

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TECHNICAL REPORT COVERSHEET

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ENVIRONMENTAL
MANAGEMENT
06/17

Location Hydraulics Report

Florida Department of Transportation District Two

SR 115

Lem Turner Road (SR 115) over Trout River Bridge Replacement Bridge No. 720033

Duval County, Florida

Financial Management Number: 437437-2-22-01

ETDM Number: 14449

Date: August 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 Federal Highway Administration and FDOT.

Authorized Signature

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Federal Aid Project ID No: TBD

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Prepared For:



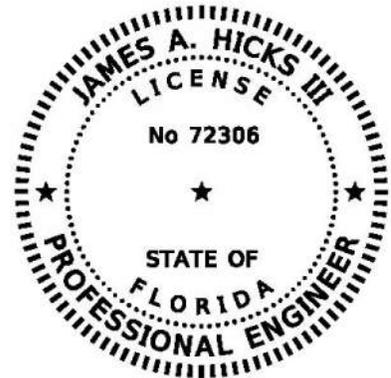
Florida Department of Transportation
District Two

Prepared By:

Parsons Transportation Group Inc.
1300 Riverplace Blvd. Suite 200 | Jacksonville, Florida
904-596-1400

This item has been digitally signed and sealed by
James A. Hicks III, PE on the date adjacent to the seal.

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August 2023

TABLE OF CONTENTS

- 1.0 PROJECT SUMMARY 1**
 - 1.1 Project Description 1
 - 1.2 Purpose and Need 3
 - 1.3 Project Status 3
- 2.0 EXISTING CONDITIONS..... 3**
- 3.0 DESIGN FEATURES OF THE BUILD ALTERNATIVE..... 4**
 - 3.1 Typical Section 4
 - 3.2 Proposed Bridge Structure..... 5
 - 3.3 Temporary Traffic Control..... 6
 - 3.4 Floodplain Impacts 6
- 4.0 CONCLUSION 8**

LIST OF FIGURES

- Figure 1: Project Limits and Location..... 2
- Figure 2: Existing Bridge Typical Section 4
- Figure 3: Proposed Bridge Typical Section 5
- Figure 4: Proposed Roadway Typical Section 5
- Figure 5: FEMA FIRM Map 7

LIST OF APPENDICES

Appendix A: Build Alternative Concept Plans

Lem Turner Road (SR 115) over Trout River Bridge (No. 720033) Replacement
FM 437437-2-22-01

1.0 PROJECT SUMMARY

1.1 Project Description

This project will replace the existing Lem Turner Road (SR 115) Bridge (No. 720033) over Trout River in Duval County. The project limits are from Trout River Boulevard to Broward Road. Lem Turner Road is classified as an urban minor arterial within the study area. The current bridge is a four-lane undivided facility as is Lem Turner Road on the south approach to the bridge but is a four-lane divided facility on the north approach. The total length of the bridge is 732'. The project location is shown in **Figure 1**.

Trout River is a navigable waterway with a channel depth of 22' under the bridge. The bridge provides a 40' navigational horizontal clearance and a 17.9' vertical clearance.

Lem Turner Road is designated as an emergency evacuation route by the City of Jacksonville Emergency Preparedness Office.

The proposed project is identified in the Efficient Transportation Decision Making (ETDM) system as Project #14449, entitled "Lem Turner Road (SR 115) over Trout River Bridge Replacement".

The anticipated class of action for the project is a Type 2 Categorical Exclusion.

The proposed Build Alternative Concept Plans are shown in **Appendix A**.

Lem Turner Road (SR 115) over Trout River Bridge (No. 720033) Replacement
FM 437437-2-22-01



Figure 1: Project Limits and Location
Lem Turner Road (SR 115) over Trout River
Bridge Replacement

Lem Turner Road (SR 115) over Trout River Bridge (No. 720033) Replacement
FM 437437-2-22-01

1.2 Purpose and Need

Purpose

The purpose of this project is to address structural issues related to the existing Lem Turner Road (SR 115) Bridge (No. 720033) over the Trout River.

Need

The current bridge structure was constructed in 1957 and is considered structurally deficient by the Florida Department of Transportation (FDOT) and will need replacement due to deteriorating conditions.

A bridge sufficiency survey conducted by FDOT in 2018 resulted in a score of 22.0 on a scale of 0-100. The bridge was also rated as “Scour Critical” and “Functionally Obsolete”. Sufficiency rating is essentially an overall rating of a bridge's fitness to remain in service. A bridge with a sufficiency rating of 80 or less is eligible for bridge rehabilitation funding. A sufficiency rating below 50 qualifies a bridge for replacement funds. The bridge conditions are as follows:

- Deck: Satisfactory
- Superstructure: Satisfactory
- Substructure: Fair
- Performance Rating: Fair
- Channel: Bank Protection Eroded

1.3 Project Status

Bridge rehab work was performed to address the structural stability deficiencies by adding struts between the bridge piles that had been compromised due to scour. The bridge rehabilitation project was completed in March 2021.

The current 5-year Work Program shows Right-of-way (R/W) being funded in fiscal year (FY) 2025 and construction funded in FY 2027 for the bridge placement.

2.0 EXISTING CONDITIONS

Lem Turner Road is a 4-lane urban minor arterial roadway with an access classification 5. South of the project, a two-way left turn lane exists within the median, which transitions to an undivided facility north of Trout River Boulevard as the roadway approaches the bridge. North of the bridge, Lem Turner Road transitions from an undivided to divided facility with a left turn lane at Dolly Drive and right turn lane at Broward Road. The posted speed limit is 45-mph. There are bicycle and pedestrian facilities along the corridor, north and south of the bridge; however, the existing bridge only has narrow sidewalks (catwalks) with no bicycle lanes.

The Trout River Bridge (Bridge No. 720033) was constructed in 1957. It consists of 20 spans and is 732'-0" long and carries 4 lanes of traffic. The bridge is located over a tidally influenced river and has a substructure classification of “extremely aggressive”. The typical section is 57'-3" out-to-out with two 12' lanes in each direction and two 3'-6" raised sidewalks, see **Figure 2**. The superstructure consists of a simple span reinforced concrete tee beam system. The intermediate bents are a combination of regular pile bents or tower bents and they consist of eight 20" square prestressed concrete piles. The bridge structure has undergone several renovations including a fender

replacement in 2005, the installment of pile jackets as part of a cathodic protection in 2012, and the installation of cross brace struts to stabilize the bridge piers in 2021 that had been compromised due to scour.

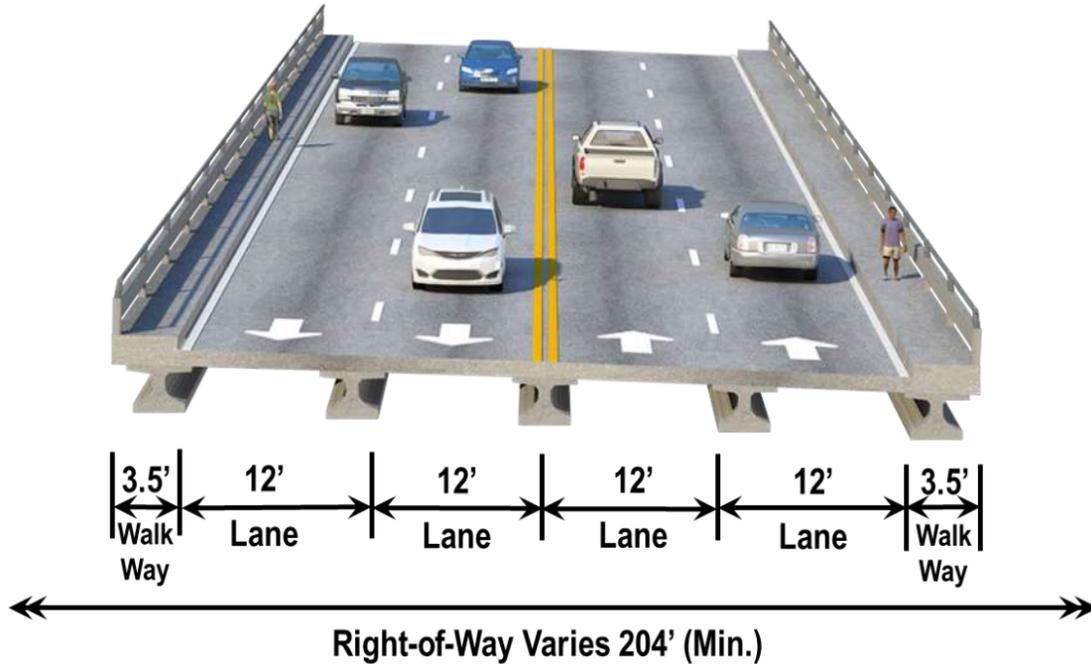


Figure 2: Existing Bridge Typical Section

3.0 DESIGN FEATURES OF THE BUILD ALTERNATIVE

A range of alternatives were investigated during the initial concept development phase of the project. The recommended Build Alternative was primarily selected since it would minimize impacts on the surrounding environment and require only three permanent right-of-way takes. Temporary traffic control during construction was a major consideration in the alternative selection process.

3.1 Typical Section

The Build Alternative bridge replacement concepts were developed based on a typical section that includes four 11' travel lanes, 7' median, and 10' shared use paths on each side with a 45-mph design speed. The roadway approaches will also incorporate bicycle lanes and sidewalks. The proposed bridge and roadway typical sections are shown in **Figure 3** and **Figure 4** respectively.

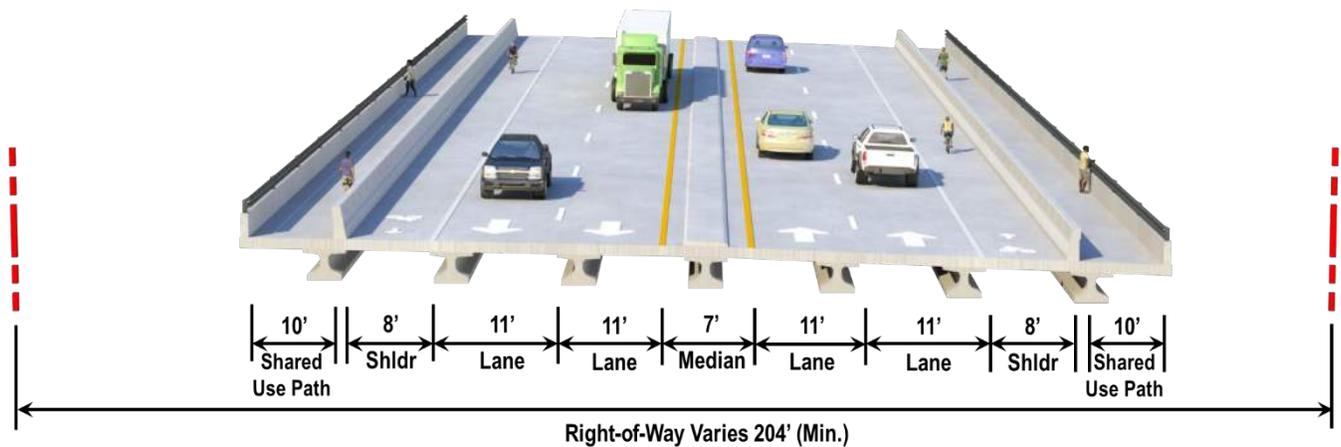


Figure 3: Proposed Bridge Typical Section

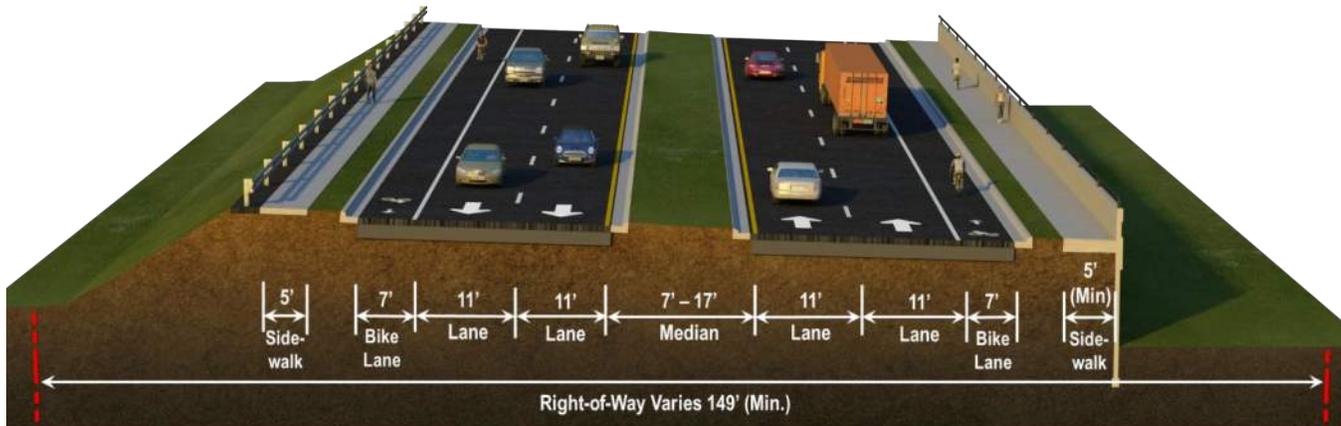


Figure 4: Proposed Roadway Typical Section

3.2 Proposed Bridge Structure

The preliminary span arrangement of the Build Alternative includes eight, 96' spans. This equates to the proposed structure being 768' long, which is 36' longer than the existing bridge. The substructure would be pile bents with a Florida I-Beam (FIB) superstructure and cast-in-place concrete deck. The pilings for Span 5 over the navigational channel would be arranged to maintain a minimum of 40' clear.

The proposed end bents will be a retaining wall system. The wall will be armored with bank and shore rip-rap that sits atop a layer of filter fabric and bedding stone. The exact type of retaining wall system will be finalized during design.

The vertical profile of the bridge will also be modified; however, the existing 17.9' navigational clearance will be maintained.

A fender system along with navigational lighting will also be installed for the proposed structure.

Lem Turner Road (SR 115) over Trout River Bridge (No. 720033) Replacement
FM 437437-2-22-01

3.3 Temporary Traffic Control

As mentioned above, temporary traffic control was a major consideration in the alternative selection process. The preliminary approach will be to phase the construction of the new structure. A portion of the new structure will be constructed east of the existing bridge, allowing traffic to still utilize the existing bridge as it does today. Once the new portion of the bridge is constructed, traffic will be placed on new structure, the old bridge removed, and the remainder of the new structure completed. The roadway approaches will be constructed in multiple phases, due to the changes in vertical alignment. The preliminary temporary traffic control is shown in **Appendix A**.

3.4 Floodplain Impacts

The project is located within the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FRIM) panel 12031C0187J. The majority of this project is located within the floodplain as shown in **Figure 5**.



Figure 5: FEMA FIRM Map

The existing Trout River basin is approximately 27.6 square miles. The river flows from west to east and converges into the St. Johns River. At the project location, Trout River is saltwater in nature and is tidally influenced. There is approximately 2.5' of tidal change between the mean high water and mean low water. The Zone AE has a Base Flood Elevation (BFE) of +5' NAVD and is subject to

Lem Turner Road (SR 115) over Trout River Bridge (No. 720033) Replacement
FM 437437-2-22-01

inundation by the 1% chance flood event and wave heights less than 1.5', if any. FEMA maps show that the 100-yr Still Water Elevation (SWE) is between 4.5' and 5.5' NAVD.

Based on the Build Alternative shown in **Appendix A**, it is anticipated that 0.746 acres of floodplains will be impacted along the south and north banks of Trout River, with an additional 0.497 acres of impacts to the surface waters. The impacts along the banks will be longitudinal impacts due to the wider proposed typical section, new pond in the northwest quadrant, and realignment of the proposed structure. The surface water impacts will be transverse impacts due to the pilings and slope protection at the bridge end bents.

A Bridge Hydraulics Report (BHR) was prepared by Intera Incorporated (dated June 2023) for the Build Alternative. The results of the hydraulic modeling found that the 100-year (base) would result in an elevation of +6.3' NAVD, which includes 1' of sea level rise. This base elevation is higher than the FEMA SWE; however, the current FEMA SWE's do not include the projected sea level rise of 1' that was included within the modeling.

4.0 CONCLUSION

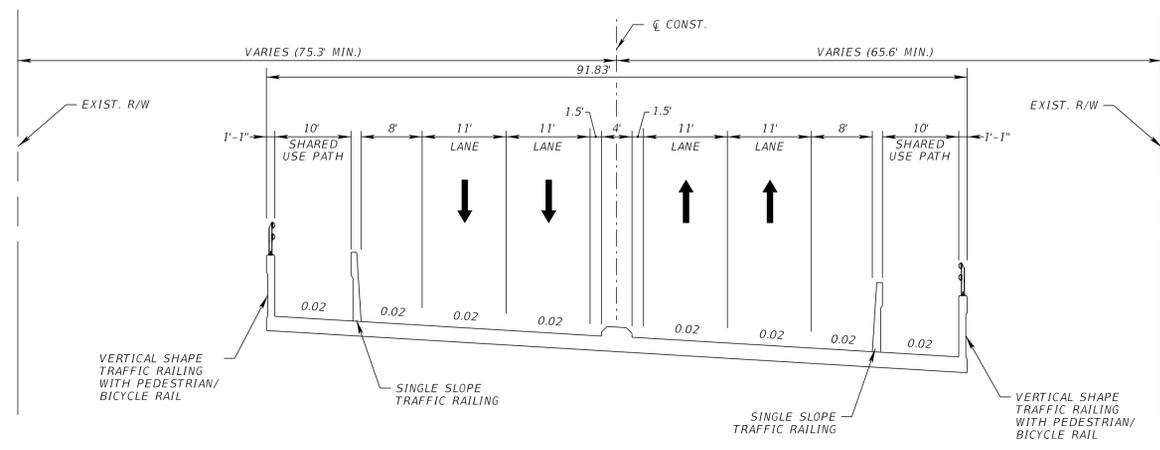
The project is expected to have Minimal Encroachments to the existing floodplains.

It is anticipated that approximately 1.243 acres of floodplains are anticipated for the Build Alternative. However, based on the hydraulic modeling found in the BHR, the estimated elevation (not including sea level rise) would fall within the FEMA SWE range that currently exists today. Based on the information above, no floodplain compensation would be required. Furthermore, the inclusion of stormwater ponds for the project will help control discharge rates to Trout River.

The proposed bridge structure will be longer than the existing and require less pilings within the river, reducing impacts. Additionally, the anticipated temporary traffic control will allow emergency transportation facilities and evacuation routes to remain functional.

Appendix A: Build Alternative Concept Plans

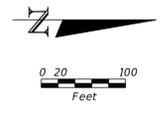
PREFERRED ALTERNATIVE



SR 115 (LEM TURNER) at TROUT RIVER
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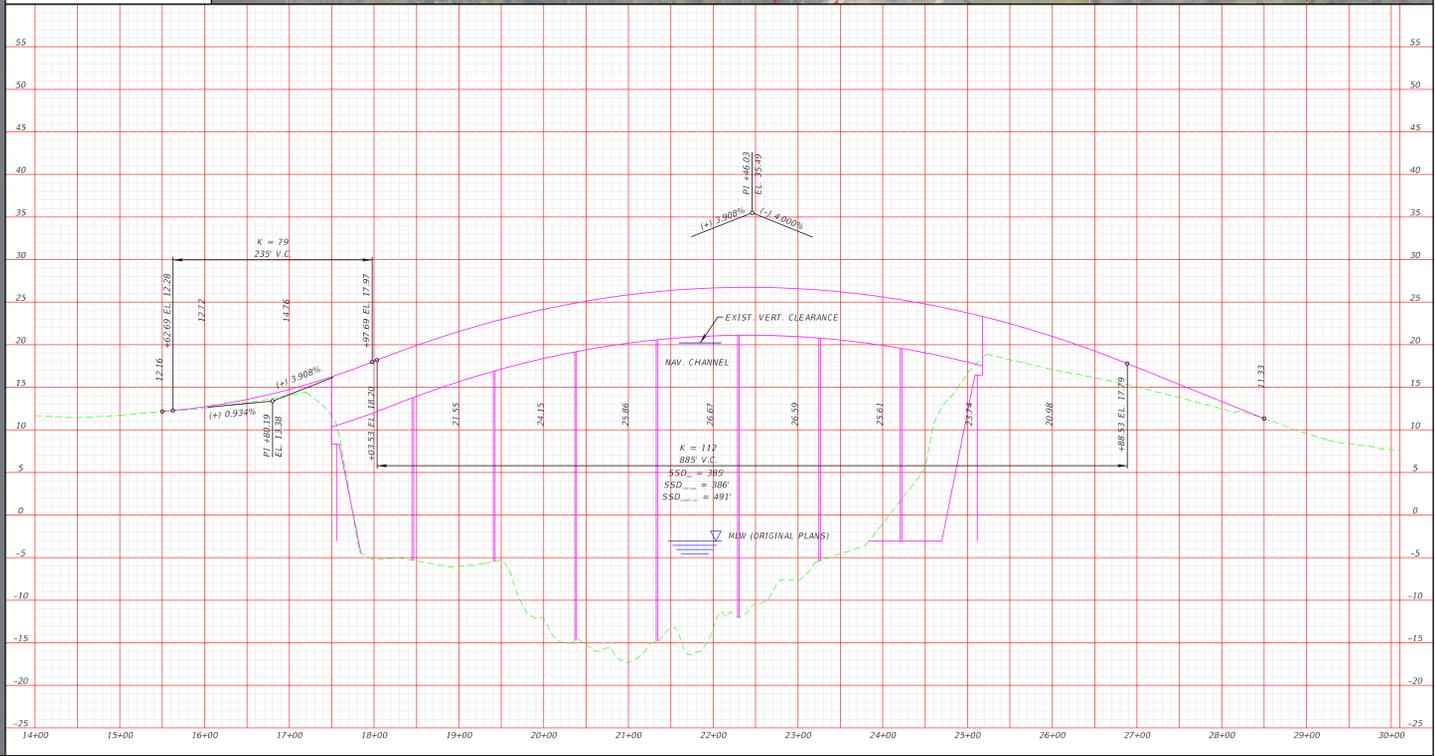
LEGEND

- PARCEL LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED TITF EASEMENT
- WIDENING / RECONSTRUCTION
- MILLING & RESURFACING
- BRIDGE
- PONDS



July 26, 2023

PROFILE



<p>CURVE DATA BLS-SR115-1 PI STA. = 115+25.49 Δ = 77° 12' 55" (RT) D = 3° 00' 00" L = 1,525.49 T = 2,574.40 R = 1,909.66 PC STA. = 100+00.00 PT STA. = 125+74.40</p>	<p>CURVE DATA BLC-PRE-ALT-1 PI STA. = 11+14.89 Δ = 6° 51' 58" (RT) D = 2° 59' 31" L = 114.89 T = 229.50 R = 1,915.09 PC STA. = 10+00.00 PT STA. = 12+29.50</p>
<p>CURVE DATA BLC-PRE-ALT-2 PI STA. = 13+20.66 Δ = 7° 42' 06" (RT) D = 3° 53' 22" L = 99.16 T = 198.02 R = 1,473.11 PC STA. = 12+29.50 PT STA. = 14+27.52</p>	<p>CURVE DATA BLC-PRE-ALT-3 PI STA. = 15+59.32 Δ = 20° 09' 32" (RT) D = 7° 43' 37" L = 131.81 T = 260.89 R = 741.50 PC STA. = 14+27.52 PT STA. = 16+40.41</p>
<p>CURVE DATA BLC-PRE-ALT-4 PI STA. = 27+50.43 Δ = 20° 23' 39" (RT) D = 6° 07' 18" L = 231.65 T = 465.45 R = 935.94 PC STA. = 25+12.78 PT STA. = 29+78.24</p>	

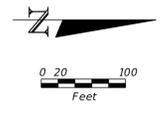
PREFERRED ALT
TTCP Phase 1A

SR 115 (LEM TURNER) at TROUT RIVER

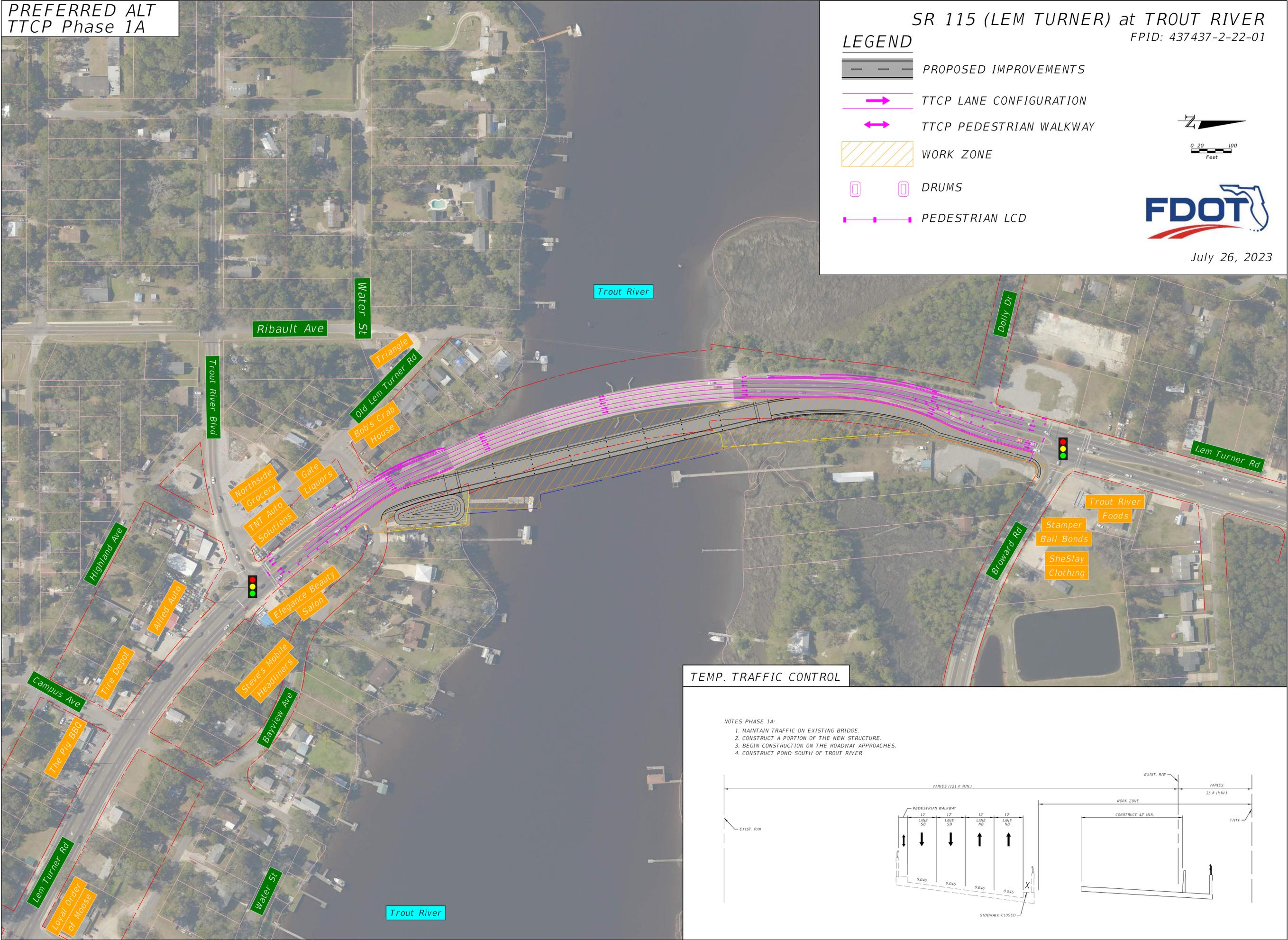
FPID: 437437-2-22-01

LEGEND

-  PROPOSED IMPROVEMENTS
-  TTCP LANE CONFIGURATION
-  TTCP PEDESTRIAN WALKWAY
-  WORK ZONE
-  DRUMS
-  PEDESTRIAN LCD

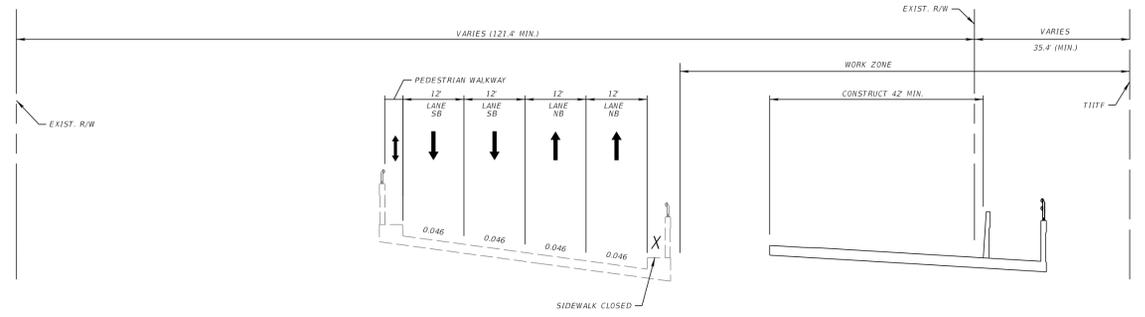


July 26, 2023



TEMP. TRAFFIC CONTROL

- NOTES PHASE 1A:
1. MAINTAIN TRAFFIC ON EXISTING BRIDGE.
 2. CONSTRUCT A PORTION OF THE NEW STRUCTURE.
 3. BEGIN CONSTRUCTION ON THE ROADWAY APPROACHES.
 4. CONSTRUCT POND SOUTH OF TROUT RIVER.



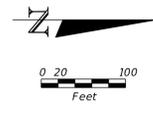
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SR 115 (LEM TURNER) at TROUT RIVER

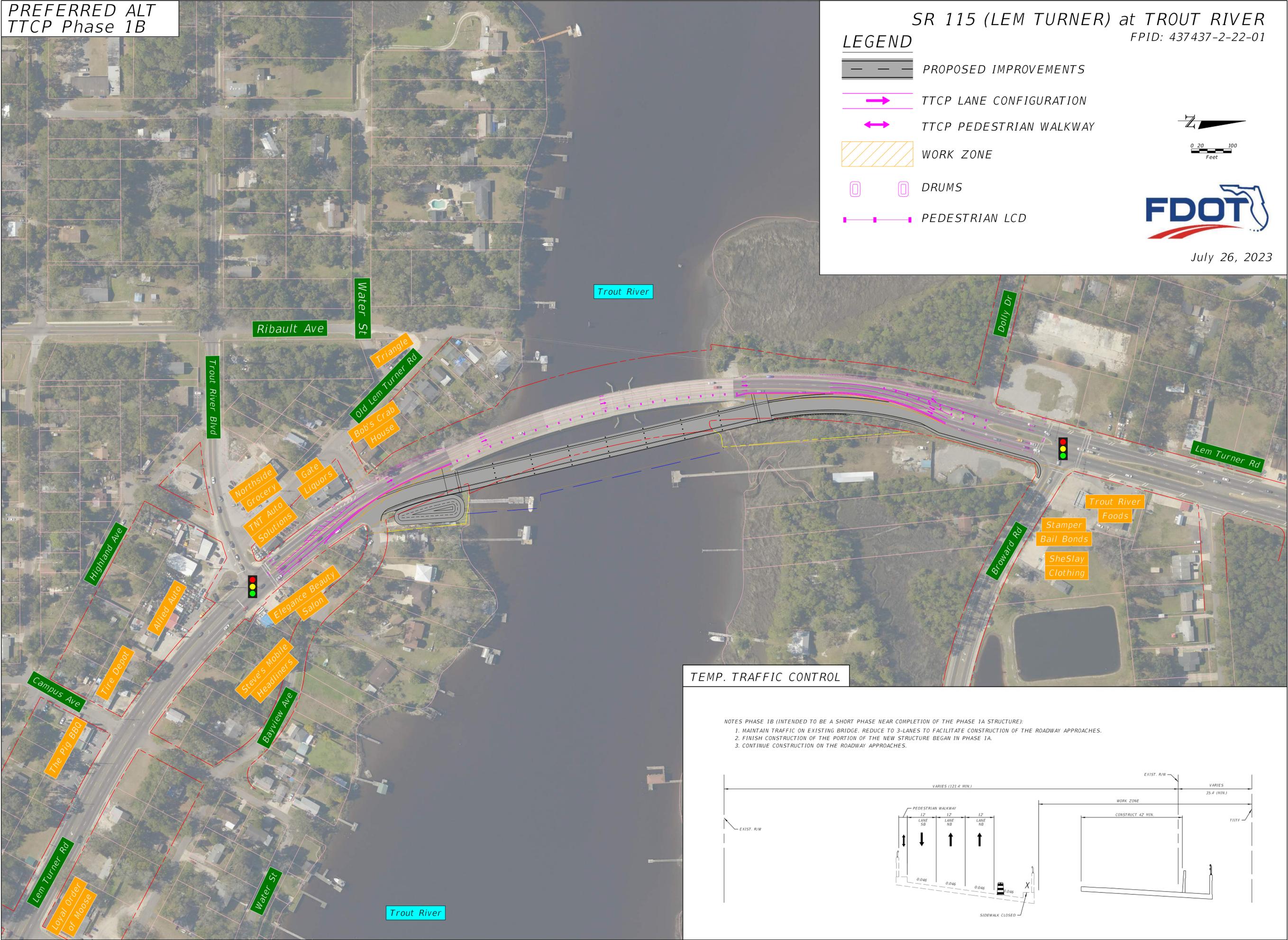
FPID: 437437-2-22-01

LEGEND

-  PROPOSED IMPROVEMENTS
-  TTCP LANE CONFIGURATION
-  TTCP PEDESTRIAN WALKWAY
-  WORK ZONE
-  DRUMS
-  PEDESTRIAN LCD

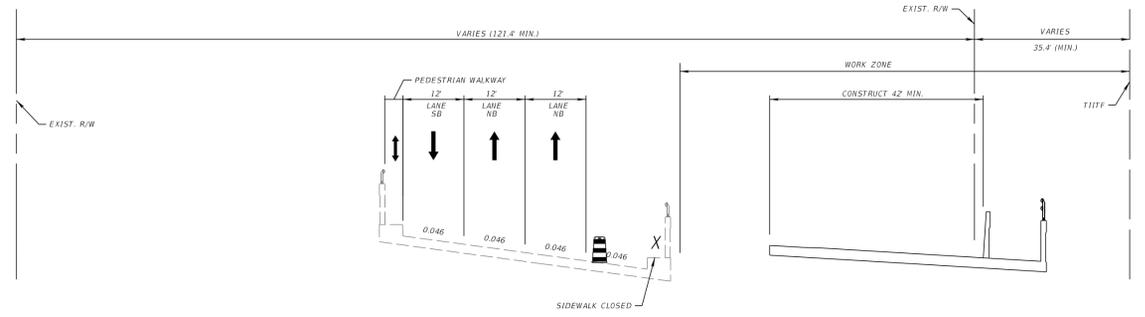


July 26, 2023



TEMP. TRAFFIC CONTROL

- NOTES PHASE 1B (INTENDED TO BE A SHORT PHASE NEAR COMPLETION OF THE PHASE 1A STRUCTURE):
1. MAINTAIN TRAFFIC ON EXISTING BRIDGE. REDUCE TO 3-LANES TO FACILITATE CONSTRUCTION OF THE ROADWAY APPROACHES.
 2. FINISH CONSTRUCTION OF THE PORTION OF THE NEW STRUCTURE BEGAN IN PHASE 1A.
 3. CONTINUE CONSTRUCTION ON THE ROADWAY APPROACHES.



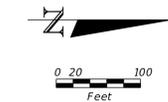
PREFERRED ALT
TTCP Phase 2 & 3

SR 115 (LEM TURNER) at TROUT RIVER

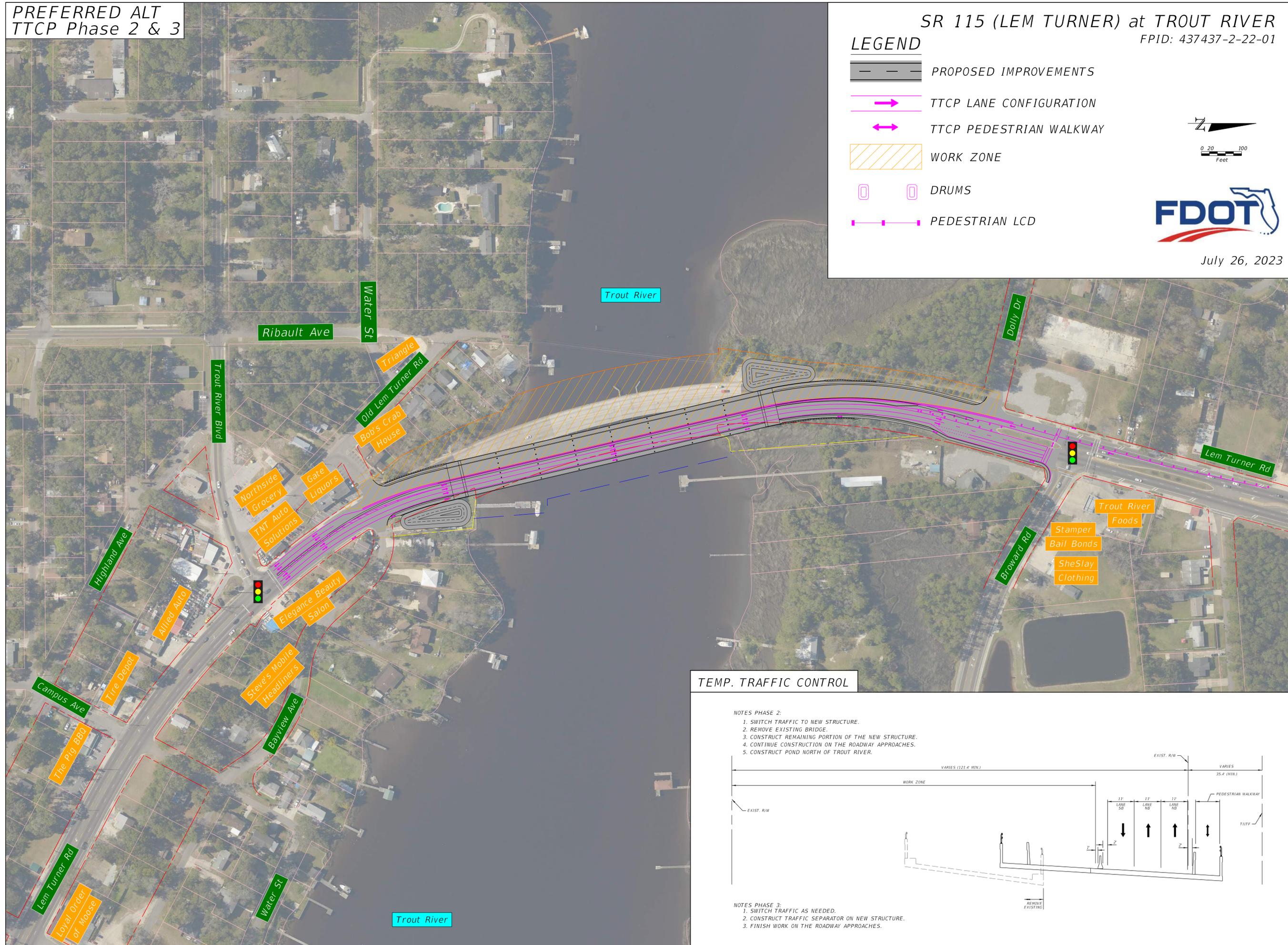
FPID: 437437-2-22-01

LEGEND

-  PROPOSED IMPROVEMENTS
-  TTCP LANE CONFIGURATION
-  TTCP PEDESTRIAN WALKWAY
-  WORK ZONE
-  DRUMS
-  PEDESTRIAN LCD

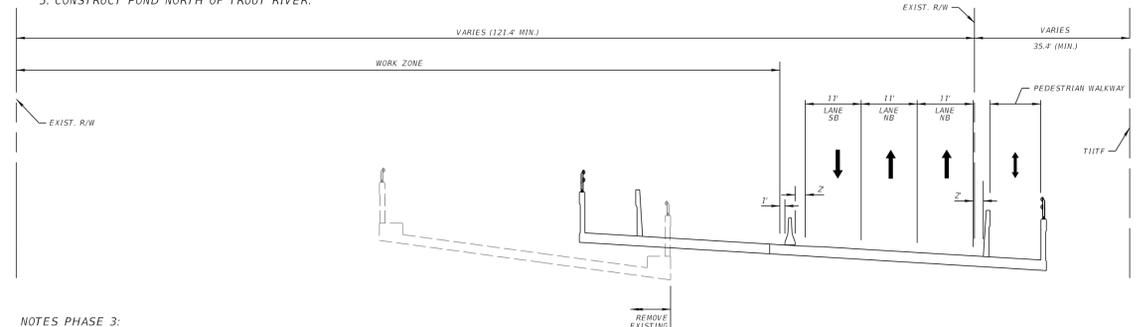


July 26, 2023



TEMP. TRAFFIC CONTROL

- NOTES PHASE 2:
1. SWITCH TRAFFIC TO NEW STRUCTURE.
 2. REMOVE EXISTING BRIDGE.
 3. CONSTRUCT REMAINING PORTION OF THE NEW STRUCTURE.
 4. CONTINUE CONSTRUCTION ON THE ROADWAY APPROACHES.
 5. CONSTRUCT POND NORTH OF TROUT RIVER.



- NOTES PHASE 3:
1. SWITCH TRAFFIC AS NEEDED.
 2. CONSTRUCT TRAFFIC SEPARATOR ON NEW STRUCTURE.
 3. FINISH WORK ON THE ROADWAY APPROACHES.