADWAY TO REDUCE ROW	Idea No(s). 1, 48

Baseline Concept

The current baseline design aligns the roadway through the center of the corridor and impacts parcels on both sides.

Recommendation Concept

The recommended concept is to realign the roadway to only impact parcels on one side of the corridor and avoid parcels that will be more expensive.

Advantages	Disadvantages
• Reduce number of parcels • Reduce cost • Reduce schedule duration • Reduces utility impact • Improves MOT • May reduce ROW costs • May calm traffic	• Increase the impact to ROW parcels acquired • Introduce horizontal curves • Reduces the opportunity to use existing pavement

Cost Summary	Construction	Right-of-way	Total
Baseline Concept			
Recommendation Concept			
Cost Avoidance/ (Added Value)			

FHWA Function Benefit

Safety	*Operations*	*Environment*	*Construction*	*Right-of-way*
	✓		✓	✓

DESIGN VALIDATION NO. 3: REALIGN ROADWAY TO REDUCE ROW	Idea No(s). 1, 48

Discussion/Sketches/Photos/Calculations

Technical Discussion/Sketches

The current baseline concept design aligns the roadway through the center of the corridor and impacts parcels on both sides. The recommnded concept is to realign the roadway to only impact parcels on one side of the corridor and avoid parcels that will be more expensive.

Reviewing the CADD plans and attempting ot shift the alignment it was clear that the existing usable space was maximized and that ROW acquisition was only necessary in areas where actually needed.This analysis was done assuming a typical section width of 97-ft .

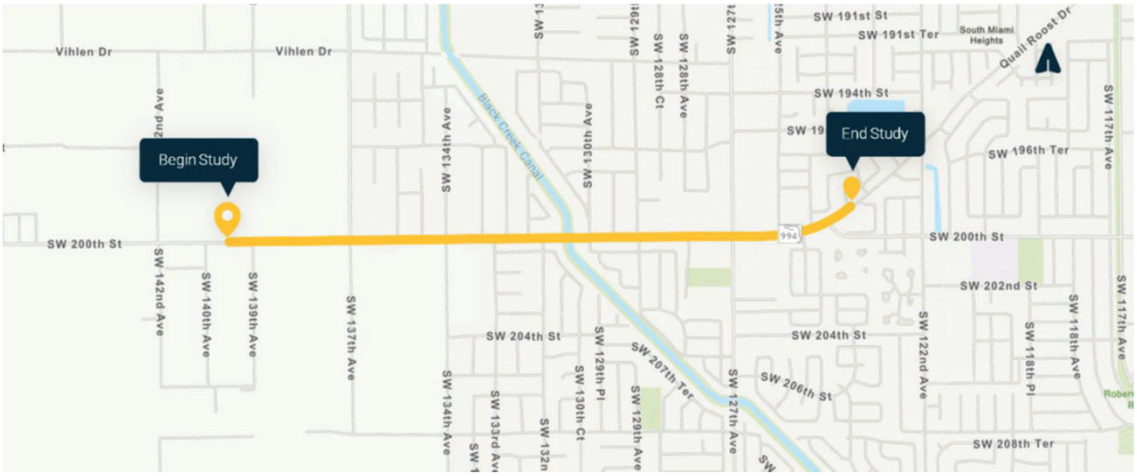
However, if the preferred alternative were to shrink the typical section width in anyway, the VE team recommends that the roadway and potential impacts be reanalyzed to determine if any existing structures or historical wall / buildings can be avoided. Currently most ROW impacts appear to be minimal.

Overall, the VE team's analysis reinforces the current recommendation stating that the current layout is minimizing the amount of ROW required for the baseline design with the given typical section.

Assumptions/Calculations

No calculations needed as recommendation validates baseline.

Appendix F. Closing Presentation



VALUE ENGINEERING STUDY

SR 994 / SW 200thSt / Quail Roost Drive Project

From: SW 137th Avenue To: SW 127th Avenue

FPN# 445804-1-22-01

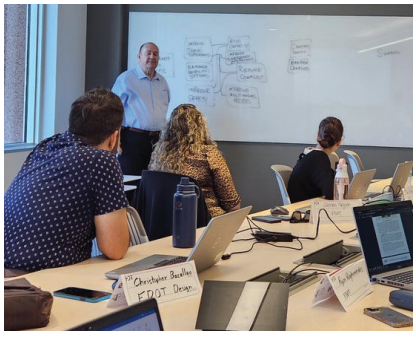
Miami-Dade County, Florida

June12-16, 2023

SAFETY FIRST

- Emergency exits
- Meeting point
- CPR
- Defibrillators?
- “911” Callers

VE TEAM



Mark Alvarez (FDOT)

Christopher Bacallao (FDOT)

Alejandro Gomez (CTS)

Claudia Gutierrez (FDOT)

Christopher Johnson (HDR)

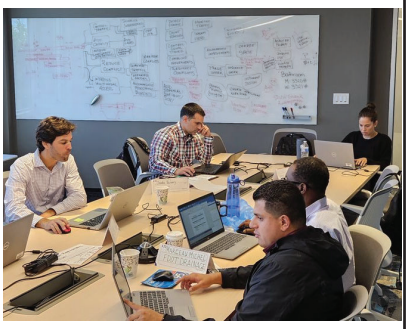
Marceau Michel (FDOT)

Carmen Negron (FDOT)

Mario Perez (FDOT)

Ryan Raghunandan (FDOT)

Jose Theiler (HDR)



PROJECT INFORMATION

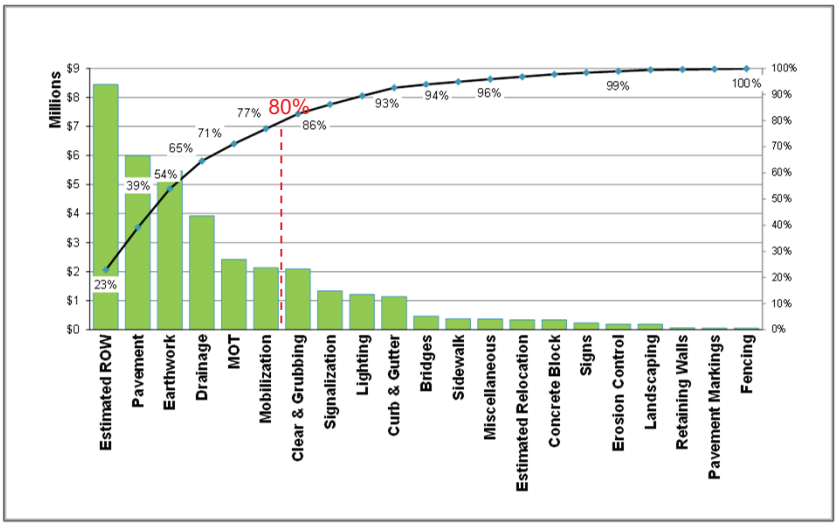
Purpose and Need

- Improve operations
- Improve safety
- Improve emergency operations and reduce response time
- Accommodate pedestrians and bicyclists

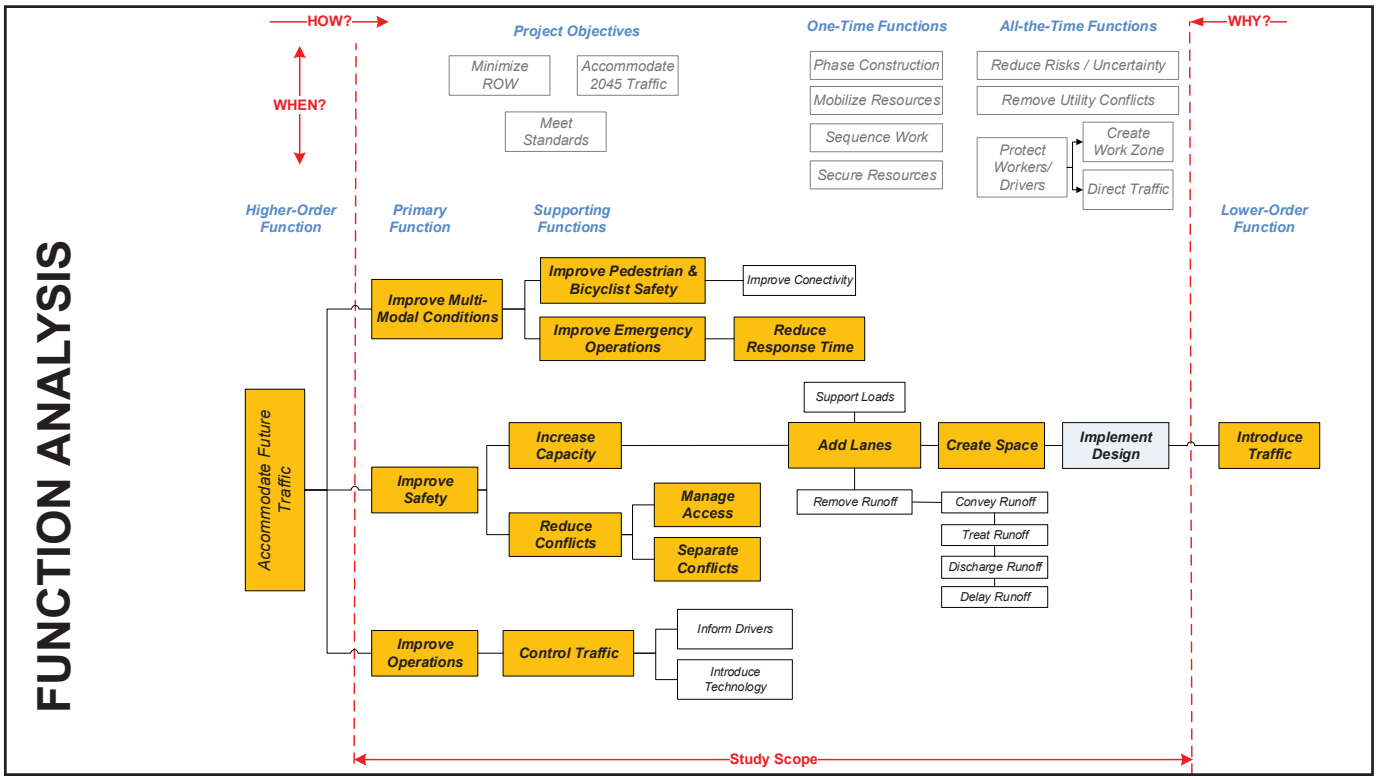
PROJECT INFORMATION

- Widen Quail Roost Drive
  - Four 11’ lanes
  - 16.5’ median
  - 10’ SUP in each direction
  - Four signalized intersections
  - Replace Bridge over Black Creek Canal
  - Create a trail underpass
- Project length: 1.67 miles

COST MODEL



Description	Amount
Estimated ROW	$ 8,438,713
Pavement	$ 5,994,644
Earthwork	$ 5,465,907
Drainage	$ 3,917,399
MOT	$ 2,422,156
Mobilization	$ 2,131,497
Clear & Grubbing	$ 2,096,256
Signalization	$ 1,333,031
Lighting	$ 1,211,046
Curb & Gutter	$ 1,138,957
Bridges	$ 470,901
Sidewalk	$ 378,920
Miscellaneous	$ 366,812
Estimated Relocation	$ 344,750
Concrete Block	$ 343,108
Signs	$ 236,014
Erosion Control	$ 190,827
Landscaping	$ 189,136
Retaining Walls	$ 63,728
Pavement Markings	$ 56,855
Fencing	$ 53,720
Barrier Wall	$ 43,440
Maintenance	$ 2,458
Total Cost	**$ 36,890,274**



OBJECTIVE OF THE VE STUDY

The objective of the VE team is to **VALIDATE or IMPROVE** on the various concepts for the **Quail Roost Drive from 12th Ave to 137 Ave** project**,** through the application of the VE job plan.

$$Value = \frac{Performance}{Cost}$$

EVALUATION PROCESS – TIER 1

Function: Mobilize Resources					
23	Deliver and remove material using the RR. Build temporary spur.	• Provides a means of access • May improve schedule duration • Reduces contractor risks • Provides means to remove materials (demo)	• RR agreement • Means and methods	*3*	Move forward to Development Phase

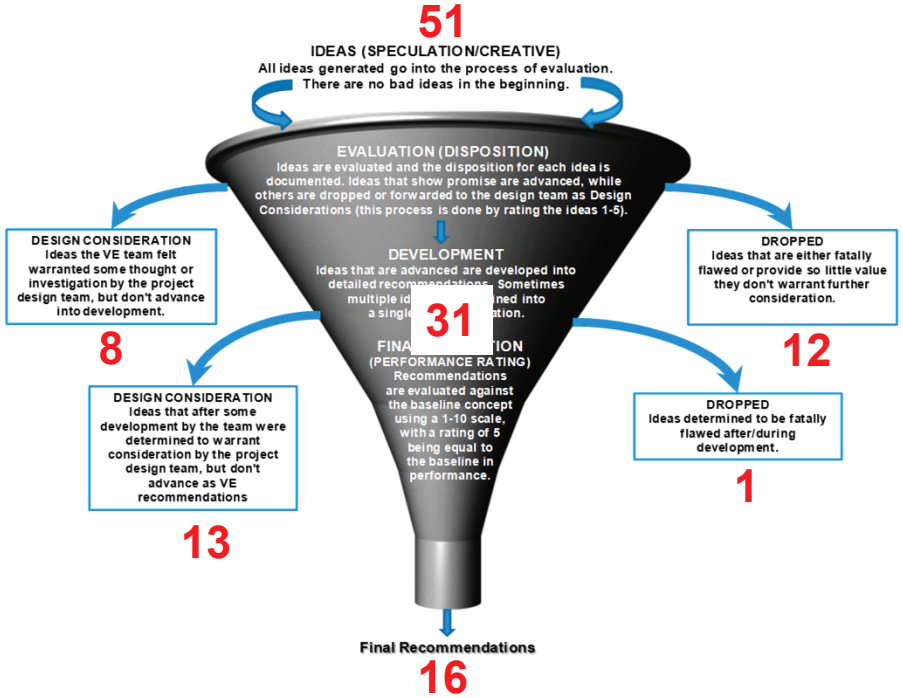
0-Unacceptable Impact / Fatal Flaw

1-Poor Opportunity

2-Good idea for design team to pursue

3-Good Opportunity

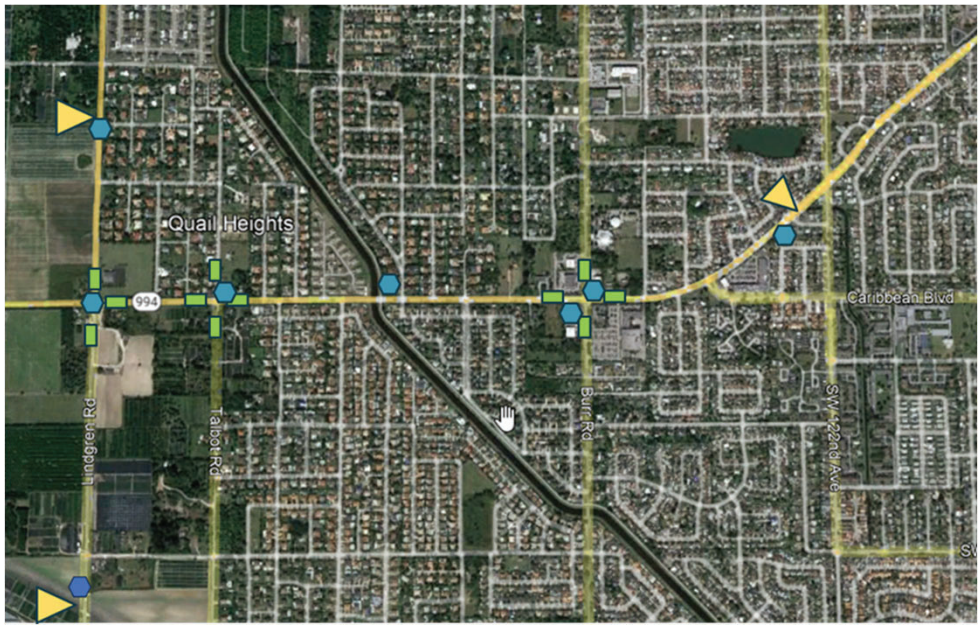
EVALUATION PROCESS – INFORMATION FLOW



IMPLEMENT TSMO STRATEGIES

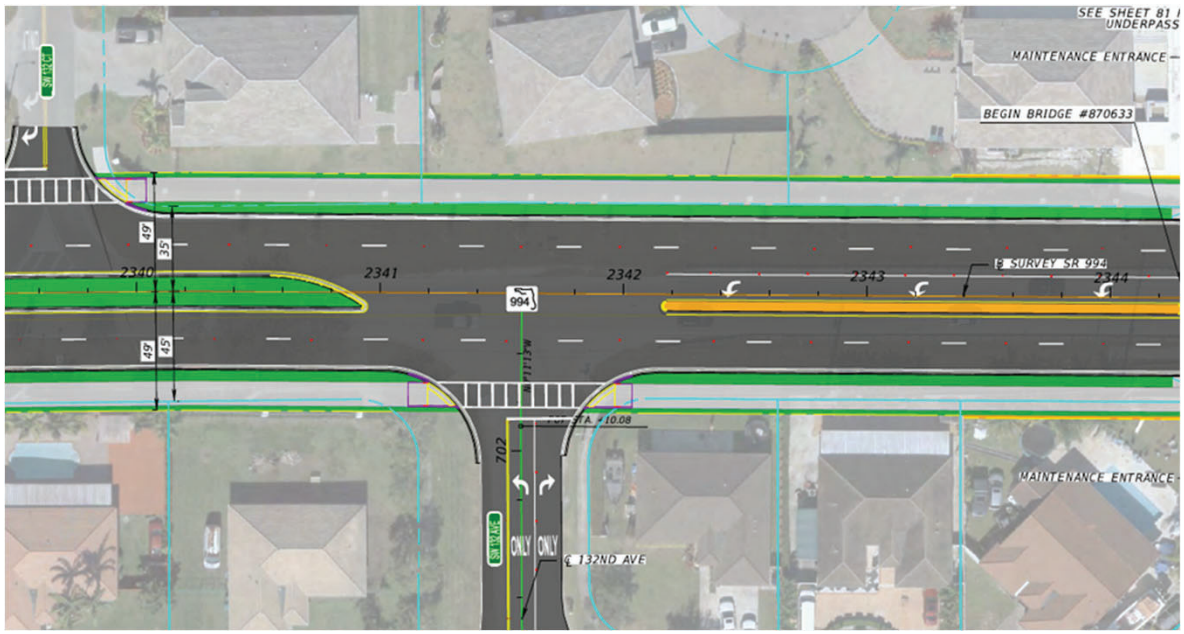
Baseline

IMPLEMENT TSMO STRATEGIES



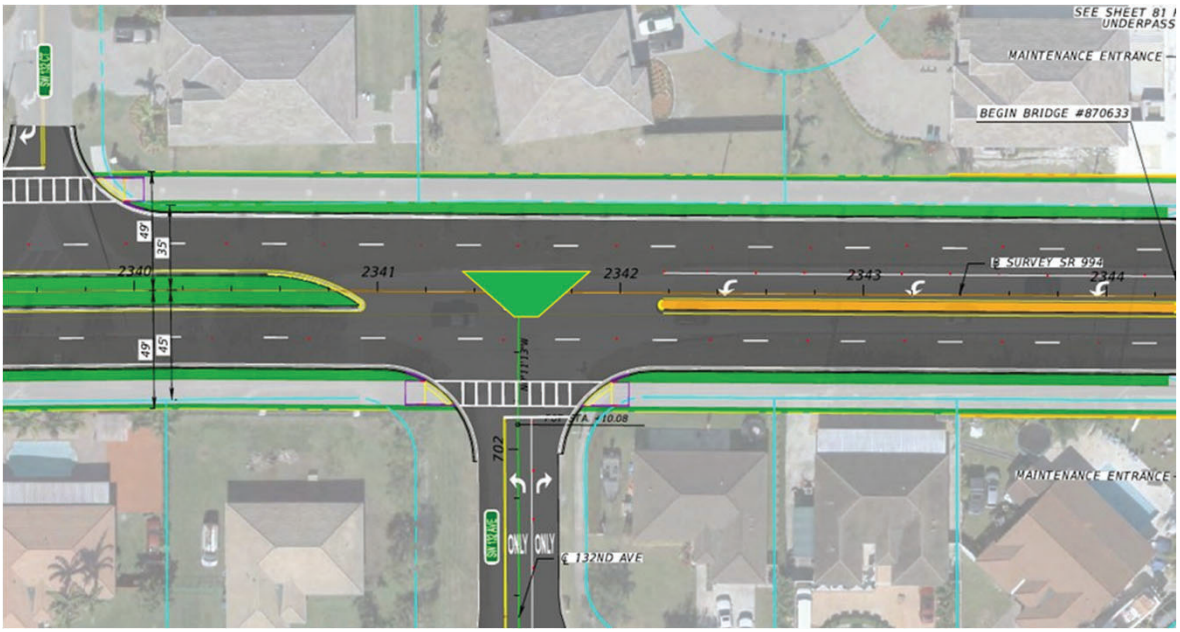
Recommendation

MODIFY MEDIAN ACCESS



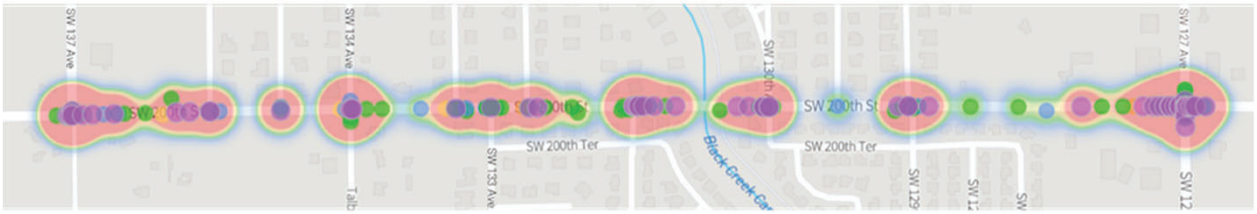
Baseline

MODIFY MEDIAN ACCESS



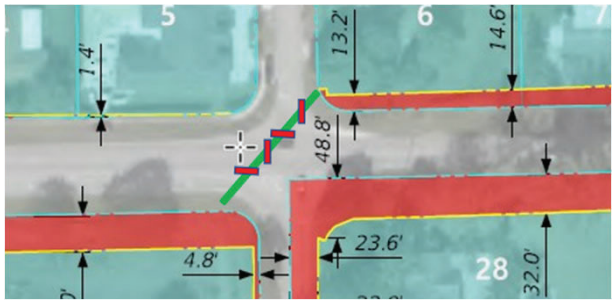
Recommendation

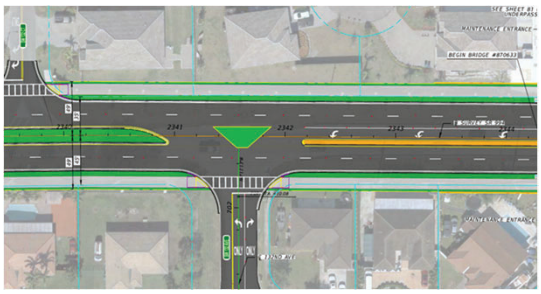
ADVANCE SAFETY IMPROVEMENTS AT CRITICAL LOCATIONS



Baseline

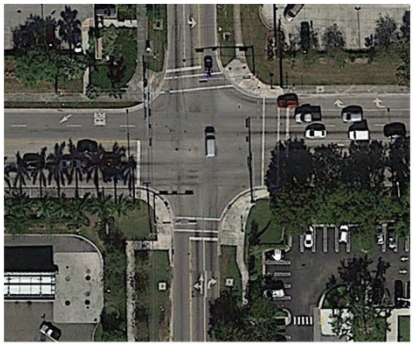
ADVANCE SAFETY IMPROVEMENTS AT CRITICAL LOCATIONS





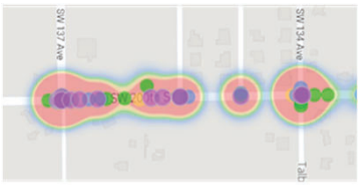
Recommendation

ADVANCE SAFETY IMPROVEMENTS AT CRITICAL LOCATIONS



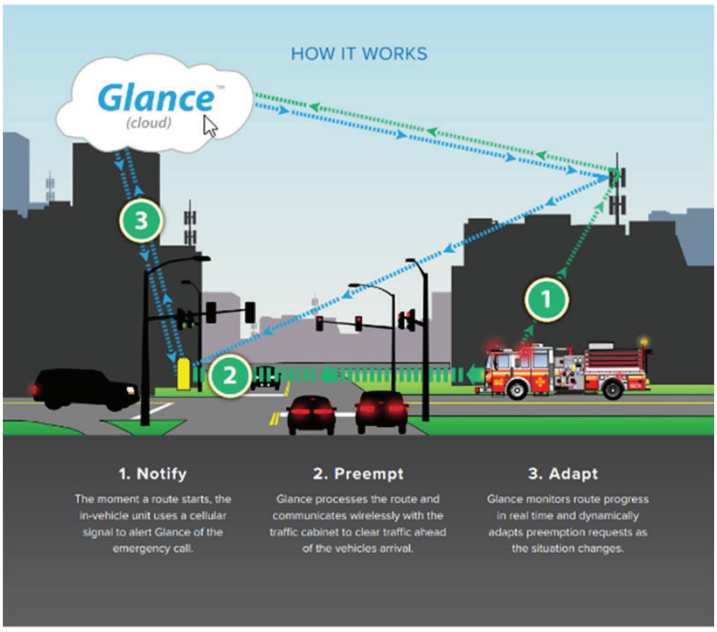
Recommendation

ADVANCE SAFETY IMPROVEMENTS AT CRITICAL LOCATIONS



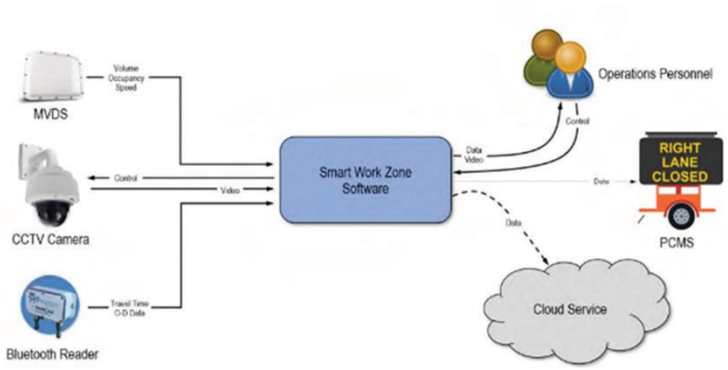
Recommendation

USE PREEMPTION TECHNOLOGY



Recommendation

INSTALL ITS INFRASTRUCTURE PRIOR TO CONSTRUCTION



Recommendation

REMOVE 196th STREET CONNECTOR IMPROVEMENT

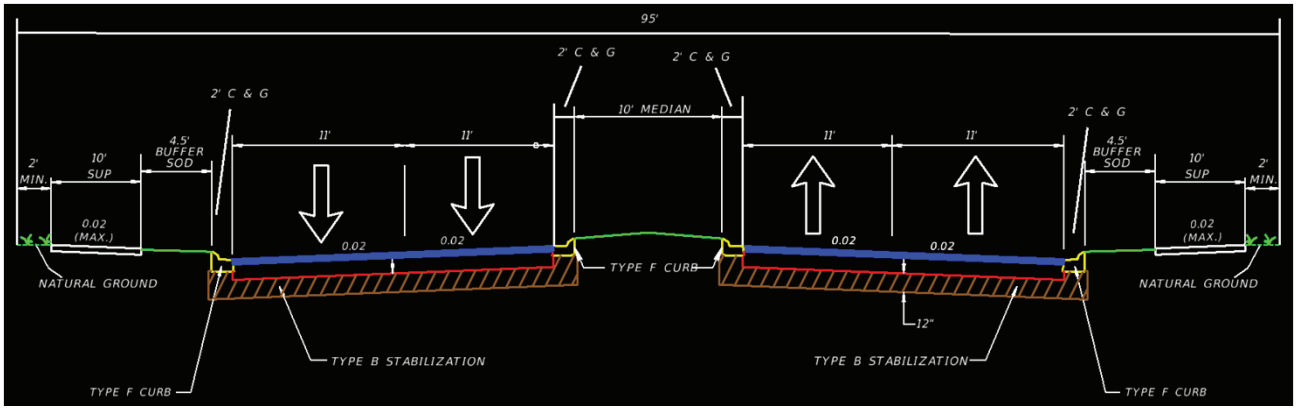
Baseline

Recommendation

MODIFY MEDIAN DESIGN

Baseline

MODIFY MEDIAN DESIGN

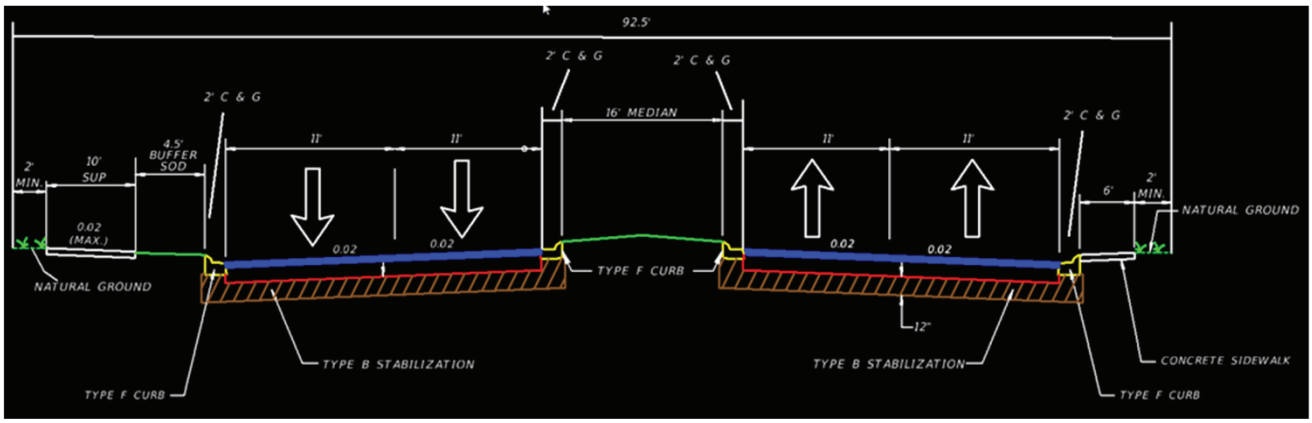


Recommendation

MODIFY PEDESTRIAN & BICYCLIST ACCOMMODATIONS

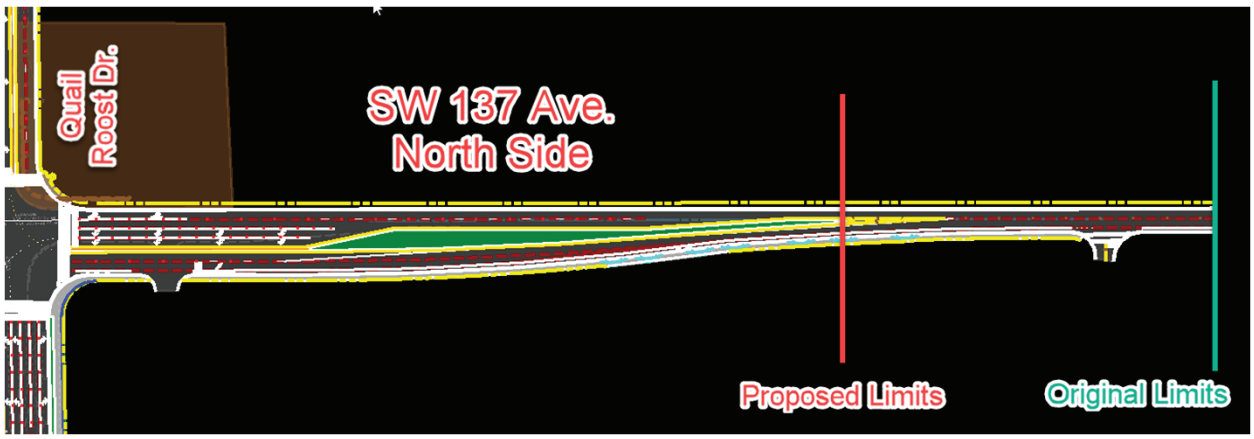
Baseline

MODIFY PEDESTRIAN & BICYCLIST ACCOMMODATIONS

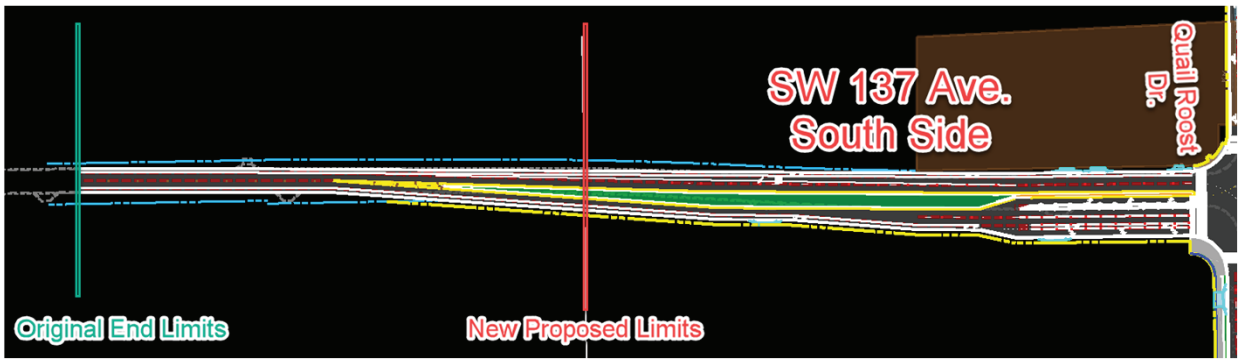


Recommendation

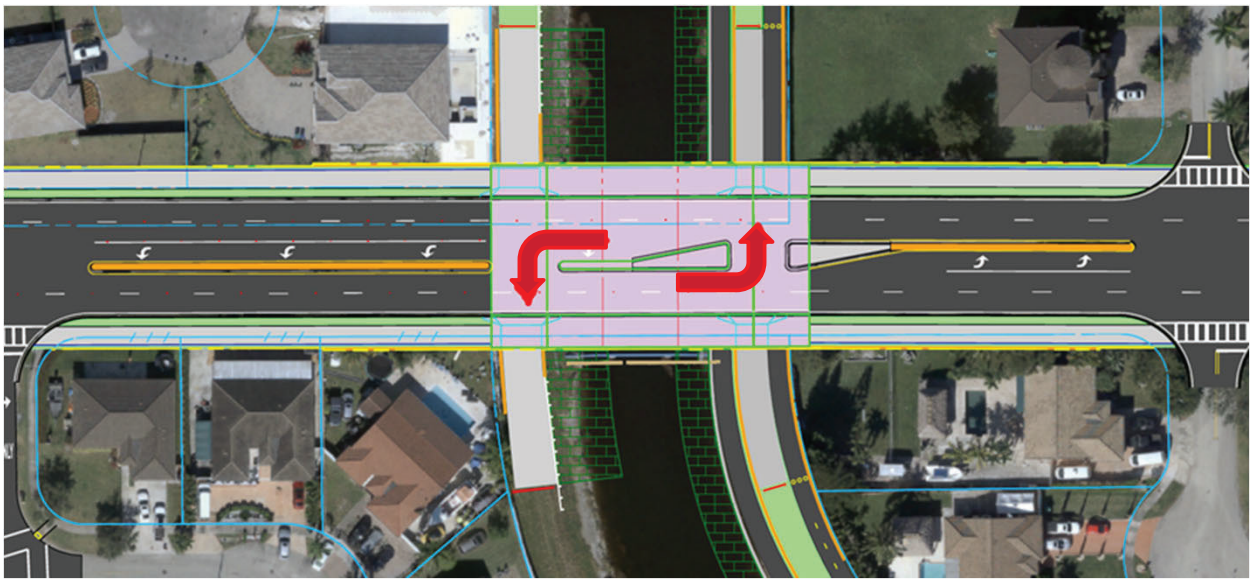
REDUCE LIMITS OF PROJECTS ALONG SW 127, SW 134, SW 137



REDUCE LIMITS OF PROJECTS ALONG SW 127, SW 134, SW 137

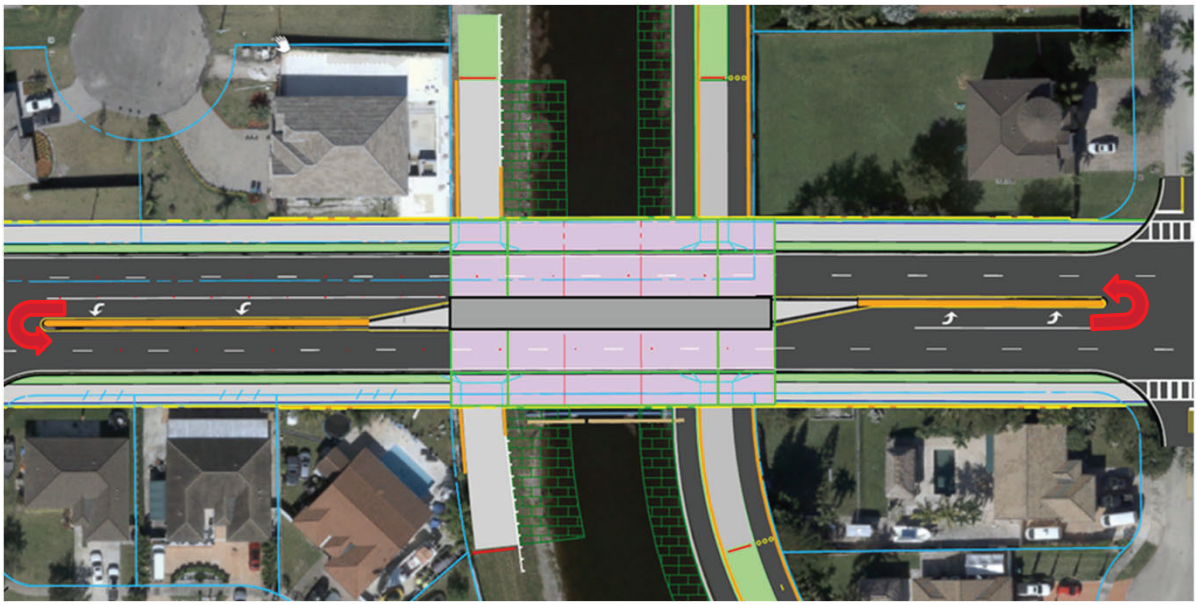


MODIFY SFWMD CANAL ACCESS



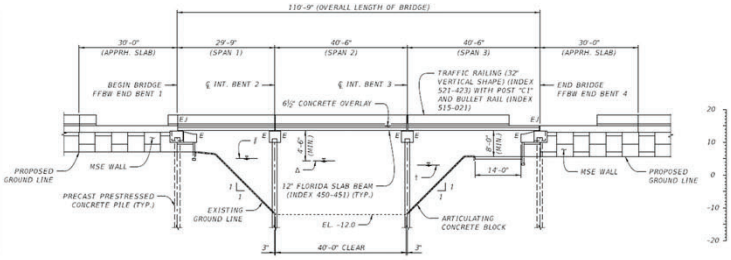
Baseline

MODIFY SFWMD CANAL ACCESS



Recommendation

ELIMINATE TRAIL UNDERPASS

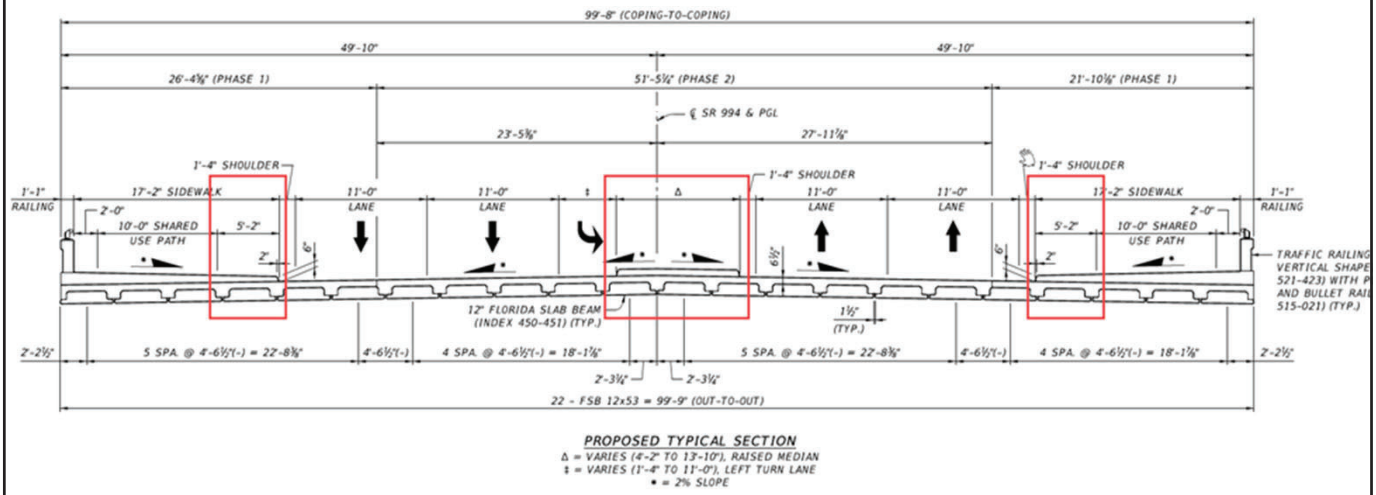


Baseline

ELIMINATE TRAIL UNDERPASS

Recommendation

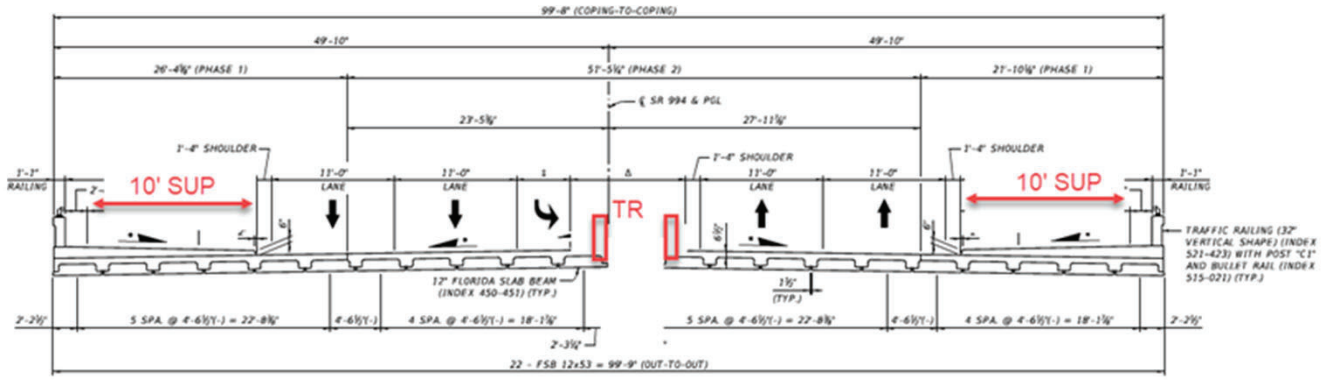
REDUCE BRIDGE WIDTH



PROPOSED TYPICAL SECTION
Δ = VARIES (4'-2" TO 13'-10"), RAISED MEDIAN
‡ = VARIES (1'-4" TO 11'-0"), LEFT TURN LANE
• = 2% SLOPE

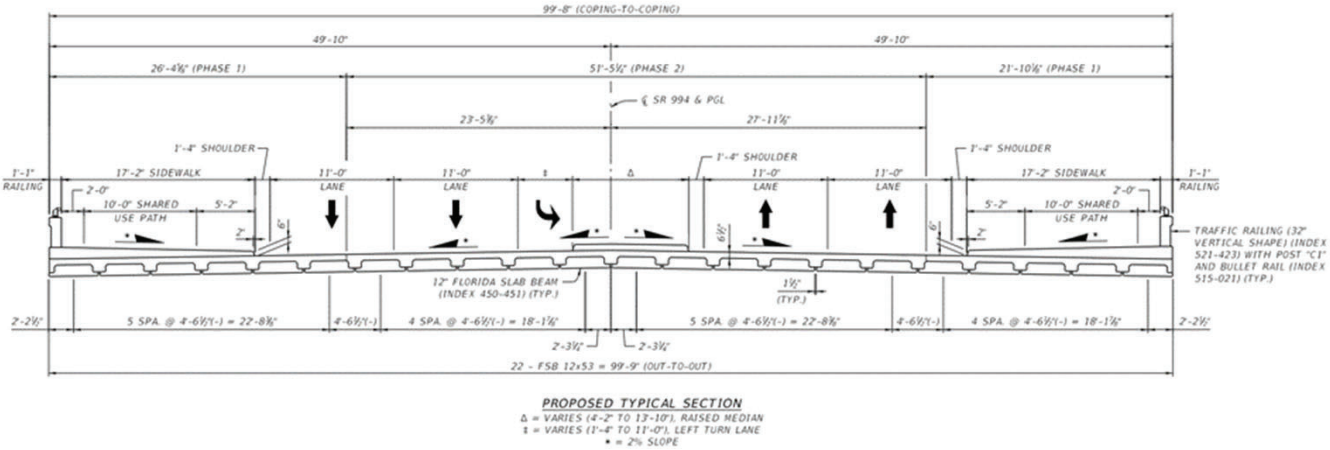
Baseline

REDUCE BRIDGE WIDTH



Recommendation

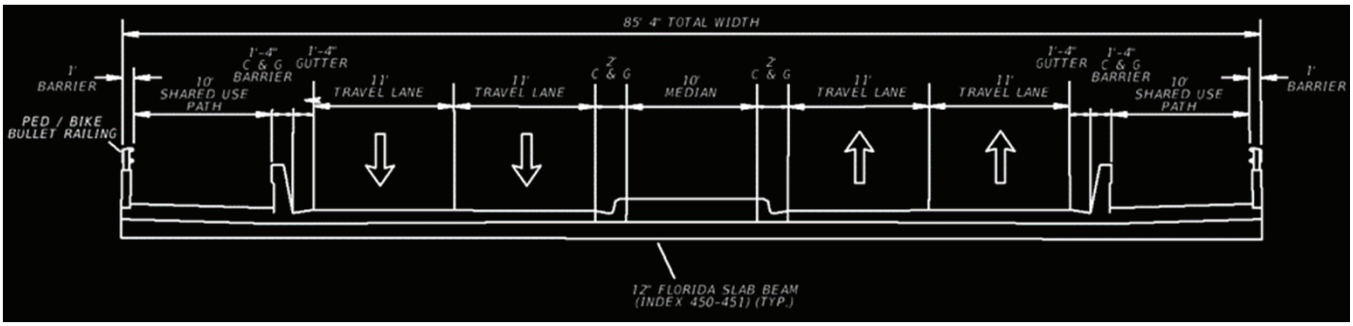
REMOVE BUFFER ALONG BRIDGE



PROPOSED TYPICAL SECTION
Δ = VARIES (4'-2" TO 13'-10"), RAISED MEDIAN
‡ = VARIES (1'-4" TO 11'-0"), LEFT TURN LANE
▪ = 2% SLOPE

Baseline

REMOVE BUFFER ALONG BRIDGE

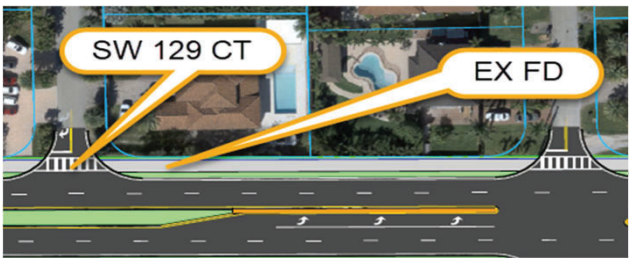


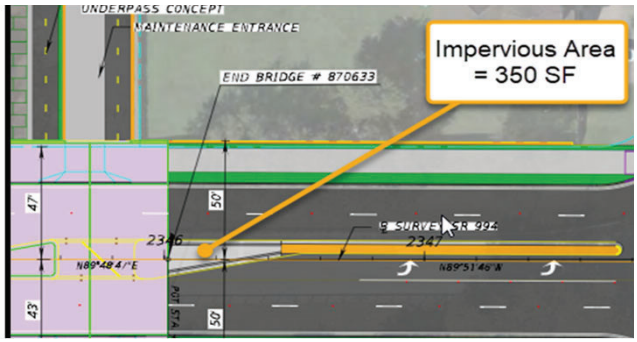
Recommendation

IDENTIFY COUNTY & FDOT PROPERTY FOR STAGING AND DRAINAGE PURPOSES

Recommendation

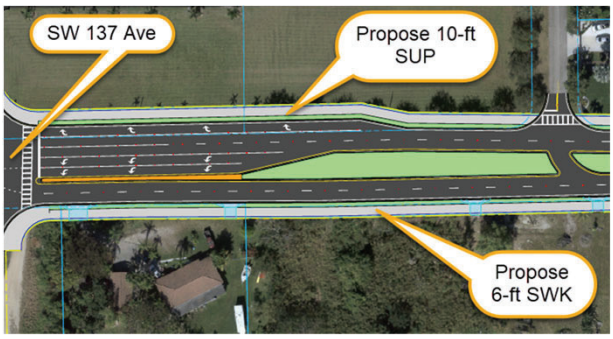
DEVELOP ALTERNATIVE DRAINAGE SOLUTION





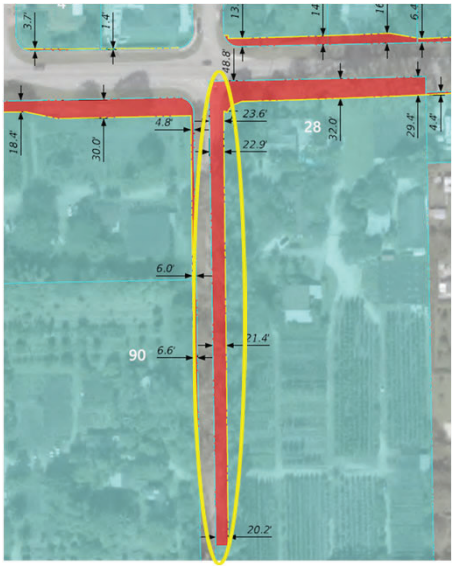
Baseline

DEVELOP ALTERNATIVE DRAINAGE SOLUTION



Recommendation

SEEK REIMBURSEMENT FOR 134th AVE ROW COST TO NORMALIZE ENCROACHMENT



Recommendation

DESIGN CONSIDERATIONS

ID	Idea Description
6	Install solar operated signals - (beacons, pedestrian signals, signal heads)
10	Shorten left turn queue length to remove it from structure
33	Reduce comprehensive landscaping to one focal location
38	Recycle bridge materials for riprap
39	Reuse asphalt for shoulder areas and other projects
41	Use incentives / disincentives for early construction
42	Adjust design schedule to accelerate allowable ROW activities before 60% design milestone and reduce duration from 36 Mo to 24 Mo
45	Re-run the noise wall benefit cost analysis to include updated prices

DESIGN CONSIDERATIONS TIER 2

Value engineering has traditionally been perceived as an effective means for reducing project costs.

This paradigm only addresses one part of the value equation, oftentimes at the expense of overlooking the role that VE can play regarding improving project performance.

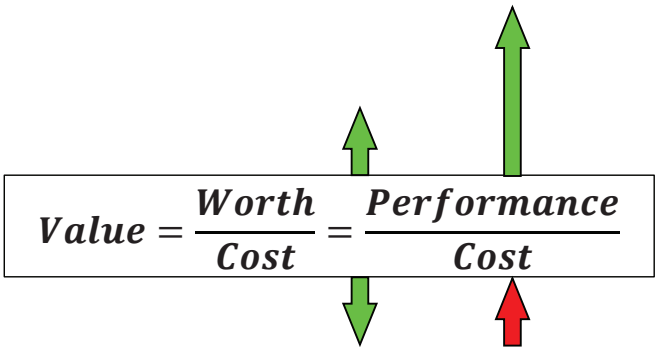
Performance-based VE

$$Value = \frac{Worth}{Cost} = \frac{Performance}{Cost}$$

PERFORMANCE ATTRIBUTES – PAIRED COMPARISON

Paired Comparison							Total points	% of Total
Main Line Operations	A	A	A	A	A	A/F	5.5	26%
Local Operations		B	B	B	B	B/F	4.5	21%
Maintainability			C	C	E	C/F	2.5	12%
Construction Impacts				D	E	D/F	1.5	7%
Environmental Impacts					E	E	4.0	19%
Project Schedule						F	3.0	14%
						Total	21.0	100%

Performance Attributes – Paired Comparison



VE RECOMMENDATION NO. 1	IDEA NO.		
UTILIZE TURBINE INTERCHANGE			
PERFORMANCE MEASURES	*Performance*	*Baseline*	*Recommendation*
Attributes and Rating Rationale for Recommendation			
Main Line Operations	*Rating*	5	7
Improves system vs service movements Increase ramp speed Increase throughput at ramps Lowers sawgrass through operational speed Provides all movements at interchange	*Weight*	28.5	
	Contribution	142.5	199.5
Local Operations	*Rating*	5	5
No Change	*Weight*	23.8	
	Contribution	119	119
Maintainability	*Rating*	5	4
More bridges to maintain Higher bridges to increase complex inspection	*Weight*	19.0	
	Contribution	95	76
Construction Impacts	*Rating*	5	4.5
Eliminates the Punch Through Pile driving closer to home Increase overnight detours and closures	*Weight*	7.1	
	Contribution	35.5	32
Environmental Impacts	*Rating*	5	6.72
Reducing the Quite Waters Park ROW and ENV impact May increase noise by bringing traffic closer to neighborhoods Improves all connections satisfying stakeholder wishes	*Weight*	14.2	
	Contribution	71	95.4
Project Schedule	*Rating*	5	5
No Change	*Weight*	7.1	
	Contribution	35.5	35.5
	Total Performance	499	557
	Net Change in Performance		12%

Total Value Improvement Summary

Value Index								
Recommendations		**Performance (P)**	**% Change Performance**	**Cost (C) $ millions**	**Cost Change $ millions**	**% Change Cost**	**Value Index**	**% Value Improvement**
	Baseline	499	---	$37.7	---	---	13.22	---
1	Develop Alternative Drainage Solution	605	+21.4%	$36.7	($1.00)	-2.7%	16.49	+25%
2	Identify County & FDOT Property for Drainage	499	0.0%	$37.7	$0.00	0.0%	13.22	0%
3	Modify Median Design	532	+6.7%	$37.3	($0.44)	-1.2%	14.27	+8%
4	Use Preemption Technology	594	+19.1%	$37.9	$0.22	+0.6%	15.65	+18%
5	Modify Median Access	529	+6.2%	$37.7	$0.04	+0.1%	14.02	+6%
6	Modify SFWMD Canal Access	577	+15.7%	$37.7	$0.01	+0.0%	15.30	+16%
7	Remove Buffer along Bridge	493	-1.2%	$37.3	($0.42)	-1.1%	13.21	0%
8	Modify Pedestrian & Bicyclist Accommodations	508	+1.9%	$36.6	($1.10)	-2.9%	13.88	+5%

Total Value Improvement Summary

Value Index								
Recommendations		Performance (P)	% Change Performance	Cost (C) $ millions	Cost Change $ millions	% Change Cost	Value Index	% Value Improvement
	Baseline	499	---	$37.7	---	---	13.22	---
9	Advance Safety Improvements at Critical Locations	616	+23.6%	$42.1	$4.44	+11.8%	14.62	+11%
10	Eliminate Trail Underpass	606	+21.6%	$34.5	($3.20)	-8.5%	17.58	+33%
11	Implement TSMO Strategies	582	+16.7%	$38.5	$0.77	+2.0%	15.12	+14%
12	Reduce Limits of Projects along SW 127th, SW 134th & SW 137th	502	+0.7%	$37.2	($0.52)	-1.4%	13.50	+2%
13	Reduce Bridge Width	506	+1.4%	$37.0	($0.71)	-1.9%	13.67	+3%
14	Install ITS Infrastructure Prior to Construction	513	+2.8%	$37.4	($0.28)	-0.7%	13.70	+4%
15	Remove 196th St Connector Improvements	512	+2.6%	$37.5	($0.18)	-0.5%	13.63	+3%
16	Seek ROW Cost Reimbursement along SW 134th South of Quail Roost	499	0.0%	$37.4	($0.33)	-0.9%	13.34	+1%

QUESTIONS

Jose Theiler, PE, CVS
Christopher Johnson, VMA, PMP

IDENTIFY COUNTY & FDOT PROPERTY FOR STAGING AND DRAINAGE PURPOSES

Baseline

Appendix B. VE Recommendation Approval Form

Project: SR 994/SW 200 Street/Quail Roost Drive from West of SW 137th Avenue to East of SW 127th Avenue
VE Study Date: June 12-16, 2023

	Recommendation	Approved Y/N	FHWA Functional Benefit: Safety	Operations	Environment	Construction	Right-of-way	VE Team Estimated Cost Avoidance or Cost Added ($M)	Responses
1	Develop Alternative Drainage Solution	Y			✓	✓		$0.81	Recommendation will be considered during the design phase, based on approved typical section package.
2	Identify County & FDOT Property for Staging and Drainage Purposes	Y					✓	$0.00	Recommendation will be coordinated with Miami-Dade County after 60% design.
3	Modify Median Design	Y				✓	✓	$0.44	A 12-ft median was previously considered but it was not accepted by the DDE.
4	Use Preemption Technology	Y	✓	✓				($0.22)	Recommendation will be considered during design phase, as part of the signalization design.

	Recommendation	Approved Y/N	FHWA Functional Benefit: Safety	Operations	Environment	Construction	Right-of-way	VE Team Estimated Cost Avoidance or Cost Added ($M)	Responses
5	Modify Median Access	Y	✓	✓				($0.04)	Storage area as proposed for SW 132nd Ave would require a design variation due to insufficient acceleration length. The island at SW 134 CT has been reconfigured to restrict the SBL movement as recommended.
6	Modify SFWMD Canal Access	Y	✓	✓				($0.01)	As part of the coordination with SFWMD during the PD&E phase, the proposed concept reflects the design requested by SFWMD. Recommendation can be further evaluated during design as part of the SFWMD ROW Occupancy Permit coordination process.
7	Remove Buffer along Bridge	Y				✓	✓	$0.62	Per FDM, the bridge typical section needs to match the typical section of the roadway approaches. Removing buffer would require design variation.
8	Modify Pedestrian & Bicyclist Accommodations	Y			✓	✓	✓	$1.02	The PD&E concept with one SUP on either side of the road was previously coordinated with the PLEMO and Safety offices and it was determined to be the preferred option. After further analysis and coordination with the District 6 Design Office, the SUPs were replaced by sidewalks with sidewalk level SBLs.

	Recommendation	Approved Y/N	FHWA Functional Benefit: Safety	Operations	Environment	Construction	Right-of-way	VE Team Estimated Cost Avoidance or Cost Added ($M)	Responses
9	Advance Safety Improvements at Critical Locations	Y	✓	✓				($4.45)	The improvements at SW 134th Ave and SW 132nd Ave were previously evaluated by the Safety Office and it was determined that improvements would be included in this project. Also, at some of the critical locations like SW 134th Avenue, even an interim improvement will require ROW.
10	Eliminate Trail Underpass	Y		✓	✓	✓	✓	$3.39	After further analysis and coordination with the District 6 Design, Maintenance and ROW Offices, an at-grade crossing is being proposed as the preferred option for the trail crossing.
11	Implement TSMO Strategies	Y	✓	✓				($0.77)	ITS improvements were coordinated with the TSM&O Office. The study corridor has not been identified by the FDOT District 6 as a priority corridor for implementation of TSM&O strategies such as Adaptive Signal Control Technologies (ASCT) or Traffic Signal Priority (TSP). Please refer to section 6.1.9 of the Preliminary Engineering Report (PER) for additional information.

	Recommendation	Approved Y/N	FHWA Functional Benefit: Safety	Operations	Environment	Construction	Right-of-way	VE Team Estimated Cost Avoidance or Cost Added ($M)	Responses
12	Reduce Limits of Projects along SW 127th, SW 134th & SW 137th	Y				✓	✓	$0.52	The proposed improvements at the intersections with County roads are controlled by traffic operations needs to achieve an acceptable Level of Service (LOS). The proposed work along the County roads is limited to the minimum acceleration length required, taking into account not only the FDOT standard plans but also the queue length to avoid spillover into the intersection (prior to the merge). Also, note the design speed for SW 137 Ave was assumed to be 45 mph per as-built plans.
13	Reduce Bridge Width	Y		✓		✓	✓	$0.71	The buffer reduction was discussed under VE Recommendation No. 7. Providing two separate bridges would restrict the length of the left turn lane to SW 132 Ave and it would impact SFWMD's maintenance access. Also, the overall footprint of the two bridges would be similar to the one-bridge alternative due to pair bridges needing inside shoulders and railings per FDM.
14	Install ITS Infrastructure Prior to Construction	Y	✓			✓		$0.28	Please refer to response to VE Response No. 11. No ITS improvements proposed.
15	Remove 196th St Connector Improvements	Y				✓		$0.18	SW 196 Street connector has been removed from the project.

	Recommendation	Approved Y/N	FHWA Functional Benefit: Safety	Operations	Environment	Construction	Right-of-way	VE Team Estimated Cost Avoidance or Cost Added ($M)	Responses
16	Seek ROW Cost Reimbursement of County Encroachments to Private Owners	Y					✓	$0.33	Recommendation will be coordinated during the ROW Acquisition phase.
	TOTALS		6	7	3	9	8		

Please provide justification if the value engineering study recommendations are **not** approved or are implemented in a modified form.

Florida DOT is required to report Value Engineering results annually to FHWA. To facilitate this reporting requirement, the Value Engineering Recommendation Approval Form is included herein. If the Department elects to reject or modify a recommendation, please include a brief explanation of why. Please complete the form and return it to Florida DOT State Value Engineer.

Raul E Quintela

Digitally signed by: Raul E Quintela
DN: CN = Raul E Quintela C = US O = FLORIDA DEPARTMENT OF TRANSPORTATION
Date: 2024.06.11 11:45:03 -04'00'

Signature – Project Manager Date

Name (please print)

FHWA Functional Benefit Criteria

Each year, State DOTs are required to report on VE recommendations to FHWA. In addition to cost implications, FHWA requires the DOTs to evaluate each approved recommendation in terms of the project feature or features that recommendation benefits. If a specific recommendation can be shown to provide benefit to more than one feature described below, count the recommendation in *each category that is applicable*.

Safety: Recommendations that mitigate or reduce hazards on the facility.

Operations: Recommendations that improve real-time service and/or local, corridor, or regional levels of service of the facility.

Environment: Recommendations that successfully avoid or mitigate impacts to natural and/or cultural resources.

Construction: Recommendations that improve work zone conditions or expedite the project delivery.

Right-of-way: Recommendations that lower the impacts or costs of right-of-way.