

Final Location Hydraulic Report

Florida Department of Transportation - District VII

County Line Road (C.R. 578) Project Development and Environment Study From U.S. 19 (S.R. 55) to U.S. 41 (S.R. 45)

Work Program Item Segment Number: 257298 1

Federal-Aid Program Number: 7822 001 S

Pasco and Hernando Counties, Florida

The proposed project involves improving County Line Road (C.R. 578) to a multi-lane facility from U.S. 19 (S.R. 55) to east of U.S. 41 (S.R. 45) in Pasco and Hernando Counties, a distance of approximately 12.0 miles (19.3 kilometers). The project includes a segment of roadway along a new alignment. This segment is referred to as the Ayers Road Extension and extends from the interchange of C.R. 578 and the Suncoast Parkway to east of U.S. 41, a distance of approximately 3.5 miles (5.6 kilometers).



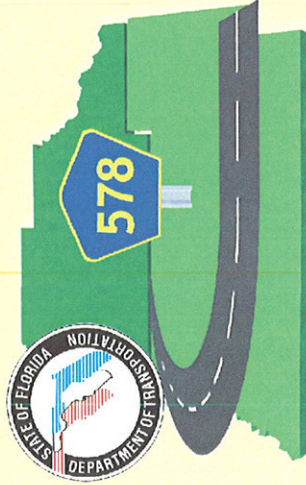
April 2002
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Prepared by:

J.W. Dorzback & Assoc., Inc.

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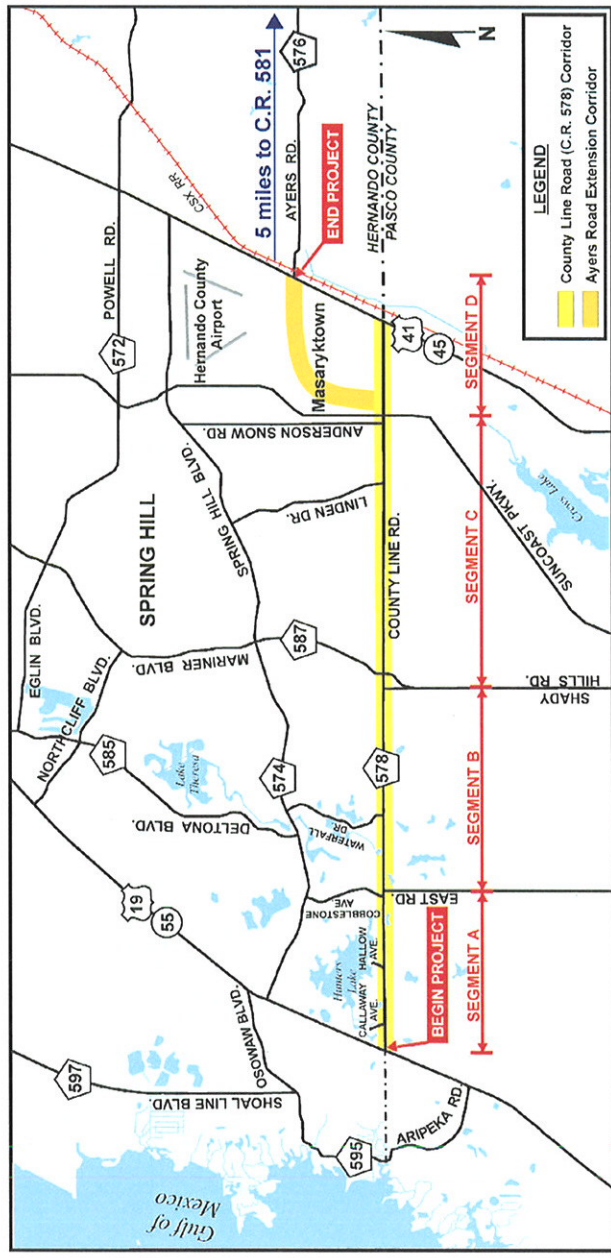
INTRODUCTION

Protection of floodplains and floodways is required by Executive Order 11988, “Floodplain Management,” United States Department of Transportation (USDOT) Order 5650.2, “Floodplain Management and Protection,” and Federal-Aid Policy Guide 23 CFR 650A, Subchapter G, Part 650, Subpart A, Section 650.111, December 9, 1991. This Location Hydraulic Report is prepared in accordance with the requirements set forth in the Florida Department of Transportation (FDOT) Project Development and Environmental (PD&E) Manual, Part 2, Chapter 24, revised April 22, 1998. This document supports the County Line Road (C.R. 578) PD&E Study. It is intended to determine the effects of the encroachment within the 100-year base floodplain of the recommended alternative and, where practicable, avoid supporting land use development that is incompatible with floodplain values as the result of the proposed improvements.

PROJECT DESCRIPTION

The FDOT in partnership with Pasco and Hernando Counties is conducting a PD&E Study to evaluate capacity improvement alternatives for C.R. 578 in Pasco and Hernando Counties, as shown on Figure 1.

FIGURE 1
PROJECT LOCATION MAP



C.R. 578 is currently a two-lane rural highway from U.S. 19 (S.R. 55) to Callaway Avenue and from Hallow Avenue to U.S. 41 (S.R. 45) and is functionally classified as a major collector. From the vicinity of Callaway Avenue to Hallow Avenue, C.R. 578 has been expanded to a four-lane divided suburban facility with an open drainage system. In addition, for 0.5 miles (mi) [0.8 kilometers (km)] west and east of the interchange at the Suncoast Parkway, C.R. 578 has been expanded to a four-lane divided facility. The existing right-of-way ranges from 50 feet (ft) [15.3 meters (m)] to 170 ft (51.9 m) except at the Suncoast Parkway interchange where the right-of-way is 254 ft (77.5 m) (see Project Location Map below). C.R. 578 is a designated evacuation route.

For the purpose of developing and evaluating project alternatives, C.R. 578 was divided into four study segments: Segment A from U.S. 19 to East Road, a distance of 2.4 mi (3.9 km); Segment B from East Road to Mariner Boulevard/Shady Hills Road, a distance of 3.2 mi (5.1 km); Segment C from Mariner Boulevard/Shady Hills Road to the Suncoast Parkway, a distance of 3.9 mi (6.3 km); and Segment D from the Suncoast Parkway to U.S. 41 (Ayers Road Extension), a distance of 3.5 mi (5.6 km).

The recommended project involves improving C.R. 578 to a four-lane suburban facility from the vicinity of U.S. 19 to the vicinity of U.S. 41, a distance of approximately 12.0 mi (19.3 km). A segment of roadway on new alignment, referred to as the Ayers Road Extension, is also recommended from the C.R. 578/Suncoast Parkway interchange north then east to the vicinity of U.S. 41 and Ayers Road (C.R. 576). The recommended route extends northward through mostly undeveloped pasture then east for a distance of approximately 3.5 mi (5.6 km) terminating at the U.S. 41/Ayers Road intersection north of Masaryktown. Based on the design speed, level of service, and access requirements, the improved facility will be functionally classified as an arterial roadway.

The portion of the project from East Road to the Suncoast Parkway is included in the Pasco County Metropolitan Planning Organization's (MPO's) *2025 Long Range Transportation Plan (LRTP)* as a four-lane divided facility. The portion of the project from U.S. 19 to the Suncoast Parkway is included in the Hernando County MPO's *2025 LRTP* and is recommended to be improved to a four-lane divided facility.

The recommended new roadway alignment (S-5), the Ayers Road Extension, from the C.R. 578/Suncoast Parkway interchange to the vicinity of the U.S. 41/Ayers Road intersection, is also identified in the Hernando County *2025 LRTP* as a four-lane facility.

For the Ayers Road Extension, it was determined that because of the potentially adverse effects Alignment S-5 had on the Alexsuk Site (Site – 8HE426), further coordination with FHWA and SHPO was needed. Consequently, a new alignment, S-8, was developed. This alternative was developed in an effort to minimize or eliminate effects to the Alexsuk Site. Both alignments were presented at the Public Hearing. Alignment S-5 was the preferred alternative. The Ayers Road Extension will provide a continuous east-west travel route from U.S. 19 to west of I-75 and facilitate new access to the Hernando County Airport in accordance with the *Hernando County Airport Master Plan*. Both alignments are shown on Figure 2.

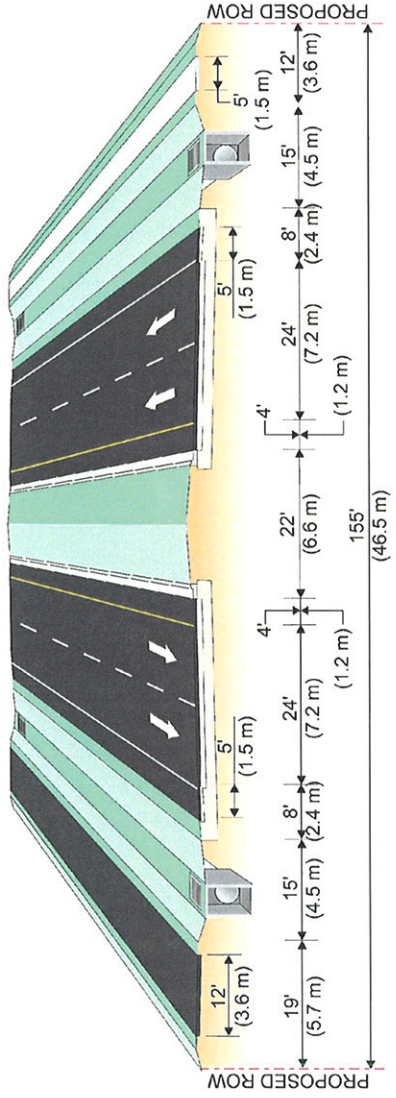
**FIGURE 2
AYERS ROAD EXTENSION ALIGNMENTS**



RECOMMENDED SUBURBAN TYPICAL SECTION

The typical section recommended in this study and approved by Pasco and Hernando Counties, is a four-lane divided suburban facility with a 30 ft (9.0 m) median of which 22 ft (6.6 m) is raised, two 12 ft (3.6 m) travel lanes in each direction, 8 ft (2.4 m) outside shoulders with 5 ft (1.5 m) of the shoulder paved, and 15 ft (4.5 m) drainage swales. A 12 ft (3.6 m) multi-use facility on the north side of the roadway and a 5 ft (1.5 m) sidewalk on the south side of the roadway are recommended. The recommended design speed for this typical section is 55 mph (90 km/h). See Figure 3.

**FIGURE 3
SUBURBAN TYPICAL SECTION**



BUILD ALTERNATIVE ALIGNMENTS

Southern, northern, and centered alignments were developed for the Build Alternative in Segments A, B, and C using the suburban typical section shown in Figure 3. In Segment D, the proposed Ayers Road Extension, two alignments were developed for the Build Alternative. Segment D also utilizes the suburban typical section. A brief description of the alternative alignments follows:

Segments A, B, and C

- Alignment S-1: (South Alignment) proposes the widening of C.R. 578 to the south with ROW acquisitions primarily to the south.
- Alignment S-2: (Center Alignment) proposes the widening of C.R. 578 to the center with ROW acquisitions from both sides of the roadway.
- Alignment S-3: (North Alignment) proposes the widening of C.R. 578 to the north with ROW acquisitions primarily to the north.

Segment D (Ayers Road Extension)

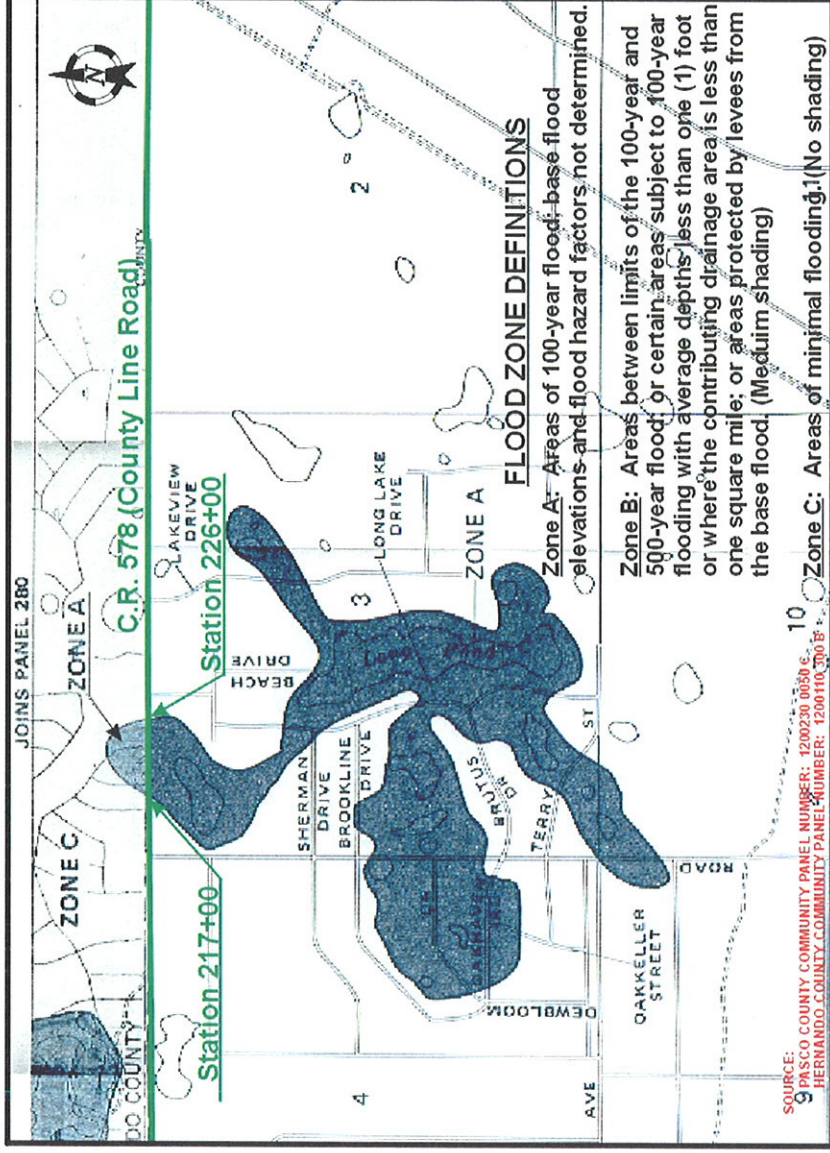
- Alignment S-5: Alignment S-5 is a new alignment that begins east of the Suncoast Parkway and travels north to east and connects to U.S. 41 at Ayers Road.
- Alignment S-8: Alignment S-8 is a new alignment that begins east of the Suncoast Parkway and travels north to east and connects to U.S. 41 at Ayers Road. This alignment parallels the Masaryktown residential community located in the northwest quadrant of C.R. 578 and U.S. 41.

ENCROACHMENTS TO BASE FLOODPLAINS

Examination of *Flood Insurance Rate Maps (FIRMs) Community Panel Numbers 120230-0020C, 120230-0050C, 120230-0075C, 120110-270B, 120110-300B, and 120110-325B* indicates that relatively small portions of the C.R. 578 project limits encroach upon the 100-year Flood Zone.

The first floodplain encroachment is located approximately 2.6 mi (4.2 km) east of U.S. 19 in Segment B as shown on Figure 4.

FIGURE 4
FLOODPLAIN LOCATION NUMBER 1



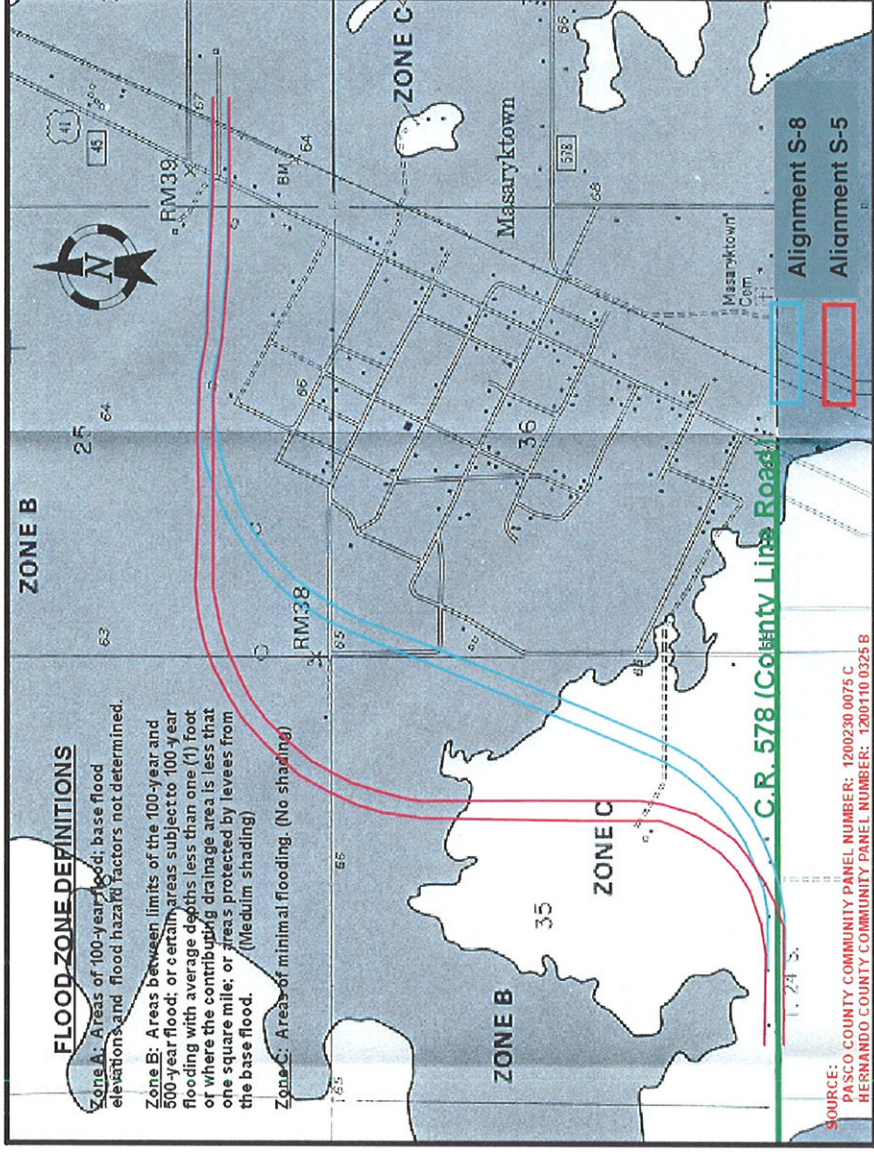
Both the Pasco County FIRM (Community Panel 1200230 0050C) and Hernando County FIRM (Community Panel 1200110 300 B) show encroachment into Flood Zone A extending from west of Blaine Avenue (Station 217+00) eastward for a distance of approximately 900 ft (274.3 m). The encroachment ends at a point 300 ft (91.4 m) east of Clearwater Drive (station 226+00).

Flood Zone A is defined as areas of the 100-year flood zone where the base flood elevations and flood hazard factors have not been determined.

The second floodplain encroachment is located immediately west of U.S. 41 and extends eastward to a point approximately 350 ft (106.7 m) west of Marianna Street as shown on Figure 5. Pasco County Community Panel 1200230 0075 C shows 900 ft (274.3 m) of the C.R. 578 ROW as being in Flood Zone A. The northern half of the ROW within this same section of roadway is shown on the Hernando County Community Panel 12001100 0325 B as Flood Zone B. Flood Zone B is defined as areas between the limits of the 100-year and 500-year flood; or certain areas subject to the 100-year flood with average depths less than 1 ft (0.3 m). In addition, Flood Zone B is defined as contributing areas less than 1 square mile or areas that are protected by levees from the 100-year base flood. The Ayers Road Extension will cross a portion of Flood Zone B. Displacement of floodplain volume within Flood Zone A is not anticipated in this segment of the project.

There are no regulated floodways located within the project limits.

FIGURE 5
FLOODPLAIN LOCATION NUMBER 2



EXISTING DRAINAGE PATTERNS

The existing roadway drainage system within the project limits consists predominantly of roadside grass swales and ditches, with numerous driveway culverts and cross drains. The project is located within the Coastal Rivers Basin and exhibits hydrogeologic characteristics associated with the Karst topography.

Sinkholes and other depressed areas are prevalent throughout the project limits providing vast amounts of natural surface storage within numerous closed basins. Shallow lakes are also present, many of which may be connected directly to the underlying confined aquifer.

Stormwater runoff for most of the eastern portion of the project located between U.S. 19 and Mariner Boulevard/Shady Hills Road, a distance of approximately 4.3 mi (6.9 km), drains north and outfalls into Hunters Lake. Within this segment, approximately 0.85 mi (1.37 km) of roadway was recently widened to four lanes. Stormwater management facilities (two retention ponds) have been provided on the south side of the roadway.

Stormwater runoff from the remainder of the project flows to closed basins and/or sinkholes adjacent to the project corridor. Under normal conditions, the closed basins are internally drained. However, during periods of high groundwater levels and extreme rainfall, excess runoff from some of these closed basins/depression areas will flow overland following poorly defined shallow swales and ditches toward the Masaryktown canal.

EXISTING DRAINAGE RELATED PROBLEMS

The Pasco County and Hernando County Public Works Departments were contacted concerning any historical flooding problems within and adjacent to the project limits. No drainage problems along the existing roadway were reported other than erosion along the roadway shoulders. The worst areas were reported to be west of Mariner Boulevard/Shady Hills Road where steep embankments were noted. These areas are adjacent to what appears to be old sinkholes or low-lying areas.

FLOODPLAIN ENCROACHMENT

Within the project corridor, C.R. 578 represents a transverse encroachment on the floodplain associated with one existing cross drain. The estimated floodplain volume displaced by the roadway improvements is approximately 1.12 acre-ft (0.14-hectare-meter). This encroachment should remain at existing levels for all proposed alternatives. The proposed drainage structure improvements will not significantly increase the potential for risks or damages. Interruption of emergency services and emergency evacuation routes due to roadway flooding should not change significantly from existing levels. Cut and fill activities required as part of the roadway improvements are not expected to significantly impact the fauna, flora, and open space environments along the corridor. Additionally, local groundwater and surface water systems, flow patterns, and water quality will experience no significant impacts.

PROPOSED DRAINAGE SYSTEM

During the design phase, the recommended drainage system for this project will be designed in accordance with the Department's drainage standards and procedures, to carry stormwater runoff away from the roadway in the natural flow directions of that particular basin. In most cases, this will require modifications to existing structures, such as culvert extensions, to correspond to the new roadway sections and clear zone requirements. The existing structures could be extended without significant impacts to headwater elevations or negative effects to emergency services

and evacuation. The Southwest Florida Water Management District (SWFWMD) criteria requires that the proposed headwater at modified structures should not rise more than 0.1 foot for the 50-year design storm event. A detailed culvert analysis should be performed during the final design phase of the project to identify the exact culvert inverts, dimensions, and design headwater elevations.

The Ayers Road Extension will require the construction of new cross drain structures in order to maintain existing drainage patterns and preserve the natural hydration periods of adjacent wetlands. The preliminary size and location of these structures will be determined following selection of the preferred corridor.

RISK ASSESSMENT

In accordance with the requirements set forth in 23 CFR 650A, the project corridor was evaluated to determine the effect, if any, of the recommended roadway improvements. Hydraulic improvements, required as part of the roadway project, are divided into seven categories based on the type of hydraulic improvement proposed and the estimated floodplain effects. A preliminary hydraulic evaluation was performed as a means of selecting the appropriate floodplain activity category.

Under the categorization scheme mentioned above, the existing cross drains and associated floodplain encroachments were classified as Category 3. This category describes the type of individual modification, if any, required for each structure. Cross drains constructed as part of the Ayers Road extension are classified as Category 6.

Category 3: Projects Involving Modifications to Existing Drainage Structures

This category applies to those activities that modify existing structures (e.g., extending cross drains, adding headwalls, or relocating manholes and inlets). The recommended roadway improvements will require modification to existing drainage structures.

The following conclusion applies to Category 3 structures:

“The modifications to drainage structures included in this portion of the project will result in an insignificant change in their capacity to carry floodwater. This change will cause minimal increases to flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant”.

Category 6: Projects on New Alignment and Projects on Existing Alignment with Potentially Significant Changes in the 100-Year Flood Elevations

Cross drain structures required as part of the proposed Ayers Road Extension are included in Category 6.

“The modification and construction of the drainage structure(s) proposed for this project will cause changes in flood stage and flood limits. These changes will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant changes in flood risk or damage. These changes have been reviewed by the appropriate regulatory authorities who have concurred with the determination that there will be no significant impacts. There will not be significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.”

C.R. 578 does not involve any regulatory floodways and should not support incompatible base floodplain development; therefore, the following statement can be made:

“It has been determined, through consultation with local, state, and federal water resources and floodplain management agencies that there is no regulatory floodway involvement on the proposed project and that the project will not support base floodplain development that is incompatible with existing floodplain management programs.”

CONCLUSION

The recommended drainage improvements, consisting of extending existing culverts to accommodate improvements within the C.R. 578 study corridor, should not adversely affect the surrounding area. The existing flood zones fit the surrounding flat lowland terrain and should not change because of the widening. The area surrounding the corridor is rural and urban in nature with wetlands located at several locations along the project corridor. Improvements to existing facilities should have minimal effect on development in flood zones and provide an improvement to emergency services. The Preliminary Engineering Report (PER) has documented that widening C.R. 578 adjacent to the existing alignment is the most viable solution.

Within Segment D, the Ayers Road Extension, new drainage facilities will be designed in accordance with Department’s drainage standards and procedures resulting in insignificant impacts limited to 0.1 ft (0.03 m) of backwater rise for the 50-year storm event.

The recommended project will not significantly change the risks or damages associated with roadway flooding or cause an interruption of emergency services and evacuation of the community. Additionally, the recommended drainage improvements will perform hydraulically in a manner equal to or greater than the existing structures. For these reasons, the previously outlined drainage improvements are recommended as part of the C.R. 578 roadway improvement project.