FLORIDA DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL MANAGEMENT OFFICE

THE HISTORIC HIGHWAY BRIDGES OF FLORIDA

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Tampa, Florida

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PREFACE

This report represents the third statewide inventory of Florida's historic highway bridges. The survey was performed as a task work order under contract C8Q73 by Archaeological Consultants, Inc. (ACI) on behalf of the Florida Department of Transportation (FDOT, Environmental Management Office (EMO), and in association with Jacobs Engineering Group, Inc. ACI's Joan Deming was the Principal Investigator for this project. Elaine Lund, AICP, the principal author of the draft report, led the effort to inventory and evaluate Florida's bridges. She is also credited with the preparation of the National Register of Historic Places (NRHP) multiple property cover nomination. Kisa Hooks, MHP, worked in cooperation with Ms. Lund to conduct research, field survey, and all phases of report development and accompanying documentation, including the completion of Florida Master Site File (FMSF) forms and a set of PowerPoint presentation slides for all newly identified significant bridges. ACI's Jennifer Marshall, Beth Horvath, Barbara Perry, and Tesa Norman assisted with the FMSF forms, and report graphics, format, and production.

The update to *The Historic Highway Bridges of Florida* (2004) was initiated in Fall of 2009 and completed in December 2010. During this time, many individuals provided invaluable assistance to the ACI project team. We extend very special thanks to Department Project Manager Roy Jackson and Section Manager George Ballo for affording ACI the privilege to update Florida's historic bridge inventory. Jackson shared his first-hand experience and lessons learned from the previous statewide inventory, and helped us fine tune the project methodology. We are indebted to Jackson and Ballo for their overall leadership and friendly support. Department Contract Manager Jeff Caster is gratefully acknowledged for his patience and administrative assistance.

Finding bridge data is hard work since there is no central repository. The search for bridge records, including histories and photographs, involved the generous assistance of numerous Structures Maintenance Engineers, Structures Maintenance Coordinators, Structures and Facilities Bridge Inspectors, Bridge Support Engineers, and Document Specialists in all FDOT districts. Bridge-specific rehabilitation and other relevant project information was gathered with the help of the District Cultural Resource Coordinators. Our collective thanks to FDOT's A.D. Blais, William Berryman, Dennis J. Fernandez, Carlo Ferrera, Jose Garcia, Edward Gassman, Frank P. Guyamier, Lynn Kelley, Carol Loecken, Leah McAllister, Ron J. Meade, Katrina Monroe, Melissa Morgan, Terri Newman, Brian O'Donoughue, Michael Rausch, Susanne Travis, Martha Trujillo, and William Watts. In addition, many County and City Engineers, Planners, and Transportation specialists throughout Florida responded to our requests for information. We gratefully acknowledge the assistance of Terry Rauth and Mary Beltran, Martin County; Jennifer A. Stults, Polk County; Peter Buchwald, St. Lucie County; Jodi B. Pracht, Sarasota County; and Jessica Paul and Mary Bo Robinson of the West Florida Regional Planning Council. Erin Bailey, Ginny Jones, and Vincent "Chip" Birdsong of the Division of Historical Resources, FMSF Office, facilitated access to cultural resource survey reports, site file forms, National Register nominations, and other data.

The gain a better understanding of bridge building technology of the 1960s, particularly in regard to the fabrication of ubiquitous concrete bridges, ACI turned to Cardno/TBE's structural engineers Bob Heck, Frank Haunstetter, and Larry Mau. We are deeply grateful for their expert help in making the preliminary and final selection of Florida's most significant 1960s bridges.

As this project progressed, the absence of a uniform application of bridge terminology became evident. In the final analysis, comparing "numbers" from this and previous studies is an exercise in futility. Nevertheless, after 30 years of study, Florida's surviving historic highway bridges continue to both reflect the significant patterns of our history, as well as to embody the highest achievements in bridge design, construction, technological innovation, artistry, and aesthetics, in wood, metal, and concrete.

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CHAPTER 1 - INTRODUCTION

Early highway bridges provide valuable examples of our engineering and industrial heritage. In completing a statewide survey and evaluation, Florida contributes to the body of knowledge related to American bridge-building history and documents the engineering and design solutions to crossing the state's many waterways. The inventory of Florida's historic highway bridges further functions as a planning tool that mediates between maintaining a safe highway system and affording protection for some of the state's most significant and valuable historic resources. Florida conducts a historic bridge inventory every 10 years. This is the third statewide study, conducted between 2009 and 2010. Chapter 1 of this inventory contains a synopsis of project methodology.

PURPOSE AND OBJECTIVES

This report provides a ten-year update to the Florida Department of Transportation's (FDOT) *The Historic Highway Bridges of Florida*,[1] last updated in 2000, in accordance with the Highway Bridge Replacement and Rehabilitation Program enacted by the *Surface Transportation and Uniform Relocation Assistance Act of 1987*. This Act includes a provision that requires each State to complete an inventory and assessment of historic highway bridges within the federal aid program ("on system"), as well as those owned by county and municipal authorities ("off system"), in order to receive funding through this program for historic bridge preservation. The intent was to encourage the rehabilitation, reuse, and preservation of historic bridges that are listed in or eligible for the National Register of Historic Places (NRHP). In passing this legislation, Congress also recognized the importance of historic bridges as "links to our past" that "serve as safe and vital transportation routes in the present, and can represent significant resources for the future."

The purpose of this 2010 inventory, which builds on three previous studies (1981, 1991, and 2000), is to review and update the status of previously inventoried and analyzed historic bridges and to locate and assess the significance of additional bridges constructed between 1960 and 1970, per the criteria of eligibility for listing in the NRHP. This report identifies and describes the predominant bridge types found in Florida, updates the construction methods used through 1970, notes significant engineering innovations of the 1960s, and describes Florida bridges that best represent their types, for all periods of significance through 1970.

Preparation of this 2010 update was conducted in accordance with the requirements set forth in the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended; the *Archaeological and Historical Preservation Act* (Public Law 93-291), as amended; Executive Order 11593; Chapter 267, *Florida Statutes* (*F.S.*); Section 123(f) of the *Surface Transportation and Uniform Relocation Assistance Act of 1987*; the Section 106 Exemption Regarding Effects to the Interstate Highway System issued by the Advisory Council on Historic Preservation; and the Interstate Highway Exemption enacted in Section 6007 of the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU).

The 1981 survey was performed in response to both the *Emergency Bridge Repair Act of 1971* and *National Historic Preservation Act of 1966*. The former legislation required that state highway agencies pursue a strategy to replace structurally deficient bridges, while the latter requires that consideration be

[1] FDOT, *The Historic Highway Bridges of Florida* (Tallahassee, FL: Environmental Management Office, 2004).

given to the preservation of many of the same bridges. The 1991 and 2000 surveys were designed to comply with the *Surface Transportation and Uniform Relocation Assistance Act of 1987.*

The 2010 bridge update was performed as a task work order under contract C8Q73 by Archaeological Consultants, Inc. (ACI) on behalf of the FDOT, Environmental Management Office (EMO), and in association with the prime contractor, Jacobs Engineering Group, Inc. The specific task objectives under this work order included the following:

- Establish the important historical themes of the 1960s and update the historic context
- Develop evaluation criteria for NRHP eligibility based on the historic context and the Criteria for Evaluation, and apply to Florida's historic highway bridges
- Update the evaluation for previously identified historic highway bridges

In addition to this report, task work order products included an electronic database; new and updated Florida Master Site File (FMSF) forms for NRHP listed and eligible bridges; a NRHP cover nomination; and a Bridge Management Plan. The latter was developed as a separate companion document.

PREVIOUS SURVEYS

The 1981 survey, conducted by Stephen B. Atkins and William E. Keeler of the FDOT,[2] focused only on metal fixed truss, swing, and vertical lift bridges. At that time, a total of 9,100 bridges existed in the state that represented 13 different design types. Atkins and Keeler selected the three bridge types because of their relative rarity and the large number of them slated for replacement. This survey identified 20 metal fixed truss, 27 swing, and 9 vertical lift bridges in Florida.

The first comprehensive survey of all bridge types was completed in 1991 by Joseph E. King and Donald R. Abbe of the Center for Historic Preservation and Technology at Texas Tech University, under contract with the FDOT EMO.[3] The study identified 208 bridges constructed in 1950 or earlier, of which 54 were considered eligible for listing in the NRHP. Compared with the Atkins and Keeler study ten years before, only 7 metal fixed truss, 15 swing, and 8 vertical lift bridges were identified as extant.

Beginning in 2000, Roy A. Jackson and George R. Ballo of FDOT conducted a survey encompassing bridges built prior to 1960.[4] To maintain consistency, the methods used mirrored those developed and used by King and Abbe. The study began with a review of departmental bridge records designed to determine the current physical status of the bridges assessed by King, and to identify the bridges that had subsequently become at least 50 years old. A file review of more than 2,100 bridges included examination of the bridge records and photographs maintained at FDOT Bridge Maintenance Offices, the FMSF records at the Florida Division of Historical Resources (DHR), local libraries, and other repositories. Based upon the research findings, approximately 230 bridges were selected for field review. Among the attributes used to determine the bridges selected for field review were known historical associations, bridge age, bridge type, appearance, size, and other technical features. Each identified bridge was field inspected, photographed, researched, evaluated as per the NRHP Criteria for Evaluation, and in consideration of criteria adopted by the Historic American Engineering Record (HAER) and the American Society of Civil Engineers (ASCE) for identifying and designating historic engineering sites. As a result,

[2] Atkins, Stephen B. and William E. Keller, *Survey of Metal Truss, Swing, and Vertical Lift Bridges in Florida* (Tallahassee, FL: FDOT, EMO, 1981).
[3] FDOT, *The Historic Highway Bridges of Florida* (Tallahassee, FL: FDOT, EMO, 1992).
[4] FDOT, 2004.

5 bridges were identified as NRHP-listed and 89 were considered eligible. All of the metal fixed truss and swing bridges identified in the previous statewide bridge survey were still extant, but only 4 of the vertical lift bridges remained.

2010 UPDATE SURVEY METHODS

The 2010 update survey of Florida's historic highway bridges entailed research and context development, including the definition of significance criteria; field survey and bridge-specific research; and analysis, including the evaluation of NRHP eligibility, and preparation of FMSF forms, a NRHP cover nomination, and a bridge management plan.

Research and Context Development

Initial research focused on meeting two objectives: 1) updating the existing historic context originally prepared during the 1991 and 2000 bridge inventories, and 2) identifying all known and potentially significant historic highway bridges that would require field survey.

Relevant historical materials were studied to expand the existing historic context through 1970. Study efforts were focused on statewide, rather than local or national, trends, particularly those dating to the period of the 1960s and early 1970s. Among the research materials used to identify relevant bridge types, significant bridge engineering and construction methods, important bridge builders, and major historical events and trends, were the following:

- Bridge files at the District Bridge Maintenance Offices, including bridge inspection reports, photo inventories, bridge histories, and correspondence regarding bridge alterations;
- Bridge design manuals from the 1960s;
- FMSF forms for documented bridges;
- Cultural Resource Assessment Survey reports on file at the DHR;
- NRHP registration forms and determinations of eligibility;
- State Historic Preservation Officer (SHPO) correspondence regarding bridge eligibility for listing in the NRHP;
- Miscellaneous resources at the University of South Florida and the University of Central Florida libraries;
- Miscellaneous materials at the Florida State Archives, including the digital archives; and
- Books, articles, and manuscripts concerning general bridge history, engineering, and construction, including *A Context for Common Historic Bridge Types.*[5]

The 2010 identification of NRHP-listed, determined eligible, and newly recommended eligible highway bridges began with an examination of the three previous bridge surveys, the FMSF bridge records, the NRHP listings, and the National Bridge Inventory (NBI). Using a cut-off date of 1970, the NBI was used to identify highway bridges that were not previously recorded in the FMSF, but that were potential candidates for inclusion in this survey update. The NBI lists approximately 11,800 bridges in Florida. An initial screening eliminated all bridges built after 1970; all bridges that are part of the Interstate Highway

[5] Parsons Brinkerhoff and Engineering and Industrial Heritage, *A Context for Common Historic Bridge Types, NCHRP Project 25-25, Task 15* (Washington, D.C.: National Cooperative Highway Research Program, Transportation Research Board, 2005).

System (IHS); and all bridges not located on public roads, such as those on military lands, tribal lands, and in state and national parks. As a result, 4,160 bridges were identified for consideration (**Table 1-1**).

Table 1-1. Pre-1971 Florida Highway Bridges (exclusive of IHS Bridges), by Material and Type and FDOT District.

Bridge Material and Type	FDOT District							Bridge Material and Type Totals
	1	2	3	4	5	6	7	
CONCRETE								
Arch Deck	7	4	2	5	1	30	20	**69**
Through Arch	-	-	-	-	-	-	1	**1**
Slab	245	158	104	135	52	66	34	**794**
Frame	-	-	1	-	-	1	-	**2**
Tee-Beam	14	47	33	48	19	35	23	**219**
Channel Beam	-	-	-	1	-	-	-	**1**
Box Beam	-	1	-	-	-	3	-	**4**
Girder	5	9	2	5	6	1	8	**36**
Culvert	255	320	283	43	128	5	113	**1,147**
PRESTRESSED CONCRETE								
Slab	121	68	11	135	53	136	21	**545**
Tee-Beam	7	5	-	-	4	3	5	**24**
Channel Beam	84	6	-	7	29	3	67	**196**
Girder	66	84	51	43	135	109	54	**542**
ALUMINUM								
Culvert	3	-	1	-	-	-	-	**4**
STEEL								
Fixed Truss	-	7	4	1	1	2	-	**15**
Through Arch	-	1	-	-	-	-	-	**1**
Culvert	20	35	33	3	14	-	7	**112**
Girder	25	98	69	32	24	46	20	**314**
Through Girder	-	-	-	-	-	2	-	**2**
CABLE								
Stayed Girder	-	1	-	-	-	-	1	**2**
Suspension	-	1	-	-	-	-	-	**1**
MOVABLE								
Bascule	15	6	2	28	9	16	15	**91**
Lift	1	2	-			1	1	**5**
Swing	2	1	-	2	4	2	1	**12**
STONE								
Arch Deck	-	-	-	1	-	-	-	**1**
TIMBER								
Girder	7	-	6	-	2	-	-	**15**
Slab	1	4		-	-	-	-	**5**
District TOTALS	878	858	602	489	481	461	391	**4,160**

To further hone this database, bridges were selected for field inspection and NRHP evaluation based on the following NBI data fields:

- Year Built
- Year Reconstructed
- Historical Significance
- Main Span: Kind of Material/ Design
- Main Span: Type of Design/ Construction
- Approach Spans: Kind of Material/ Design
- Approach Spans: Type of Design/ Construction
- Number Of Spans In Main Unit
- Number Of Approach Spans
- Length Of Maximum Span
- Structure Length

Priority consideration for field survey was given to bridges that met the following criteria:

- constructed from 1960-1970 that were not reconstructed after 1970;
- featured less common span materials, design, or construction methods;
- featured span materials, design, or construction methods not used prior to 1960;
- exhibited a high number of spans and/or a notably long span or total structure length; and
- located within NRHP-listed, eligible or potentially eligible historic districts.

Examination of the digital database of the FMSF resulted in the identification of 644 recorded historic bridges (including railroad, highway, and pedestrian bridges). Of these, 305 were evaluated for their NRHP eligibility by the Florida SHPO. These data, as well as a check of the current (December 2010 and earlier) NRHP listings for Florida, indicated that 39 of Florida's historic highway bridges are listed in the NRHP:

- 12 Venetian Causeway Bridges in Miami-Dade County,
- 23 Overseas Highway Bridges in Monroe County,
- Bridge of Lions in St. Johns County,
- Blackburn Point Bridge in Sarasota County,
- Moore's Creek Bridge in St. Lucie County, and
- SW 72nd Avenue Bridge in Miami-Dade County.

In addition to archival research at libraries and other repositories, interviews with FDOT District Bridge Engineers, Cultural Resource Coordinators, and local government engineers helped identify significant bridges that were not readily identifiable from the NBI list and other data sources. Interviews were conducted either in person or via electronic mail. In addition, a questionnaire was sent to FDOT District Bridge Engineers, Cultural Resource Coordinators, and the heads of regional Metropolitan Planning Organizations and Transportation Planning Organizations, as well as attendees of a monthly meeting of the American Society of Highway Engineers (ASHE) held in Tampa. This questionnaire asked the recipients to provide information on bridges that were constructed in the 1960s, exclusive of IHS bridges, that were considered:

- excellent examples of construction materials or engineering methods considered innovative in the 1960s,
- representative of construction materials or engineering methods not usually found in bridges from the 1960s,
- representative of architectural or aesthetic design elements not commonly seen in 1960s bridges,
- constructed through major federal, state, or local funding programs of the 1960s,

- constructed as a direct result of new federal or state legislation, such as the 1962 *Federal-Aid Highway Act* and the resulting comprehensive transportation plans carried out by newly established Metropolitan Planning Organizations;
- associated with events or persons significant in 1960s social history, or
- associated with the development of barrier islands or other areas that had limited access prior to the bridge construction.

The questionnaire also asked recipients to identify bridges that had received engineering or design awards, that were designed by renowned engineers, or that were rare examples of bridge types no longer constructed.

Field Survey

A district-by-district, statewide field survey of approximately 520 bridges was conducted by ACI Architectural Historians Elaine Lund, Kisa Hooks, and Marielle Lumang over a period of six months. With the exception of a few inaccessible structures, all bridges identified as previously listed in or eligible for listing in the NRHP, plus all additional bridges considered eligible or likely eligible for listing, were field inspected. Each bridge was documented with color digital photographs to include the bridge roadway, profile, and distinguishing engineering and architectural features.

To supplement the information derived from the field survey, ACI reviewed Bridge Inspection Reports, photo inventories, and bridge histories (when available) from the District Bridge Maintenance Offices, as well as FMSF records, NRHP registration forms, cultural resource assessment survey reports, Section 106 Case Study Reports, and other relevant materials.

Analysis

The analysis of Florida's historic highway bridges included:

- status updates on bridges considered eligible for listing in the NRHP in 2000;
- identification of severely altered or demolished bridges that were considered eligible for listing in 2000;
- identification of bridges considered newly eligible for listing in the NRHP;
- comparative analysis of tabulated data;
- preparation of FMSF historic bridge forms for bridges requiring updates and newly identified NRHP-eligible bridges; and
- preparation of a thematic NRHP Multiple Property cover nomination for candidate bridge groups.

At several stages in the study process, informal meeting were held with structural engineers Bob Heck and Frank Haunstetter of Cardno/TBE to address specific bridge issues. Mr. Haunstetter also provided clarification and answered questions relevant to 1960s bridge design and construction.

EVALUATING BRIDGE SIGNIFICANCE

Applying the NRHP Criteria for Evaluation

The significance of Florida's historic highway bridges was evaluated in terms of the NRHP Criteria for Evaluation, as described in 36 CFR Part 60.4, and within the historic context updated in this study to cover major developments, trends and engineering innovations up through 1970. The NRHP guidelines define historic significance as "the importance of a property to the history, architecture, archaeology, engineering, or culture of a community, state, or the nation."[6] The bridges in this survey were evaluated for significance primarily at the state level, in accordance with the NRHP criteria:

> **Criterion A**: that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> **Criterion B**: that are associated with the lives of persons significant in our past; or
>
> **Criterion C**: that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> **Criterion D**: that have yielded, or may be likely to yield, information important in prehistory or history.

The significance embodied in historic bridges is often associated with their construction and physical appearance but may also be associated with development activities facilitated by their construction (i.e., neighborhood development, increased accessibility on major transportation routes). As such, historic bridges generally possess significance under Criterion A in the areas of Transportation and Community Planning and Development, and under Criterion C in the areas of Architecture and Engineering. Typically, Criteria B and D are not used in the evaluation of historic bridges. For Criterion B, in accordance with National Park Service guidance, significant engineers and architects are often best represented by their works, which are evaluated under Criterion C.[7]

To be eligible for listing in the NRHP under Criterion A, a bridge must have an important association with significant events, trends, or patterns in Florida's transportation history, or in a community's planning and development. Bridges that have played a key role in the state's transportation history include those that cross navigable bodies of water, such as major rivers and the Intracoastal Waterway. This category of bridges may also include those that cross man-made waterways, such as canals. Bridges that were constructed as movable bridges over navigable waterways must have their movable parts intact in order to retain their eligibility in the area of Transportation. If the movable parts have been removed, the bridge may no longer maintain an association with its historic function to assist the movement of both automobile traffic and traffic along a navigable waterway.

Other bridges significant for their association with transportation history include those that cross Florida's railroad corridors, such as the Lilly Avenue Bridge in Polk County, the oldest remaining example of a grade separation. The Overseas Highway Bridges in Monroe County, built originally to carry the Florida East Coast Railway, are significant as representations of both Florida's railroad and highway histories.

Bridges eligible for listing under Criterion A in the area of Community Planning and Development may be associated with residential developments. For example, the Nurmi Isles Bridges in Fort Lauderdale in Broward County provided access to the man-made finger islands built with dredged spoil during the Land Boom Era of the 1920s. Some bridges are responsible for connecting adjoining cities, such as the

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[6] National Park Service (NPS), *National Register Bulletin, How to Apply the National Register Criteria for Evaluation (*Washington, D.C.: U.S. Government Printing Office, 1997).
[7] NPS, 1997, 16.

Columbus Drive Swing Bridge in Hillsborough County, which fostered economic development between Tampa and West Tampa. The Venetian Causeway, which crosses Biscayne Bay between Miami and Miami Beach in Miami-Dade County, is another example of a physical connection between growing communities that enhanced development on both sides.

A bridge may be significant under Criterion C because it embodies features which best represent its type, period, or method of construction; technological advances and innovations; high aesthetic values; and/or the work of a master. A bridge that is the only remaining or rare example of its type may also qualify for inclusion in the NRHP under Criterion C.

Many early bridges constructed during the City Beautiful Movement reflect high-style architectural elements. Especially popular were tender stations with Mediterranean Revival style motifs and Neoclassical Revival style urn-shaped balustrades, seen in bridges throughout the state. Other decorative railing patterns included Maltese crosses, seen in bridges in Duval County; eight-point stars, as found on the Platt Street and Cass Street Bridges in Hillsborough County; and the zig-zag patterns in the railings of the Ware’s Creek bridges in Manatee County. The Duval County bridges designed by architect Henry J. Klutho exhibit several Beaux Arts and Neoclassical Revival style elements, including obelisks, urns, decorative lighting, and relief sculptures. A bridge must retain its historic decorative elements to be considered eligible for listing in the NRHP in the area of Architecture.

Many bridges possess significance under Criterion C as examples of national or regional advances and trends in engineering. A bridge constructed using innovative engineering techniques for its time, such as an early 1950s prestressed concrete channel beam bridge, may be significant. A bridge constructed using engineering techniques common at the time, but no longer in use, and of which few examples remain, such as a 1920s movable swing bridge, may also be significant.

Other bridges are examples of specific engineering responses associated with the location, site, and period in which they were constructed. One such example is the bascule bridge that carries A1A over the Boca Inlet in Palm Beach County, one of only four bridges built in the nation using the patented Hanover Skew design to address site design challenges. Bridges eligible for listing in the NRHP under Criterion C in the area of Engineering must retain their significant engineered structural elements. Movable bridges that are significant for their engineering must retain their machinery and movable parts.

Additionally, bridges may be significant under Criterion C for their association with important architects, engineers, designers, or builders. Examples include the concrete arch bridges throughout Florida designed by Daniel Luten and built by the Luten Bridge Company, as well as the bridges in Manatee County designed by local engineer Freeman Horton. Steel truss and movable bridges may also be significant if they were designed and constructed by a prominent company, such as the Converse Bridge and Steel Company, the Champion Bridge Company of Ohio, and the Strauss Bascule Bridge Company.

Typically, historic bridges may be eligible under a combination of the criteria and areas of significance discussed above.

Criteria Considerations

Some types of cultural resources are not considered eligible for the NRHP unless they meet special considerations. For example, structures that have been moved from their original locations, reconstructed properties, and properties that have achieved significance within the past 50 years are not considered eligible. However, such properties qualify if they are integral parts of historic districts that do meet the criteria or if they fall within a defined category. Of relevance to Florida's historic highway bridges are criteria considerations B, and G, as follows:

> ***Criteria Consideration B***: "A property removed from its original location or historically significant location can be eligible if it is significant primarily for architectural value or it is the surviving property most importantly associated with a historic person or event."[8]
>
> ***Criteria Consideration G***: "A property achieving significance within the last fifty years is eligible if it is of exceptional importance." [9]

In the case of moved bridges, according to National Park Service guidance, properties designed to be moved must be located in a historically appropriate setting in order to qualify. Thus, bridges relocated from one body of water to another may be eligible if the integrity of setting, design, feeling and association (see below) are retained. The design of historic truss bridges enabled them to be conveniently removed to other locations.

Integrity

For Florida's historic highway bridges to be eligible for NRHP listing, they must meet Criterion A and/or C and must possess historic physical integrity. Integrity is defined as the ability of a property to convey its significance, and is evidenced by "the survival of physical characteristics that existed" during the historic period of significance. The integrity of individual bridges must always be evaluated on a case-by-case basis. Bridges that have been rehabilitated or reconstructed after the period of significance must have been altered in a manner that maintains the historic physical integrity in order to be eligible for listing.

The National Register defines seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. In order to retain its historic physical integrity, a bridge must possess most, if not all, of these aspects, or qualities, defined as follows.

Location: Location is the most important aspect of historic bridge integrity. To possess integrity of location, a bridge must be in its original placement and even orientation. The specific location of a bridge is important as it relates to historic events associated with its construction as well as the specific engineering and construction methods used to build the bridge at its location. Typically, the relocation of a historic bridge from its original location outside of its period of significance will compromise the bridge's integrity of location.

Design: Design is the combination of the physical elements, including the form, plan, structure, and style used to construct a bridge. It is foremost based on function but becomes distinguished by additional elements which surpass this utilitarian purpose. Bridge design relates to the engineering system used for the substructure and superstructure as well as its approaches. It includes such elements as the alignment, causeways, walkways, culverts, curbs-and-gutters, embankments, ditches, grading, guardrails, and related structures. Architectural detailing and aesthetic elements, especially in elements such as lampposts, railings, and tender stations, may also be included in the design. Bridges should retain their original design to a high degree, especially since the design of the bridge relates to its function and its aesthetics, where the bridge is a prominent visual feature in a community. The alteration, change, or removal of original design features can exclude a bridge from NRHP eligibility. Bridges that are no longer in use, or that have been converted from one use to another, may not retain their design integrity.

[8] NPS, 1997, 29.
[9] NPS, 1997, 41

Setting: The setting of a historic bridge is integral to its location and consists of its physical environment, including the bridge itself, the feature it carries and crosses, and its immediate surroundings, including properties adjacent to the right-of-way or natural setting. A historic bridge may carry a roadway over a railroad corridor, a waterway, or over other roadways through sparsely populated or densely developed urban areas. To retain integrity of setting, the general land uses surrounding the historic bridge must be similar to its historic ones.

Materials: Closely related to bridge design are the materials used to construct the bridge. To possess historic material integrity, a bridge must retain its exterior materials dating from its period of significance. Materials used during rehabilitation and reconstruction may not negatively affect the bridge's integrity if they are representative materials of the bridge's period of significance or if they do not affect the bridge's exterior appearance. Historic structural materials generally consist of timber, steel, reinforced concrete and prestressed concrete. Historic decorative materials may also include, but are not limited to, stone, terra cotta, cast-in-place concrete and precast concrete. Original exterior materials should not be altered or obscured. The replacement of original visually-apparent elements with materials other than in-kind ones will generally result in the bridge being considered not eligible for the NRHP.

Workmanship: Workmanship is the physical evidence of the craft and skill of the bridge engineer, designer, or builder that dates from the bridge's period of significance. The integrity of workmanship is important, for instance, for steel bridges manufactured using patented designs or for bridges that display architectural or aesthetic elements. The historic elements such as any decorative railings, lampposts, tender stations, or engineered elements such as movable parts should display their original workmanship.

Feeling: Feeling is the bridge's visual expression of the aesthetic or historic sense of its period of significance. Integrity of feeling may be associated with the concept of retaining a "sense of place." To that end, the setting and feeling of a historic bridge are inextricably linked. A bridge retains its integrity of feeling if its historic character is still conveyed through a combination of its historic physical features and surroundings. In general, a bridge that retains its original design, materials, workmanship, and setting will relay the feeling of a historic bridge. Bridges that have been altered in terms of design and materials may no longer convey a historic feeling.

Association: Association is the direct link between a historic bridge and an important historic event, significant transportation trend or a significant person. The integrity of association is integrally tied to the reasons for its construction and the parties responsible for it. Association is often an overlay to the aforementioned NRHP criteria. For example, a bridge may be eligible under Criterion C in the area of Engineering as a bridge designed by the Luten Bridge Company, a notable bridge designer. Integrity through association can play a key role in assessing eligibility. Such an association is linked to its physical integrity of design, location, and materials.

CHAPTER 2 - HISTORIC CONTEXT

The purpose of this chapter is to define the relevant historic context that will be used in assessing the significance of Florida's historic highway bridges. The historic context emphasizes automobile transportation in Florida and bridge design, engineering, innovations, and developments from the late nineteenth century through the 1960s. This includes a glance at the significant engineers, designers, and builders of Florida's pre-1970 bridges, within the framework of the important historical events and social, political, and economic trends of the times.

FIRST EUROPEAN CONTACT: THE SPANISH (1513-1762 AND 1784-1819)

Florida was controlled by Spain for nearly two and a half centuries, excepting a brief twenty-one year British rule. During the Spanish occupation, little effort was focused on building roadways because of Spain's greater interest in their rich and vast empire of gold and silver mines in South America. Early Spanish explorers such as Pánfilo de Narváez in 1528 and Hernando de Soto in 1539 used pathways created by Native Americans to travel from the Tampa Bay region to the Tallahassee area.[10]

The few wagon roads constructed by the Spanish linked a growing number of military outposts to missions and villages established among the Native Americans in North Florida.[11] St. Augustine, founded by Pedro Menéndez de Avilés in 1565, became the first permanent European settlement in Florida and thus the oldest city in the continental United States. It began as a fort, selected because of its strategic location on the Mantanzas Inlet.[12] While shipments of men and material entered at the port of St. Augustine, Native American pathways and trails continued to be used overland. The Spanish constructed military roads to connect the fort with the St. Johns River.

The end of the American Revolution saw Florida being returned to the control of Spain because of the Treaty of Paris of 1783. As with the earlier period, Florida was divided into East and West with St. Augustine and Pensacola being the respective capitols. Although Spain was now in control, they retained the British policy of trade with the Indians. However, with the change of flags, the British occupants of Florida left, resulting in a serious depopulation of the state, and many plantations and other developments, especially in East Florida were abandoned. In order to attract more settlers to the area, very lax immigration policies were established. The only requirement for land ownership was an oath of loyalty to the Spanish Crown, and unlike other Spanish colonies, there was no requirement to be Catholic. Each head of household would be granted 100 acres, and each additional family member or slave qualified for an additional 50 acres. Title to the lands would be passed on to the homesteaders after 10 years of occupancy, farming, erecting appropriate buildings, and maintaining livestock.[13]

The population at this time was very diverse, and included a mixture of Spanish, Minorcan, Indian, British loyalists, British Isles immigrants, U.S. immigrants, and black, both free and slave.[14] Most of the population was centered on the two capitals and Fernandina. The rural population was small, scattered,

[10] Gannon, Michael, *The New History of Florida* (Gainesville, FL: University Press of Florida, 1996), 22-31.
[11] Gannon, 1996, 67.
[12] Tebeau, Charlton W., *A History of Florida* (Coral Gables, FL: University of Miami Press, 1971), 34-5.
[13] Coker, William S. and Susan R. Parker, "The Second Spanish Period in the Two Floridas," In *The New History of Florida*, edited by Michael Gannon (Gainesville, FL: University of Press Florida, 1996), 15-166.
[14] George, Paul, Historical/Architectural Contexts, *Draft: State of Florida Comprehensive Historic Preservation Plan* (FDHR, Tallahassee, 1990).

and relied on subsistence farming. There were also plantations established, as well as timbering, citrus cultivation, and cattle ranching. The number of farms and plantations greatly increased throughout this period, especially along the northeastern waterways. The importance of the timber industry can be noted by the number of large sawmill grants that were awarded by the Spanish governors.

Indian trade was also an important economic activity. The Panton, Leslie Company, which later became the John Forbes and Company were British firms that were licensed by the Spanish, and controlled all of the trade.[15] Their centers of operation were in St. Augustine and Pensacola and they had their stores on the St. Johns River and on the St. Marks River. Prior to the American colonial settlement of Florida, remnants of the Creek Nation and other Indian groups from Alabama, Georgia, and South Carolina moved into Florida and began to repopulate the vacuum created by the decimation of the aboriginal inhabitants. The Seminoles, as these migrating groups of Indians became known, formed at various times, loose confederacies for mutual protection against the new American Nation to the north.[16] The Seminoles crossed back and forth into Georgia and Alabama conducting raids and welcoming escaped slaves. This resulted in General Andrew Jackson's invasion of Spanish Florida in 1818, which became known as the First Seminole War. Florida became a United States territory in 1821 as a result of the Adams-Onis Treaty of 1819.

Although its origins and actual route remain somewhat unclear, the most significant road built (measured by its long-term impact) during the Spanish occupation began in St. Augustine and ended in Pensacola. The Spanish used the Camino Real or "royal road," which was more of a pathway than a built road, during the seventeenth century as an overland route to supply forts and missions,[17] as well as to avoid the perilous journey of sailing around the Florida Keys. Streams along the trail were crossed at fords or by means of log rafts or simple pine-pole bridges. In time, the Camino Real became a major transportation corridor and future railroad and road builders followed its course in the building of old State Road (SR) No. 1, US-90, and Interstate 10.

FLORIDA UNDER THE ENGLISH (1763-1818)

During the brief English occupation of Florida between the end of the French and Indian War (1763) and the close of the American Revolution (1783), the British Crown supported the construction of roads to and from St. Augustine. These efforts resulted in the "King's Road" that extended north through Cowford (now Jacksonville) to the St. Mary's River and south to New Smyrna, a colony of indentured servants on the North Indian River. An attempt to bridge the San Sebastian River at St. Augustine during the 1760s failed when, according to one witness, "the great depth of the river joined to the instability of the bottom, did not suffer it [the bridge] to remain long." The crossing could only be made by ferry.

FLORIDA, AN AMERICAN TERRITORY (1819-1845)

According to C. B. Treadway, Chairman of the State Road Department in the 1930s, Florida's highway system actually began during the Territorial period when the United States government appropriated funds to build important roadways. In 1824, Congress provided:

[15] Coker, William S. and Thomas D. Watson, *Indian Traders of the Southeaster Spanish Borderlands* (Pensacola, FL: University of West Florida Press, 1986).
[16] Tebeau, Charlton W., *A History of Florida. (*Coral Gables: University of Miami Press, 1980).
[17] Worth, John E., *Timucuan Chiefdoms of Spanish Florida* (Gainesville, FL: University Press of Florida, 1998), 154.

> *...that the President of the United States be, and is hereby, authorized to cause to be opened, in the Territory of Florida, a public road from Pensacola to St. Augustine, commencing at Deer Point, on the Bay of Pensacola, and pursuing the old Indian Trail to Cow Ford, on the Choctawhatchy River; thence, to the Ochesee Bluff, on the Apalachicola river; thence in the most direct practicable route, to the site of Fort St. Lewis; thence as nearly as practicable on the old Spanish road to St. Augustine, crossing the St. Johns River at Picolata; which road shall be plainly and distinctly marked and of the width of twenty-five feet.*[18]

The advertisement for the contract states that it is required that the road, causeways, and bridges must be made in substantial manner; and the stumps cut down as even to the ground as possible.[19] Captain Daniel Burch of the Army's Quartermaster Corps was assigned this daunting project. He contracted with planter John Bellamy for the slave labor used to build the road from St. Augustine to Tallahassee. The "Bellamy Road" was completed in 1826, with portions of it "corduroyed" by logs sunk crossways into the roadway, and ferries provided crossings of all major streams.[20] This road greatly aided the expansion of cotton and cattle production in northern Florida. Captain Burch also laid out another road between Tallahassee and Pensacola that also proved a boon to trade and communications. Unfortunately, it deteriorated from a lack of maintenance.

The expansion of Florida's road system was a by-product of the Army campaigns that waged war against the Seminole Indians. Federal troops that penetrated Florida's interior opened new trails and erected makeshift bridges in order to move supplies between forts. Among the temporary bridges built by Colonel Zachary Taylor, who operated in the area north of Lake Okeechobee, was an inflated pontoon made of cotton fabric and rubber used to cross the Kissimmee River. Later reports credited Taylor with constructing 848 miles of wagon roads and 3,643 feet of causeways and bridges during the late 1830s.[21]

EARLY STATEHOOD THROUGH THE CIVIL WAR AND RECONSTRUCTION (1845-1899)

Toll Roads, Ferries, Steamboats and Private Enterprise

Even taking into account the Army's accomplishments, there were no adequate road and bridge systems in Florida before the Civil War. In fact, there were few improvements made as Florida approached the end of the nineteenth century. Roads remained strictly local matters falling under the jurisdiction of county commissioners. The commissioners divided their counties into districts and appointed road overseers, an honorary position until 1895. In addition, there were no requirements for road overseers to have specific knowledge or experience in road or bridge building. In fact, counties required all adult males (exempting only disabled persons, those of unsound mind, and ministers) to labor several days each year as road workers, or pay a tax in lieu of service. Under this system, commonly practiced throughout the United States, roads were built to serve the needs of the local property owners and rarely became anything more than rudimentary, scratched-out paths that were unconnected with other roads. When it was necessary to cross water, simple log rafts or crude timber bridges were built. Still in operation today, the Fort Gates

[18] Boyd, Mark F., The First American Road in Florida: Papers Relating to the Survey and Construction of the Pensacola-St. Augustine Highway (Part I), *Florida Historical Quarterly* 14(2):74.
[19] Boyd, Mark F., The First American Road in Florida: Papers Relating to the Survey and Construction of the Pensacola-St. Augustine Highway (Part II), *Florida Historical Quarterly* 14(3):166.
[20] Tebeau, 141.
[21] Mahon, John K., *History of the Second Seminole War 1835-1842* (Gainesville, FL: University of Florida Press, 1985), 261.

Ferry across the St. Johns River in Putnam County was constructed in 1853 at a federal encampment established during the Second Seminole War. The original ferrymen pushed the simple barge across the river with long poles. A steam-powered tugboat was used to move the ferry following the Civil War, and it was replaced with a tugboat powered by an internal combustion engine in the early part of the twentieth century.[22]

Before the establishment of a Florida road building authority, some enterprising individuals built their own roads and bridges and operated ferry services. Users of "toll roads" paid a fee established by the road owner. During the 1850s, Florida shared in the national enthusiasm for building plank roads made from sawed timbers spiked to wooden stringers and embedded in the roadway.[23] Florida's abundant timberlands prompted the rise of many plank road companies, although few succeeded before the onset of the Civil War. The Newport plank road, running from Newport on the St. Marks River to the Georgia state line with a branch to Tallahassee, was perhaps the most successful.[24] Another, the Alligator plank road, though only partially completed, extended from Jacksonville towards the village of Alligator, now known as Lake City.[25]

The privately owned toll ferries over Florida rivers were frequently the subjects of complaints by travelers, who called them slow, undependable, and dangerous. Today, some ferries are remembered by the river crossings that still bear the name of old ferry operators, among them Kolar's Ferry on the St. Mary's River and Charles Ferry on the Suwannee. Like the roads they served, ferry service varied widely in kind and quality, ranging from mere rowboats to rope-strung rafts pulled by hand or dragged by mules on the bank. Bad roads, unreliable ferries, and the few tottering bridges that did exist discouraged long distance overland travel and limited available transportation to a few stagecoach lines and freight wagon companies.

The failure to build and maintain roadways until the early twentieth century is largely due to the more convenient and pleasant transportation afforded by steamboats and railroads. Steamboats plied many Florida rivers and operated along the coasts, hauling goods as well as passengers. The St. Johns, St. Marks, and Apalachicola rivers became major arteries of the steamboat trade, although these waterways required constant attention to remove snags, sandbars, and other obstacles in the channel.[26] In some cases, navigation became impossible. Streams that reached deep into the backcountry of Florida and Georgia could not accommodate steamboats, thus leaving important agricultural regions without adequate transportation. Along with their navigational limitations, the expansion of the railroads, and later the popularity of the personal automobile, ultimately doomed the steamboat industry.

The Arrival of the Railroad

The first Florida railroads were built prior to the Civil War, mainly to haul farm goods from the interior to port towns. For example, during the 1830s, a 23-mile mule-drawn railway was built between Tallahassee and St. Marks on the Gulf Coast.[27] A major boost to railroad construction came when the State Assembly created the Internal Improvement Board. Using public funds, the board aided railroad construction at

[22] Klinkenberg, Jeff, “Fort Gates Ferry still crossing St. Johns River,” *St. Petersburg Times*, August 23, 2009.
[23] Dovell, Junius E., “The Development of Florida’s Highways,” *Economic Leaflet,* October 11, 1952.
[24] Smith, Elizabeth F., “The Old Plank Road to Tallahassee,” *Magnolia Monthly*, November 1971.
[25] Davis, T. Frederick, *History of Jacksonville, Florida and Vicinity, 1513-1924* (Jacksonville, FL: Florida Historical Society Press, 1925).
[26] Buker, George E., Removing Navigation Hazards for Steamboat Travel, In *The Steamboat Era in Florida* (Gainesville, FL: Florida Maritime Heritage Program, 1984), 15-20.
[27] Turner, Gregg, *A Short History of Florida Railroads* (Charleston, SC: Arcadia Publishing, 2003), 15-17.

Jacksonville and Gainesville and helped to complete a major project, the Florida Railroad, which connected Atlantic and Gulf ports by cutting across the state between Fernandina and Cedar Key.[28]

Florida's modest advancements of the 1850s came to a halt with the Civil War. Although no prolonged campaigns or major battles occurred on Florida's soil, the conflict and the reconstruction period that followed left the railroads and other transportation facilities in damaged and deteriorated condition. An insolvent Internal Improvement Fund made matters worse. As a consequence, Florida did not resume expansion of its transportation system until the 1880s and 1890s. During these decades, the railroads entered a new and vigorous phase of construction that helped usher in a modern period of economic development. The State was "still frontier country" in 1880, wrote historians Rembert Patrick and Allen Morris,[29] with "a few cities on the coasts, a developed agricultural area, and an almost uninhabited region in the south." Within 40 years, changes were to come so quickly that the transportation improvements made during the 1880s seemed virtually insignificant by comparison.

The steam-powered railroad became a potent force for change everywhere in the United States during the nineteenth century. In Florida, the railroad's role was critical, as it transformed the state by opening previously unoccupied lands to settlement, welding together a fragmented state into a single interdependent community and, most notably, integrating the state with the rest of the nation.

In Florida, the growth of the railroad can be directly attributed to the role of private citizens, businessmen who promoted and financed projects that were to fundamentally shape the future of the state's transportation network. William Chipley was one such man, who in the 1880s managed construction of the Louisville and Nashville Railroad across West Florida from Pensacola to the Apalachicola River. At that same time, Henry Plant established a system that extended from Georgia through north Florida and the peninsula to Tampa, reaching that city in 1884.[30]

Few men could surpass the accomplishments of Henry Morrison Flagler. Investing a huge personal fortune earned with his partner John D. Rockefeller and their Standard Oil Company, Flagler pushed his Florida East Coast (FEC) line from Jacksonville to Miami. After reaching Miami in 1896, Flagler began the unthinkable, the creation of an Overseas Railway that would link Miami with Key West over vast stretches of open water.[31] Built between 1903 and 1912, the Overseas Railway garnered international attention as an extraordinary engineering triumph. Flagler's Key West Extension convincingly demonstrated that railroad companies possessed a high level of engineering expertise and introduced numerous technological advancements to Florida. Their railroad bridges are a striking example of that technology.

Bridge construction was developed as a special branch of structural engineering, subsidized by railroad companies that needed rigid structures capable of carrying fast-moving, heavy loads. Metal truss bridges served this purpose well, and the railroads used them extensively. Some lines, such as the Pennsylvania Railroad, even originated exclusive designs for their own use. Florida's many waterways required the railroad companies to become active bridge builders, and they frequently constructed the first substantial

[28] Pettengill, George W., The Story of the Florida Railroads 1834-1903, The Railway & Locomotive Historical Society, Inc. *Bulletin* No. 86, 1952, 21-22.
[29] Patrick, Rembert W. and Allen C. Morris, *Florida under Five Flags* (Gainesville, FL: University of Florida Press, 1967).
[30] Pettengill, 1952; Turner, 2003.
[31] Boyer, Willet A., *Henry Morrison Flagler, Florida's Foremost Developer* (St. Augustine, FL: St. Augustine Historical Society, 2003); Standiford, Les, *Last Train to Paradise: Henry Flagler and the Spectacular Rise and Fall of the Railroad that Crossed an Ocean* (New York: Crown Publishers, Inc., 2002).

spans over rivers. Surviving structures built during this era of rapid growth are reminders of the railroads' enormous contribution to the State's economic and technological development.

As an example, the FEC Railway built a swing span across the St. Johns River at Jacksonville in 1890.[32] The booming 1920s created the need for expansion, and between 1924 and 1925 the company replaced an earlier span with a two-track bridge that included a trunnion bascule, or Strauss-type lift span. The single leaf, measuring 216 feet long, made it one of the largest of its kind at the time. The bridge continues in service today and commands a prominent place on the river.

As the railroads made possible reliable long distance travel, they also focused attention on the dismal state of local roadways. Farmers and merchants came to realize that improvements in roads and bridge construction would enhance the overall transportation network, providing them with better access to railroad depots and hence larger markets for their goods.

However, bicyclists, who were generally members of the middle and upper classes, were more influential among politicians than farmers. At the 1893 Columbian Exposition in Chicago, the League of American Wheelmen organized the National League for Good Roads. They delivered lectures, published articles, and pressured government at all levels for greater attention to road building and for increased public funding for road improvements.[33]

The demise of Wheelman's Clubs across the country coincided with the advent of the automobile. The Jacksonville Wheelman's Club was formed in the 1880s and lasted until about 1907. In Jacksonville, the first auto arrived in 1900, the first automobile dealership was established in 1903, and by 1911, about 1,000 cars were said to be on the streets. The automobile age had arrived.

EARLY TWENTIETH CENTURY (1900-1941)

The Age of the Automobile

The vast changes that occurred in American society at the turn of the century affected every area of life. In particular, the new mobility Americans experienced because of the availability of the personal automobile marked a monumental shift in both the way people lived and where they chose to live it. In the transportation arena, local governments were abruptly made aware of the need to improve roadways. While provision for new and improved transportation corridors was in itself a formidable task, the construction of bridges presented the greatest challenge. Bridges were big, complex and costly.

In 1902, Citrus County, needing to span the Withlacoochee River and other streams, advanced from erecting wooden bridges put together by local contractors at a cost of a few hundred dollars to acquiring its first metal bridge for $3,000. One of the side effects of bridge building was the cooperation it engendered in neighboring localities. Because of the great costs involved and because waterways often defined county borders, bridges often became the reason for the first cooperative ventures between counties. After a dispute with neighboring Marion County over a poorly built span on the Withlacoochee, Citrus County shared the cost with Marion to erect a large steel truss bridge over the river at Dunnellon. This bridge is no longer extant.

[32] Pettengill, 1952, 104.
[33] Hilles, William Clark, *The Good Roads Movement in the United States: 1880-1916* (M.A. thesis, Durham: Duke University, 1958).

To raise funds to build bridges, local politicians frequently chose to issue bonds, an approach that was unpopular and a step that was taken reluctantly. However, once they got beyond the funding barrier, the construction of a new bridge was cause for great excitement. As an example, in 1910, Hamilton County commissioners announced that, "notice is hereby given that the Board will receive bids at their next meeting... and contract with some firm or corporation for the purpose of building a steel bridge across the Alapaha River near Nobles Ferry, and all persons, firms, and corporations desiring to bid on said contracts will please govern themselves accordingly." This steel bridge is also no longer extant.

In the early twentieth century, Florida industrial development was limited and did not include the fabrication of metal truss bridges. The State depended upon the northern industrial belt, which led the nation in the technology and manufacture of metal trusses at the region's iron and steel manufacturing plants. Companies that built trusses for Florida, with their existing bridges, include:

- American Bridge Company/ New York, New York
  - Ortega River Bridge, FDOT #720005, 1927/1996, Duval Co.
- Austin Brothers Bridge Company/ Atlanta, Georgia
  - Mather’s Swing Bridge, FDOT #704063, Brevard Co.
  - Sharpe’s Ferry Swing Bridge, FDOT #364110, Marion Co.
- Champion Bridge Company/ Wilmington, Ohio
  - SW 11th Avenue Swing Bridge, formerly FDOT #865748, 1925/2010, Broward Co.
  - Hialeah-Miami Springs Vertical Lift Bridge, FDOT #874129, 1930/2003, Miami-Dade Co.
  - Miami River Canal Swing Bridge, FDOT #874130, 1941/2003, Miami-Dade Co.
  - Blackburn Point Swing Bridge, FDOT #170064, 1925/1995, Sarasota Co.
- Converse Bridge Company/ Chattanooga, Tennessee
  - Steinhatchee Springs Truss Bridge, FDOT #334001, 1921/1989, Lafayette Co.
- Groton Bridge and Manufacturing Company/ Groton, New York
- King Bridge Company/ Cleveland, Ohio
- Nashville Bridge Company/Nashville, Tennessee
- Pensacola Shipbuilding Company/Pensacola, Florida
  - Ellaville/Hillman Bridge, formerly FDOT# 350910, 1925, Madison Co.
  - St. Mary’s River Swing Bridge, FDOT #740008, 1927/2005, Nassau Co.
- Virginia Bridge and Iron Company/ Roanoke, Virginia
  - Belle Glade Swing Bridge, FDOT #930072, 1935/1998, Palm Beach Co.
  - Bridge of Lions, FDOT #780074, 1927/1979/2010, St. Johns Co.
- Wisconsin Bridge and Iron Company/ Milwaukee, Wisconsin
  - Blountstown Bridge, FDOT #470029, 1938/1998, Calhoun Co.

The Champion Bridge Company of Ohio, founded in 1860 as Zimri Wall and Company, garnered a significant amount of Florida's bridge building business. In the early years, it erected timber and wrought iron bridges. Champion Bridge Company, as it became known in 1881, was the first to use steel in small highway bridges. It was active in Florida from the 1890s through the early 1930s and constructed many movable bridges in the state. The company claimed that it introduced the rolling lift bascule bridge to Florida. Besides a "reputation for quality work and fair prices," Champion shrewdly opened offices in Birmingham, Alabama and Atlanta, Georgia. To further cement their relationship with the Southern states, the company appointed local citizens as their agents and engineers. Hugh Quinn, an engineer trained at the University of Georgia who constructed the DeLand Waterworks, joined Champion and in 1904, built a movable bridge at St. Augustine, which is no longer extant. Quinn later helped establish a firm at Fort

Lauderdale that became the Powell Brothers, an important road and bridge contractor beginning in the 1920s.

Photo 2-1. The Sharps Ferry Bridge Over the Oklawaha River in Marion County, Built by the Austin Brothers Bridge Company in 1926.
(Florida Photographic Collection)

While numerous northern companies sold bridges in Florida, they met with strong competition from the few southern firms that drew upon the steel plants of Birmingham. Champion's principal competitor, particularly in the building of swing bridges, was the Austin Brothers Bridge Company of Atlanta. The company began with George L. Austin, who once traveled in the south as an agent for the George E. King Bridge Company of Des Moines, Iowa. While his brother Frank set up an Austin Brothers bridge firm in Dallas, Texas (known today as Austin Industries), George became an independent contractor in the Southeast and a leading builder of movable bridges in Florida.

Other bridge manufacturers that ranked among the leaders in Florida until the Great Depression included the Virginia Bridge Company of Roanoke, the Converse Bridge Company of Chattanooga, Tennessee and the Nashville Bridge Company, also in Tennessee. William Converse, once an agent for Ohio companies, established his firm in the 1890s and sent his salesmen throughout the South. His company succeeded in winning contracts for pony and through truss bridges in counties of northern Florida; only one, the Steinhatchee River Swing Bridge, remains.

Arthur Dyer, a graduate engineer of Vanderbilt University, founded the Nashville Bridge Company in 1902. Dyer claimed to have built more than half of the bascule bridges in Florida. The firm's success in that field may be traced to its chief bridge engineer, L. O. Hopkins, who designed inexpensive and efficient bascule spans. The firm begun by Dyer remained active in Florida until the 1970s.

The Pensacola Shipbuilding Company emerged as Florida's principal in-state producer of steel bridges. Organized by Chicago financiers to build ships for the war effort in 1917, the company developed a bridge building business in the 1920s. It often supplied bascule spans from designs patented by Chicago engineering firms, such as Strauss and Scherzer. The Pensacola Shipbuilding Company may have fabricated bridges itself or may simply have supplied and installed structures made elsewhere.

In the early decades of the twentieth century, bridge construction addressed regional and local needs depending on the availability of resources. Such factors as the population base, the level of economic development, geographic locale, and transportation needs determined the type and scope of county road projects. As a widely available and inexpensive material, timber answered most needs for building crude trestles or deck bridges. Counties that wanted more durability and greater permanence in their bridges opted for metal trusses or reinforced concrete spans. Jackson County, for example, contracted with the Converse Bridge Company to build a standard design Pratt through truss over the Chipola River near Marianna. Completed for $2,289 in 1914, the Bellamy Bridge measured 119 feet long and rested on filled metal cylinder piers. The Bellamy Bridge remains in place; however, the bridge and the road it carried are no longer in use. For lighter duties and narrower streams, the choice was often Pratt pony trusses. A good example is the previously mentioned 60-foot span purchased by Lafayette County from Converse in 1912 to cross the Steinhatchee River.

Reinforced concrete, first used only for small spans and later for longer spans as the engineering improved, grew in popularity through the 1920s. A number of companies with national reputations built reinforced concrete bridges in Florida, including A. Bentley and Sons of Toledo, Ohio and the Concrete Steel Bridge Company of New York City. Local firms were also established and they became important bridge contractors. These companies include C. T. Felix of St. Petersburg and George D. Auchter of Jacksonville.

The need for numerous inexpensive, low maintenance, and durable highway bridges enabled the Luten Bridge Company of York, Pennsylvania to become a leading builder of reinforced concrete structures, in particular concrete arches. Engineer and entrepreneur Daniel B. Luten (1869-1946) of Indianapolis designed and promoted bridges that he and his agents sold as superior to "tin bridges." The company's bridges gained a reputation for strength and reliability under the hot, humid, and sometimes salty conditions in Florida. Luten succeeded in reducing the quantity of concrete required in his bridges without sacrificing its strength or resistance to floods. In some instances, he extended the steel tie rods from the bridge to underneath the streambed and buried them in concrete. This method reduced the need for heavy abutments, particularly desirable when stream banks were weak. In 1915, he also built an innovative half-arch bridge, which remains extant, at the entrance to the luxurious Belleview Hotel near Belleair in Pinellas County. This bridge was built with a 46-foot main span and 23-foot half spans. While the half arches appeared to be cantilevered, the fact that they were supported by abutments made them true arches. The bridge maker claimed to have achieved greater stability and efficiency in material use.

Luten patented his designs, put them in catalogs, and promoted them by establishing relationships with business partners throughout the country. By the mid-1920s, Luten reportedly held fifty patents for reinforced concrete bridges and had built more than 14,000 spans throughout the United States.

The Role of the Bridge in Cities

Often the most ambitious bridge building took place in Florida's rapidly growing urban areas. In Tampa, the spread of subdivisions west of the Hillsborough River necessitated the building of a new bridge. In 1913, an impressive bridge (**Photo 2-2**) with concrete arches and a double-leaf Scherzer rolling lift main span was constructed on Lafayette Street (now Kennedy Boulevard). Its classically inspired design expressed the pervasive influence of the nationwide City Beautiful Movement. The bridge remains a fine example of the melding of function and form that created an attractive centerpiece in downtown Tampa.

Photo 2-2. The Lafayette Bridge in Downtown Tampa, 1925.
(*Florida Photographic Collection*)

Built after World War I, the Acosta Bridge over the St. Johns River in Jacksonville was another good example of a notable city-constructed bridge. Named for City Councilman St. Elmo W. Acosta, who convinced voters to approve a $950,000 bond issue for the bridge construction, the Acosta Bridge was the first vertical lift span in the State. It was replaced in 1991 by FDOT Nos. 720570 and 720571. The decision to build a vertical lift span was based on the river's operating needs that resulted from the heavy maritime traffic. The construction of this bridge involved several notable engineering accomplishments. Its designer, J. L. Harrington, enjoyed a national reputation as a distinguished engineer and co-founder of a prominent engineering firm. The Missouri Valley Bridge and Iron Company of Leavenworth, Kansas built the foundation and was experienced in sub-aqueous construction. The building of the Acosta Bridge required pneumatic methods never before used in the region to sink the caissons. Acosta's size (2,865 feet) and cost ($1.2 million) made it a fitting symbol of the booming 1920s and its ever-increasing automobile traffic. In 1994, the state replaced the Acosta Bridge and the remnants of the historic span became an artificial reef for Atlantic sea life.[34]

[34] Jacksonville Offshore Sport Fishing Club (JOSFC), "Acosta Bridge Artificial Reef." Accessed at: http://www.jaxrrt.org/acosta.htm.

Photo 2-3. Acosta River Bridge over the St. Johns River.
(Florida Photographic Collection)

Travel in Rural Florida

In the years following World War I, traveling by automobile in Florida remained an adventure in most areas because of the poor roads, which more often resembled stump-ridden, overgrown and sandy trails. Some counties made an effort to improve their roadways by grading, adding a sand-clay mixture, or spreading pine needles or oyster shells on the surface. The specifications for spreading shell on the roadway called for the shell to be laid four inches deep and seven or eight feet wide. There were no rolling, binder or drainage facilities or anything of the sort. Mule and ox hooves, the iron tires of wagons, and the travel of a few automobiles over the surface were thought to be sufficient to convert the shell into a "high-speed" highway surface. After this shell was laid, cars that could negotiate the sand road between Melbourne and Eau Gallie could make the 40-mile trip from Melbourne to Titusville, the county seat, in half a day. That is, of course, only if the vehicles weren't shaken to pieces by the hard sand pull.

More satisfactory results came from gravel or crushed rock mixed with asphalt. One popular method combined asphalt with crushed slag that was shipped in from the steel mills of Birmingham, Alabama. Polk County, which was using trails dating from the Seminole War, responded to Good Roads advocates, and in 1916 contracted for 217 miles of asphalt road. When it was completed, the citizenry raised a triumphal arch declaring, "Our roads are smooth and free of dust at all seasons, and we have no mud." The Champion Bridge Company opened an office in Bartow in order to construct bridges for Polk County.

Miami Beach developer Carl Fisher, whose Indianapolis company Prest-O-Lite invented a vastly improved automobile headlight, became a champion for improving roadways.[35] In 1915, to convince the public that Florida could be reached by car, Fisher organized a 15-car caravan that made the trip from Indianapolis to Miami. He called his expedition the "Dixie Highway Pathfinding Tour." That approximate route would be

[35] Fisher, Jerry M., *The Pacesetter: The Untold Story of Carl G. Fisher* (Fort Bragg, NC: Lost Coast Press, 1998); Foster, Mark S., *Castles in the Sand: The Life and Times of Carl Graham Fisher* (Gainesville, FL: University Press of Florida, 2000).

followed when the Dixie Highway was built. Counties that wanted to be included in this grand plan took on road construction projects. Some counties, particularly in the area south of Jacksonville in St. Johns, Flagler, and Putnam counties, laid nine-foot-wide brick roads. The majority of the paving bricks came from Birmingham, Alabama. Other brick roads extended from Tampa and Orlando.

Good Roads Movement (1880-1916)

The Good Roads Movement was initiated by bicyclists, riding clubs and various manufacturers who met in New Port, Rhode Island. Their goal was to increase awareness and promote the advocacy of improved roadways. Beyond cities, roadways were rarely paved and consisted of packed dirt which were difficult to bike, let alone drive. The movement promoted extending a quality road system beyond cities to include roads to rural areas. This grassroots advocacy movement led to national change. As the group gained momentum it organized as the League of American Wheelman who published the *Good Roads* magazine, a national magazine whose circulation reached a million readers in three years. Groups began to meet nationally and through road conventions and public demonstrations sought to influence politicians and legislatures to build good roads, a mostly locally governed and funded operation.[36] Although this movement did not lead to passed legislation, its success derived from raising awareness and the need for improved roadways at a national level. It set the climate for the foundation for the Bankhead Bill passed by Congress in 1916.

The Creation of a Road Department

Since the 1890s, the federal government had been encouraging and offering some support for highway building. In 1916, Congress made a quantum leap when it passed the Bankhead Bill (The Federal Aid Road Act) that committed federal funds to the construction of rural post roads. Under the Act, federal and state governments began to consolidate road- and bridge-building activities. Up to this point, the majority of bridge building had been privatized. However, government control required standardized bridge construction. Luckily, this federal action coincided with a decline in patent protection for bridge designs and materials, which freed up access to developing bridge technologies that would have been too expensive to utilize under patent protection.

The 1916 legislation required that each state establish a road department to administer the program. In 1915, in anticipation of this federal legislation, Florida created a State Road Department (SRD) and appointed William F. Cocke, an engineer from the Virginia Highway Department, as its first State Road Commissioner or Highway Engineer. In Florida, as elsewhere around the nation, the transition from solely local control of roads to state supervision slowly moved ahead, and was further impeded by the national crisis created by World War I. As a result, it was not until 1923, that the Florida Legislature officially designated a system of state roads and authorized the SRD to complete those routes.[37] The "first system" or priorities were:

- Road No. 1 - Pensacola to Jacksonville
- Road No. 2 - Georgia state line at Jennings to Fort Myers
- Road No. 3 - St. Mary's River at Wild's Landing, through Jacksonville, to Orlando
- Road No. 4 - Georgia state line south of Folkston, Georgia, to Miami

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[36] Parson Brinkerhoff and Engineering and Industrial Heritage, *A Context for Common Historic Bridge Types, NCHRP Project 25-25, Task 15* (Washington, D.C.: National Cooperative Highway Research Program, Transportation Research Board, 2005), 2-21; "Good Roads Movement," Accessed at:: http://en.wikipedia.org/wiki/Good_Roads_Movement.

[37] "Two and One-half Years of Road Construction in Florida," *Florida Highways* 5(4), 1928, 18, 20.

- Road No. 5 - High Springs to Fort Myers
- Road No. 8 - Haines City to Fort Pierce
- Road No. 19 - Tallahassee to Ocala
- Road No. 27 - Fort Myers to Miami

A "second system" was designated in 1925:

- Road No. 5A - High Springs to Perry
- Road No. 10 - Tallahassee to Milton
- Road No. 11 - Georgia state line south of Thomasville to Capps Road No. 13 - Cedar Key to Yulee
- Road No. 15 - from near Wakulla to St. Petersburg
- Road No. 20 - Cottondale to Panama City
- Road No. 28 - Lake City to San Mateo
- Road No. 47 - Jacksonville to East Palatka

The Florida Real Estate Boom: An Era with No Limits

Florida's road system experienced a hectic period of growth and change in the 1920s due to the impact of a frenzied real estate boom. In 1926, the boom began its abrupt end, as a series of events caused a collapse in the Florida market.

During the boom years, the whole state, wrote one observer, "acted as though it were on a glorious bender—beautifully intoxicated and wildly hysterical." The tourist trade flourished as well as the year-round residents. In 1920, Florida's population was 968,470 and by 1930 had reached 1,468,211. In 1926, *Florida Highways* magazine concluded that the counties with the highest land values were also those counties that had the best roads. In such a euphoric economic climate which seemed to have no end, some counties voted enormous issues of bonds to build roads and bridges. Orange County put $7 million worth of bonds on sale, Lake County budgeted $6 million, and sparsely populated Monroe County spent $4 million, partially building a highway parallel to Flagler's railroad from the mainland to Key West.

Frank C. Wright, the editor of the respected *Engineering News-Record*, reported from Florida in 1926 on the importance of engineering on the building of roads. He said:

> *Without the engineer and the contractor the Florida real estate boom would be a frivolous and empty thing for climate, even Florida's climate, does not attract new money by itself alone. What has been done in Florida is to attract thousands, perhaps millions, of investors and prospective residents by physical evidences of development, by making roads where once jungle was, by building homes with all the conveniences of a modern city where a year ago was only sand and pine, and by turning a swampy shore into a tropical winter resort. To do this at all takes engineering skill; to do it in the short time that has been permitted has required both engineering skill and construction enterprise.*[38]

The frantic pace of development made it difficult for the SRD to supervise adequately highway projects. Despite the vast sums spent, roads and bridges dating from the Boom were often built hastily and cheaply to meet pressing demand. Editor Wright also noted that, "The demand for engineers has been so great, however, that the report has spread all over the country and from every state, engineers good and bad, have been pouring into Florida." The period produced many large bridges, but relatively few could be

[38] Wright, Frank C., "Florida," *Engineering News-Record*, 96 (January 7, 1926), 20-24.

distinguished by their high quality of design or innovative engineering. In 1935, SRD Chairman Chester B. Treadway commented that, "until a comparatively recent date, the importance of bridges and bridge building was apparently overlooked, to a large extent. In the enthusiasm that surrounded highway construction during the days of the Boom, when money was literally plentiful, it is surprising to note that only a mere handful of the essential bridges connecting up the roads that were built were given consideration. There seems to have been an attitude that bridges, if not really of secondary consequence, should be placed in a classification other than that of actual road building."

Photo 2-4. Gandy Bridge Toll Gate, 1930.
(FDOT at http:www.dot.state.fl.us/publicinformationoffice/historic dotphotos/bridges/gandy.shtm)

Like the railroad barons before them, individual citizens were often the reason for the construction of bridges and building of roadways during the Boom. George Gandy, who spanned the bay from Tampa to St. Petersburg, was the most notable of the private builders.[39] Gandy's 1924 toll bridge, which was dismantled in 1975,[40] was comprised of two-and-one-half miles of reinforced concrete spans and three miles of causeway. The new bridge enabled a traveler to complete the passage from Tampa to St. Petersburg in half the time it previously took.

In Miami, a local private development company constructed a series of concrete spans, called the Venetian Causeway, to Miami Beach in 1926. The Venetian Causeway, listed in the NRHP, replaced a huge timber structure erected by pioneering Miami Beach developer John Collins in 1913.[41]

While there are a number of examples that illustrate the role of private development in the creation of roads and bridges, two projects in particular illustrate this. Ernest Kouwen-Hoven, developer of the resort Indialantic-by-the-Sea, for instance, built a wooden trestle and an $8,000 drawbridge (now demolished) on

[39] Anon., Official Opening Program and Pictorial History of the Gandy Bridge, November 20, 1924. On file, Florida Room, Florida State Library, Tallahassee.
[40] "Old Gandy Bridge is coming down," *St. Petersburg Times*, October 28, 1975, 4B.
[41] Florida Department of State, "The Great Floridians of Florida 2000 Program: John Stiles Collins." Accessed at: http://dhr.dos.state.fl.us/services/sites/floridians/?section=m#Miami.

the Indian River near Melbourne in 1921.[42] On a grander scale, in 1928, Clay County banker and farmer Allie G. Shandy attracted New York and St. Louis investors to construct an 11,500-foot timber bridge with a Strauss bascule lift span on the St. Johns River at Green Cove Springs. It was reported that it took more than two million feet of southern pine to build the bridge. The "Shandy Bridge," which is no longer extant, was the longest timber vehicular bridge ever built. When engineers encountered problems in setting piers on the soft river bottom, they curved the bridge to firmer ground on the east end.

For its sheer scope and ambitious design, few projects in the state have matched the construction challenge of the Tamiami Trail. The "Trail" linked Miami and Tampa via Fort Myers by a road dug out of Everglades muck.[43] Begun in 1915, the building of the Trail was fraught with delays as underneath the surface, the hard limestone rock required 40,000 pounds of dynamite per mile to pulverize it. After its completion in 1928, *Florida Highways* magazine described the project as "a wilderness finally overpowered which will soon hum to the tune of heavy automobile traffic."

New Yorker William Conners also made a dramatic impact on the Everglades environment. In 1917, he began his extensive efforts to drain areas around Lake Okeechobee, seeking access to his reclaimed properties. Conners built a toll road in the 1920s from West Palm Beach to the town of Okeechobee, a technical feat in overcoming the natural obstacles.[44] On both the Tamiami Trail and the Conners Highway, the bridges were generally wooden stringers resting on timber piles sunk in the mud. Conners alone built twenty-six timber pile trestles on his road. While these roads remain well-traveled highways today, the timber bridges have all been replaced.

Timber remained a common bridge building material in the 1920s and beyond, though reinforced concrete grew in popularity for permanence and on heavily traveled routes. In 1927, the SRD estimated that there were 11,214 feet of concrete bridges and 12,875 feet of timber structures on SR No. 1 (The Old Spanish Trail). Based on a design of its own engineer, St. Johns County erected about 40 creosoted timber bridges on county roads utilizing a series of standard short spans combined with a central drawbridge. In 1928, Volusia County erected two pressure-treated timber bridges (no longer extant) on the Halifax River at Daytona Beach, each one exceeding 2,000 feet in length. The timber's low cost and ease of construction were among the factors that convinced the county to use the material.

The decision to use timber as a construction material was based not only on the number of waterways that would need to be crossed, but also on the existing and potential size of those waterways. Many of the state's rivers frequently overflowed their banks, thus requiring long causeways or multiple relief spans across wide "swamp valleys." As an example, in building a timber pile bridge over the Hillsborough River near Zephyrhills in 1934, engineers took into account that the normally placid stream measuring 100 feet wide and 20 feet deep would grow to become 1,700 feet wide and 25 feet deep during a flood stage.

The Boom also produced several exceptional examples of reinforced concrete construction. One particularly striking example is St. Augustine's majestic Bridge of Lions across the Matanzas River. The bridge was built in 1926 from a design by the engineering firm of J. E. Greiner in Baltimore and used concrete to create a distinctive Mediterranean style on a steel arched girder bridge with a bascule span. It quickly became a landmark in the old Spanish city known for its historic landmarks. This bridge was listed in the NRHP in 1982.

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[42] Thomas, Frank J., *Melbourne Beach and Indialantic* (Charleston, SC: Arcadia Publishing, 1999).
[43] Scupholm, Carrie, "The Tamiami Trail: Connecting the East and West Coasts of the Sunshine State." *The Society for Commercial Archeology Journal* (15, 2), 20-24.
[44] Will, Lawrence, *A Cracker History of Okeechobee* (St. Petersburg, FL: The Great Outdoors Publishing Co., 1964), 229-234.

Photo 2-5. 1948 Photograph of Memorial Bridge in Palatka.
(Florida Photographic Collection)

Photo 2-6. Remnant 1940 Memorial Causeway Overflow Bridge, FDOT #764038, Putnam County.

Daniel Luten, particularly successful in building small reinforced concrete arch deck bridges in Florida,[45] erected a large and handsome shallow arch bridge (now demolished) over the Little Manatee River at Wimauma. He completed the impressive Putnam County Memorial Bridge (**Photo 2-5**) on the St. Johns River at Palatka in 1927. This bridge was 2,600 feet in length and cost $1.25 million. The structure consisted of thirty concrete arch spans, ten with open spandrels, and a double-leaf bascule bridge at midstream. By all appearances, the Memorial Bridge represented one of Luten's finest works. It was replaced in 1977 by FDOT No. 760043. The only extant remnants of this beautiful structure are two overflow concrete arch deck bridges (Nos. 764037 and 764038) **(Photo 2-6)** located south where the original roadway remains. Yet the concrete structure that garnered the greatest attention and praise within the SRD was the Victory Bridge over the Apalachicola River at Chattahoochee. The bridge was built by the Masters-Mullen Construction Company of Cleveland, Ohio between 1921 and 1922 as one of the first major bridge projects of the Department. At 2,027 feet in length, it may have ranked at the time of its construction as the largest reinforced concrete arch bridge in the South. While concrete found greater applications in bridge building, it also appeared in road paving. The first concrete highways in the State were built from Jacksonville west towards Lake City and near the town of Fellsmere.

Although the road and bridge developments could not capture the public's attention like the exuberant real estate boom could, it was these improvements that made more stable growth possible. The SRD expressed this view of bridges in 1924: "Our first idea is permanence, and in most cases the bridges which are being built today will no doubt outlive the memory of many of us who are instrumental in their construction."

[45] Luten, Daniel B., "Curves for Reinforced Arches," *Engineering Record* 53 (April 14, 1906), 482-483; Luten, Daniel B. "Double-Drum and Cantilever Arches," *Engineering World* (July 1921), 11-15.

Bridges over Navigable Waterways

Local governments and individuals built many of the early drawbridges over the state's navigable waterways. Most of these structures were crude affairs, differing little in appearance and operation from medieval models that crossed over moats at castles or fortresses. In Florida, they were manually operated, hoisted by rope, built of wood with some iron parts, and placed in the middle of simple wooden deck bridges supported by spindly timber poles. Engineers vastly improved the movable span in the latter years of the nineteenth and into the twentieth century. This was accomplished by wedding the technology of steel truss bridges to that of swing pivots and lifting towers to move the structure and provide clearance for ships in the channel. Similarly, the application of new technology to the ancient principles of the drawbridge, resulted in the modern bascule bridge built under various patented designs.

The swing bridge, in both its older rim-bearing and its improved center-bearing versions, became popular in Florida because of its simplicity, lower cost, ease of construction and dependability. However, this bridge type created an obstruction in the channel because of its pivot pier. Beginning at the turn of the century and lasting until the late 1920s, Ohio's Champion Bridge Company, along with the Austin Brothers Company in Atlanta, took the lead in building Florida's swing spans. Generally supported by a Warren-style truss, the swing span could be rotated 90 degrees.

When there was a need for full clearance in the channel, or when the channel was known to shift, engineers chose the vertical lift bridge type. The vertical lift bridge consists of a truss span hoisted by cables mounted on pulleys in high steel towers. The towers also contain heavy concrete counterweights. Lifts are ordinarily classified by the location of their drive machinery, whether in the tower or on the span itself. Though smooth and efficient in operation, the vertical lift generally costs more to fabricate and erect. Only a few examples remain in Florida, such as the massive Main Street Bridge over the St. Johns River in Jacksonville and the small, unusual hydraulically-operated lift over Billy Creek in Fort Myers.

The bascule bridge, believed to possess a number of advantages over other movable types, steadily won wider acceptance among bridge builders. It opened a clear channel, operated swiftly and dependably, required simple mechanisms with few moving parts, offered strength and safety, and lent itself to artistic treatment. Engineering firms, primarily from Chicago where many of this bridge type were built, sold patented designs. Inventor William Scherzer claimed that his rolling-lift type bascule bridge operated with less friction and therefore needed less power. But the trunnion type, improved by Chicago engineer Joseph Strauss, who designed the Golden Gate Bridge in San Francisco, became the most preferred. In this type, the bascule span rotated around a trunnion or axle and made use of a heavy counterweight.

The bascule bridge was particularly suitable for Florida's many navigable streams. The prestigious engineering firm Harrington, Howard and Ash of Kansas City, which specialized in movable structures, designed several bascule bridges to cross the Miami River in the 1920s. Tampa, likewise experiencing traffic congestion downtown and into its new suburbs, built bascule bridges on the Hillsborough River. Among the most notable was the Kennedy Boulevard Bridge (formerly Laurel Street Bridge) which used a Warren pony truss span in an overhead counterweight trunnion-type bascule. The contract for the Laurel Street Bridge was awarded to a Philadelphia company that began as a builder of gas systems, a somewhat odd choice of contractors. The prosperous twenties brought all manner of bridge builders to Florida.

The Great Depression

The bright optimism of the 1920s all but disappeared during the dark days of the 1930s, when the nation's economy suffered its severest crisis in history. The Great Depression quelled the previous decade's spirit of capitalist individualism. The public became leery of and marginalized from the privatized development that typified the previous century. "In the world of highways and bridges, the pendulum swing manifested itself in the move away from locally controlled, private, or entrepreneurial bridge design and towards consolidated, government-controlled and mandated design."[46] This change was enforced by the availability of federal funding to construct roadways and bridges for which there was a demonstrated need. Bridge building as a federally-funded endeavor often favored simple, yet labor intensive structures.

Attempting to relieve the ill effects of the Great Depression, President Franklin Roosevelt implemented his New Deal programs. To stimulate the economy and to "make work" for the unemployed, the building of roads became a high priority, and the states were not required to match federal funds granted for road construction. Also, for the first time, funding available through the Bureau of Public Roads "could be used in cities, and on 'secondary and feeder roads' off the Federal-aid System."[47] Under the Hayden-Cartwright Act of 1934 and similar legislation, the federal government expended about $1 billion on highway construction between 1933 and 1938. The total of all federal spending in Florida grew from $12,772,000 in 1930 to $62,718,000 in 1934 and reportedly averaged $54,000,000 during the mid-1930s. Under these circumstances, the state's road program leaped forward. The Hayden-Cartwright Act of 1936 authorized $216.5 million over two years, including $50 million for elimination of hazardous rail-highway grade crossings on primary highways, and their replacement with grade separation structures.

One of the largest projects ever undertaken in Florida, the building of the Overseas Highway, took place at this time. In 1935, a ferocious hurricane struck the Florida Keys, resulting in great loss of life and property. The FEC Railway, which provided service from the mainland to Key West, was destroyed. The local economy was crippled, but state and federal officials were quick to respond. The state secured a $3.5 million loan from the Public Works Administration, and used $640,000 to purchase the bridges and right-of-way of the FEC Railway.[48] The concrete arches, steel plate girders and trusses, along with a bascule and a swing bridge, were transformed into vehicular spans when the narrowness of the Bahia Honda through truss bridge could not provide for two lanes of automobile traffic. Engineers transformed the structure into a deck truss by building the roadway on the top chords and cantilevering cross beams off each side to provide sufficient width.[49] Opened for traffic on March 29, 1938, the Overseas Highway was the product of considerable skill and imagination in its engineering and construction. The Overseas Highway helped revive the area's economy and enabled Key West to serve critical military purposes during World War II.

Florida added a number of important bridges during the Great Depression. What was then called the Gulf Coast Highway gained an impressive new structure in 1935 when the Gorrie Bridge opened to traffic over the Apalachicola Bay in Franklin County.[50] To provide a sturdier foundation, contractors drove timber piles as much as 100 feet into the bottom of the bay as footing for the concrete piers. The central span of the 12,400-foot structure consisted of an electrically-operated swing that opened wide channels on each side of the pivot pier. Operators were present 24 hours a day, seven days a week, until 1988, when the bridge was torn down and used as an artificial reef out in the Gulf.

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[46] M&H Architecture, Inc., *Indiana Bridges Historic Context Study, 1830s-1965*. February 2007, 48-49.
[47] Weingroff, Richard F., "Clearly Vicious as a Matter of Policy: The Fight Against Federal-Aid Part Three: To Control the Levers," Accessed at: http://www.fhwa.dot.gov/infrastructure/hwyhist-06a.cfm.
[48] Vinten, C.R., "A Highway Over the Sea," *The Regional Review*, 1 (July 1938), Accessed at: http://www.nps.gov/history/historyonlinebooks/regionalreview/vol1-1c.htm.
[49] Bethel, Rodman, *Second Overseas Highway to Key West, Florida: Metamorphosis from Railroad to Highway* (Privately published by author, 1989); Duncan, B.M., "Making a Highway by Conversion of the Florida Overseas Railroad," *American Highways* 17 (October 1938), 8-11, 16-17; Hopkins, Alice, "The Development of the Overseas Highway," *Tequesta* 46, 45-58.
[50] McCarthy, Kevin M., *Apalachicola Bay* (Sarasota, FL: Pineapple Press, Inc., 2004).

Using federal aid, Calhoun County completed a major long span steel bridge over the Apalachicola River near Blountstown (FDOT No. 470029, **Photo 2-7**). Erected by the Wisconsin Bridge and Iron Company and opened in 1938, it had a continuous truss design, a first for the state, and stood 52 feet above the river to permit unrestricted navigation. Jacksonville gained a substantial and costly structure with the completion of the Main Street Bridge in 1941. The bridge contained a 365-foot vertical lift span. The contractor had to take steps to protect the steel pilings by encasing them in additional layers of concrete. Built by the Mt. Vernon Bridge Company of Ohio, the structure reflected the rapidly expanding size of Jacksonville and the increasing flow of traffic south to the suburbs and beaches.

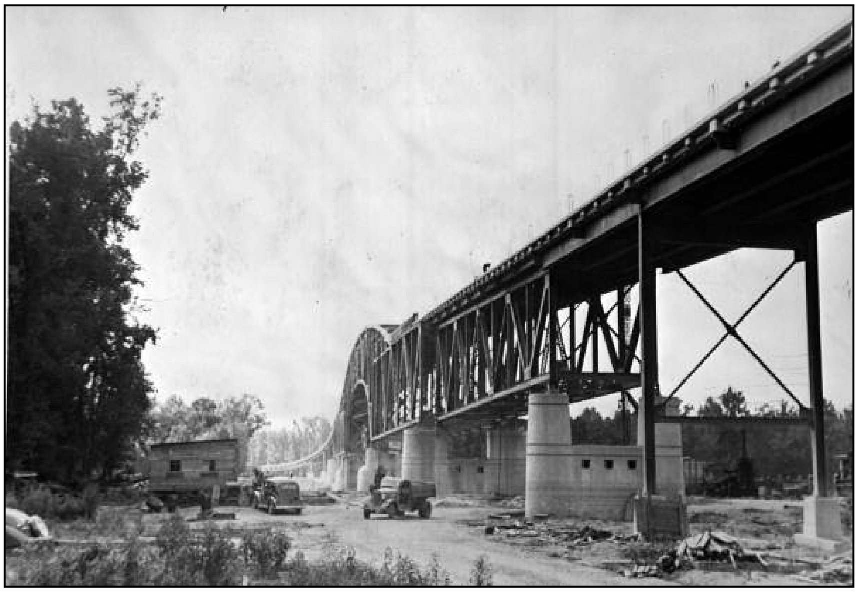

Photo 2-7. Construction of Blountstown Bridge Nearing Completion, 1937.
(Florida Photographic Collection)

WORLD WAR II AND THE MODERN AGE (1941-1956)

World War II

In 1941, America entered World War II. The war effort quickly curtailed work on the state highways, except for defense-related work. During the war years, the SRD provided access roads to military installations and improved highways that were deemed crucial to the movement of military traffic. These road projects were conducted at Pensacola, Tampa, Jacksonville, Orlando, as well as other locations around Florida. Contractors modernized and shortened the Overseas Highway to Key West, which housed a naval training station, and new bridges were constructed over the Banana and Indian Rivers to serve naval facilities at Cocoa. Camp Blanding near Starke, one of the state's major military bases, was improved with several connecting roads.[51]

The war would also bring an end to the tradition of private toll roads and bridges. The move to eliminate private tolls on bridges, roads, and ferries had begun during the Great Depression, but there were holdouts. Two remaining toll bridges in Tampa, the Davis Causeway to Clearwater and the Gandy Bridge, became public property during the war and were freed of toll charges despite resistance by the owners of the

[51] "Mathers Bridge-Banana River," *Florida Highways* 17(11), 1949, 29.

Gandy Bridge.[52] The federal government maintained the position that tolls were impediments to the defense effort. They invoked wartime powers and took over the structure.

World War II became the first of many conflicts to shape the American efficiency and cost effectiveness that standardized manufacturing provided. Stone and timber as building materials, especially for bridges, were passé. Structural steel was prioritized for war efforts, and as such, was in short supply for other construction. The big American steel companies adopted standardized designs for production; there was no time or money to fabricate unique items. This trend continued into the 1950s. Postwar economic booms ushered in the automotive age, which greatly overloaded the limited transportation infrastructure.

The Post-War Era and the Changing American Landscape

The post-World War II period opened the modern era of road and bridge building in Florida. Franklin D. Roosevelt passed the Federal-Aid Highway Act of 1944, which created the National System of Interstate Highways, a network of express highways. The social context for these strides in transportation development was stormy. A country in a seemingly perpetual state of war exposed the need for a national infrastructure of strategic military roads to support the military. The construction of the interstate highway system "was initially justified as a defense system for moving military vehicles and evacuating civilians. Defense requirements called for the interstate systems' geometry and structures to accommodate and aid the movement of large military equipment."[53] This Act also established the basis for federal-aid funding and distribution, although it was severely under-equipped to handle the dramatic increase in automobile usage after World War II. Revisions to this Act in 1950, 1952, and 1954 made significant steps in rectifying this shortcoming.

In the early 1950s, the Korean War dramatically curtailed the post-war boom of World War II, but had its own prolific period of post-war expansion that ushered in an era of standardization and cost-effective construction materials and methods. The steel shortage created by the Korean War (and later by the Vietnam War) had a direct affect on bridge development by creating a need for a cost-effective alternative to steel. Applied concrete technology in Europe and successful domestic examples from the 1920s lent credibility to concrete as a viable building material, especially for bridges.

Although it first was developed by French engineer Eugene Freyssinet in 1927, prestressed concrete did not gain widespread acceptance as a viable alternative to reinforced concrete until the mid-twentieth century. The first prestressed concrete bridge constructed in the United States was the 1950 Walnut Lane Memorial Bridge, which carries Lincoln Drive over Monoshone Creek in Philadelphia. Concrete became the preferred material for bridge construction because its individual components (cement, aggregate, water, chemical additives) were readily available and economical. Additionally, concrete's flexibility to be cast-in-place or precast in numerous forms allowed rapid and standardized construction.

The American landscape changed at an unprecedented rate as urban construction and suburban development continued, and the need for a safe and efficient roadway system increased. A method to standardize roadway construction became paramount to accommodate the growing demand on transportation infrastructure; this included bridge construction. As standardization became the new paradigm for roadway development, simple utilitarian slab, beam, and girder bridges proliferated. This trend was in stark contrast to the highly privatized and individualized bridge design, development, and construction of the early twentieth century.

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[52] Hartley, Howard W., "Courtney Campbell Parkway," *Florida Highways* 16(3), 1948, 9-12.
[53] M&H Architecture, Inc., 2007, 41-42.

Two national organizations were key sources of well-researched technical information that enabled standardized bridge design specifications: the Bureau of Public Roads (BPR, now known as the Federal Highway Administration [FHWA]), and the American Association of State Highway Officials (AASHO, now known as the American Association of State Highway and Transportation Officials [AASHTO]. These two organizations disseminated design standards for bridge construction in an unprecedented collaborative fashion. The focus of the BPR and AASHO were rural and state roadway development, respectively.

The BPR had its origins in the 1893 Office of Road Inquiry, whose mandate was to provide information for the construction and management of rural and agricultural roadways. The BPR issued design standards under the AASHO name in 1953, 1956, and 1962. They individually published findings on precast concrete in 1950, although this information was not included in AASHO specifications until 1961 to allow sufficient time for the "then-new" pretressed concrete technology to advance in research and use.

AASHO was established in December 1914 as a professional organization of state transportation officials in North Carolina, Virginia, and Maryland. The organization changed its name to AASHTO, established in November of 1974, but their mandate remained steadfast: to study and recommend improvements related to state-level road construction and to advocate transportation-related policies and provide technical services to support states in their efforts to efficiently and safely move people and goods.[54] AASHO published its first set of bridge specifications in 1931.

The Eisenhower Interstate Highway System

By 1954, President Eisenhower appointed a committee to study the national highway needs. The recommendations of this committee, under advisement by the brilliant yet polarizing Robert Moses, led to the enactment, on June 29, 1956, of the Federal-Aid Highway Act of 1956, popularity known as the National Interstate and Defense Highways Act. This Act provided funding for interstate highway construction for a 13-year period (1956-1969). If increased federal appropriations to states for highway construction, and brought nationwide uniformity to road building efforts by including a provision requiring the development of uniform design standards to accommodate projected traffic volume through 1975. "Toll roads, bridges, and tunnels could be included in the system if they met system standards and their inclusion promoted development of an integrated system."[55]

THE MODERN ERA (1956-1970)

The Federal-Aid Highway Act of 1956, occurring at the same time as the Baby Boom and a mass exodus to suburbia, initiated a building frenzy in transportation systems. Florida was emerging as a highly desirable place to live and work, since it featured no personal income tax and a reasonable cost of living. In addition, with beaches and good weather, Florida was a favorite tourist destination. This population influx put considerable pressure on the state highway system to expand and improve, and at the same time underscored the value of careful planning, sound construction techniques, and innovative engineering. During the construction boom in the 1950s and 1960s, hundreds of simple trunnion bascule bridges were constructed over the inland waterways. The Hopkins trunnion bascule configuration, patented in 1936, saw widespread use in Florida during this time, and was "the most prevalent type of bascule span utilized in

[54] AASHTO: American Association of State Highway and Transportation Officials, "What is AASHTO," Accessed at: http://www.transportation.org/?siteid=37&pageid=330.
[55] Weingroff, Richard F., "Federal-Aid Highway Act of 1956: Creating the Interstate System, *Public Roads* 60:1 (Summer 1996), Accessed at: http://www.fhwa.dot.gov/publications/publicroads/96summer/p96sulo.cfm.

Florida from the 1950s to the mid 1990s." **Figure 2-1** illustrates the dramatic rise in bridge construction in the 1960s.[56]

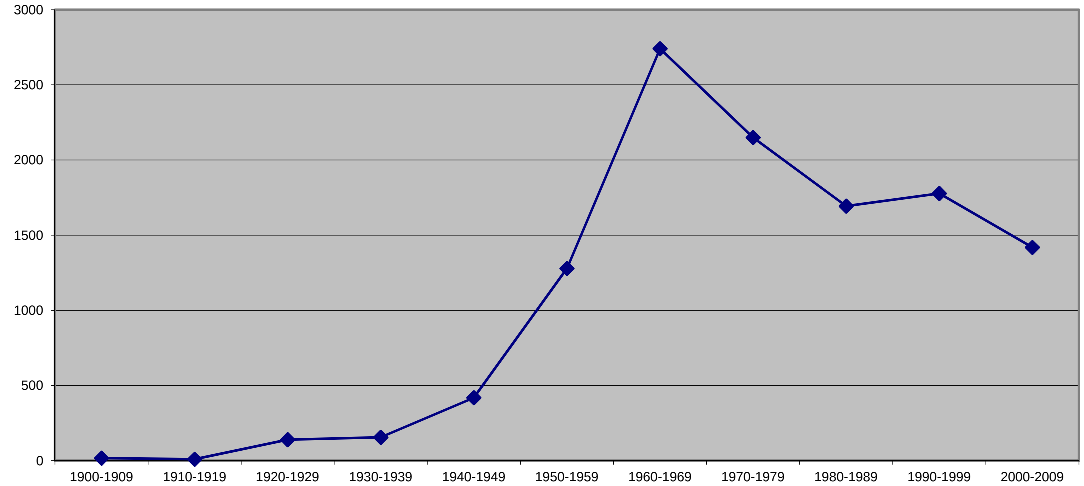

Figure 2-1. Number of Bridges Built in Florida by Decade
(Based on 2009 NBI data. Does not include demolished bridges.)

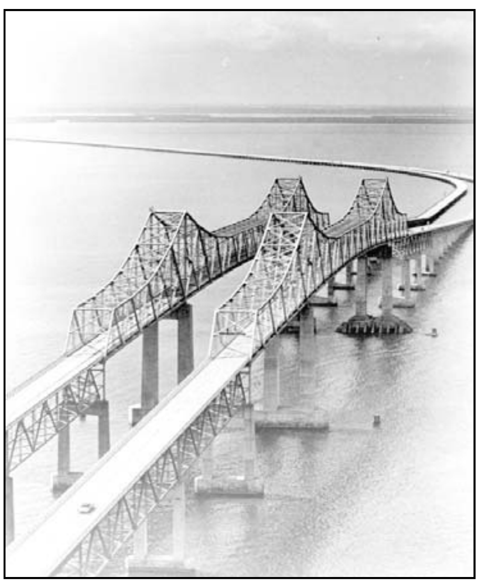

Photo 2-8. 1972 Photograph of Original Sunshine Skyway Bridge.
(Florida Photographic Collection)

The magnitude of the 49,700-mile Dwight D. Eisenhower National System of Interstate and Defense Highways and its historical significance presented administrative challenges to the FHWA. In 2005, the Advisory Council on Historic Preservation (ACHP) published an "Exemption Regarding Effects to the Interstate Highway System" in the *Federal Register*. This permitted federal agencies to proceed with the ongoing maintenance, improvements, and upgrades necessary to allow the IHS to serve its primary function without the interruption of the review process found in Section 106 (NHPA). This categorical exemption excludes certain elements of the IHS that have been found to be eligible for listing in the NRHP. Elements of the IHS in Florida that were found to be eligible include the Bob Graham Sunshine Skyway Bridge (I-275) in Manatee and Pinellas Counties, Alligator Alley (I-75) in Collier and Broward Counties, the Snake Wall (I-75) in Alachua County, and the Myrtle Avenue Overpass (I-95) in Duval County.

William E. Dean, the FDOT's chief bridge engineer from 1948 to 1962, gained national prominence for advocating the use of a new innovative building material, prestressed concrete, in bridge construction. He introduced prestressed concrete slabs into the state system when he sought durable replacements for timber decks on spans along the Tamiami Trail.

[56] Noles, Timothy and Michael Sileno, "Retrofit of the Christa McAuliffe Bridge," Paper Presented at the Ninth Biennial Symposium, Heavy Movable Structures, Inc., October 22-25, 2002, Accessed at http://www.heavymovablestructures.org/assets/technical-papers/00918.pdf.

Photo 2-9. Photograph of new Sunshine Skyway Bridge.

Prestressed concrete was crucial to modern concrete bridge design because it overcame concrete's natural weakness in tension. Early generations of concrete cantilevered bridges were box girders due to the efficiency of the structural form and its inherent stability without the need for falsework (temporary support frames used during construction). Without the requirement for falsework, bridges could be built at higher elevations above ground. With the development of prestressed concrete, bridges were then able to span upwards of 500 feet.[57] A prominent early example is the original Sunshine Skyway (**Photo 2-8**), a vast project costing $22 million that would facilitate the development of the entire Gulf Coast. Many of Dean's progressive ideas and methods went into building the Skyway, which opened in 1954, stretching approximately fifteen miles and linking the St. Petersburg and Bradenton areas. Long, filled-in causeways led to a cantilevered steel truss, which rose 155 feet above the bay and provided wide clearance for shipping into busy Gulf ports. The size of the project gave Dean many opportunities to demonstrate the value and strength of prestressed concrete construction. In 1969, a virtually identical structure was completed adjacent to the original to accommodate the increasing volume of traffic. However, a tragic accident occurred in 1980 when a ship, the Summit Venture, rammed a concrete pier and toppled a main span into Tampa Bay. Consequently, a new Sunshine Skyway (**Photo 2-9**), utilizing a dramatic cable-stayed design by Figg and Muller Engineers, opened in 1987, providing the area once again with an exceptional example of bridge engineering.

Barrier Island Development

Marco Island is an example of a still-continuing trend of development on what were previously considered primitive barrier islands. Marco Island was the single-largest undeveloped tract of barrier island property in Southwest Florida. In 1962, Baron Collier, in conjunction with the Mackle brothers, sold 6,700 acres on Marco Island. Their development company, the Deltona Corporation, led the major canal construction on the barrier islands. This changed the face of Collier County, dramatically altering the Isles of Capri and Marco Island. The community was designed as a water-oriented, second-home retirement community and resort center with the SR-951 Bridge over Big Marco Pass, a continuous steel girder bridge, providing access to the island. Bay bottoms and mangrove swamps were transformed by dredge-and-fill into a complex of upland subdivisions and canal waterfront home sites with numerous small bridges using prestressed concrete of a slab or girder design connecting the network of canals. However, growing public concern over potential environmental impacts led to government-sanctioned intervention and lawsuits which effectively ended future residential canal development on Marco Island.[58]

Barrier island development continued along the entire Florida coastline as increasing wealth led to intense development of desirable coastal property. Dredge-and-fill became the established method to accommodate the demand for more waterfront property.[59] While dredge-and-fill was not necessarily a new

[57] Murillo, J., "Brief History of Segmental Concrete Bridge Construction." *Segmental Bridges* (57, 19), February 2004.
[58] Mormino, Gary., *Land of Sunshine, State of Dreams: A Social History of Modern Florida* (Gainesville, FL: University Press of Florida, 2005); Antonini, Gustavo, David Fann and Paul Roat, *A Historical Geography of Southwest Florida Waterways Volume 2: Placida Harbor to Marco Island*, 2002.
[59] Antonini et al., 2002.

technology (as exemplified by the Nurmi Isles neighborhood), it was practiced most extensively during the 1950s and 1960s. Beginning in the early 1950s, developers dug many "finger canals," with the fill deposited behind vertical cement seawalls, creating numerous large-scale canal communities. As discussed in *The Affluent Society*, economist John Kenneth Galbraith contended that prosperity had become a template for 1950s America. "Nowhere was prosperity rearranging America with more force and speed than along Florida's beaches. It was free enterprise at its best and worst."[60] This method of construction was most practiced in Pinellas County, Florida's most dredged and built-up county. Accessing these newly created land developments was often through standard concrete or steel girder bridges and simple prestressed concrete bridges.

Developers who foresaw this trend in Pinellas County purchased large tracts of waterfront property in the late 1940s. With such potential for profit through the creation of waterfront property, developers created over thirty miles of new shoreline by 1956. The new construction was not without controversy and public debate, as some projects gained statewide attention. In 1957, Albert Furen purchased a deed to Mud Key in Boca Ciega Bay with plans to dredge and fill 504 acres. Despite opposition from Governor LeRoy Collins, substantial public uproar, and court proceedings, Furen was able to acquire the necessary permits and develop the 225-acre Vina Del Mar subdivision, with the double-leaf bascule SR-682 Bridge over the Intracoastal Waterway providing access.[61]

The ongoing controversy surrounding the dredge-and-fill practices beginning in the early twentieth century led to the emergence of new environmental laws and planning policies. Every beachfront development was unregulated, and construction too close to the beach often resulted in destruction of the natural dune system. The Mud Key project displaced turtles and seabirds. The combination of unregulated coastal development and the destabilization of many tidal inlets led to significant beach erosion issues in the mid-twentieth century.

Nathaniel Reed and Governor Claude Roy Kirk, Jr. championed two key conservation measures, the 1957 Bulkhead Act and the 1967 Florida Air and Water Pollution Control Act. In addition, the Aquatic Preservation Law of 1968 prohibited dredge-and-fill development in designated areas. These three laws, in addition to the National Environmental Policy Act of 1969 (NEPA) and the creation of the Environmental Protection Agency (EPA) in 1970, culminated in Zabel v. Tabb (430 F. 2D 199 5th Cir. 1970), a landmark case that acknowledged the state and federal responsibility to protect environmentally threatened land. It also effectively limited the future development of finger islands and dredge-and-fill practices, significantly altering existing land use.[62]

A number of other planning and compliance policies emerged in the 1960s. Metropolitan Planning Organizations (MPOs) were enacted by federal mandate in 1962. The National Historic Preservation Act of 1966 (NHPA) along with NEPA provided protection to cultural and environmental resources. Florida's Outdoor Recreation and Conservation Act (1963) provided a means to acquire public land other than by donation or legislative line-item appropriation. State parks that were developed during this time include Lake Griffin State Park; John Pennekamp Coral Reef State Park, the nation's first underwater park; and Windley Key Fossil Reef Geological State Park.

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60 Mormino, 2005.

61 Pinellas County Environmental Management Department, *The History of Pinellas County's Federal Shore Protection Project*, 2009; Mormino, 2005.

62 Barnett, Cynthia, *Mirage: Florida and the vanishing water of the Eastern U.S.* (University of Michigan Press, 2007).

The End of an Era

During the 1960s, the U.S. economy continued to grow, and two key agencies were established: the U.S. Department of Transportation (1966) and the Federal Highway Administration (1967). The FHWA, as a division of the U.S. Department of Transportation, was tasked with the oversight of funding for agencies, including state departments of transportation that used their funds for transportation needs. To qualify for funding, these state agencies were required to adhere to FHWA standards and directives, which included AASHTO specifications to ensure safe and progressive roadway and bridge design and construction. This oversight provided quality control of projects, construction administration and standards for the nation's transportation infrastructure. "AASHTO specifications are the bible of highway bridge design engineers. They are intended to serve as a standard…for the preparation of state specifications and as a reference for bridge engineers. Because they have been adopted by all the state highway departments in the United States, they are a set of rules and regulations to be followed in designing the nation's highway bridges."[63]

The newly available funding for transportation projects fueled the road and bridge construction of the 1960s. Vehicular traffic volume continued to increase, and mounting pressure led to the creation of the FDOT. Not only did the newly created FDOT absorb the powers of the previous SRD, but it also acquired the Florida Turnpike Authority, which became a district within FDOT.[64]

Florida's Turnpike, also known as State Road 91, runs approximately 312 miles through 11 counties, beginning in Miami-Dade County and terminating in Sumter County. On January 25, 1957, it opened to traffic as the Sunshine State Parkway and operated under the direction of the Florida State Turnpike Authority. At that time, the corridor extended 110 miles, connecting Golden Glades in Miami to Fort Pierce. In 1963, a 61-mile extension connecting Fort Pierce to Orlando was completed, and the next year an extension from Orlando to Wildwood was opened. Following its incorporation into the FDOT as the Florida Turnpike District (renamed Florida's Turnpike Enterprise in 2004), the Turnpike continued to grow. The final section of the mainline connected Miami to Homestead in 1974. Today, there are 70 interchanges within the entire 312-mile Turnpike system,[65] as well as 194 bridges, 90% of which use concrete or prestressed concrete.

The construction of statewide transportation networks spurred local municipalities to improve their own infrastructure systems through funding programs. One such example was the Brorein Street Bridge in Tampa. Completed in 1959, W.I. Nolen, the city bridge engineer, oversaw the double-leaf bascule bridge design implementation by the Paul Smith Construction Company. This bridge represented the first completed project from the $20 million Public Improvement Program for the City of Tampa.[66]

Waterway Navigation Innovations

Waterway access in Southwest Florida began as early as 1889, when a Naples pier was constructed to accommodate steamship freight and passengers. Further improvements to waterway access to Naples were made in the 1930s by a local entrepreneur, W.W. Crayon, who dredged and maintained cuts in the area from Naples to Big Marco Pass. In 1939, the U.S. Board of Engineers for Rivers and Harbors recognized the need to create a commercial water thoroughfare for passengers, goods, and services and recommended

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[63] Taly, Narendra, *Design of Modern Highway Bridges* (New York: McGraw-Hill, 1998), 91, 93.
[64] Samuel, Peter, "Florida's Turnpike celebrating 50th birthday & half price transponders," *TOLL ROADS News*, January 25, 2007.
[65] Florida's Turnpike Enterprise, "Florida's Turnpike: The first 50 years. Florida's Turnpike: The Less-Stressway," Accessed at: http://www.floridaturnpike.com/about_history.cfm; Samuel, 2007.
[66] "788,000 River Bridge Opened in Downtown Tampa," *Tampa Tribune*, Wednesday, July 8, 1959.

creating the Gulf Intracoastal Waterway stretching from the mouth of the Caloosahatchee to Lemon Bay and beyond to Tarpon Springs. Federal funds, however, were not authorized until 1945. Dredging from the south began in 1960 and reached Gasparilla Sound by 1964. The Florida legislature created the West Coast Inland Navigation District (WCIND) as a special taxing authority to fund future canal maintenance. Originally, the WCIND encompassed Lee, Charlotte, Sarasota, Manatee, and Pinellas counties (although Pinellas County later withdrew). The WCIND mandate eventually included waterway management of anchorages, boat traffic, inlets, and beaches.[67] A number of bridges were built crossing the Intracoastal Waterway (ICWW), including the Madeira Beach and Tierra Verde Causeways in Pinellas County, both of which are prestressed concrete girders with a movable double-leaf bascule. The early ICWW bridges typically included a movable span with steel or concrete girder approach spans. More recent designs, such as the Port Boulevard Bridge in Miami-Dade County (Bridge Nos. 875000 and 875001/1991) and the A1A Bridge in Broward County (Bridge No. 860620/2002) use a continuous prestressed concrete segmental box girder design.

The Cross Florida Barge Canal was intended to cross northern Florida, connecting the Gulf Intracoastal Waterway with the Atlantic Intracoastal Waterway (**Figure 2-2**). The planned route of the canal followed the St. Johns River from the Atlantic coast to Palatka, the valley of the Ocklawaha River to the coastal divide, and the Withlacoochee River to the Gulf of Mexico. Although the project was authorized by Congress in 1942, construction did not begin on the canal until 1964. The project was halted by President Richard Nixon in 1971 after several lawsuits, based on environmental concerns, were filed seeking an injunction to the project. About 25 miles of the 110-mile project were built, including the cross-country section from the St. Johns River to the Ocklawaha River, part of the route along the Ocklawaha River, and a small section at the Gulf of Mexico ending at the dammed Lake Rousseau. The completed infrastructure included three of the five planned locks, all three planned dams, and four of the 11 planned bridges. All the bridges over the St. Johns River north of the canal are high enough for ships, or have movable sections. High bridges were built over the canal, as well as several over the Ocklawaha River where it was not widened to the canal. The land intended for the canal is now a protected greenbelt known as the Marjorie Harris Carr Cross Florida Greenway, named for the leader of the opposition to the canal.[68]

Figure 2-2. Completed Elements of the Cross Florida Barge Canal, 1976.
(University of Florida Libraries, Department of Special and Area Studies Collections)

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[67] Antonini et al., 2002.
[68] Department of the Army, *Cross Florida Barge Canal Restudy Report Summary* (Jacksonville, FL: Jacksonville District Corps of Engineers, 1976), 1, 7.

The U.S. Space Program

In addition to roadway and waterway improvements, the 1960s saw a technological advancement that would have global impact. The "Space Race" that marked the mid-century history of the U.S. spurred development of two Central Florida institutions: the Florida Technological University (later, the University of Central Florida), opened for students in 1968, and the Brevard Engineering College (later, the Florida Institute of Technology). Brevard County and state officials were still grappling with traffic congestion resulting from the growth of the missile program and the new college campuses when the National Aeronautics and Space Administration (NASA) launched an ambitious building program. This created the need for new roads and bridges and the widening of most of those that were already in place. The new roads included arterial highways throughout the County as well as access roads to facilitate the flow of traffic to and from Cape Canaveral, Patrick Air Force Base, and the Merritt Island Launch Area.[69]

Plans for construction of I-95 were completed in 1961, and most of its construction was completed by the end of the decade. The four-laning of U.S. Highway 1 through Brevard County was completed in 1964. During this same year, the Emory L. Bennett Causeway (SR-528) was opened. This facility carries the easternmost portion of SR-528 and SR A1A from U.S. 1 to the eastern terminus of SR 528, across the Indian and Banana Rivers, Sykes Creek, and Merritt Island, via a series of prestressed concrete girder bridges. Two years later, the four-span, prestressed concrete girder bridge along the NASA Causeway (SR 405) was constructed and connected to SR-50. In addition, the opening of SR-520 across the Indian and Banana Rivers enhanced the traffic flow between Cocoa and Cocoa Beach. The causeways at Eau Gallie and Melbourne also were improved during the 1960s. These major projects were accompanied by many others aimed at four-laning most of the routes leading to and from the Cape and North Merritt Island.[70]

The road construction of the 1960s in Brevard County was met with rivalry and competition. Neighboring counties put up signs advising motorists to avoid certain routes and travel other roads for "better" access to South Florida. A high-speed road was also proposed to connect Brevard County to Orlando near McCoy Jetport (now Orlando International Airport). When the Walt Disney Company announced its ambitious plans for Orange County, Brevard County leaders began to see the proposal of a high-speed road as a way to bring visitors to Kennedy Space Center (KSC). This road became the Martin Anderson Beeline (SR-528), which, together with the Bennett Causeway, provided access to Cape Canaveral.

Port Canaveral also expanded in the 1960s, stimulated by the development of KSC and the Apollo program. In 1965, Port Canaveral completed a series of locks to connect the port with the barge canal across Merritt Island. Two bascule and concrete girder bridges were constructed in 1963 as part of this series. The locks were first used to transport the Saturn rocket on its way to the Cape. The Canaveral Lock, the only lock in Florida that connected the Atlantic Ocean to the ICWW, opened between the port and the Indian River in 1965.

Toll-Financed Bridges

The vigorous bridge building program begun in the 1950s maintained its momentum throughout more recent decades. In 1967, Jacksonville acquired an imposing continuous through truss bridge, named for the city's founder Isaiah Hart, that provides a 1,093-foot clear channel for shipping on the St. Johns River. Still another reminder of Jacksonville's historical tradition as a crossing point on the St. Johns occurred in 1988 with the opening of the Napoleon Bonaparte Broward Bridge at Dames Point, a major transportation

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[69] Shofner, Jerrell H., *History of Brevard County: Volume 2* (Stuart, FL: Brevard County Historical Commission, 1996).
[70] Shofner, 1996.

facility in the city and state. Designed by the engineering firm of Howard, Needles, Tammen & Bergendoff, the cable-stayed bridge, having the longest central span of this type in the U.S., is a graceful addition to the river. While the Hart Bridge is now a free road, both the Hart Bridge and Dames Point Bridge were toll-financed. In addition, tolls originally financed at least three other bridges in Duval County: the Fuller Warren Bridge, a bascule span just south of the downtown built in 1954; the Trout River Bridge, an arched girder bridge built in 1926; and the Mathews Bridge, a steel through truss bridge built in 1953.[71]

The evolution of bridges in Florida is the story of ingenuity and perseverance. Begun as the proud achievements of their time, the historic bridges of Florida serve as a benchmark of Florida's growth and development.

[71] Samuel, 2007.

CHAPTER 3 - BRIDGE BASICS

INTRODUCTION

This chapter introduces the basics of bridge typology, including structural configurations and building materials. Innovations in design, materials, and construction methods are examined for each of Florida's major bridge types.

STANDARD BRIDGE COMPONENTS

Standard components of bridges include the **deck**, **superstructure**, and **substructure** (**Figure 3-1**). The FHWA's *Bridge Inspector's Reference Manual* is the principle source for the information that follows.

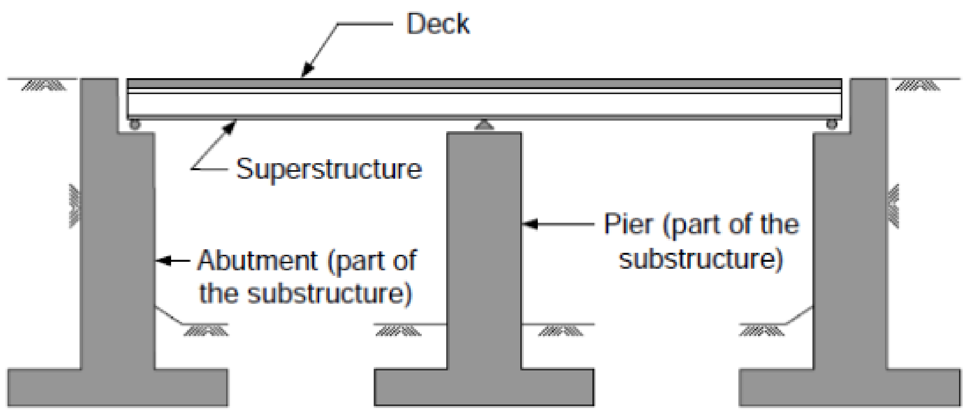

Figure 3-1. Major Bridge Components.
(From the Bridge Inspector's Reference Manual [BIRM], 1.2)

The bridge **deck** is the part of the bridge that comes in direct contact with vehicular or pedestrian traffic. Decks in Florida are often constructed of concrete (cast-in-place or precast), open steel grating, or wood planks. A deck may be non-composite, composite, or integral with the superstructure, depending on the bridge type. Bridge plans must be reviewed to determine whether a structure is non-composite or composite.[72] A deck is often topped with a waterproofing membrane and a top-most wearing surface, such as concrete or asphalt, to protect the deck from deterioration.[73]

Deck features may include open or closed joints between bridge segments or at the approach roadway; drainage elements such as scuppers; appurtenances such as barriers and railings for automobiles and pedestrians, sidewalks, and curbs; signage; and lighting.[74]

The **superstructure** of a bridge receives the traffic load and distributes it between spans to the substructure elements. A reference to a bridge type usually refers to the engineering of the main elements of the superstructure, such as the girders or arch. These types are discussed in more detail below. In

[72] U.S. Department of Transportation, Federal Highway Administration, *Bridge Inspector's Reference Manual* (Washington, D.C., 2006), 2.31-3.
[73] *Bridge Inspector's Reference Manual,* 1.23-9.
[74] *Bridge Inspector's Reference Manual,* 1.29-34.

bridges where the deck is not integral or composite with the superstructure, a floor system, consisting of stringers and floorbeams, may serve as part of the superstructure by transferring the traffic load from the deck to the main elements of the superstructure. Diaphragms and braces between the main superstructure elements help to evenly distribute stresses and stabilize the bridge.[75]

The **substructure** transfers the bridge loads from the superstructure to the foundation or soil below. The substructure includes abutments, found at the ends of the superstructure, and piers and/or bents, found at intermediate points along the bridge spans.[76] **Abutments** often serve a dual purpose, as they may also retain the embankment under the roadway approach to the bridge. These solid abutments may stretch the full height from the superstructure to the grade level of the roadway or waterway below, or they may be a stub abutment, which reaches from the superstructure to the upper part of the embankment. Open abutments, which consist of columns but have no solid wall, are found where the embankment is covered with retaining material, such as rock or concrete.[77]

Piers and bents provide support to the superstructure at intermediate intervals with minimal obstruction to the flow of traffic or water under the bridge. Piers and bents differ in appearance, but not function. A **pier** has only one footing, such as a single column, whereas a **bent** may contain no footing or multiple footings. A substructure unit that consists of two columns with individual footings is an example of a bent. A pile bent, which features multiple long and thin piles extending directly from a pile cap into the ground, is an example of a bent with no footing. Barriers such as dolphins or fenders may be put in place to help protect the substructure from collisions with traffic or debris.[78]

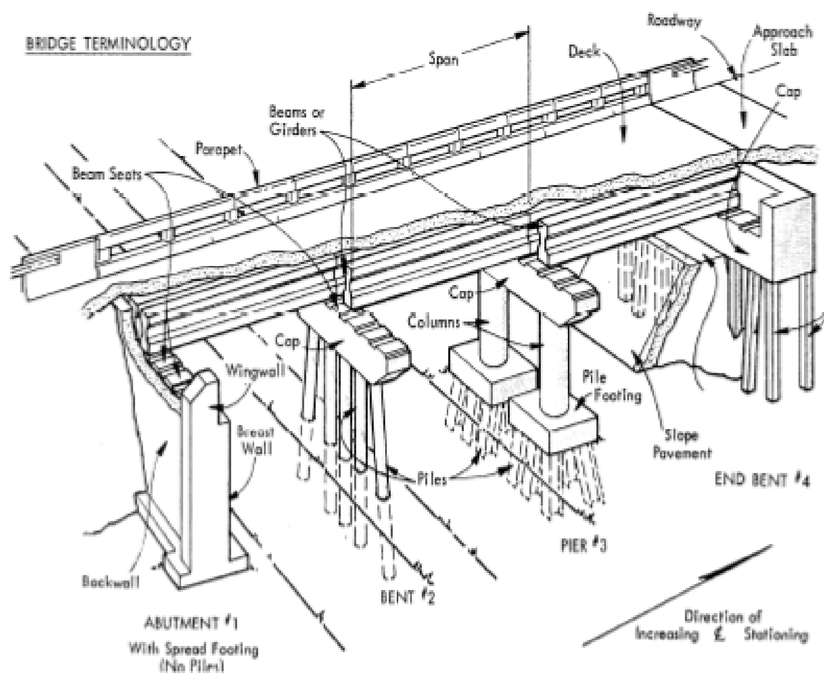

Figure 3-2. Bridge Terminology.
(Courtesy of the Federal Highway Administration)

75 *Bridge Inspector's Reference Manual,* 1.34-6.
76 *Bridge Inspector's Reference Manual,* 1.49-50, 10.2.1.
77 *Bridge Inspector's Reference Manual,* 1.50-1.
78 *Bridge Inspector's Reference Manual,* 1.52, 10.2.1,14.

There are three types of spans that are defined by the relationship between the superstructure and the substructure: simple, continuous, and cantilevered. A simple span is a superstructure span with only two substructure supports, each of which is at or near the end of the span. A **simple span** bridge can have a single span supported at the ends by two abutments or multiple spans with intermediate piers, with each span behaving independently of the others. A **continuous span** bridge is one that is supported at the ends by two abutments and that continues uninterrupted over one or more intermediate piers. In a continuous span, the behavior of each segment of the span is dependent on the adjacent span segments. A continuous span bridge allows for longer spans than a bridge consisting of multiple simple spans. A **cantilever span** is a span in which one end is fixed and the other end is completely free. A cantilever generally does not form an entire bridge. Portions of a bridge can behave as a cantilever, but they are usually extensions of a continuous span and therefore are dependent on the adjacent span segments.[79]

BRIDGE MATERIALS

Most of Florida's historic bridges are constructed of timber, steel, or concrete.

Timber

Timber is one of the oldest structural materials. In the first half of the twentieth century, longitudinal sawn timber beams and transverse sawn lumber decking was the prevalent timber bridge construction system. The decking members were attached to adjacent pieces by through nailing, and toe-nailing was used to attach these decking pieces to the timber beams. This system provided a structurally sound deck system when initially installed, but the effects of moisture, insects, and the dynamic impact of moving vehicles often resulted in decay and a loosening of mechanical fasteners. Timber bridges, therefore, have extensive maintenance requirements. Additionally, unlike manufactured steel and concrete, sawn timber does not have consistent structural properties. Its strength varies depending on species, density, and moisture content. These disadvantages led county and state bridge engineers to discontinue the use of timber in highway bridge construction in favor of reinforced concrete and steel. [80]

Timber bridges do have some advantages, as their members can resist both tensile and compressive stresses. Modern timber bridges overcome the inherent weaknesses of wood by using engineered glued-laminated (glulam) or stressed-laminated wood members.[81] Additionally, timber bridges are inexpensive and quick to construct, making them ideal for areas with low traffic volumes, such as rural areas and publically-owned lands. Timber bridges are common in the Blackwater River and Tate's Hell State Forests in FDOT District 3.

Early timber beam bridges typically consist of multiple solid-sawn beams running between wood piers. The decks are often wood plank, although other materials may be found. Modern timber bridges are more likely to use more structurally efficient and cost effective glued-laminated or stress-laminated wood members.

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[79] *Bridge Inspector's Reference Manual,* 2.27-31.
[80] Williamson, Thomas G., "Timber Highway Bridge Construction Practices in the United States"(paper presented at the National Conference on Wood Transportation Structures, Madison, WI, October 23-25, 1996), USDA, Forest Service, Forest Products Lab, FPL-GTR-94.
[81] *Bridge Inspector's Reference Manual,* 6.2.1.

Steel

Modern steelmaking originated with Henry Bessemer, whose mid-nineteenth century invention of the Bessemer process enabled the mass production of steel. Bessemer's patented method of converting pig iron to steel greatly reduced the cost and increased the speed and scale of steel production. Steel was commonly used in the construction of truss, cantilever, arch, and suspension bridges throughout the U.S. in the late nineteenth and early twentieth centuries.[82]

Due to their strength, steel bridge members are used to carry axial forces as well as bending forces. Steel shapes are generally either rolled or built-up. Rolled steel bars and plates are frequently used in truss construction, and they may be connected with rolled angles to form bracing members. Rolled channels are used as diaphragms, struts, or other built-up members. Rolled beams are "I"-shaped sections used as main load-carrying members in which the load carrying capacity increases as the member size increases. During the early days of the iron and steel industry, the various manufacturers each rolled beams to their own standards. It was not until 1896 that the Association of American Steel Manufacturers adopted the American Standard beam, standardizing beam weights and dimensions.[83]

Built-up shapes, fabricated by either riveting or welding techniques, allow the bridge engineer to customize the members to their use as they offer a great deal of flexibility in design. Riveting steel shapes was a common practice from the 1800s through the 1950s. Welded steel boxes and girders began to be manufactured in the early 1960s. Typical built-up shapes include girders and boxes. Riveted I-beam girders were fabricated from plates and angles when the largest rolled beams were still not large enough as required by the bridge design. Riveted boxes, fabricated from plates, angles, or channels, were used for cross-girders, truss chord members, and substructure members. Welded girders and boxes are fabricated from plates. Welded boxes are commonly used for superstructure girders, truss members, and cross girders.[84]

Steel cables are tension members and are used in suspension, tied-arch, and cable-stayed bridges.[85]

Concrete

Structural concrete is concrete that includes structural steel as reinforcement, including both reinforced and prestressed concrete; both can be precast in numerous forms. On its own, concrete is inherently strong in compression but not in tension. Steel rebar embedded in the concrete increases its performance in tension, allowing for longer unsupported spans.

The difference between reinforced and prestressed concrete is how the embedded steel is treated. Both the steel placement and cure time for reinforced concrete are determined by very specific and tested engineering standards. The steel in conventional reinforced concrete is simply laid in its engineered placement in a form, and then the concrete is poured over the steel and cured appropriately.

In contrast, the steel in most prestressed concrete is stressed before the concrete is poured and cured. In pre-tensioned prestressed concrete technology, the steel is tensioned in the form before the concrete is poured. Once the concrete has cured to its required strength, the steel strands are cut and detensioned. As the strands attempt to regain their original untensioned length, they bond to the concrete and apply a

[82] Chatterjee, Sukhen, *The Design of Modern Steel Bridges* (Malden, MA: Blackwell Publishing, Inc., 2003), 10-17.
[83] *Bridge Inspector's Reference Manual*, 1.10-2.
[84] *Bridge Inspector's Reference Manual,* 1.13-4.
[85] *Bridge Inspector's Reference Manual,* 1.15.

compressive force. This process increases the load-carrying capacity and helps control cracking of the final structural components.[86] In post-tensioned prestressed concrete, the concrete is cast with open ducts in the place of steel strands. After the concrete is cured, the steel strands are run through the ducts and then tensioned. Post-tensioning may be used to join together large precast concrete elements, such as box girders.[87] Post-tensioning using tendons was first introduced in Florida in 1954 by the FDOT's chief bridge engineer, Bill Dean in the first Sunshine Skyway Bridge in Pinellas County.[88]

The history of reinforced concrete begins in Europe. European experimentation, developments, construction, and early design theory occurred in England, France, and Germany during the nineteenth century. At that time, steel, masonry, and timber bridges were more common than concrete bridges in the U.S. As early as 1903, the Swiss Institute of Engineers & Architects produced specifications for reinforced concrete. European examples provided the precedence to validate the material properties of reinforced concrete that were later incorporated into American practice. The first reinforced concrete bridge built in the U.S. was the 1908 Walnut Street Bridge in Philadelphia.

The material limitations of reinforced concrete, including a high weight-to-span-ratio, cracking, and spalling, and continued experimentation with concrete by French engineer Eugene Freyssinet, led to the development of prestressed concrete in 1927. Despite this early date, the technology was severely hampered by stalled developments in steel engineering to reinforce the concrete due to the war.[89] Prestressed concrete did not gain widespread acceptance as a viable alternative to reinforced concrete until mid-century. The first prestressed concrete bridge constructed in the U.S. is the 1950 Walnut Lane Memorial Bridge over Monoshone Creek in Philadelphia. The successful completion of the Walnut Lane Memorial Bridge launched the development of the multi-billion dollar prestressed concrete industry and revolutionized the construction world.[90] Despite this successful achievement, AASHTO did not publish specifications for prestressed concrete until 1961, when it released specifications based on a 1958 prestressed concrete report by the joint committee of the American Concrete Institute (ACI) and the American Society of Civil Engineers (ASCE).

As is true in fundamental post-and-lintel bridge design, the longer the span, the more intermediate support is required to be structurally sound. Reinforced concrete, while strong, is known for its "heavy" aesthetic. Prestressed concrete, in contrast, has a slimmer, more streamlined appearance due to its material properties. The advantages of prestressed concrete over reinforced concrete include:

- longer spans that allow for wider column-free spaces due to a higher span-to-depth ratio;
- beams that are approximately two-thirds the size and weight of reinforced concrete beams;
- reduced self-supporting weight that requires less material, which makes for more slender, aesthetic proportions;
- approximately one-fourth the amount of steel required for reinforced concrete; and

[86] Precast/Prestressed Concrete Institute (PCI), *Designing with Precast and Prestressed Concrete,* Accessed at: http://www.pci.org/designing_with_precast.cfm, 8.
[87] Allen, Edward, *Fundamentals of Building Construction: Materials and Methods* (New York, NY: John Wiley & Sons, 1990), 535.
[88] Corven Engineering, Inc., *New Directions for Florida Post-Tensioned Bridges, Volume 1 of 10: Post-Tensioning in Florida Bridges* (Tallahassee, FL: Corven Engineering, Inc., 2002), 7.
[89] Nasser, George D., "The Legacy of the Walnut Lane Memorial Bridge" in *Structure*. October 2008, Accessed at: http://www.structuremag.org/article.aspx?articleID=775, 27.
[90] Ibid., 1.

- increased steel durability, which leads to less corrosion, and improved steel performance and resiliency.[91]

FLORIDA BRIDGE TYPES

The *Context for Common Historic Bridge Types* prepared by Parsons Brinkerhoff and Engineering and Industrial Heritage identifies seven main bridge categories: 1) Truss; 2) Arch; 3) Slab, Beam, Girder and Rigid Types; 4) Movable spans; 5) Suspension; 6) Trestles and Viaducts; and 7) Cantilevers. These categories include 42 bridge sub-types constructed throughout the nation. The Slab, Beam, Girder and Rigid Types category, for example, includes a variety of stringer, slab, tee-beam, channel beam, box beam, rigid frame, and girder types. For the purposes of this study, Florida's historic highway bridges were classified into eight main categories of **Fixed** bridges: 1) Truss; 2) Arch; 3) Frame; 4) Slab; 5) Beam; 6) Girder; 7) Cable; and 8) Culvert; plus three categories of **Movable** spans: Swing, Vertical Lift, and Bascule. In total, these 11 main categories subsume 27 bridge sub-types. A general history and description for each bridge type follows, as well as illustrative drawings.

Truss

There are three main subtypes of steel fixed truss bridges in Florida: **through**, **deck**, and **pony** (**Figure 3-3**). These terms describe the placement of the travel surface in relation to the superstructure. A **through truss** is cross-braced above and below the traffic, which flows through the truss. In a **deck truss** configuration, the traffic travels on top of the main truss structure. In a **pony truss** bridge, the traffic passes between the parallel superstructure trusses.[92] Various truss designs, often patented by and named after their inventor, are seen in these three basic configurations (**Figure 3-4**).

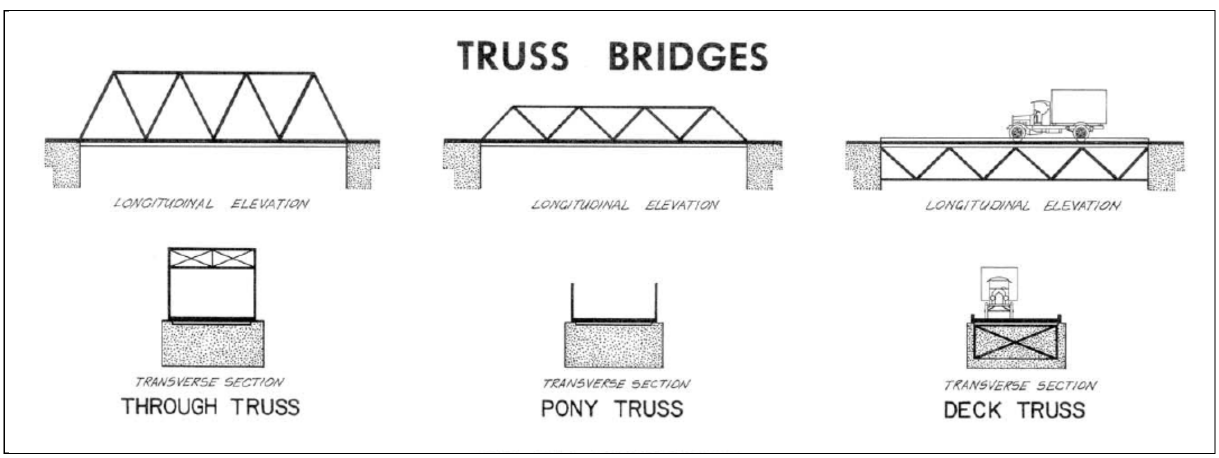

Figure 3-3. Truss Bridge Types.
(Courtesy of the Historic American Engineering Record, National Park Service, 1976)

[91] Sengupta, Amlan K. and Menon, Devdas, "Prestressed Concrete Structures," Indian Institute of Technology Madras, n.d., 2-3. Accessed at: http://www.scribd.com/doc/36651941/Post-TensioningSystems.
[92] *Bridge Inspector's Reference Manual,* 8.6.1-3.

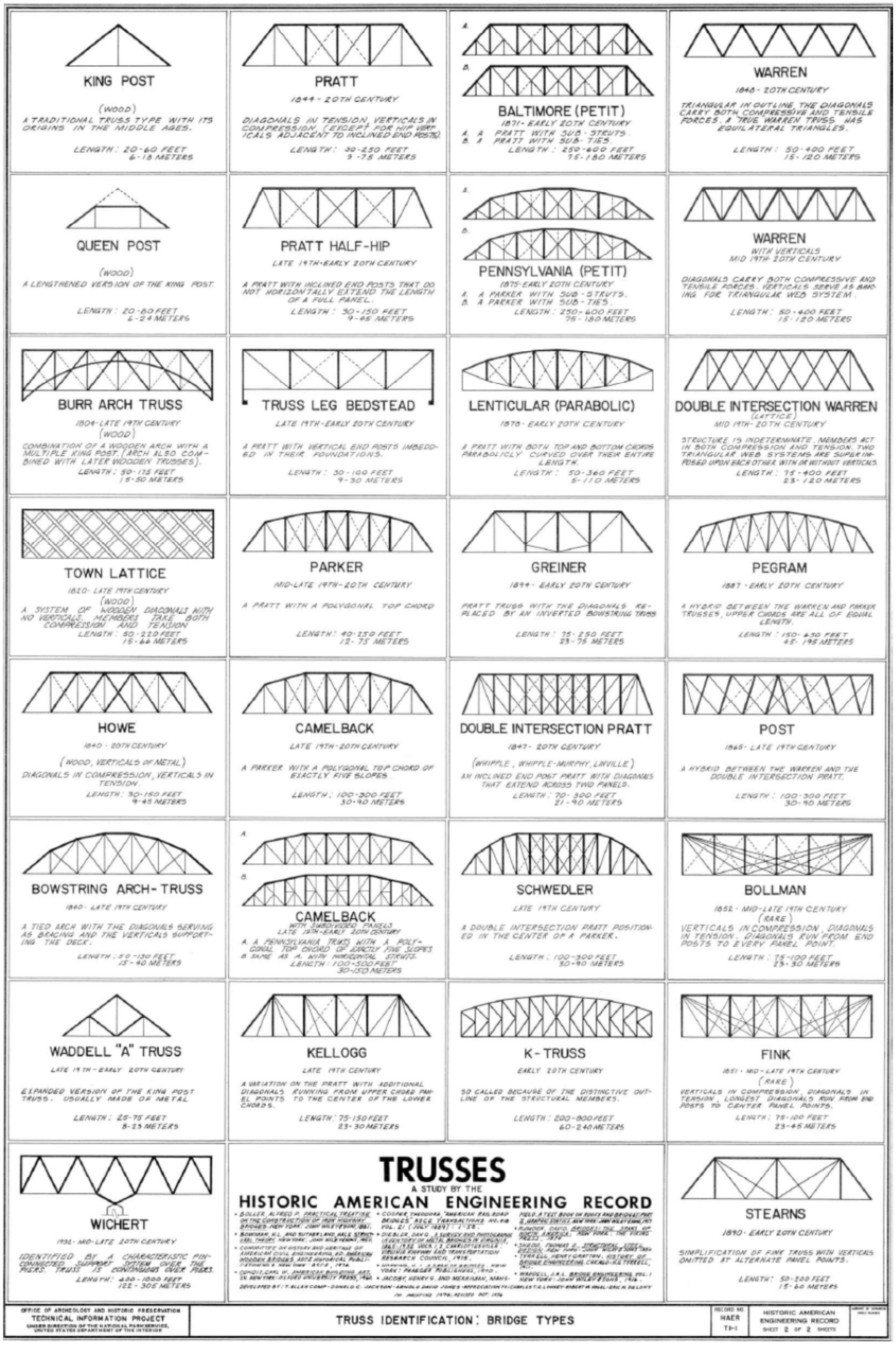

Figure 3-4. Truss Designs.

(Courtesy of the Historic American Engineering Record, National Park Service, 1976)

Truss bridges represent an important phase in the development of American bridge building and were often the first attempts at making permanent improvements on county roads. The truss is a skeletal structure comprised of several small beams that together can support a large amount of weight and span great distances. Typically, the design, fabrication, and erection of a truss are relatively simple. The superstructure of a truss bridge consists of two parallel trusses. Truss bridges consist of top and bottom chords connected by diagonal and vertical web members, which are always joined in a triangular formation. Lateral bracing between the upper and lower chords serves to keep the parallel trusses in line with each other.[93] Older trusses were usually constructed of built up metal components that were riveted together. Riveting is no longer used as a means of joining together structural steel bridge components. High strength bolts can be used to replace rivets, if needed, during rehabilitation.

Arch

An arch is a structure in which the supporting component forms a semicircle or curve, the purpose of which is to reduce or eliminate the tensile force in that component. Arches can be stone, brick, steel, or concrete. The arch bridge represents one of the oldest types of bridges because of its natural strength. This technology generally is not used for modern bridges. In arch bridges, an elliptical arch, in a state of pure axial compression, transfers the weight of the traffic and structure from the deck to the land on both sides by means of abutments. The abutments carry the load to the ground and keep the bridge from spreading out.[94] There are two subtypes of arches used in bridges: **arch decks** and **through arches**.

An **arch deck** bridge (**Figure 3-5**) consists of an arched support system with a deck placed over it. Unreinforced concrete is viable only in an arched form. An unreinforced concrete arch deck bridge is poured as one solid, monolithic piece around an arched formwork. The required compressive strength within the concrete can span up to 100 feet. Reinforced concrete arch deck bridges can span from 40 to 150 feet.[95]

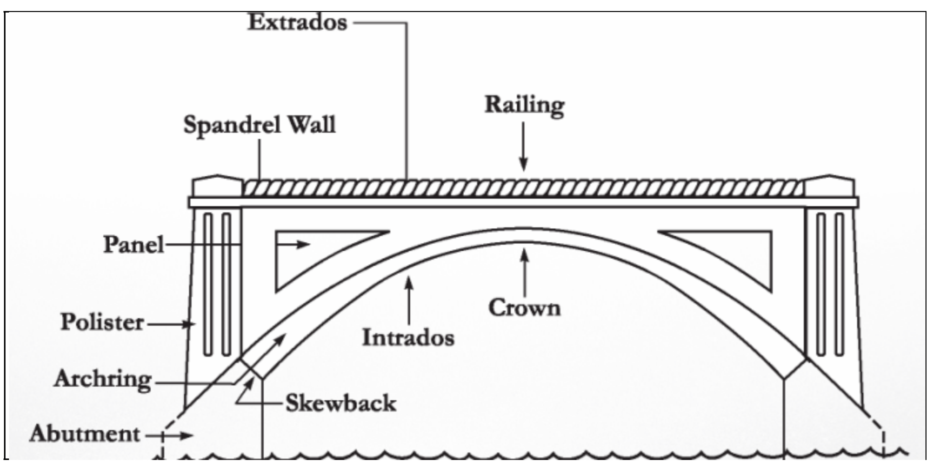

Figure 3-5. Arch Deck Bridge.

A **through arch** bridge is constructed with the crown of the arch above the deck and the arch foundations below the deck. Concrete through arch bridges often are called "rainbow arches."[96] These, as well as steel arch bridges, are rare in Florida.

[93] *Bridge Inspector's Reference Manual,* 8.6.9, 21.
[94] *Bridge Inspector's Reference Manual,* 7.5.1.
[95] Troitsky, M.S., *Planning and Design of Bridges* (New York, NY: John Wiley & Sons, Inc., 1994), 137.
[96] *Bridge Inspector's Reference Manual,* 7.5.2.

Frame

A concrete frame is a three-sided structure consisting of a top slab and two walls. A frame differs from a culvert in that there is no continuous floor. Florida's rare **rigid frame bridges** consist of a simple concrete slab superstructure cast in place as one unit with its substructure abutments. The rigid frame structure was so economical that it was often used for bridges of moderate span (40-120 feet) and railroad grade separations throughout the U.S. In older bridges of this type, the horizontal component is often thicker at the ends than in the middle, forming a shallow arch. In more modern examples, the rigid frame bridge often looks like an inverted "U."[97] Frame bridges are rare in Florida.

Slab, Beam, and Girder

A slab bridge consists of a flat slab that is both the riding surface for the vehicles using the bridge and the main structural component supporting this loading. Slab bridges are simple structures that carry relatively short spans. They consist of a timber or concrete slab that spans a distance between two supports. The slab functions as both the deck and the structural element that carries all stresses and loads to its pier supports and/or abutments. **Timber slab** bridges can carry loads across short spans. They consist of timber planks that lay directly on abutments or pier caps.

A **concrete slab** can be unreinforced, reinforced, or prestressed. Monolithic concrete slabs can only span short distances; the longer the span, the deeper the slab required and therefore reinforcement must be added. For reinforced slabs, the recommended and most economical length is 20-25 feet but can span up to 35 feet.[98] Early reinforced concrete examples could be cast in place, with the slab serving as the superstructure and the deck. Slab bridges are reinforced by steel in the lower portion of the slab, where bending is the greatest, and at the ends, where shear is maximum. Historic concrete slab bridges are very common in Florida.

In general**, beam and girder bridges** consist of a series of beams topped with a deck. The beams can be wood, steel, or concrete. In the case of timber bridges, the beams (called stringers) are usually topped with a wood deck. Beams made of steel or prestressed concrete are usually topped with a cast-in-place concrete deck. Steel beams can be made composite (monolithic) with the deck by welding steel studs to the top flange of the beam that penetrate into the cast-in-place deck. Prestressed concrete beams have reinforcing steel that sticks out of the top of the beam and into the cast-in-place deck to make the two composite. On some older bridges, a rectangular beam and the deck are cast-in-place together. These are called cast-in-place tee-beam bridges.

Beams and girders represent a simple, straightforward method of creating a bridge. However, many variations in their use result in several subtypes of beam and girder bridges. Historic tee-beam, channel beam, box beam, girder, through girder, and box girder bridges are found in Florida.

A **beam** is a linear structural member designed to span from one support to another and support vertical loads.[99] In its simplest form, a beam bridge can be a plank or log across a stream. It consists of a horizontal beam supported at each end by piers. The beam must be strong enough to support both its own weight and the traffic that crosses it. When a load pushes down on the beam, the top edge is compressed together, while the bottom edge is stretched. Beams can be constructed from timber, concrete, or steel.

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[97] *A Context for Common Historic Bridge Types*, 3-96.
[98] *A Context for Common Historic Bridge Types*, 3-129.
[99] *Bridge Inspector's Reference Manual*, G-3.

Timber beam bridges, while not often seen on public roads, are inexpensive to construct and are commonly used in remote areas without much traffic such as military lands, state forests, and national parks. Due to the rapidity at which the material decomposes, these bridges are subject to frequent alterations when members must be replaced.

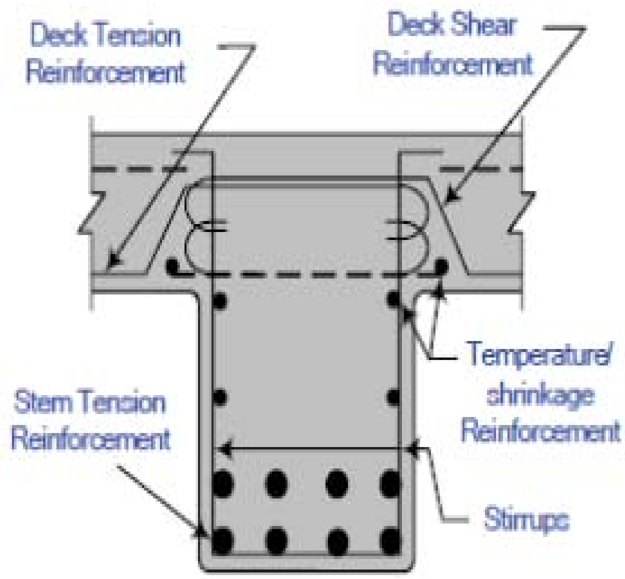

Figure 3-6. Tee-Beam Cross Section.
(BIRM, 7.2.4)

Although technologically simple, modern developments in steel and concrete technology have often made beam and girder bridges some of the most durable bridges constructed. **Tee-beam bridges** were commonly constructed in the 1930s and 1940s as integral cast-in-place reinforced concrete decks and beam stems (**Figure 3-6**). Reinforced steel runs longitudinally at the bottom of the beam stem and perpendicular to the stem in the deck. Typical spans range from 30 to 50 feet, although they can span up to 80 feet.[100] Relatively few prestressed concrete tee-beam bridges were constructed in Florida.

Channel beam bridges are much more likely to have been constructed with prestressed concrete. Channel beams are similar in appearance to tee-beams, with integral decks and stems. However, the concrete beams are cast in place around u-shaped forms, to create a channel between two stems (**Figure 3-7**). This bridge type is very common in some Florida counties. For example, roughly one-third of the bridges in Hillsborough County are channel beams. The earliest date to the 1960s. "The beams were sized by certain engineering tables and were shipped directly to the site for installation."[101]

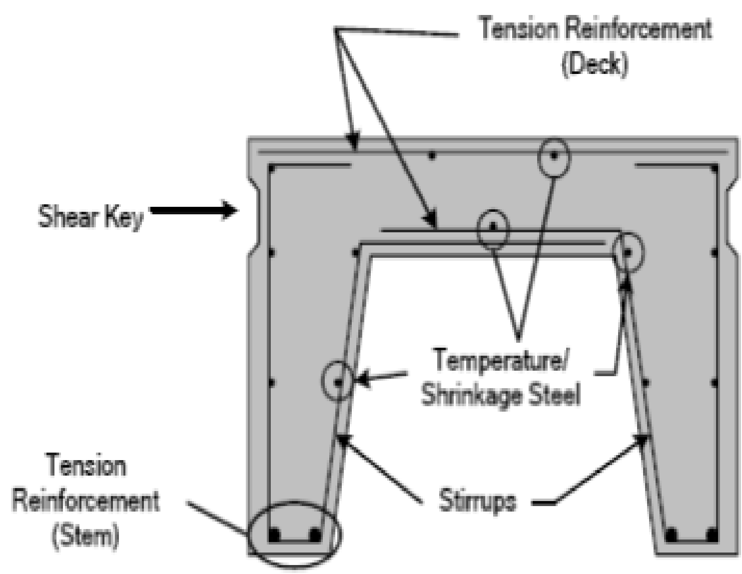

Figure 3-7. Channel Beam Cross Section.
(BIRM, 7.4.3)

[100] Troitsky, M.S., *Planning and Design of Bridges* (New York, NY: John Wiley & Sons, Inc., 1994), 131.
[101] "Space Age Technology Applied to Hillsborough County Bridges," *SPANS* (Volume I, Issue 2, April 2003), 1.

A **box beam bridge** derives its name from its shape. A box beam is a hollow unit, bounded by top and bottom flanges and two webs along the sides (**Figure 3-8**). The voided center of the beam reduces the dead load of the bridge. The single void is generally square or rectangular, although examples from the 1950s may contain a round void.

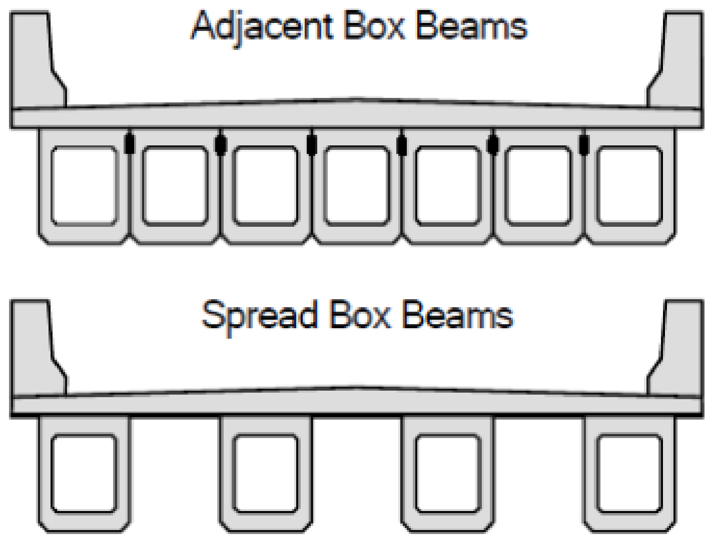

Figure 3-8. Box Beam Bridge Cross Sections.
(BIRM, 7.10.2.)

Concrete box beam technology dates from the late 1930s. By the 1950s, with the introduction of prestressed concrete technology, reinforced concrete box beam bridge construction waned in favor of the stronger prestressed concrete box beam bridge. This bridge type is used in longer ranges of 60 to 100 feet for reinforced concrete and up to 300 feet for prestressed concrete. Box beams are advantageous in their resistance to torsional loading, which allows for horizontal and vertical curves and their adaptability as continuous structures.[102] The prestressed reinforcement of high strength steel strands is typically found in the bottom flange and the side webs. Box beams are commonly precast, which reduces bridge construction time.

A **girder** is essentially a large beam that serves as the primary support for a bridge. A girder bridge usually has a floor system in between the deck and superstructure, unlike a beam bridge, which generally features a composite or integral deck and superstructure.[103] Girders are constructed from either concrete or steel.

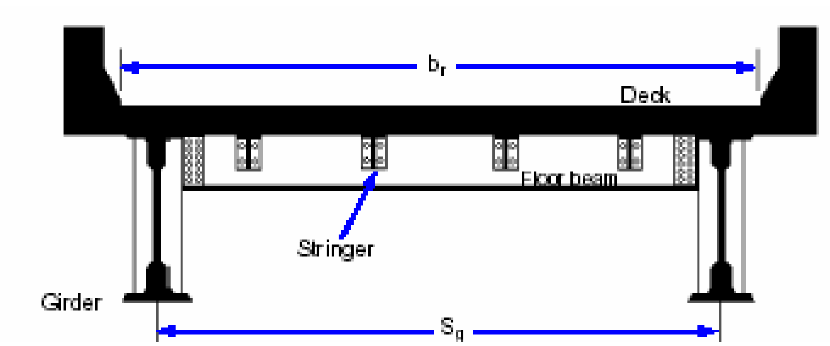

Figure 3-9. Deck Girder Cross Section.
(Department of the Army Field Manual No. 3-34.343. Military Nonstandard Fixed Bridging, February 2002, Washington D.C.)

Girder bridges generally feature a monolithic concrete deck that is cast in place on top of two or more rolled or built-up steel or concrete girders that run the length of the bridge. A floor system of floorbeams and stringers transfers the weight of the deck to the girder superstructure (**Figure 3-9**).

[102] Troitsky, 131.
[103] *Bridge Inspector's Reference Manual*, G-21.

Occasionally, the deck is cast in between the girders. In these **through girder bridges**, the girders also serve as a parapet or railing along the top of the bridge (**Figure 3-10**).

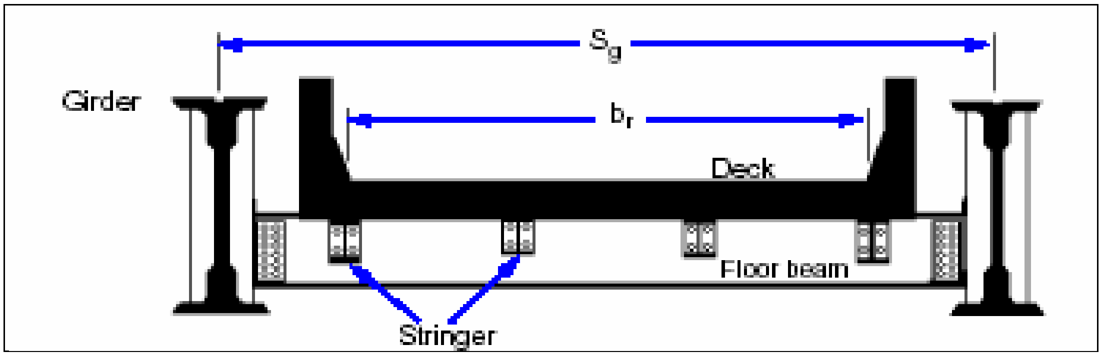

Figure 3-10. Through Girder Cross Section.
(Department of the Army Field Manual No. 3-34.343. Military Nonstandard Fixed Bridging, February 2002, Washington, D.C.)

The beam and girder bridge type is the backbone of the highway system bridges because of the uniform designs that can be easily standardized to fit numerous locations, spans, and geographical conditions. The uniformity and standardization of the bridge designs are considered critical for maintaining bridges in large transportation networks. Standardization minimizes the need for multiple codes and specifications for engineers to follow in the design of new and the rehabilitation of existing bridges. Uniformity also means that consistent, and therefore economical, methods are used in repairing deteriorated bridges.[104]

Cable

Cable-supported bridges can be either **suspension bridges** or **cable-stayed bridges**. The cable system carries much of the load of the superstructure, reducing the need for support under the bridge (i.e., substructure piers and bents) and thereby allowing longer spans.

A **suspension bridge** is composed of cables draped between towers with vertical suspenders connecting the cables to the deck (**Figure 3-11**). The cables continue over the main span and approach spans and are anchored at each end of the bridge. The deck can be stiffened to resist wind loads with the addition of a steel truss. The cables, suspenders, and structural components of the deck are made of steel. Newer suspension bridges usually have cables made of wire that is spun in place on site. Older bridges may have suspension cables made of metal chain or eyebars. The above water portion of the towers is usually steel or concrete and the underwater portion of the tower is usually reinforced concrete. Suspension bridges are well-suited for spanning great distances, and some of the most monumental and historically significant bridges in the United States are of this type. However, several suspension bridges of very modest span length were built across the country due to the type's basic simplicity, ease of erection, and adaptability to unstable ground.[105] The 1947 Hal Adams Bridge in Lafayette County is Florida's only suspension bridge located on a state road.

A **cable-stayed bridge** has one or more towers with cables that connect the tower to the deck. The cables can be arranged in a harp pattern (**Figure 3-12**) in which the cables are parallel and attach to various points on the tower or a fan pattern in which the cables converge near the top of the tower. The cable-stayed

[104]Tonias, Demetrios E., P.E. and Jim J. Zhao, P.E., *Bridge Engineering: Design, Rehabilitation, and Maintenance of Modern Highway Bridges* (New York, NY: McGraw Hill, 1995), 13.
[105] *A Context for Common Historic Bridge Types*, 3-133.

bridge differs from a suspension bridge in that there is no draped suspension cable and no anchorages at the ends of the bridge. The deck and cables on one side of the tower balance the deck and cables on the other side, thereby eliminating the need for the anchorages at the ends of the bridge. Both of Florida's cable-stayed bridges, the Bob Graham Sunshine Skyway in Pinellas and Manatee Counties and the Dames Point Bridge in Duval County, feature the harp array (**Figure 3-12**).

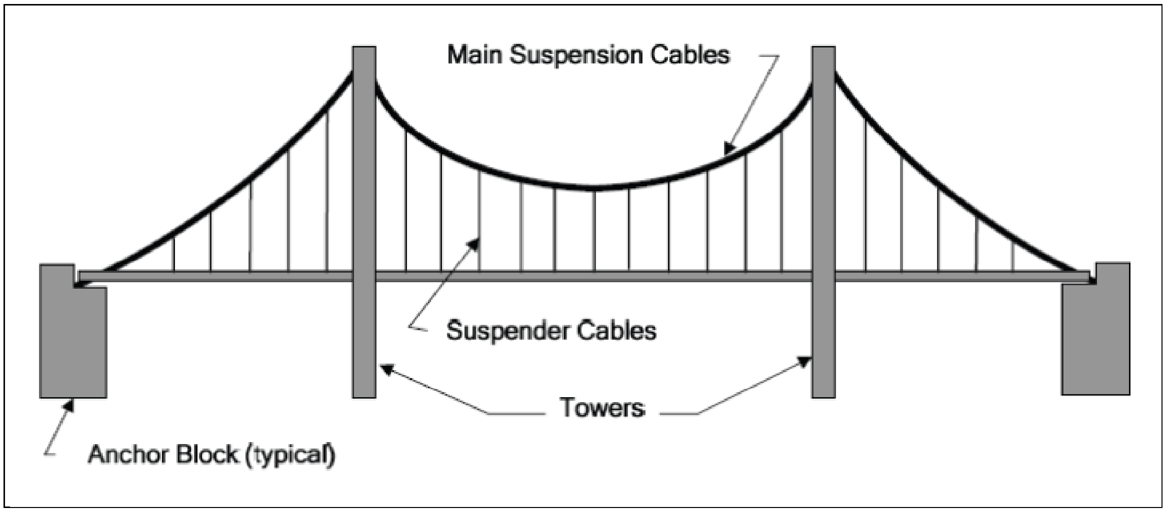

Figure 3-11. Suspension Bridge Schematic.
(BIRM 12.1.9)

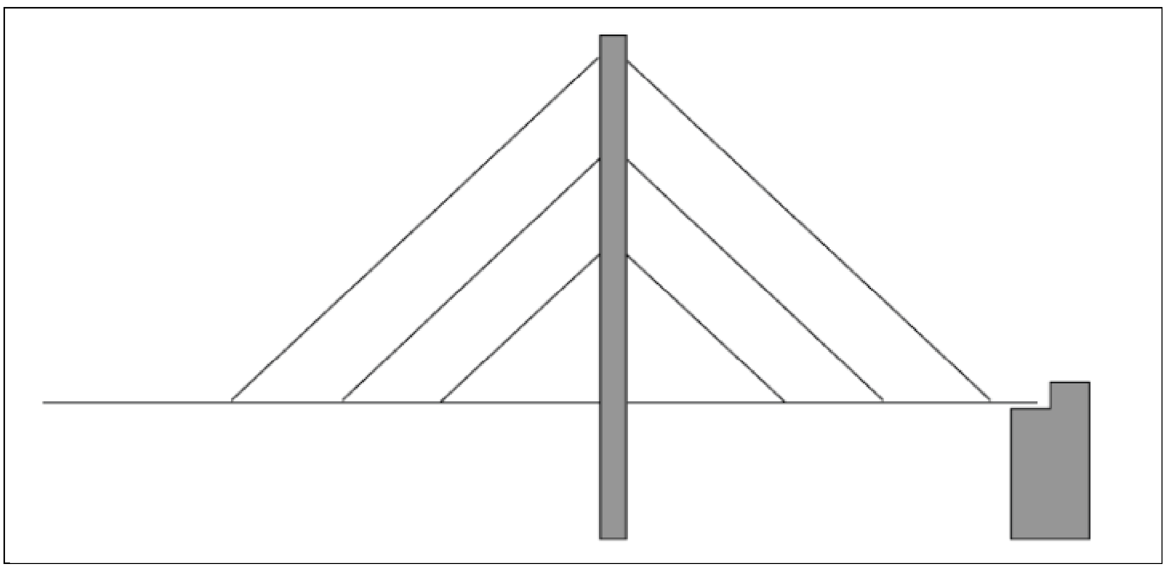

Figure 3-12. Harp Array Cable System Schematic.
(BIRM, 12.1.5)

Culverts

Culverts are often thought of as small bridges, but they differ in structure. Culverts are essentially structures for hydraulic control, whereas bridges are constructed primarily to carry traffic over an obstruction. A culvert usually consists of structural material that is continuous around the waterway, including the bottom and covering the stream bed. A culvert can have one or several openings called barrels. Multiple pipes surrounded by earth fill are considered as one structure if the clear distance between openings is less than half the pipe opening. Culverts included in this survey update that were not identified in the previous survey measure at least 20 feet in length, the standard minimum measurement for inclusion in the NBI.

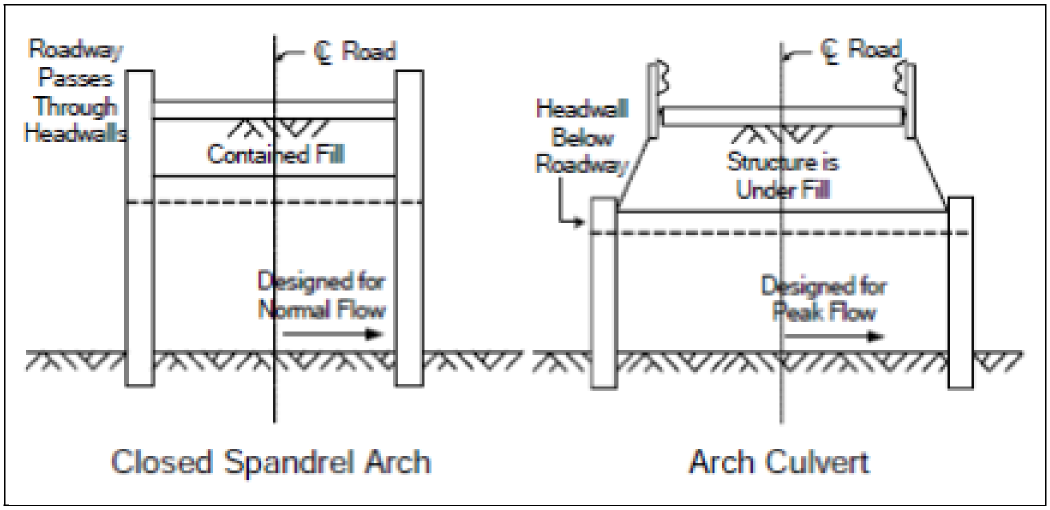

Figure 3-13. An Arch Deck (L) vs. Arch Culvert (R).
(BIRM, 7.5.6)

Like bridges over waterways, culverts function to allow water to flow efficiently despite the construction of a roadway. Culverts are constructed entirely below and independent of the roadway surface, and they do not have decks, superstructures, or substructures (**Figure 3-13**). Culverts are designed to support the dead load of the embankment over the culvert as well as live loads of traffic. However, in most culvert designs the soil or embankment material surrounding the culvert provides lateral pressures that enhance the culvert's ability to support vertical loads. While most culverts feature continuous structural material around their entire perimeter, including the bottom, arch and frame culverts may not have a floor, allowing the streambed to serve as the bottom of the culvert.

Culverts may be constructed of rigid material, such as reinforced concrete or masonry (seen in early examples), or of flexible material, like aluminum or steel. Rigid materials are used in the construction of arch, box, and frame culverts, whereas flexible materials are used in circular or elliptical pipe culverts.

Movable Vertical Lift

Vertical lift structures were first constructed in Europe. Beginning in the 1870s, increasing numbers were built in the U.S. A **vertical lift** bridge consists of a movable (lift) span (**Figure 3-14**) that can be raised to allow the passage of vessels underneath the bridge. On most lift bridges, cables attached to each end of the lift span extend vertically up towers at each end of the span, and attach to counter weights. In lieu of this system, hydraulic jacks can be used to raise and lower the lift span. The lift span and above water section of the towers are usually made of steel trusses and the underwater section of the towers are reinforced concrete. The spans are typically of a truss configuration.

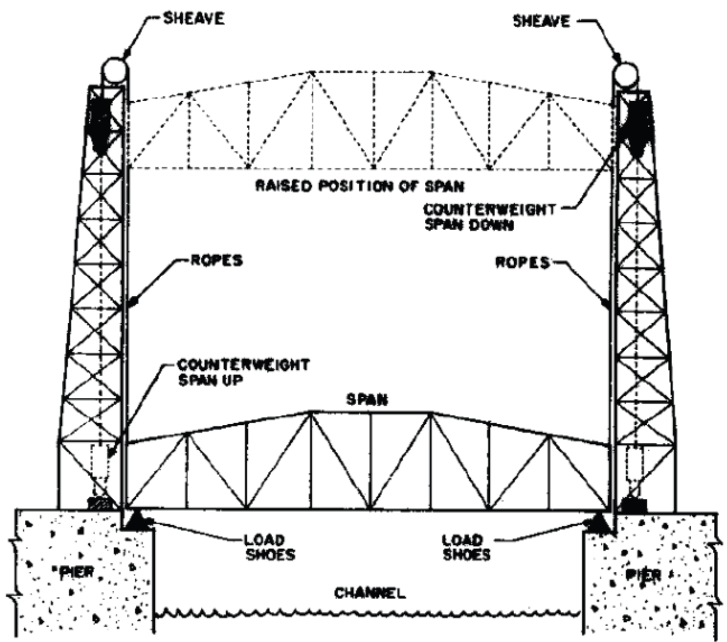

Figure 3-14. Vertical Lift Bridge Schematic.
(BIRM, 12.2.12)

Movable Swing

A **swing bridge** consists of a movable (swing) span that can be rotated horizontally to allow the passage of vessels. The swing span is balanced on a pivot pier. Usually, the swing span is symmetrical over the pivot pier; however, an asymmetrical swing span can be achieved by adding extra weight to the short end of the swing span. The swing span is usually made of steel trusses and the piers are reinforced concrete.

More common than vertical lifts but still an endangered bridge type, swing bridges represent another type of historic movable bridge technology. Swing bridges accommodate river navigation by rotating the **swing span** on a pivot pier into a position parallel to the channel. Unfortunately, this central pier usually lies in, and therefore often blocks, part of the navigable channel. Consequently, bridge engineers developed several modifications of this technology. An earlier method of adapting swing bridges for channel clearance involved changing the location of the pivot pier in relation to the swing span. This variant form became known as the **"bob-tailed" swing** because of the asymmetrical location of the pivot pier. Sometimes the designers simply extended the length of the movable span so that the central pier could be located outside the channel. With time, this effort changed the nature of the central spans as more technology was applied to extending their length.

Swing bridges utilize one of two main types of pivot piers, center bearing (**Figure 3-15**) or rim bearing. **Center-bearing pivots** support the swing span via a cross-girder situated over a disc. Balance wheels along the rim of the pivot pier stabilize the center span while it is opening. The movable span on **rim-bearing pivots** is supported by a circular girder that, in turn, is supported by rollers placed along its outer edge.

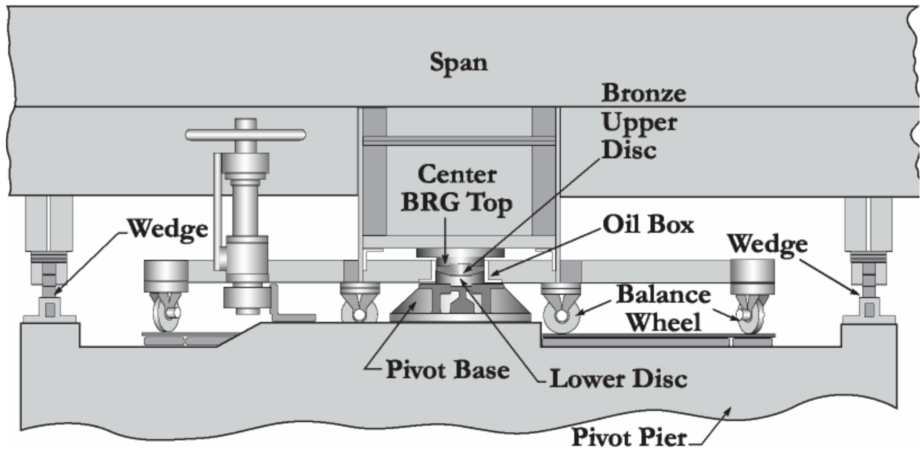

Figure 3-15. Diagram of Center-Bearing Swing Bridge Mechanism.

Besides the above-mentioned difference in forms and machinery, swing bridges also present varying types of structural technologies. Most swing bridges in Florida use a truss configuration on the main span, though rarely on the approach spans. Slow, cumbersome in operation, and restrictive of the channel, swing bridges passed their peak use by the 1930s.

Movable Bascule

A **bascule bridge** is a movable bridge in which the movable span (or leaf) rotates vertically to allow the passage of vessels. The bridge may be either a single or double leaf. The leaf(s) rotate around a large axle called a trunnion. A counterweight on the other side of the trunnion balances the weight of the leaf. In lieu of a trunnion, a rolling lift bascule bridge uses a curved track at the end of the leaf that is mated with a horizontal track on the pier. The piers at the end of leaf are usually quite large to provide a room for the counterweight. The leaf is usually composed of steel stringers and the counter weight is usually a steel structure filled with concrete. The piers are usually reinforced concrete.

Believed to possess a number of advantages over other movable types, the bascule bridge **(Figure 3-16**), or drawbridge, provides an open channel with unlimited clear headway, swift and dependable operation, and simple mechanisms with few moving parts. It consists of a **single-** or **double-leaf bascule span** that rotates from a horizontal to a near vertical position. The weight of the counterweight is adjusted by removing or adding balance blocks in pockets to position the center of gravity of the moving leaf at the center of rotation. In a single-leaf bascule span, the entire span lifts above one end. The double-leaf has a center joint, and half of the span rotates about each end. The most common mechanical types of bascule bridges are the **rolling lift** (Scherzer) bridge **(Figure 3-17**), the **simple trunnion** (Chicago) bridge (**Figure 3-18**), and the **multi-trunnion** (Strauss) bridge.

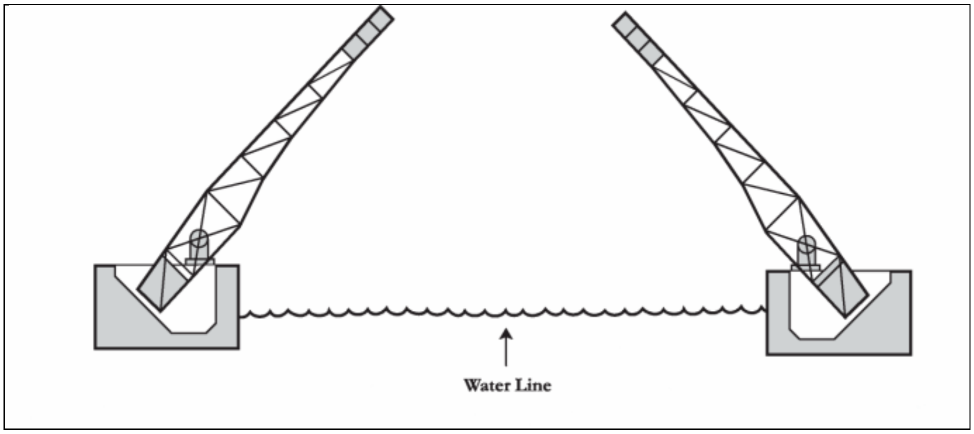

Figure 3-16. Bascule Span Cross Section.

The bascule span bridge also offered strength and safety, and it could be aesthetically treated. Engineering firms that sold patented bascule designs were mainly from Chicago, where many of this bridge type were built. Inventor William Scherzer claimed that his rolling lift type operated with less friction and, therefore, reduced power. The Scherzer bascule was infrequently chosen for highway use because it required a complicated mechanism with a curved base which rocked back on a girder track and required more substantial foundations. For these reasons, designers preferred the trunnion-type bascule. The trunnion type, improved by Chicago engineer Joseph Strauss, who designed the Golden Gate Bridge, became dominant. In this type, the bascule span rotated around a trunnion or axle and made use of a heavy counterweight.

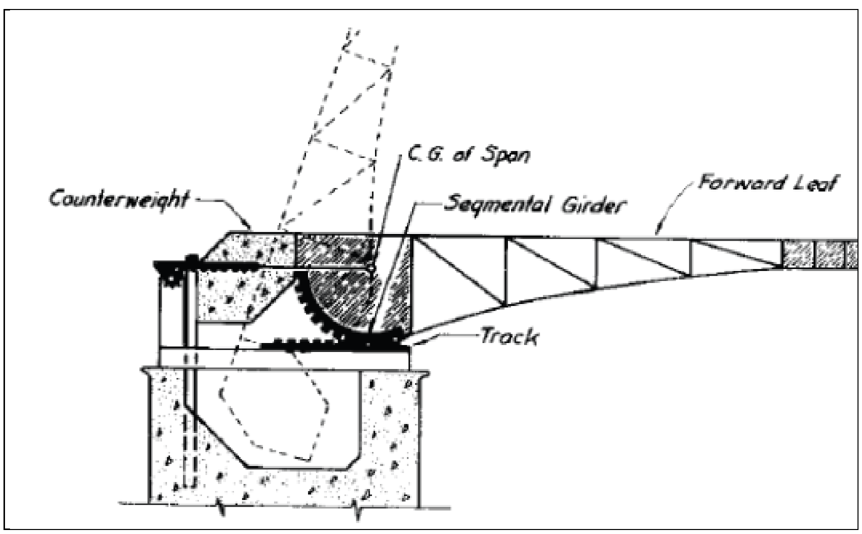

Figure 3-17. Rolling Lift Bascule Bridge Schematic.
(BIRM, 12.2.7)

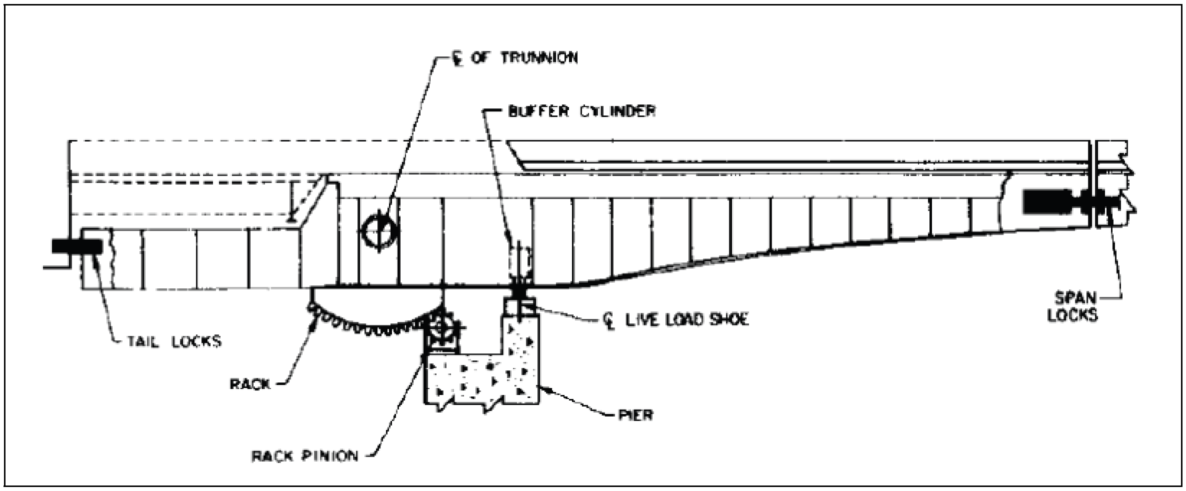

Figure 3-18. Trunnion Bascule Bridge Schematic.
(BIRM, 12.2.9)

CHAPTER 4 - SURVEY RESULTS

OVERVIEW

The 2010 statewide survey update (pre-1971 bridges) began with an initial study sample of 4,160 bridges. Of these, 590 were selected for pre-survey field review, and approximately 510 for field survey (**Appendix A**), resulting in the identification of 166 NRHP-listed, determined eligible, and newly recommended eligible bridges. **Table 4-1** presents a summary of bridges included in the study, tallied by bridge type.

Table 4-1. Summary of Survey Results, by Bridge Type.

Bridge Type	Initial Study	Field Survey	NRHP Bridges
Fixed Truss	15	13	9
Arch	72	72	44
• Deck	70	70	42
• Through	2	2	2
Slab	1344	63	15
Frame	2	2	1
Beam	444	75	37
• Box beam	4	2	1
• Channel beam	197	7	3
• Tee-beam	243	66	33
Girder	909	130	11
Cable	3	3	3
Culvert	1263	46	10
Lift	5	5	4
Swing	12	15	11
Bascule	91	85	21
Total	**4160**	**509** * exclusive of one tunnel	**166**

The results of research and field survey indicated that of the total surveyed historic highway bridges:

- 120 previously listed and eligible bridges are still extant
- 46 bridges are newly recommended as NRHP-eligible
- 59 bridges identified in the previous statewide surveys are no longer extant
- 5 bridges are no longer FDOT-owned
- 244 bridges do not meet the eligibility criteria for listing in the NRHP
- 35 bridges have insufficient information to make a NRHP eligibility assessment

Approximately 24 percent of the bridges selected for field survey were built between 1960 and 1971. Of these, 10 bridges were newly recommended as NRHP-eligible. These include one concrete box beam, one prestressed concrete girder, three steel girders, one steel through truss, and four movable bascule bridges (**Table 4-2**).

Table 4-2. Significant Historic Highway Bridges, 1960 to 1970.

Bridge No.	County/ District	Type	Date	Significance
720100	Duval/2	Concrete Box Beam	1961	Earliest example of its type. One of only 3 dating to the 1960s. Curved cast concrete flyover is significant. (Box beams did not become common until the 1980s)
880005	Indian River/4	Prestressed Concrete Girder	1964	Unique cantilevered center span and pretensioned concrete construction
720087	Duval/2	Steel Girder	1968	Urban planning. Design incorporates brick-paved plaza beneath the elevated deck. Modern geometric pier design.
910009	Okeechobee/1	Steel Girder	1964	Excellent example of a prestressed concrete girder bridge that includes a removable lift-out deck. Cost-effective alternative to movable bascule bridge.
364040	Marion/5	Steel Girder	1969	Associated with Cross Florida Barge Canal
720107	Duval/2	Steel Cantilevered Through Truss	1967	Rare example of its type.
860038	Broward/4	Steel Bascule	1960	One of nine remaining rolling-lift bascule bridges in Florida
864071	Broward/4	Steel Bascule	1960	One of nine remaining rolling-lift bascule bridges in Florida
864072	Broward/4	Steel Bascule	1964	One of nine remaining rolling-lift bascule bridges in Florida
930060	Palm Beach/4	Steel Bascule	1963	Rare Hanover skew design. Only intact example in the U.S.

Among the 166 significant bridges are 23 Overseas Highway bridges in Monroe County, as well as the 12 Venetian Causeway bridges in Miami-Dade County. All the NRHP-listed, eligible, and newly recommended eligible bridges are listed in **Table 4-3.** Summary information for all surveyed bridges is provided in **Appendix A;** FDOT District-specific tables are contained in **Appendix B**.

The following sections focus on the evaluation of each of Florida's major bridge type groups. Descriptions, evaluations, and photographs of selected individual bridges and thematic bridge groups are contained in Chapters 5 and 6, respectively. The page reference for a summary description of selected bridges is provided in the first column of **Table 4-3**.

Table 4-3. NRHP-Listed, Eligible, and Newly Recommended Eligible Historic Highway Bridges, by FDOT District.

Ref. Pg.	County	FDOT Number	Bridge Name / Location	Year Built/ Recon.	Material-Bridge Type	FMSF Number	NRHP Status
LEGEND: C - Concrete; CC - Continuous Concrete; CS - Continuous Steel; PSC - Prestressed Concrete; S - Steel; T – Timber * Overseas Highway NRHP Status: L – Listed; EL – Eligible; PE – Potentially Eligible; RE – Recommended Eligible							
FDOT DISTRICT 1							
5-16	Glades	054015	CR-721A / Harney Pond Canal	1958	PSC - Slab	8GL458	RE: 2010
5-6	Hardee	060034	Little Payne Creek Bridge	1915	C - Arch Deck	8HR374	P-EL: 2009
5-7	Hardee	064069	Hobb Road/Payne Creek	1920	C - Arch Deck	8HR375	EL: 2000
5-39	Hendry	070013	Fort Denaud Swing Bridge / Caloosahatchee River	1940/1963 /1987	S - Swing	8HN632	EL: 2000
5-35	Lee	120001	Billy Creek Lift Bridge / Billy Creek	1941	S - Lift	8LL705	EL: 2000
6-11	Manatee	135250	7th Avenue West / Wares Creek	1949	CS - Girder	8MA992	P-EL: 2009
6-11	Manatee	135251	9th Avenue West / Wares Creek	1945	C - Arch Deck	8MA993	P-EL: 2007
6-10	Manatee	135252	12th Avenue West / Wares Creek	1938	C - Tee-Beam	8MA994	P-EL: 2007
	Polk	160064	US-98 (SR-700) / Peace River	1931	C - Tee-Beam	8PO5440	RE: 2010
5-25	Polk	165700	Haines City Overpass Lilly Avenue / ACL Railroad	1927	S - Girder	8PO3013	EL: 2000
5-18	Sarasota	170060	Hanson Bayou Bridge	1928	C - Tee-Beam	8SO2373	RE: 2010
5-39	Sarasota	170064	Blackburn Point Swing Bridge / ICWW	1925/1995	S - Swing	8SO1890	L: 2001
5-18	Sarasota	175660	Whitaker Bayou Bridge	1926	C - Tee-Beam	8SO2375	RE: 2010
5-5	Sarasota	175950	Osprey Avenue / Hudson Bayou	1916/1973	C - Arch Deck	8SO2376	EL: 2000
5-5	DeSoto	450001	Peace River Bridge at Arcadia	1925	C - Arch Deck	8DE381	EL: 2000
5-25	Okeechobee	910009	SR-78 / Kissimmee River	1964	PSC - Girder	8OB321	RE: 2010
	Okeechobee/ Highlands	910001	SR-70 / Kissimmee River	1966	S- Girder	8OB366/ 8HG1236	RE: 2010
	Okeechobee	910054	US-441/US-98 (SR-700)/Taylor Creek	1948	S - Bascule	8OB056	EL: 2000
FDOT DISTRICT 2							
	Alachua	264126	Rocky Creek Bridge	1924	C - Tee-Beam	8AL3510	RE: 2010
6-15	Baker	270001	Sanderson Overpass/US-90 (SR-10)/CSXRR	1936	C - Tee-Beam	8BA423	RE: 2010
5-33	Bradford	280036	CR-18 / Braggs Branch	1940	S - Culvert	8BF730	RE: 2010
5-33	Bradford	280037	CR-18 / Gum Creek	1940	S - Culvert	8BF731	RE: 2010
5-33	Bradford	280038	CR-18 / Branch of Sampson River	1940	S - Culvert	8BF732	RE: 2010
7-4	Hamilton	324302	Apalahoochee River Pony Truss	1911	S – Pony Truss	8HA87	EL: 2000
7-5	Hamilton	None	Jennings Bridge	1902	S –Through Truss	8HA89	EL: 2000
5-30	Lafayette	330009	Hal Adams Bridge SR-51 / Suwannee River	1947	Cable-Suspension	8LF22	EL: 2000
5-1	Lafayette	334001	Steinhatchee Springs Pony Truss/ Camp Grade Road / Steinhatchee River	1921/1989	S - Pony Truss	8LF21	EL: 2000
5-20	Levy	340045	Ten Mile Creek Bridge	1933	C - Tee-Beam	8LV513	RE: 2010
6-13	Suwannee	374004	164th Street / Little River Bridge	1940	S - Culvert	8SU395	RE: 2010
6-13	Suwannee	374006	61st Road / Little Creek	1919/1943	C - Culvert	8SU396	RE: 2010
6-13	Suwannee	374012	Mt. Olive Road Bridge/ 98th Terrace / Rocky Creek	1932	S - Culvert	8SU397	RE: 2010
5-36	Duval	720005	Ortega River Bridge SR-211 / Ortega River	1927/1996	S - Bascule	8DU11167	EL: 2000

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5-36	Duval	720022	Main Street Bridge/J.T. Alsop Bridge/US-1 / St. Johns River	1941	S - Lift	8DU1553	EL: 2000
6-15	Duval	720026	Baldwin Overpass/US-301 (SR-200)/CSXRR	1940	S – Girder	8DU11299	RE: 2010
5-19	Duval	720075	SR-109 / SR-10A	1952	C - Tee-Beam	8DU21151	RE: 2010
5-3	Duval	720076	Mathews Bridge/SR-10A / St. Johns River	1953	CS - Through Truss	8DU1554	P-EL: 2007
5-26	Duval	720087	US-1 (SR-5) / Miami Road	1968	CS - Girder	8DU21150	RE: 2010
5-24	Duval	720100	SR-115A Flyover / SR-10A	1961	C - Box Beam	8DU21149	RE: 2010
5-4	Duval	720107	Hart Bridge/SR-228 / St. Johns River	1967	CS - Through Truss	8DU1555	RE: 2010
5-7	Duval	720163	I-95 Through Arch Bridge/ I-95 (SR-9) / Myrtle Avenue	1955	S - Through Arch	8DU17724	P-EL: 2006
5-31	Duval	720518	Napoleon Bonaparte Broward Bridge/Dames Point Bridge/ SR-9A / St. Johns River	1989	Cable-Stayed	8DU21148	RE: 2010
	Duval	724076	Smith Street Bridge	1929	C - Slab	8DU11903	RE: 2010
	Duval	724077	Stockton Street/McCoy's Creek	1930	C - Slab	8DU11904	RE: 2010
6-8	Duval	724171	Newnan Street / Hogan Creek	1929	C - Slab	8DU7540	RE: 2010
6-8	Duval	724172	Market Street/Hogan Creek	1929	C-Slab	8DU7539	P-EL: 2006
6-8	Duval	724175	Laura Street / Hogan Creek	1929	C - Slab	8DU7538	RE: 2010
5-19	Duval	724258	Myrtle Avenue / McCoy Creek	1930	C - Tee-Beam	8DU11915	EL: 2000
	Duval	none	St. Johns Avenue/Willow Branch	1935	C - Slab	8DU11274	P-EL: 2007
6-8	Duval	724359 (formerly 724173)	Liberty Street / Hogan Creek	1929	C - Slab	8DU7551	P-EL: 2007
6-8	Duval	none	Main Street / Hogan Creek	1929	C - Slab	8DU7541	RE: 2010
5-40	Nassau	740008	St. Mary's River Swing Bridge/US-1 (SR-5)	1927/2005	S - Swing	8NA240	EL: 2000
	Nassau	740022	US-301 (SR-200)/SCL RR	1936	C- Tee-Beam	8NA1270	RE: 2010
5-16	Nassau	744006	Hill Road / Little Mills Creek	1931/1982	T - Slab	8NA1246	RE: 2010
5-8	Putnam	764024	Old San Mateo Road / Mill Branch	1916/2002	C - Arch Deck	8PU1210	EL: 2000
5-64	Putnam	764039	Fort Gates Ferry / St. Johns River	1924/1985	Wood Ferry, T - Girder	8PU1629	RE: 2010
5-17	Putnam	764044	Old US-17 / Crescent Lake Outflow	1922	C - Slab	8PU1631	RE: 2010
5-49	St. Johns	780074	Bridge of Lions/SR-A1A / Matanzas River	1927/1979 /2004	S - Bascule	8SJ2460	L: 1982
FDOT DISTRICT 3							
	Bay	460053	Frank M. Nelson, Sr. Bridge/ Beach Drive / Massalina Bayou	1951	S - Bascule	none	EL: 2000
5-2	Calhoun	470029	Blountstown Truss / SR-20 / Apalachicola River	1938/1998	CS - Through Truss	8CA37	EL: 2000
5-15	Jackson	530003	Atlanta & St. Andrews Bay Railway Bridge / Bay Line Railroad / US-90 (SR-10)	1940	C - Frame	8JA1849	RE: 2010
7-5	Jackson	none	Bellamy Bridge Road / Chipola River	1914	S - Through Truss	8JA399	EL: 2000
6-12	Liberty	none	Torreya Stone Arch Bridge / Torreya State Park	1940	C - Arch Deck	8LI338	EL: 2000
7-5	Okaloosa	none	Baggett Creek Arch Bridge	1924	C - Arch Deck	None	EL: 2000
5-14	Santa Rosa	580013	US-90 (SR-10) / Macavis Bayou	1937	C - Tee-Beam	8SR1930	P-EL: 2010

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FDOT DISTRICT 4							
5-62	Broward	860003	Henry E. Kinney Tunnel/US-1 (SR- 5) / New River	1960	C - Tunnel	8BD4504	P-EL: 2009
5-50	Broward	860038	Davie Boulevard / New River	1960	S - Bascule	8BD4772	RE: 2010
5-51	Broward	864071	SE 3rd Avenue / New River	1960	S - Bascule	8BD4770	RE: 2010
5-51	Broward	864072	William H. Marshall Memorial Bridge / New River	1964	S - Bascule	8BD4771	RE: 2010
5-9	Broward	865732	Grande Canal Arch Deck Bridge/ Coconut Isle / Grande Canal	1925	C - Tee-Beam	8BD3165	EL: 2000
6-2	Broward	865734	Isle of Venice / Las Olas Canal	1948	C - Slab	8BD3149	P-EL: 2008
6-2	Broward	865735	Fiesta Way / Las Olas Canal	1948	C - Slab	8BD3150	P-EL: 2008
6-2	Broward	865736	Nurmi Drive / Las Olas Canal	1947	C - Slab	8BD3168	P-EL: 2008
6-2	Broward	865737	Royal Palm Drive / Las Olas Canal	1946	C - Slab	8BD3169	P-EL: 2008
5-42	Broward	865748	Snow-Reed Swing Bridge/SW 11th Avenue/N. Fork of New River	1925	S- Swing	8BD3171	EL: 2000
	Indian River	880001	US-1 SB (SR-5)/Old Dixie Hwy & FEC RR	1928/1934	C - Tee-Beam	8IR1516	RE: 2010
5-27	Indian River	880005	James H. Prewitt Memorial Bridge / SR-A1A/Sebastian Inlet	1964	PSC - Girder	8IR1493	RE: 2010
7-7	Palm Beach	930005	Jupiter US-1 (SR-5) / ICWW	1958	S - Bascule	8PB14878	RE: 2010
5-53	Palm Beach	930026	George Bush Boulevard Bridge/ NE 8th Street / ICWW	1949	S - Bascule	8PB13707	P-EL: 2008
5-52	Palm Beach	930060	Haven Ashe Bridge / Boca Inlet	1963	S - Bascule	8PB14789	RE: 2010
5-41	Palm Beach	930072	Belle Glade Swing Bridge/ CR-717 / Okeechobee Rim Canal	1916/1935 /1998	S - Swing	8PB212	P-EL: 2002
	Palm Beach	930157	SR-A1A / ICWW	1938	S - Bascule	8PB9533	P-EL: 2007
5-43	Palm Beach	930940	Twenty Mile Bend Bridge / CR-880 / Loxahatchee River (C-51 Canal)	1937	S - Swing	8PB231	P-EL: 1990
5-54	Palm Beach	934408	Geist Memorial Bridge/East Camino Real Bridge/Boca Raton Club Bridge/ ICWW	1939/2007	S - Bascule	8PB8111	EL: 2007
5-8	St. Lucie	945000	Moore's Creek Bridge/ North 2nd Street / Moore's Creek	1925/1997	C - Arch Deck	8SL1141	L: 2001
FDOT DISTRICT 5							
6-15	Lake	114089	Mt. Dora Overpass/Highland St./SCL RR	1934	C - Tee-Beam	8LA2043	RE: 2010
7-7	Sumter	184000	CR-558 / Big Prairie Canal	1926	C - Tee-Beam	8SM171	RE: 2010
5-28	Marion	364040	CR-316 / Proposed Cross Florida Barge Canal	1969	CS - Girder	8MR3585	RE: 2010
6-13	Marion	364060	NE 105th Street / Daisy Creek	1940	S - Culvert	8MR3601	EL: 2000
5-44	Marion	364110	Sharpe's Ferry Bridge/CR-314 / Oklawaha River	1928/1971	S - Swing	8MR2539	P-EL: 2007
6-12	Marion	364120	SE 137th Avenue Road / Creek	1940	S - Culvert	8MR3602	EL: 2000
6-13	Marion	364150	NE 145th Avenue Road / Canal	1940	S - Culvert	8MR3603	EL: 2000
	Brevard	704063	Mathers Bridge/Banana River Drive / Banana River	1927/2005	S - Swing	8BR1700	EL: 2000
5-21	Orange	755100	Lake Conway Bridge/Nela Avenue / Lake Conway Connector	1926/1982	CC - Tee-Beam	8OR8339	RE: 2010
5-10	Orange	755806	Washington Street / Fern Creek	1926	C - Arch Deck	8OR3190	EL: 2000
5-21	Orange	755807	Poinsettia Avenue / Lake Ivanhoe	1942	C - Tee-Beam	8OR6033	P-EL: 2007

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5-10	Volusia	794081	Deep Creek Arch Deck CR-3 / Deep Creek	1920	C – Arch Deck	8VO7105	P-EL: 2006
FDOT DISTRICT 6							
5-55	Miami-Dade	870660	SW 1st Street / Miami River	1929	S - Bascule	8DA6222	P-EL: 2007
5-37	Miami-Dade	874129	Hialeah-Miami Springs Vertical Lift Bridge / Curtiss Parkway SB over Miami Canal	1927/1954	S - Lift	8DA99	P-EL: 1995
5-45	Miami-Dade	874130	Miami River Canal (NW 54th Street) Swing Bridge / Curtiss Parkway NB over Miami Canal	1924/1941 /2003	S - Swing	8DA100	P-EL: 1995
5-46	Miami-Dade	874135	NW South River Drive Swing Bridge over Tamiami Canal	1921/1940	S - Swing	8DA6431	EL: 2000
5-56	Miami-Dade	874161	NW 17th Avenue / Miami River	1928	S - Bascule	8DA5886	EL: 2000
5-12	Miami-Dade	874218	Sunny Isles Bridge No. 2 Atlantic Isle / Ocean Canal	1925	C - Arch Deck	8DA6433	EL: 2000
5-29	Miami-Dade	874307	SW 117th Avenue over North Canal	1937	S - Through Girder	8DA11918	RE: 2010
	Miami-Dade	874425	Deering Estate Bridge / SW 72nd Avenue over Gully	1920	C - Tee-Beam	8DA2815C	L: 1986
6-6	Miami-Dade	874459	Venetian Causeway Bridge 1 / ICWW	1927	S - Bascule	8DA4736	L: 1989
6-6	Miami-Dade	874460	Venetian Causeway Bridge 2 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874461	Venetian Causeway Bridge 3 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874463	Venetian Causeway Bridge 4 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874465	Venetian Causeway Bridge 5 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874466	Venetian Causeway Bridge 6 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874471	Venetian Causeway Bridge 7 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874472	Venetian Causeway Bridge 8 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874473	Venetian Causeway Bridge 9 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874474	Venetian Causeway Bridge 10 / Biscayne Bay	1927	S - Bascule	8DA4736	L: 1989
6-6	Miami-Dade	874477	Venetian Causeway Bridge 11 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
6-6	Miami-Dade	874481	Venetian Causeway Bridge 12 / Biscayne Bay	1927	CC - Tee-Beam	8DA4736	L: 1989
	Miami-Dade	875305	Hardee Road (64th Street) over Coral Gables Canal	1930	C - Arch Deck	8DA6437	EL: 2000
5-22	Miami-Dade	876100	Surfside Boulevard over Indian Creek	1930	CC - Tee-Beam	8DA6439	EL: 2000
5-11	Miami-Dade	876400	Seybold Canal Bridge / NW 7th Street over Wagner Creek Canal	1919	C - Arch Deck	8DA2384	P-EL: 1987
6-5	Miami-Dade	876707	Sunset Island Bridge # 1 / Sunset Drive over Sunset Lake Canal	1926	CC - Tee-Beam	8DA6441	P-EL: 2010
6-5	Miami-Dade	876708	Sunset Island Bridge # 2 / Sunset Drive over Sunset Lake Canal	1926	CC - Tee-Beam	8DA5828	P-EL: 2010
6-5	Miami-Dade	876710	Sunset Island Bridge # 4 / W 29th Street over Sunset Lake Canal	1926	CC - Tee-Beam	8DA5829	EL: 2000
7-6	Miami-Dade	None	Aerojet Truss	1910	S – Pony Truss	None	EL: 2000
6-18	Monroe	900016*	Bahia Honda	1909/1972	S - Through Truss	8MO1231	L: 1979

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6-18	Monroe	900080*	Rockland Channel	1911/1979	C - Arch Deck	8MO1490	L: 2004
6-18	Monroe	900081*	Shark Channel Bridge	1911/1979	C - Arch Deck	8MO1489	L: 2004
6-18	Monroe	900090*	Saddlebunch #5 Bridge	1943/1980	C - Arch Deck	8MO3953	L: 2004
6-18	Monroe	900091*	Saddlebunch #4 Bridge	1943/1980	C - Arch Deck	8MO3954	L: 2004
6-18	Monroe	900092*	Saddlebunch #3 Bridge	1943/1981	C - Arch Deck	8MO3955	L: 2004
6-18	Monroe	900093	Saddlebunch #2 Bridge	1943/1981	C - Arch Deck	8MO3956	L: 2004
6-18	Monroe	900094*	Long Key Viaduct	1906/1981	C - Arch Deck	8MO1229	L: 1979
6-18	Monroe	900097*	Channel Two Viaduct	1909/1981	C - Arch Deck	8MO3476	L: 2004
6-18	Monroe	900098*	Channel #5 Bridge	1909/1982	C - Arch Deck	8MO3968	L: 2004
6-18	Monroe	900099*	Tom's Harbor Cut Bridge	1909/1980	C - Arch Deck	8MO3967	L: 2004
6-18	Monroe	900100*	Tom's Harbor Channel Bridge	1909/1980	C - Arch Deck	8MO3966	L: 2004
6-18	Monroe	900101*	Knight Key Bridge/ Seven Mile Bridge	1909/1982	C - Arch Deck	8MO1230	L: 1979
6-18	Monroe	900102*	Lower Sugarloaf Channel Bridge	1943/1981	C - Arch Deck	8MO3957	L: 2004
6-18	Monroe	900103*	Little Duck-Missouri Channel Bridge	1943/1981	C - Arch Deck	8MO3965	L: 2004
6-18	Monroe	900104*	Ohio-Missouri Channel Bridge	1943/1981	C - Arch Deck	8MO3964	L: 2004
6-18	Monroe	900105*	Ohio-Bahia Honda Bridge	1943/1981	C - Arch Deck	8MO3963	L: 2004
6-18	Monroe	900106*	Spanish Harbor Channel Bridge	1912/1982	C - Arch Deck	8MO1484	L: 2004
6-18	Monroe	900111*	South Pine Channel Bridge	1943/1982	C - Arch Deck	8MO3962	L: 2004
6-18	Monroe	900112*	Park Channel Bridge	1943/1982	C - Arch Deck	8MO3958	L: 2004
6-18	Monroe	900115*	Bow Channel Bridge	1943/1982	C - Arch Deck	8MO3959	L: 2004
6-18	Monroe	900116*	Kemp Channel Bridge	1943/1982	C - Arch Deck	8MO3960	L: 2004
6-18	Monroe	900117*	Niles Channel Bridge	1943/1983	C - Arch Deck	8MO3961	L: 2004
6-3	Monroe	904602	Truman Bridge / Duck Key Drive over Unnamed Channel	1955/1982	C - Arch Deck	8MO2137	EL: 2000
6-3	Monroe	904603	Bimini Drive / Sam's Canal	1955/1982	PSC - Channel Beam	8MO2136	EL: 2000
6-3	Monroe	904604	Harbour Drive / Joe's Canal	1955/1982	PSC - Channel Beam	8MO2135	EL: 2000
6-3	Monroe	904606	Rosen Bridge / Seaview Drive over Unnamed Canal	1955/1982	PSC - Channel Beam	8MO2138	EL: 2000
FDOT DISTRICT 7							
	Hernando	080001	Brooksville Overpass/US-41 (SR-45)/CSX RR	1936	S: Girder	8HE389	RE: 2010
	Hillsborough	100069	James N. Holmes Bridge / Florida Avenue (US-41B) / Hillsborough River	1926	C - Tee-Beam	8HI6668	EL: 2000
5-57	Hillsborough	100100	Kennedy Boulevard (SR-60) / Hillsborough River	1913/1995	S - Bascule	8HI640	P-EL: 1987
5-38	Hillsborough	100920	Hillsborough River Lift Bridge / Hillsborough Avenue (US-92 EB) / Hillsborough River	1939/1999	S - Lift	8HI6669	EL: 2000
5-58	Hillsborough	105500	Platt Street / Hillsborough River	1926	S - Bascule	8HI862	P-EL: 2005
5-61	Hillsborough	105501	Brorein Street / Hillsborough River	1959	S - Bascule	8HI11540	P-EL: 2009
5-59	Hillsborough	105502	Cass Street / Hillsborough River	1927/1949	S - Bascule	8HI6670	P-EL: 2002
5-60	Hillsborough	105503	Laurel Street / Hillsborough River	1927/1969	S - Bascule	8HI6671	EL: 2000
5-47	Hillsborough	105504	Michigan Ave. Swing Bridge/Columbus Drive Swing Bridge / Hillsborough River	1926/2012	S - Swing	8HI6672	EL: 2000

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5-34	Hillsborough	100647 (formerly 100037)	Blackwater Creek Overflow Bridge / SR-39 / Blackwater Creek Relief	c.1936/ 2002	S - Culvert	8HI5042	P-EL: 1993
5-12	Pasco	144002	N Crystal Springs Road / Hillsborough River	1923	C - Arch Deck	8PA637	RE: 2010
5-13	Pinellas	150009	Philippe Parkway / Mullet Creek Bridge No. 2	1926	C - Arch Deck	8PI8742	RE: 2010
	Pinellas	150022	4th Street South / Salt Creek Bridge No. 1	1935	C - Culvert	8PI8726	EL: 2000
5-13	Pinellas	150113	Moss Rainbow Arch / Coachman Road (SR-590) / Alligator Creek	1926	C - Through Arch	8PI8730	EL: 2000
5-32	Pinellas/ Manatee	150189	Sunshine Skyway / I-275 (SR-93) / Tampa Bay	1986	Cable-Stayed	8PI11962/ 8MA1798	El: 2007
5-23	Pinellas	157127	Burlington Avenue / Booker Creek	1942	CC - Tee-Beam	8PI8747	EL: 2000
5-14	Pinellas	159901	Luten "Half-Arch"/ Belleview Blvd.	1915	C - Arch Deck	8PI8749	EL: 2000

ASSESSING COMMON BRIDGE TYPES

One challenge in evaluating the significance of bridges constructed during the 1960s is the generally "common" nature of these resources. The definition for "common" used in this report combines those coined in *A Context for Common Historic Bridge Types*[106] and a paper prepared by Barbara Wyatt in 2009, as follows: "a resource type that is prevalent or ubiquitous, i.e., the type is widely represented in extant examples throughout regions of the United States and, therefore, difficult to evaluate."[107]

The NBI identifies 2,939 Florida bridges constructed between 1960 and 1969. The Interstate Highway System (IHS) was the major catalyst for this number. The IHS encompasses over 44,000 miles of paved highways, a labyrinth of roadways and bridges. The creation of the Interstate system would not have been possible without standardized bridge plans and construction methods. In addition, innovations in materials science engineering during the decade of the 1960s, most notably in prestressed concrete, were an important factor in the increase in bridge construction. Typically, bridges constructed in the 1960s are considered significant for their engineering, not for their aesthetics. Historically, most slab, beam, or girder ("SBG") bridges of this era are examples of bridge technology and construction that allowed for rapid, cost-effective, and relatively quick construction. SBG bridges comprise approximately 65 percent of the historic highway bridges in this study. According to Demetrios Tonios, "The Interstate system, as a result of its magnitude, *forced the issue*, if you will, by making the various state and local agencies adopt a uniform approach to the engineering of highway bridges. While some may argue that this has depleted bridge design of its flare and creativity, the reality is that construction of such a large number of structures in so short a time frame could never have been undertaken any other way."[108]

[106] Parsons Brinckerhoff and Engineering and Industrial Heritage, 2005.
[107] Wyatt, Barbara, "Evaluating Common Resources for National Register of Historic Places Eligibility: A National Register White Paper," April 9, 2009.
[108] Tonios, Demetrios E., Bridge Engineering: Design, Rehabilitation, and Maintenance of Modern Highway Bridges, (New York: McGraw-Hill, 1995), 4.

SIGNIFICANCE ASSESSMENTS OF BRIDGES BY TYPE

Florida's fixed truss, arch, frame, cable, slab, beam, and girder bridges, as well as culverts, are generally constructed of timber, concrete, or steel. Florida's movable swing, vertical lift, and bascule bridge spans are fabricated of steel. The many subtypes of bridges are often defined on the basis of construction materials (i.e., reinforced vs. prestressed concrete). In evaluating the NRHP eligibility of Florida's historic highway bridges, the applicable criteria are typically Criteria A and/or C in the areas of Transportation and Community Planning and Development (for A), and Engineering and Architecture (for C). In addition to meeting one or both of these criteria, the historic physical integrity of the bridge must always be taken into consideration. The considerations for each bridge type are noted in the tables included in this section. In general, the evaluation of a bridge's significance always considers the following characteristics:

- bridge age;
- bridge size and type;
- construction methods or materials;
- architectural design and details;
- historic associations with significant persons or events (including trends in social history, the environment and land use development, and public infrastructure programs);
- associations with significant trends in engineering history;
- associations with significant designers, engineers, architects, or master builders;
- physical integrity; and
- rarity as an example of a bridge type.

Fixed Truss Bridges

All 15 of the fixed truss bridges among the total 4160 highway bridges identified were included in the file review. Thirteen were selected for field survey, of which three could not be located or accessed (Jennings Bridge and Apalahoochee River Pony Truss in Hamilton County; Aerojet Truss in Miami-Dade). Thus, their current condition and NRHP status are unknown. Florida's fixed truss bridges include 11 through and 4 pony trusses (**Table 4-4**). The truss bridges were constructed between 1902 and 1967, with roughly 80 percent built between 1910 and 1939. The Hart Bridge (No. 720107), a through truss located in Duval County (See page 5-4), is the only bridge of this type built during the 1960s. As per the information contained in the NBI, two of the surveyed bridges have been reconstructed, all post-1971. While not indicated in the NBI, a third truss bridge, Bahia Honda (No. 900016), part of the Overseas Highway, also was rebuilt.

Table 4-4. Florida's Fixed Truss Bridges Selected for Field Survey.

FDOT No.	County	Name/Route Carried/Feature Intersected	Year Built/ Recon.	Type	NRHP Status	Comments
470029	Calhoun	Blountstown Truss	1938/1998	Through (Warren)	Eligible in 2000	
720076	Duval	Mathews Bridge	1953	Through (Warren)	Potentially eligible in 2007	
720107	Duval	Hart Bridge	1967	Through (Cantilevered)	Newly recommended eligible	
None	Hamilton	Jennings Bridge	1902	Through (Pratt)	Eligible in 2000	Existing condition is undocumented.
324302	Hamilton	Apalahoochee River Pony Truss	1911	Pony (Pratt)	Eligible in 2000	Existing condition is undocumented.
None	Jackson	Bellamy Bridge	1914	Through (Pratt)	Eligible in 2000	
334001	Lafayette	Steinhatchee Springs	1921/1989	Pony (Pratt)	Eligible in 2000	Florida's only verified intact pony truss
350910 (formerly)	Madison	Ellaville/Hillman	1925	Through (Pratt)		No longer a FDOT resource. Now a pedestrian bridge
None	Miami-Dade	Aerojet Truss	1910	Pony	Eligible in 2000	Existing condition is undocumented.
900016	Monroe	Bahia Honda	1909/1972	Through (Pratt, camelback)	Listed in 1979	
None	Okaloosa	Log Lake	1915	Pony (Warren)	Eligible in 2000. Newly recommended ineligible due to loss of integrity	Moved from original location. Loss of integrity and eligibility.
None	Santa Rosa	Coldwater Creek Truss	1910	Through (Pratt)	Eligible in 2000. Newly recommended ineligible due to loss of integrity	Partially demolished. Loss of integrity and eligibility.
374014 (formerly)	Suwannee	Suwannee Springs	1931	Through (Parker)		No longer a FDOT resource. Now a pedestrian bridge

The surveyed truss bridges include nine through trusses and four pony trusses; Pratt is the most common truss design (**Table 4-4**). The Bahia Honda Bridge is the only NRHP-listed fixed truss bridge. Another seven were determined eligible or potentially eligible by the SHPO, and one is newly recommended as eligible. The distribution of significant bridges by FDOT district is provided in **Table 4-5.**

Table 4-5. Distribution of Significant Fixed Truss Bridges by FDOT District.

District	NRHP Listed	SHPO Determined Eligible/Potentially Eligible	Newly Recommended as Eligible	Total
1	0	0	0	0
2	0	4	1	5
3	0	2	0	2
4	0	0	0	0
5	0	0	0	0
6	1	1	0	2
7	0	0	0	0
Total	**1**	**7**	**1**	**9**

Fixed truss bridges are considered significant for their rarity in Florida. Of the 12 fixed truss bridges verified through field survey, only the Steinhatchee Springs Bridge in Lafayette County, with its Pratt pony truss, and the dismantled Log Lake Bridge in Okaloosa County, are pony trusses. The Warren pony truss of the Log Lake Bridge has been removed to a location adjacent to the Yellow River; therefore, it no longer retains its integrity and is recommended as no longer eligible for listing in the NRHP. The Bahia Honda Bridge in Monroe County was originally built (and is currently classified) as a through truss bridge for the Florida East Coast (FEC) Railroad. However, it functioned as a fixed deck truss bridge during the period when it was modified for use as an automobile bridge. The Blountstown Truss Bridge features deck truss approach spans and a Warren through truss main span.

Certain truss designs are also significant for their rarity: the Bahia Honda Bridge featured the only camelback truss span in Florida (along with 26 Pratt truss spans), and the through truss Suwannee Springs Bridge in Suwannee County is the only Parker truss bridge in the State. However, the Suwannee Springs Bridge has been removed from the Florida highway system, and currently functions as a pedestrian bridge. The Ellaville/Hillman Bridge in Madison County has undergone a similar change in status.

Fixed truss bridges may derive additional significance from their historic associations with significant persons or events. These bridges often were constructed under the auspices of early federal aid programs, such as the Ellaville/Hillman Bridge on SR-1 in Madison County, or as part of major growth and development ventures, such as the Bahia Honda Bridge within the Overseas Highway system.

A summary table for evaluating the significance of Florida's 10 extant (and verified) fixed truss bridges is provided in **Table 4-6.**

Table 4-6. Fixed Truss Bridge Significance Table.

<table>
<tr><th colspan="2">FIXED STEEL TRUSS BRIDGE - SIGNIFICANCE TABLE</th></tr>
<tr><th colspan="2">TYPES OF STEEL TRUSS BRIDGES</th></tr>
<tr><th>PONY TRUSS</th><th>THROUGH TRUSS</th></tr>
<tr><td>Level of Significance & No. of Surveyed Resources:
• HIGH: 1
• LOW: 1
Defining Elements*:
• truss form
• method of connection
• top and bottom chords
• vertical and diagonal members
• floor beams and stringers</td><td>Level of Significance & No. of Surveyed Resources:
• HIGH: 7
• LOW: 1
Defining Elements*:
• Same elements listed under Pony Truss Defining, including:
• lateral top bracing
• struts
• portal features</td></tr>
</table>

<table>
<tr><th colspan="3">APPLICABLE NRHP CRITERIA**</th></tr>
<tr><th>Criterion A</th><th>Criterion C</th><th>None</th></tr>
<tr><td>• Community Planning & Development
• Transportation
• Other significant associations (i.e., contributing resource to a listed or potentially eligible historic district)</td><td>• Engineering
– rare surviving example of type
– early example of type
– exhibits distinct engineering elements
– exhibits early application of new technology
• Assc. w/a prominent builder, designer, engineer or planner</td><td>• Standard Plan (and not a rare surviving or early example of its type)
• Unembellished w/no distinct or character defining engineering or aesthetic elements
• Loss of integrity due to structural compromise/ non-historic alterations
• No significant assc. w/a prominent builder, designer, engineer or planner
• No assc. w/a listed or potentially-eligible historic district</td></tr>
</table>

*A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.
** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Arch Bridges

Seventy-two of the 4160 highway bridges in this study are arch bridges. All were selected for file review and/or field survey, including two through arch and 70 arch deck bridges. With the exception of the 1955 Myrtle Avenue Overpass (No. 720163) in Duval County (See page 5-7), all the arch bridges are of concrete construction. The heyday in arch bridge construction in Florida ended in the 1940s; roughly 36 percent were built in the 1920s. The oldest surveyed arch bridge dates to 1908 and the most recent is 1956. No arch bridges were constructed in the 1960s. In accordance with the NBI, 11 of the bridges surveyed for this update have been reconstructed; six of these reconstructions are within the pre-1971 period of significance for this study. Field survey indicated that six arch deck bridges have been demolished since the 2000 survey. None was previously evaluated as significant.

The NRHP-listed arch bridges include 22 Overseas Highway structures plus the 1925 Moore's Creek Bridge (No. 945000) in St. Lucie County (See page 5-8). Nineteen other arch bridges, including both through arches, previously were determined eligible, and two are newly recommended as eligible. Thus, of the total arch bridges selected for survey, 44 are listed, determined eligible, or newly recommended eligible for the NRHP. The distribution of significant bridges by FDOT district is provided in **Table 4-7.**

Table 4-7. Distribution of Significant Arch Bridges by FDOT District.

District	NRHP Listed	SHPO Determined Eligible	Newly Recommended as Eligible	Total
1	0	5	0	5
2	0	2	0	2
3	0	2	0	2
4	1	1	0	2
5	0	2	0	2
6	22	4	0	26
7	0	3	2	5
Total	**23**	**19**	**2**	**44**

Arch deck bridges may be significant for their important associations with historical events (NRHP Criterion A), particularly in the areas of Transportation as well as Community Planning and Development. For example, both the Peace River Bridge at Arcadia (No. 450001) in DeSoto County (See page 5-5), which is linked to the development of Arcadia, and the Baggett Creek Arch (No bridge no.) in Okaloosa County, constructed under the Federal-Aid Road Act of 1916, are noteworthy in the area of Transportation. Other arch bridges, such as the 1940 Torreya Stone Arch (No. bridge no.) in Liberty County, were built as part of New Deal Era programs, or as part of a major growth and development venture, such as Flagler's FEC Railroad Overseas Highway Bridges in Monroe County.

Arch bridges also may be eligible for listing in the NRHP under Criterion C in the areas of Engineering and Architecture. Notable for their rarity of design are Florida's only steel through arch bridge, noted above, and the single concrete through arch Moss Rainbow Arch (No. 150113) in Pinellas County (See page 5-13). Under Criterion C, some arch bridges are associated with significant designers and builders. For example, the 1945 9th Avenue West/Ware's Creek Bridge in Sarasota County is associated with noteworthy engineer Freeman Horton. Several arch bridges were designed by Daniel Luten, a prominent bridge designer of the early twentieth century. Luten-designed arch bridges, generally distinguished by their high aesthetic qualities, include the unique "Half-Arch" (No. 159901) in Pinellas County (See page 5-14), constructed in 1915; the Osprey Avenue Bridge (No. 175950) in Sarasota County (See page 5-5) and the San Mateo Road Bridge (No. 764024) in Putnam County (See page 5-8), both built in 1916; the 1923 Deep Creek Bridge (No. 794081) in Volusia County (See page 5-10) and the North Crystal Springs

Road Bridge (No. 144002) in Pasco County (See page 5-12); the 1925 NRHP-listed Moore's Creek Bridge (No. 945000) in St. Lucie County; and several 1920s-era bridges in Pinellas County, including the Philippi Parkway Bridge at Mullet Creek (No. 150009) (See page 5-13). A summary table for evaluating the significance of Florida's arch type bridges is provided in **Table 4-8.**

Table 4-8. Arch Bridge Significance Table.

ARCH BRIDGE - SIGNIFICANCE TABLE		
TYPES OF ARCH BRIDGES		
STEEL THROUGH ARCH	**CONCRETE THROUGH ARCH**	**CONCRETE ARCH DECK**
Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 0** Defining Elements*: • curved top girder or truss (ribs) • suspenders • ties, bottom chord, and floor system	Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 0** Defining Elements*: • arch • end posts • vertical ties • lower chord • floor beams	Level of Significance & No. of Surveyed Resources: • **HIGH: 42** • **LOW: 28** Defining Elements*: • arch • ring • spandrels • ribs or barrel
APPLICABLE *NRHP* CRITERIA**		
Criterion A	**Criterion C**	**None**
• Community Planning & Development • Transportation • Neighborhood/Barrier Island Development • Railroad History • Assc. w/New Deal Era WPA or CCC project, Overseas Highway Bridge • Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)	• Engineering – rare surviving example of type – early example of type – exhibits distinct engineering elements – exhibits early application of new technology • Architecture – high arch'l embellishment – exhibits distinct arch'l elements • Assc. w/a prominent builder, designer, engineer or planner (i.e., Luten Bridge Co.)	• Standard Plan (and not a rare surviving or early example of its type) • Unembellished w/no distinct or character defining engineering or aesthetic elements • Loss of integrity due to structural compromise/ non-historic alterations • No significant assc. w/a prominent builder, designer, engineer or planner • No assc. w/a listed or potentially-eligible historic district

*A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.

** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Slab and Frame Bridges

Approximately one-third (1344) of the 4160 highway bridges in this study are slab bridges. Of these, only five are historic timber slab bridges, and the remainder are constructed of concrete, continuous concrete, and prestressed concrete. Sixty-three of these slab bridges were selected for file review and/or field survey, including two timber, 45 concrete, and 16 prestressed concrete. The earliest of these bridges dates to 1922, and most were constructed in the 1920s and the 1960s. Twenty-two of the slab bridges, including both timber slabs, have been reconstructed; 13 of these reconstructions are within the pre-1971 period of significance for this study. Four slab bridges have been demolished since the 2000 survey, and another is now off-system. None was previously evaluated as significant.

None of Florida's slab bridges is NRHP- listed. Seven were previously determined eligible by the SHPO, and eight are newly recommended as eligible. In addition, 39 slab bridges were evaluated as ineligible for NRHP listing and three have insufficient information. The distribution of the 15 significant slab bridges by FDOT district is provided in **Table 4-9.**

Table 4-9. Distribution of Significant Slab Bridges by FDOT District.

District	NRHP Listed	SHPO Determined Eligible	Newly Recommended as Eligible	Total
1	0	0	1	1
2	0	3	7	10
3	0	0	0	0
4	0	4	0	4
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
Total	**0**	**7**	**8**	**15**

While slab bridges are very common, those built of timber are relatively rare in Florida. Of the five examples of historic timber slab bridges, only one retains sufficient integrity to be considered NRHP eligible. Thus, timber slab bridges, such as the 1931 Hill Road Bridge over Little Mills Creek in Nassau County (No. 744006) (See page 5-16), are considered significant for their relative rarity, and eligible under Criterion C in the area of Engineering. Similarly, early examples of slab bridges built to standard plans may also be eligible under Criterion C. Older "common" bridges become rare as their number diminishes and they become one of a few remaining representatives of their type. One such example of an early surviving example of its type is the 1922 concrete slab bridge which carries Old US-17 over the Crescent Lake Outflow in Putnam County (No. 764044) (See page 5-17). Slab bridges may also be considered significant under Criterion C for their design and/or historic associations with significant persons, as well as under Criterion A for their association with significant historic events. A number of concrete slab bridges over Hogan Creek in Duval County are distinguished under Criterion A in the area of Community Planning and Development for their association with the Confederate Park neighborhood. They also meet eligibility Criterion C in the area of Architecture for the aesthetic quality of their design and association with noteworthy engineer Klutho.

Historic **rigid frame bridges** are exceptionally rare in Florida. Only two were included in this update survey: the 1940 Atlanta and St. Andrews Bay Railway Bridge over US-90/SR-10 in Jackson County (No. 530003) (See page 5-15) and the 1937 Washington Avenue Bridge over Collins Canal in Miami-Dade County (No. 876705). The latter has been substantially altered and no longer retains its historic integrity.

A summary table for evaluating the significance of Florida's slab and frame bridges is provided in **Table 4-10.**

Table 4-10. Slab and Frame Bridge Significance Table.

SLAB & FRAME BRIDGES - SIGNIFICANCE TABLE		
TYPES OF SLAB & FRAME BRIDGES		
CONCRETE SLAB	**TIMBER SLAB**	**CONCRETE FRAME**
Level of Significance & No. of Surveyed Resources: • **HIGH: 14** • **LOW: 44** Defining Elements*: • materials finish • deck depth • super/substructure member sizes and construction techniques	Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 4** Defining Elements*: • timber member size/material • deck depth • construction techniques	Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 1** Defining Elements*: • integral super/substructure • mass ratios btwn. super/substructure • materials finish
APPLICABLE *NRHP* CRITERIA**		
Criterion A	**Criterion C**	**None**
• Community Planning & Development • Transportation • Neighborhood/Barrier Island Development • Railroad History • Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)	• Engineering – rare surviving example of type – early example of type – exhibits distinct engineering elements – exhibits early application of new technology • Architecture – high arch'l embellishment – exhibits distinct arch'l elements • Assc. w/a prominent builder, designer, engineer or planner	• Standard Plan (and not a rare surviving or early example of its type) • Unembellished w/no distinct or character defining engineering or aesthetic elements • Loss of integrity due to structural compromise/ non-historic alterations • No significant assc. w/a prominent builder, designer, engineer or planner • No assc. w/a listed or potentially-eligible historic district

*A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.

** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Beam and Girder Bridges

Approximately 11 percent (444) of the bridges included in this update are concrete **beam bridges**; that is, 243 tee-beams, 197 channel beams, and four box beams. Seventy-five of the beam bridges were selected for file review and/or field survey, including 66 tee-beams, seven channel beams, and two box beams. The earliest of these bridges dates to 1915, and 75 percent were constructed in the 1920s and 1930s. For the selected bridges, 1952 marks the earliest use of prestressed concrete. All but one of the total 13 tee-, channel, and box beam bridges built in the 1950s and 1960s are of prestressed concrete. Eighteen of the beam bridges have been reconstructed; 12 of these reconstructions are within the pre-1971 period of significance for this study. Four tee-beam bridges have been demolished since the 2000 survey; none was considered NRHP-eligible.

Eleven of Florida's beam bridges, all tee-beam in type, are NRHP- listed. This number includes the 1920 Deering Estate Bridge (No. 874425) and the 10 Venetian Causeway Bridges (See pages 6-6 and 6-7), all in Miami-Dade County. In addition, 10 tee-beam and three channel beam bridges previously were determined eligible by the SHPO, and 12 tee-beam bridges and one box beam bridge are newly recommended as eligible. Thus, of the beam bridges selected for survey, 75 are listed, determined eligible or newly recommended as eligible for listing in the NRHP, including 33 tee-beams, three channel beams, and one box beam (**Table 4-1**). The distribution of significant beam bridges by FDOT district is provided in **Table 4-11.**

Table 4-11. Distribution of Significant Beam Bridges by FDOT District.

District	NRHP Listed	SHPO Determined Eligible	Newly Recommended as Eligible	Total
1	0	1	3	4
2	0	1	6	7
3	0	1	0	1
4	0	0	1	1
5	0	1	3	4
6	11	7	6	18
7	0	2	2	2
Total	**11**	**13**	**13**	**37**

Approximately 22 percent (909) of the bridges in this study are **girder bridges**, including 15 timber, 316 steel, and 578 concrete. Of these, 130 girder bridges were selected for file review and/or field survey, including nine constructed of timber, 68 of steel, and 53 of concrete. The two most active decades for girder bridge construction were the 1930s and 1960s, which account for 29 percent and 42 percent, respectively of the bridges selected for study. Roughly two-thirds of the 1930s girder bridges were built of steel. In the 1960s, bridge materials are divided almost equally between steel and prestressed concrete. The earliest prestressed concrete girder bridges date to the 1950s. Seventeen of the 130 girder bridges have been reconstructed, divided almost equally among timber, steel, and concrete. Five of the reconstructions are within the pre-1971 period of significance for this study. Twenty-six girder bridges have been demolished since the 2000 survey, including four considered NRHP-eligible: the two 1939 Treasure Island Causeway bridges in Pinellas County (Nos. 157820 and 157840); the 1926 Little Six Mile Creek Bridge in Duval County (No. 724072); and the 1926 Trout River Bridge in Duval County.

None of Florida's girder bridges is NRHP-listed, and only two, including the 7th Avenue West Bridge over Wares Creek in Manatee County (No. 135250) (See page 6-11) have been determined NRHP eligible. Nine girder bridges are newly recommended as eligible. Thus, of the girder bridges selected for survey, only 11 are determined eligible or newly recommended eligible for listing in the NRHP. The distribution of significant girder bridges by FDOT district is provided in **Table 4-12.**

Table 4-12. Distribution of Significant Girder Bridges by FDOT District.

District	NRHP Listed	SHPO Determined Eligible	Newly Recommended as Eligible	Total
1	0	2	2	4
2	0	0	3	3
3	0	0	0	0
4	0	0	1	1
5	0	0	1	1
6	0	0	1	1
7	0	0	1	1
Total	0	2	9	11

Since beam and girder bridges are very common, significance may reflect a unique design, as seen more often in early concrete tee-beam bridges, or those that have historic associations with significant persons or events. The few surviving steel through girder bridges, such as the SW 117th Avenue Bridge in Miami-Dade County (No. 874307) (See page 5-29) are considered NRHP-eligible because of their rarity of type. Early examples of beam and girder bridges built to standard plan also may be significant. Some beam and girder bridges may also be eligible under Criterion A in the areas of Transportation and Community Planning and Development for their historic associations with significant events. Thirty concrete tee-beam, 3 concrete channel beams, 2 concrete box beams, 1 concrete girder, 1 timber girder, 5 steel girders, and

1steel through girder bridges are eligible for listing in the NRHP. A summary table for evaluating the significance of Florida's beam and girder bridges is provided in **Table 4-13.**

Table 4-13. Beam and Girder Bridge Significance Table.

BEAM & GIRDER BRIDGES - SIGNIFICANCE TABLE		
TYPES OF BEAM & GIRDER BRIDGES		
TIMBER GIRDER	**CONCRETE TEE & CHANNEL BEAM**	**BOX BEAM**
Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 8** Defining Elements*: • original or in-kind members, esp. longitudinal beams • construction methods	Level of Significance & No. of Surveyed Resources: • **HIGH: Tee – 33; Channel - 3** • **LOW: Tee – 33; Channel - 4** Defining Elements*: • slab integrated with longitudinal beams	Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 2** Defining Elements*: • box beam form and curvature • structure height and pier placement
CONCRETE GIRDER	**STEEL THROUGH GIRDER**	**STEEL GIRDER**
Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 52** Defining Elements*: • monolithic deck and girder system	Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 1** Defining Elements*: • material treatment • ratio between sub/superstructure	Level of Significance & No. of Surveyed Resources: • **HIGH: 8** • **LOW: 58** Defining Elements*: • monolithic deck and girder system
APPLICABLE *NRHP* CRITERIA******		
Criterion A	**Criterion C**	**None**
• Community Planning & Development (i.e., Canal history/development) • Transportation • Neighborhood/Barrier Island Development • Railroad History • Forestry History • Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)	• Engineering – rare surviving example of type – early example of type – exhibits distinct engineering elements – exhibits early application of new technology • Architecture – high arch'l embellishment – exhibits distinct arch'l elements • Assc. w/a prominent builder, designer, engineer or planner	• Standard Plan (and not a rare surviving or early example of its type) • Unembellished w/no distinct or character defining engineering or aesthetic elements • Loss of integrity due to structural compromise/ non-historic alterations • No significant assc. w/a prominent builder, designer, engineer or planner • No assc. w/a listed or potentially-eligible historic district

*A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.
** Concrete includes all of its material forms of reinforced concrete, reinforced continuous concrete and prestressed concrete.
*** Steel includes all of its material forms of steel and continuous steel.
**** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Cable Bridges

Cable-supported bridges are rare in Florida. This category includes only three structures: the Hal Adams Bridge in Lafayette County (No. 330009) (See page 5-30), Florida's only highway suspension bridge, as well as the Bob Graham Sunshine Skyway Bridge in Pinellas and Manatee Counties (No. 150189) (See page 5-32) and the Dames Point Bridge in Duval County (No. 720518) (See Page 5-31), both of which are cable-stayed bridges featuring a harp array. Due to their rarity, all cable bridges in Florida are considered significant under Criterion C for their engineering. A summary table for evaluating the significance of Florida's cable-supported bridges is provided in **Table 4-14.**

Table 4-14. Cable Bridge Significance Table.

CABLE BRIDGE - SIGNIFICANCE TABLE	
TYPES OF CABLE BRIDGES	
CABLE-STAYED	**SUSPENSION**
Level of Significance & No. of Surveyed Resources: • **HIGH: 2** • **LOW: 0** Defining Elements*: • towers and piers • cable array design (i.e., fan or harp) • stayed span (incl. truss or girder structure)	Level of Significance & No. of Surveyed Resources: • **HIGH: 1** • **LOW: 0** Defining Elements*: • material integrity • towers and piers • suspension span (incl. truss or girder structure)
APPLICABLE *NRHP* CRITERIA**	
Criterion A	**Criterion C**
• Community Planning & Development • Transportation • Neighborhood/Barrier Island Development • Railroad History • Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)	• Engineering – rare surviving example of type – early example of type – exhibits distinct engineering elements – exhibits early application of new technology • Architecture – high arch'l embellishment – exhibits distinct arch'l elements • Assc. w/a prominent builder, designer, engineer or planner
Criterion Consideration G	**None**
• significance for achievement within the past 50 years due to its exceptional importance in engineering technology, transportation engineering, community planning & development	• Standard Plan (and not a rare surviving or early example of its type) • Unembellished w/no distinct or character defining engineering or aesthetic elements • Loss of integrity due to structural compromise/ non-historic alterations • No significant assc. w/a prominent builder, designer, engineer or planner • No assc. w/a listed or potentially-eligible historic district

*A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.
** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Culverts

Culverts comprise approximately 30 percent (1263) of the bridges included in this update. Forty-six culverts were selected for file review and/or field survey. The oldest of Florida's concrete culverts was built in 1919. More than half of the surveyed culverts were constructed during the 1930s; only two date to the 1960s. Twenty-three culverts have been reconstructed, including the two surviving examples built in 1919, as well as four of seven from the 1920s. Six of the culvert reconstructions are within the pre-1971 period of significance for this study.

None of Florida's culverts is NRHP-listed. Four have been determined eligible by the SHPO, including the reconstructed Blackwater Creek Overflow Bridge in Hillsborough County (No. 100037, formerly 100647) (See page 5-34) and three 1940 steel culverts in Marion County (Nos. 364060, 364120, and 364150) that are significant for their association with the New Deal era, specifically, their construction by the WPA. Six culverts, all located in District 2, are newly recommended as eligible. Nos. 280036, 280037, and 280038 in Bradford County are unadorned steel culverts built in 1940; Nos. 374004, 374006, and 374012 in Suwannee County, constructed between 1919 and 1940, are all stone-faced. The distribution of significant culverts by FDOT district is provided in **Table 4-15.** Thirty-five of the surveyed culverts are ineligible for the NRHP, and one has been demolished since the previous statewide historic bridge survey.

Table 4-15. Distribution of Significant Culverts by FDOT District.

District	NRHP Listed	SHPO Determined Eligible	Newly Recommended As Eligible	Total
1	0	0	0	0
2	0	0	6	6
3	0	0	0	0
4	0	0	0	0
5	0	3	0	3
6	0	0	0	0
7	0	1	0	1
Total	**0**	**4**	**6**	**10**

The concrete and steel culverts are eligible for listing in the NRHP under Criterion C in the area of Engineering. Early arch culverts are often notable for their rarity of design, especially when they exhibit decorative elements such as stone facing. They may also be significant for their historic associations with significant events, and thus, qualify for listing under Criterion A. A summary table for evaluating the significance of Florida's culverts is provided in **Table 4-16.**

Table 4-16. Culvert Significance Table.

<table>
<tr><th colspan="3">CULVERT - SIGNIFICANCE TABLE</th></tr>
<tr><th colspan="3">TYPES OF CULVERTS</th></tr>
<tr><th colspan="2">METAL CULVERT</th><th>CONCRETE CULVERT</th></tr>
<tr><td colspan="2">Level of Significance & No. of Surveyed Resources:
• HIGH: 9
• LOW: 7
Defining Elements*:
• span
• culvert size opening
• façade adornment (if any)</td><td>Level of Significance & No. of Surveyed Resources:
• HIGH: 1
• LOW: 29
Defining Elements*:
• span
• culvert size opening
• façade adornment (if any)</td></tr>
<tr><th colspan="3">APPLICABLE NRHP CRITERIA**</th></tr>
<tr><th>Criterion A</th><th>Criterion C</th><th>None</th></tr>
<tr><td>• Community Planning & Development
• Transportation
• Assc. w/New Deal Era WPA or CCC project, Overseas Highway Bridge
• Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)</td><td>• Engineering
– rare surviving example of type
– early example of type
– exhibits distinct engineering elements
• Architecture
– high arch'l embellishment
– exhibits distinct arch'l elements
• Assc. w/a prominent builder, designer, engineer or planner</td><td>• Standard Plan (and not a rare surviving or early example of its type)
• Unembellished w/no distinct or character defining engineering or aesthetic elements
• Loss of integrity due to structural compromise/ non-historic alterations
• No significant assc. w/a prominent builder, designer, engineer or planner
• No assc. w/a listed or potentially-eligible historic district</td></tr>
</table>

* A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.
** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation.*

Vertical Lift Bridges

Only four vertical lift bridges remain in Florida (**Table 4-17**). Therefore, all surviving examples are considered highly significant and eligible for listing in the NRHP. A description of each lift bridge is contained in Chapter 5. Only two of the four are still operable: the 1941 Main Street Vertical Lift Bridge over the St. Johns River in Duval County (No. 720022), the largest of Florida's lift bridges; and the Hillsborough River Lift Bridge in Hillsborough County (No.100920), built in 1939 and reconstructed in 1999. The non-operable Billy Creek Vertical Lift Bridge in Lee County (No. 120001) is Florida's only hydraulic lift as well as the smallest lift bridge. Bridge No. 874129 in Miami-Dade County, constructed in 1927, was Florida's oldest vertical lift bridge. It was moved to its current location in 1954, at which time the counterweights were removed.

Table 4-17. Florida's Extant Movable Lift Bridges.

FDOT No.	County	Name/Route Carried/Feature Intersected	Year Built/ Recon	Engineer/ Builder	No. Approach Spans	Length Main Span (ft)	Structure Length (ft)
100920	Hillsborough	Hillsborough River Lift Bridge (T.N. Henderson Bridge)/ Hillsborough River	1939/1999	Cone Brothers	8	83	359
120001	Lee	Billy Creek	1941	C.T. Felix Const. Co.	2	42	116
720022	Duval	Main Street Vertical Lift Bridge/ St. Johns River	1941	Mt. Vernon Bridge Co.	14	365	1680
874129	Miami-Dade	Miami Canal	1927/1954	Champion Bridge Co.	0	110	110

A summary table for evaluating the significance of Florida's lift bridges is provided in **Table 4-18.**

Table 4-18. Vertical Lift Bridge Significance Table.

<table>
<tr><th colspan="3">VERTICAL LIFT - SIGNIFICANCE TABLE</th></tr>
<tr><th colspan="3">TYPES OF VERTICAL LIFT BRIDGES</th></tr>
<tr><th colspan="3">STEEL STRUCTURE</th></tr>
<tr><td colspan="3">Level of Significance & No. of Resources:
• HIGH: 4
• LOW: 0
Defining Elements*:
• lift span design and materials (incl. truss or girder)
• towers
• operational machinery</td></tr>
<tr><th colspan="3">APPLICABLE NRHP CRITERIA**</th></tr>
<tr><th>Criterion A</th><th>Criterion C</th><th>None</th></tr>
<tr><td>• Community Planning & Development
• Transportation
• Neighborhood or Barrier Island Development
• Intracoastal Waterway Development
• Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)</td><td>• Engineering
– rare surviving example of type
– early example of type
– exhibits distinct engineering elements
• Architecture
– exhibits distinct arch'l elements or embellishments
• Assc. w/a prominent builder, designer, engineer or planner</td><td>• Loss of integrity due to structural compromise/ non-historic alterations
• Unembellished w/no distinct or character defining engineering or aesthetic elements
• No significant assc. w/a prominent builder, designer, engineer or planner
• No assc. w/a listed or potentially-eligible historic district</td></tr>
</table>

* A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.

** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Swing Bridges

Currently, 11 historic highway swing bridges remain in Florida (**Table 4-19**). The majority are electrically-operated, center-bearing, standard swing bridges with a Warren truss system on the main span. Three feature bob-tailed swing spans, and four rest on rim-bearing pivots. Most of Florida's surviving swing bridges were constructed in the 1920s by nationally significant bridge building companies, such as the Austin Brothers, the Champion Bridge Company, and the Virginia Bridge and Iron Company. Three of the extant swing bridges, Fort Denaud (No. 070013), Tamiami Canal (No. 874135), and Belle Glade (No. 930072), were relocated to their current site, and several bridges have undergone major rehabilitation or reconstruction. Two swing bridges have been demolished since the 2000 survey. These include the 1926 Moss Bluff Bridge in Marion County (No. 364017), and Bridge No. 704049 in Brevard County, a 1949 swing bridge that carried CR 402 over the Indian River. The Angler Avenue Bridge over the Dania Cutoff Canal in Broward County (No. 864028/8BD4876), originally a movable swing bridge, is now fixed. The swing mechanism appears to have been completely removed and the bridge retro-fitted with girder approaches. In addition, two swing bridges are now off-system. These include former bridge No. 740055 (McArther Fishler Bridge, Nassau County, 1948); and No. 770009 (Lake Monroe Swing Bridge, Seminole and Volusia Counties, 1934).

Table 4-19. Florida's Extant Movable Swing Bridges.

FDOT No.	County	Name/Route Carried/Feature Intersected	Year Built/ Relocated / Recon.	Type	Swing Span Engineer/ Builder	No. Approach Spans	Structure Length
070013	Hendry	Fort Denaud Swing Bridge/ Caloosahatchee River	1940/1963/ 1987	Warren pony truss;rim-bearing	Powell Bros. Const. Co.	5	435
105504	Hillsborough	Columbus Drive (Michigan Ave)/ Hillsborough River	1926/2012	Deck truss; Bob-tailed; rim-bearing	Mt. Vernon Bridge Co.	11	470
170064	Sarasota	Blackburn Point Road (CR-789)/ ICWW	1925/1995	Warren pony truss; center-bearing	Champion Bridge Co.	0	142
364110	Marion	Sharpe's Ferry Bridge/CR-314/Oklawaha River	1928/1971	Warren pony truss; center-bearing	Austin Bros. Bridge Co.	3	236
704063	Brevard	Mathers Bridge/ Banana River Dr/ Banana River	1927/2005	Warren pony truss;center-bearing	Austin Bros. Bridge Co.	14	786
740008	Nassau	US-17 (SR-5)/St. Mary's River	1927/2005	Warren through truss; center-bearing	Pensacola Shipbuilding Co.	8	563
865748	Broward	Snow-Reed Swing Bridge/ SW 11 Avenue/N Fork New River	1925	Warren pony truss; rim-bearing	Champion Bridge Co.	0	150
874130	Miami-Dade	Miami River Canal Swing Bridge (NW 54th St.)	1924/1941/ 2003	Warren pony truss;bob-tailed	Champion Bridge Co.	0	112
874135	Miami-Dade	Tamiami Canal/NW South River Drive Swing Bridge	1921/1940	Warren pony truss;bob-tailed	Champion Bridge Co.	1	120
930072	Palm Beach	Belle Glade Swing Bridge/CR- 717/ Okeechobee Rim Canal	1916/1935/ 1998	Pratt deck truss; center-bearing	Virginia Bridge & Iron Co.	9	446
930940	Palm Beach	Twenty Mile Bend/ Loxahatchee Swing Bridge	1937	Warren through truss; center-bearing	State Road Department	2	221

As a rare type of movable bridge in Florida, all swing bridges are considered to be highly significant and eligible for listing in the NRHP under Criterion C in the area of Engineering. Swing bridges may also be eligible under Criterion A for their significant historical associations. A summary table for evaluating the significance of Florida's swing bridges is provided in **Table 4-20.**

Table 4-20. Swing Bridge Significance Table.

<table>
<tr><th colspan="3">SWING BRIDGE - SIGNIFICANCE TABLE</th></tr>
<tr><th colspan="3">TYPES OF SWING BRIDGES</th></tr>
<tr><th colspan="3">STEEL STRUCTURE</th></tr>
<tr><td colspan="3">Level of Significance & No. of Resources:
• HIGH: 11
• LOW: 0
Defining Elements*:
• swing span design and materials (incl. truss or girder)
• pivot pier
• operational machinery</td></tr>
<tr><th colspan="3">APPLICABLE NRHP CRITERIA**</th></tr>
<tr><th>Criterion A</th><th>Criterion C</th><th>None</th></tr>
<tr><td>• Community Planning & Development
• Transportation
• Neighborhood or Barrier Island Development
• Intracoastal Waterway Development
• Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)</td><td>• Engineering
– rare surviving example of type
– early example of type
– exhibits distinct engineering elements
• Architecture
– exhibits distinct arch'l elements or embellishments
• Assc. w/a prominent builder, designer, engineer or planner</td><td>• Loss of integrity due to structural compromise/ non-historic alterations
• Unembellished w/no distinct or character defining engineering or aesthetic elements
• No significant assc. w/a prominent builder, designer, engineer or planner
• No assc. w/a listed or potentially-eligible historic district</td></tr>
</table>

* A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.
** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

Bascule Bridges

Eighty-five bascule bridges were selected for file review and/or field survey in this update. Of these, the 1913 Kennedy Boulevard Bridge in Hillsborough County (No. 100100) is the oldest, and 25 other bascule bridges were constructed during the 1920s through 1940s. The majority (69 percent) of bascule bridges date to the 1950s and 1960s, and about half span the ICWW. Seventeen of the surveyed bascule bridges have been reconstructed, of which only two were rehabilitated within the pre-1971 period of significance for this study. Fourteen bascule bridges have been demolished since the 2000 survey, of which two were considered NRHP-eligible: the 1939 Treasure Island Causeway Bridge in Pinellas County (No. 157800), and the 1928 NW 12th Avenue Bridge in Miami-Dade County (No. 870662).

Bascule bridges are the most common of the movable bridge types in Florida. The most significant are early examples (pre-1950), especially those designed by notable engineers or engineering firms and which exhibit unique or high architectural design. In addition, a dwindling number of rolling lift bascule bridges has resulted in this type becoming significant for its increasing rarity. Florida's nine remaining rolling-lift bridges are listed in **Table 4-21.**

Twenty-one of Florida's bascule bridges are listed, determined eligible, or newly recommended eligible for listing in the NRHP. The three NRHP-listed bridges, all built in 1927, include the Bridge of Lions

(No. 780074) in St. Johns County, and two Venetian Causeway spans (Bridge No. 1 [No. 874459] and No. 10 [No. 874474]) in Miami-Dade County. Another 13 bascule bridges were determined eligible by the SHPO, including three bridges over the ICWW in Palm Beach County (Nos. 930026, 930157, and 934408), and four bridges over the Hillsborough River in Hillsborough County (Nos. 100100, 105500, 105501, and 105502).

Table 4-21. Significant Extant Movable Bascule Bridges.

FDOT No.	County	Name/Route Carried/Feature Intersected	Year Built/ Recon.	Type	Movable Span Designer	No. Approach Spans	Structure Length
100100	Hillsborough	Kennedy Blvd/ Hillsborough River	1913/ 1995	Rolling lift; double-leaf	Scherzer Rolling Lift Bridge Co.	2	322
105500	Hillsborough	Platt St/ Hillsborough River	1926	Strauss trunnion; double-leaf	Strauss Bascule Bridge Co.	8	420
105501	Hillsborough	Brorein St/ Hillsborough River	1959	Trunnion; double-leaf	Paul Smith Const. Co.	3	318
105502	Hillsborough	Cass St/ Hillsborough River	1927/ 1949	Strauss trunnion; double-leaf	Strauss Bascule Bridge Co.	10	505
105503	Hillsborough	Laurel St/ Hillsborough River	1926/ 1969	Strauss trunnion; Single leaf	Strauss Bascule Bridge Co.	10	366
460053	Bay	Frank M. Nelson, Sr. Bridge/Beach Drive / Massalina Bayou	1951	Trunnion; single leaf	Unknown	7	366
720005	Duval	SR-211/Ortega River	1927/ 1996	Rolling lift; double-leaf	American Bascule Bridge Co. and A. Bentley & Sons	26	1143
780074	St. Johns	Bridge of Lions/SR-A1A/Matanzas River	1927/ 1979/ 2004	Rolling lift; double-leaf	Virginia Bridge and Iron Co.	23	1538
860038	Broward	Davie Blvd./South Fork of New River	1960	Rolling lift; double-leaf	Powell Bros., Inc.	8	410
864071	Broward	SE 3rd Ave/New River	1960	Rolling lift; double-leaf	J.E. Greiner Co.	6	366
864072	Broward	SW 7th Ave/New River	1964	Rolling lift; double-leaf	J.E. Greiner Co.	6	366
870660	Miami-Dade	SW 1st St/Miami River	1929	Trunnion; double-leaf	Harrington, Howard and Ash	13	650
874161	Miami-Dade	NW 17st Ave/ Miami River	1928	Trunnion; double-leaf	Harrington, Howard and Ash	5	391
874459	Miami-Dade	Venetian Cswy No. 1/ICWW	1927	Trunnion; double-leaf	Raymond Concrete Pile Co.	40	2001
874474	Miami-Dade	Venetian Cswy No. 10/Biscayne Bay	1927	Trunnion; double-leaf	Raymond Concrete Pile Co.	4	303
910054	Okeechobee	US-441/US-98 (SR-700)/Taylor Creek	1948	Trunnion; single-leaf	Unknown	5	245
930005	Palm Beach	US-1/ICWW	1958	Trunnion; four-leaf	Unknown	17	842
930026	Palm Beach	George Bush Blvd Bridge/NE 8th St./ICWW	1949	Rolling lift; double-leaf	Murphy Const. Co.	4	270
930060	Palm Beach	Haven Ashe//Boca Inlet Bridge/AIA	1963	Trunnion; single-leaf; Hanover skew design	Cleary Bros. Const. Co.	11	540
930157	Palm Beach	Flagler Memorial Bridge/SR-A1A /ICWW	1938	Rolling lift; double-leaf	Nashville Bridge Co.	60	2413
934408	Palm Beach	East Camino Real/Geist Bridge/Boca Raton Club Bridge/ICWW	1939	Rolling lift; double-leaf	Cleary Bros. Const. Co.	4	256

Five other bascule bridges are newly recommended eligible under Criterion C in the area of Engineering as early and/or rare examples of their type, as well as for their associations with historically significant bridge building companies. For example, both the Frank M. Nelson, Sr. Bridge in Bay County (No. 460053) and the Laurel Street Bridge in Hillsborough County (No. 105503) are single-leaf bascules, plus the four-leaf US-1 bridge over the ICWW in Palm Beach County (No. 930005), are relatively rare types. Bridge No. 930060, constructed in 1963, is the only operable Hanover skew design bascule in the U.S. The distribution of significant bascule bridges by FDOT district is provided in **Table 4-22**.

Table 4-22. Distribution of Significant Bascule Bridges by FDOT District.

District	NRHP Listed	SHPO Determined Eligible	Newly Recommended As Eligible	Total
1	0	1	0	1
2	1	1	0	2
3	0	1	0	1
4	0	3	5	8
5	0	0	0	0
6	2	2	0	4
7	0	5	0	5
Total	**3**	**13**	**5**	**21**

In addition to their distinction in the area of Engineering, some of Florida's historic bascule bridges are also eligible under Criterion A in the areas of Transportation and Community Planning and Development. A summary table for evaluating the significance of Florida's bascule bridges is provided in **Table 4-23.**

Table 4-23. Bascule Bridge Significance Table.

<table>
<tr><th colspan="3">BASCULE BRIDGE - SIGNIFICANCE TABLE</th></tr>
<tr><th colspan="3">TYPES OF BASCULE BRIDGES</th></tr>
<tr><th colspan="3">STEEL STRUCTURE</th></tr>
<tr><td colspan="3">Level of Significance & No. of Resources:
• HIGH: Rolling Lift – 9; Trunnion - 12
• LOW: 64
Defining Elements*:
• bascule span design and materials (incl. truss or girder)
• tender station
• piers
• operational machinery</td></tr>
<tr><th colspan="3">APPLICABLE NRHP CRITERIA**</th></tr>
<tr><th>Criterion A</th><th>Criterion C</th><th>None</th></tr>
<tr><td>• Community Planning & Development
• Transportation
• Neighborhood or Barrier Island Development
• Intracoastal Waterway Development
• Other significant associations (i.e., contributing resource to a listed or potentially-eligible historic district)</td><td>• Engineering
– rare surviving example of type
– early example of type
– exhibits distinct engineering elements
• Architecture
– exhibits distinct arch'l elements or embellishments
• Assc. w/a prominent builder, designer, engineer or planner</td><td>• Loss of integrity due to structural compromise/ non-historic alterations
• Standard Plan (and not a rare surviving or early example of its type)
• Unembellished w/no distinct or character defining engineering or aesthetic elements
• No significant assc. w/a prominent builder, designer, engineer or planner
• No assc. w/a listed or potentially-eligible historic district</td></tr>
</table>

*A bridge's defining elements will always include any extant original tender stations, railings, decorative materials, architectural embellishments, and plaques. Original abutments, wingwalls, piers, and bents may be considered defining elements if they contribute to the integrity of the structure.

** The use of these *NRHP* criteria is not exhaustive. Each resource requires individual assessment which may or may not apply to other *NRHP* criteria. See the *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*.

CHAPTER 5 - DESCRIPTION OF SIGNIFICANT HISTORIC BRIDGES

INTRODUCTION

Chapter 5 includes a description of selected examples of the NRHP-listed, previously determined eligible, and newly recommended eligible historic bridges identified during this update survey (**Table 4-3**). Descriptions and evaluations of individual bridges, organized by bridge type, are followed by a description of two unique resources, a tunnel and a ferry slip. Other significant bridges, treated thematically, are described in Chapter 6.

FLORIDA'S SIGNIFICANT FIXED BRIDGES

Although Florida possesses a great number of navigable waterways, the majority of its bridges cross smaller bodies of water, rail lines, or roadways. In these cases, road builders used fixed bridges constructed of timber, steel, or concrete. Many of Florida's most distinguished truss, arch, frame, slab, beam, girder, and cable bridges, as well as culverts, are highlighted below.

Fixed Truss Bridges

Photo 5-1. Steinhatchee Springs Bridge, Lafayette County (No. 334001)

Steinhatchee Springs Bridge
Lafayette County
FDOT #334001, 8LF0021

Designed and constructed for Lafayette County in 1921 by the Converse Bridge Company of Chattanooga, the Steinhatchee Springs pony truss bridge is among the state's oldest bridges. It is the only wooden-decked version of this group that is still carrying traffic. Standing over the Steinhatchee River in the community of Steinhatchee Springs, the 223-foot long structure is composed of a 45-foot main steel truss span and nine wooden trestle approach spans. Standard features on the bridge include the channel bar top chord and end posts, steel rods for the bottom chord, diagonals and counterbracing, and the pinned connections with cotter pins. In Florida bridges, the latter feature is associated only with the Converse Bridge Company, an important bridge builder throughout the Southeast. Timber and steel piles have been added as a support for the main span. A concrete abutment stands at one end, while two concrete-filled cylinder piers support the other. The Steinhatchee Springs Bridge was reconstructed in 1989 with in-kind substructure and superstructure materials.

The Steinhatchee Springs Bridge is Florida's only intact Pratt pony truss bridge; the condition of the other bridge of this type, the 1911 Apalahoochee River Bridge (No. 324302) could not be verified. Along with the 1911 Bellamy through truss bridge in Jackson County (No bridge number), the Steinhatchee Springs Bridge represents one of only two surviving examples of the work of the Converse Bridge Company in Florida. It is also distinguished as an early example of steel truss bridge design and construction featuring thin structural steel members, pinned connections, and lally column piers. Despite alterations, this bridge was determined NRHP-eligible in the 2000 survey. It is significant under Criterion C in the area of Engineering as a rare example of a fixed Pratt pony truss bridge and for its association with the Converse Bridge Company of Chattanooga.

Photo 5-2. Blountstown Truss Bridge, Calhoun County (No. 470029)

<u>Trammel Bridge/</u>
<u>Blountstown Truss Bridge</u>
Calhoun County
FDOT #470029, 8CA0037

Improvements in the science and technology of building continuous trusses led to greater acceptance of this bridge type in the 1930s. Florida's first example was the Blountstown Truss Bridge, which carries SR-20 over the Apalachicola River, a major state waterway. This bridge incorporates two steel truss designs: through and deck.

Completed in 1938, the structure measures 8,397 feet in length. A Warren truss configuration with verticals was used to construct the secondary deck truss sections and the central through truss that spans the river channel. Concrete and steel piers support 202 steel beam approach spans that extend the structure over a bluff on the east side and across marshland on the west bank. Despite the bridge's excellent condition, the narrow roadway (26 feet in width) hindered its ability to meet modern traffic demands. In the late 1990s, the truss was raised to a greater height above the bridge deck, and an adjacent higher modern concrete bridge was constructed.

The bridge was named for Blountstown, the seat of Calhoun County, which had long sought a bridge at that site. The county and the federal government, through the Depression-era Public Works Administration, jointly funded the project, which cost approximately $936,000. The Allied Engineering Corporation provided the designs and the Wisconsin Bridge and Iron Company of Milwaukee built the structure.

The Blountstown Truss Bridge stands as a monument to Depression-era public works projects in Florida and represents the culmination of Calhoun County's drive to improve the regional economy through better transportation. The project gave work to a great number of unemployed people in a depressed area of northern Florida. By transforming SR-20 into a major secondary route between Tallahassee and western Florida, the bridge bolstered the local economy. The Blountstown Truss Bridge was determined NRHP-eligible in the 2000 survey. It is significant under Criterion A in the area of Transportation, and under Criterion C in the area of Engineering as a rare example of a fixed continuous steel through truss bridge and for its association with the Wisconsin Bridge and Iron Company. At the time of its completion, it was the "first attempt in long-span truss design in Florida." [109]

John E. Mathews Bridge
"Arlington Bridge"
Duval County
FDOT #720076, 8DU1554

Photo 5-3. Mathews Bridge, Duval County (No. 720076)

The John E. Mathews Bridge over the St. Johns River is a massive cantilevered steel, Warren through truss bridge. It measures 7,382 feet long, and consists of six main span panels and 59 steel stringer approach spans. The 810-foot cantilevered main span truss is flanked by two continuous span trusses. The bridge was designed by Reynolds, Smith and Hills (RS&H) of Jacksonville, fabricated by the Bethlehem Steel Company, and built between 1951 and 1953 by the Merritt-Chapman and Scott Corporation. The bridge was dedicated to Judge John E. Mathews, a Florida state legislator and Chief Justice of the 1955 Supreme Court, who had urged building on the site since the early 1930s and helped gather funding for construction.

In response to complaints about poor rideability, the original lightweight steel open grid deck of the main span was replaced with in-kind materials in 1997. In 2007, the grating was replaced with a solid deck surface designed by Hardesty & Hanover, LLP, RS&H, and BPA Associates, Inc. The work was done by PCL Contractors.[110]

The structure is historically notable for its type, contribution to the area's development, and landmark status in the city. The Mathews Bridge is eligible under Criterion A in the areas of Community Planning and Development and Transportation for its associations to the historic and continued development of Jacksonville. It is also eligible under Criterion C in the area of Engineering as a high-integrity example of a cantilevered steel Warren through truss bridge, and the only bridge of its type still in use. The Mathews Bridge was determined eligible for listing in the NRHP by the Florida SHPO in October 2007.

[109] Atkins, Stephen B. and William E. Keller, *Survey of Metal Truss, Swing, and Vertical Lift Bridges in Florida*, (Tallahassee, FL: FDOT, EMO, 1981).
[110] Noles, Tim, "Mathews Bridge Deck Replacement." SPANS, 5 (October 2007), 4.

Photo 5-4. Hart Bridge, Duval County (No. 720107)

Isaiah D. Hart Bridge
SR-228 over St. Johns River
Duval County
FDOT #720107, 8DU1555

This continuous steel through truss bridge carries SR-228 over the St. Johns River in Jacksonville. The four-lane, 17-span bridge has a cast-in-place concrete deck and is 3,844-feet in length. Construction began in 1964 and was complete by November of 1967. The three-span main unit over the navigational channel is 1,093-feet making it the longest bridge span of all highway bridges in Florida. It was designed by the consulting engineering firm Sverdrup & Parcel and Associates of St. Louis. The B.F. Diamond Construction Co. of Savannah built the substructure; the superstructure was built by the Allied Structural Steel Co. of Chicago.

Named for the founder of Jacksonville, the Isaiah D. Hart Bridge is the hallmark feature of the five-mile Commodore Point Expressway (aka Hart Bridge Expressway) that connects downtown Jacksonville to its southwest neighborhood. It is newly recommended as eligible under Criterion A in the areas of Community Planning and Development and Transportation for its associations to the historic and continued development of Jacksonville. The Isaiah Hart Bridge is also considered eligible under Criterion C in the area of Engineering as an exceptional example of continuous steel through truss bridge. It is one of only six through trusses verified as extant, and one of two dating to the post-World War II period.

Arch Bridges

Peace River Bridge at Arcadia
DeSoto County
FDOT #450001, 8DE0381

Photo 5-5. Peace River Bridge at Arcadia, DeSoto County (No. 450001)

In 1925, DeSoto County replaced a multiple-span, metal truss bridge with this four-span, reinforced concrete arch deck to carry old SR-18 across the Peace River at Arcadia. The original structure, abandoned for many years, now serves as a pedestrian bridge in Desoto Park. The replacement 201-foot long Peace River Bridge was designed and constructed by the Luten Bridge Company for $25,500. It included a standard solid parapet with cast-in rectangular patterns. The closed spandrel walls were most likely filled with compacted earth and rock.

The Peace River Bridge played a significant role in the transportation history of the Peace River area. It gains further merit for its association with the Luten Bridge Company. It is the largest remaining Luten bridge in Florida. Despite the bridge's alterations and its need for repair and maintenance, the structure has retained its historical physical integrity. Therefore, it was determined NRHP-eligible during the 2000 survey under Criterion A in the areas of Transportation and Community Planning and Development. It is also eligible under Criterion C in the area of Engineering as an early example of a multiple arch deck bridge constructed by the Luten Bridge Company.

Photo 5-6. Osprey Avenue Bridge, Sarasota County (No. 175950)

Osprey Avenue Bridge over Hudson Bayou
Sarasota County
FDOT #175950, 8SO2376

This 1915 bridge carries Osprey Avenue over Hudson Bayou in Sarasota. It was designed and constructed by the Luten Bridge Company. The 43-foot long, single-span, reinforced concrete arch deck bridge features a Neoclassical Revival style balustrade.

Contracted by Manatee County in 1916, before the creation of Sarasota County, the bridge carried the first Sarasota-to-Venice "hard road" (now known as Osprey Avenue). The county included this bridge as part of a large contract awarded to the Luten Bridge Company to construct bridges and culverts as part of an improved roadway to Venice. A major endeavor at the time, and in a region somewhat remote from the county seat at Bradenton, the project came under the supervision of the district Engineer-in-Chief, Charles A. Brown. The local newspaper reported that a seven-man crew, along with a foreman and superintendent, built the bridge of solid concrete, reinforced with steel barbs every 12 inches. Observing that the concrete abutments were placed on rock foundations, the newsman concluded that the structure would "stand all the ravages of time."

The Osprey Avenue Bridge represents an important early effort at road improvement between Sarasota, Osprey, and Venice and should be considered an important historic bridge. It retains its historic physical integrity and is an excellent example of pre-World War I Luten bridges. Therefore, it was determined NRHP-eligible during the 2000 survey under Criterion A in the area of Transportation and under Criterion C in the areas of Architecture and Engineering as an example of an early arch deck bridge designed with Neoclassical Revival style features by the Luten Bridge Company.

Photo 5-7. Little Payne Creek Bridge, Hardee County (No. 060034)

<u>CR-664/Little Payne Creek Bridge</u>
Hardee County
FDOT #060034, 8HR0374

This 96-foot, three-span reinforced concrete arch deck bridge crosses Little Payne Creek, west of Bowling Green. It was built by the Luten Bridge Company in 1915 for the county (then DeSoto County, before the creation of Hardee County), which also included building a bridge across Payne Creek (No. 064069). The bridge served as an improved road that connected with routes to Bradenton. Cantilevered floor beams support the deck which is wider than the arch substructure, a feature characteristic of many Luten concrete bridges. A cast-in recessed panel design appears on the solid concrete railings.

The Little Payne Creek Bridge was determined NRHP eligible by the SHPO on September 24, 2009. It is significant under Criterion C in the area of Engineering as one of Florida's earliest arch deck bridges and for its historical associations with the Luten Bridge Company, a leader in building lower cost reinforced concrete structures.

Payne Creek Bridge
Hardee County
FDOT #064069, 8HR0375

This 1920 reinforced concrete arch deck bridge carries the traffic along Northwest Hobb Road near Bowling Green. It was built by the Luten Bridge Company as part of the same contract as the Little Payne Creek Bridge. The 64-foot long structure features smooth spandrel walls, which were most likely filled with compacted earth, as well as a rectangular design on the solid parapets. The Payne Creek Bridge was determined NRHP-eligible during the 2000 survey. It is significant under Criterion C in the area of Engineering as an intact early example of arch deck bridge, and for its historical associations with the Luten Bridge Company, a leader in building lower cost reinforced concrete structures.

Photo 5-8. Payne Creek Bridge, Hardee County (No. 064069)

Photo 5-9. Myrtle Avenue Overpass, Duval County (No. 720163)

Myrtle Avenue Overpass
Duval County
FDOT #720163, 8DU17724

The iconic steel through arch Myrtle Avenue Overpass in downtown Jacksonville, built in 1955, carries I-95 over Myrtle Avenue and a railroad corridor. The main span extends 386 feet. Sixteen steel girder approach spans join the main span and bring the entire bridge length to an impressive 1,431 feet.

This bridge is one of four resources within the Interstate Highway System in Florida that has been determined eligible for listing in the NRHP. The Myrtle Avenue Overpass represents the State's only steel arch and is one of only two through arches found in Florida. In addition, it is Florida's only grade separation with an arch design. The Myrtle Avenue Overpass was determined NRHP-eligible by the SHPO in 2006.

Photo 5-10. Old San Mateo Road Bridge, Putnam County (No. 764024)

Old San Mateo Road Bridge
Putnam County
FDOT #764024, 8PU1210

The Old San Mateo Road Bridge spans Mill Creek between San Mateo and Palatka. This 1916 concrete arch deck bridge is one of the oldest examples of Daniel Luten's work in Florida. It once carried a brick road. The four-span structure extends 100 feet in length. The roadway is 16 feet wide and bordered by a solid concrete railing marked with a rectangular design. The panels are divided by short concrete pilasters so that one panel is located over each arch span.

A successful bond election in 1915 enabled Putnam County to contract with the Luten Bridge Company to build this structure in 1916, under the supervision of county engineer S.G. Stallings. Construction of the span was part of a larger project to build a brick road for a distance of approximately four miles to connect the small town of San Mateo with the county seat Palatka on the St. Johns River.

The bridge is significant for several reasons. It is among the oldest Luten bridges in Florida and represents the kind of concrete structures the Luten Bridge Company would successfully promote and build throughout the state in the 1920s. This bridge also reflects the effort of Putnam County to build permanent roads and bridges prior to World War I and before the creation of a state road department. Thus, the Old San Mateo Road Bridge was determined NRHP-eligible during the 2000 survey under Criteria A and C in the areas of Transportation and Engineering, respectively.

Photo 5-11. Moore's Creek Bridge, St. Lucie County (No. 945000)

Moore's Creek Bridge
St. Lucie County
FDOT #945000, 8SL1141

The City of Fort Pierce contracted with the Palatka office of the Luten Bridge Company in 1925 to construct this 30-foot long, single-span, reinforced concrete arch deck bridge over Moore's Creek, near the banks of the Indian River. The effort resulted in a typically attractive Luten bridge with an arch narrower than the deck, which is supported on cantilevered floor beams. An ornate concrete railing contains urn-shaped balusters, and it once held decorative light fixtures. The deck and balustrade gracefully curve over the stream. In 1990, the structure stood behind locked security gates on the grounds of a power plant and showed serious signs of deterioration.

In 1997, the City of Fort Pierce rehabilitated the structure, producing a beautiful bridge that once more represents an important landmark in the city. At the time of the rehabilitation, the substructure was in good and original condition. The rehabilitation restored the urn-shaped balusters on the bridge railings that give it a Neoclassical Revival style that, when joined to the gentle curve of the bridge arch, creates an aesthetically pleasing bridge. In addition, the rehabilitation incorporated the original bridge plate and added a new bridge plate commemorating the 1997 restoration.

The Moore's Creek Bridge is historically important as a notable example of Luten's arch deck bridges from the 1920s. Through its decorative features and its recent restoration, this bridge reflects the intention of Fort Pierce to add and maintain an attractive element to the city's riverfront.[111] It was listed in the NRHP on August 17, 2001.

Photo 5-12. Grand Canal Arch Deck Bridge, Broward County (No. 865732)

Grand Canal Arch Deck Bridge
Broward County
FDOT # 865732, 8BD3165

This 46-foot, single span, reinforced concrete elliptical arch deck bridge carries SW 18th Avenue over the Grande Canal in Ft. Lauderdale. The concrete railings feature balustrade sections alternating with solid walls, all topped by a heavy concrete cap. Its narrow arch supports a wider deck which has been cantilevered on the sides to provide for an ornamental railing and room for pedestrian traffic. The Luten Bridge Company designed and built this structure in 1925 as part of a residential development along Las Olas Boulevard, a main artery between Ft. Lauderdale's central city and the Oceanside. The bridge contributes to the architectural character of the surrounding neighborhood.

Luten reinforced concrete bridges as a group are important in the history of bridge development in Florida. They represent work by the principal builder of concrete spans in the state whose activity, in turn, reflected the efforts of state and local governments to keep up with the population growth of the 1920s. Age and type are also factors in making this bridge historically important.

The Grand Canal Arch Deck Bridge was determined eligible by the SHPO on August 11, 2000. It is significant under Criterion A in the area of Community Planning and Development for its historical associations with the finger islands of Las Olas Boulevard. It is also distinguished under Criterion C as an excellent example of a 1920s, single-span concrete arch deck bridge associated with the Luten Bridge Company. This structure also is contributing to the Las Olas Historic District.

[111] Harrington, Tim, Moore's Creek Bridge, National Register of Historic Places Registration Form, no date.

Photo 5-13. Deep Creek Arch Deck, Volusia County (No. 794081)

Deep Creek Arch Deck
Volusia County
FDOT #794081, 8VO7105

In the early 1920s, probably 1920 or 1921, Volusia County contracted with the Luten Bridge Company to build this four-span, reinforced concrete arch deck bridge on Deep Creek. The bridge once occupied a key location on a locally important roadway, called the St. Johns River Scenic Road (now CR-3) that joined DeLand and Barberville. The structure extends 108 feet in length and is 23 feet wide; each arch span measures 28 feet long. The multiple arch span features a solid concrete parapet with rectangular design. Short wing walls extend from the abutments.

The Luten Bridge Company built this structure from a design widely used by the firm throughout Florida in the 1920s. It is very similar in design and construction to the Old San Mateo Road Bridge in Putnam County, among others. Its arch deck bridges were well engineered, soundly constructed, aggressively sold, and competitively priced, all of which accounted for their popularity.

The Deep Creek Arch Deck Bridge was determined NRHP eligible by the SHPO on May 3, 2006. It is significant under NRHP Criterion A in the area of Transportation and under Criterion C in the area of Engineering as a fine example of a multiple arch span from the 1920s, as well as for its association with the Luten Bridge Company. Bridges of this age and type are a dwindling resource.

Photo 5-14. Washington Street Bridge, Orange County (No. 755806)

Washington Street Bridge
Orange County
FDOT #755806, 8OR3190

This bridge, which carries Washington Street over Fern Creek in Orlando, represents an especially nice example of a reinforced concrete arch deck bridge. It is located near a city park within an attractive, older residential section of Orlando. Three 20-foot long arches form the substructure that supports the deck, and cantilevered floor beams widen the bridge to provide walkways on both sides. The concrete railing consists of urn-shaped balusters in panels separated by low pilasters, giving the bridge a classical appearance. The style extends to the light fixtures, which are set upon tapered posts that stand on the railings at both approaches to the bridge. The brick roadway of this bridge adds an interesting aesthetic quality.

Morton Hagartney, an Orlando city engineer, designed this bridge, which was constructed in 1926 by the Concrete Steel Bridge Company of Florida. Headquartered in New York, the firm was a recognized leader in construction technology and maintained an office in Miami Beach. Thus, the Washington Street Bridge is distinguished by its type, age, decorative elements, and association with a well-known bridge building company. It gains additional value because it represents an excellent example of architectural quality and demonstrates how a bridge can achieve more than a functional role to become a central piece and distinctive asset within an urban neighborhood. It is located within the locally-designated (1994) Lake Lawsona historic district. The Washington Street Bridge was determined NRHP-eligible during the 2000 survey under Criteria A and C in the areas of Community Planning and Development, Engineering and Architecture.

Seybold Canal Bridge
Miami-Dade County
FDOT #876400, 8DA2384

Photo 5-15. Seybold Canal Bridge, Miami-Dade County (No. 876500)

In the 1910s, German-born baker and businessman John Seybold began developing one of Miami's earlier subdivisions, Spring Garden. As part of the development, probably in 1919, he built this 62-foot long concrete arch deck bridge to carry Northwest 7th Street over the Seybold Canal. This barrel arched bridge has a pronounced arched rib, and large, geometrically-shaped, concrete caps top the heavy, square abutments. The approaches that extend up to the abutments have solid concrete walls, with a panel design, and canted inward between posts. The decorative railings feature cast I-shaped balusters with concrete caps.

The Seybold Canal Bridge was determined NRHP eligible by the SHPO in 1987. It is significant under NRHP Criterion A in the area of Community Planning and Development for its association with the early suburb planned and envisioned by entrepreneur John Seybold. It is also distinguished by its age, type, and architecture, and thus, is eligible under Criterion C in the areas of Engineering and Architecture.

Sunny Isles Bridge No.2
Miami-Dade County
FDOT #874218, 8DA6433

Photo 5-16. Sunny Isle Bridge #2, Miami-Dade County (No. 874218)

This 1925 bridge is one of three that carry Atlantic Avenue over Ocean Canal in Sunny Isles Beach. The two other bridges were replaced in 1993. This 41-foot, single-span reinforced concrete arch deck bridge was designed by W.E. Reynolds to complement the Mediterranean Revival architectural theme of the area. The outer walls are faced with rubble stone, and the stuccoed, whitewashed inner surface of the railings creates a distinctive appearance.

The bridge's age and apparent use as a focal point and promotional element in the community's development contribute to this bridge's historical importance. Additionally, it maintains its historic physical integrity. This bridge was determined NRHP-eligible during the 2000 survey under Criterion A in the area of Community Planning and Development. It is also eligible under Criterion C in the areas of Engineering and Architecture as both an early example of an arch deck bridge and for its aesthetic values embodied in its rare shallow arch and limestone facing.

North Crystal Springs Bridge over Hillsborough River
Pasco County
FDOT #144002, 8PA0637

Photo 5-17. North Crystal Springs Bridge, Pasco County (No. 144002)

This 1923 concrete arch deck bridge carries North Crystal Springs Road over the Hillsborough River in Crystal Springs, Pasco County. It was designed by the Luten Bridge Company and was constructed by the Pasco County Board of County Commissioners under the direction of engineer J.W. Turner. The 167-foot reinforced concrete bridge is supported by four arches filled in with dirt. The roadway is flanked by solid parapet walls cast-in-place with a rectangular pattern seen on many bridges from this time. A plaque at the center of each railing notes the builder as the Luten Bridge Company of York, Pennsylvania.

Between 1923 and 1926, Pasco County financed a major road improvement program that included the construction of this bridge. The North Crystal Springs Bridge was determined NRHP-eligible during the 2000 survey under Criterion A for its significant historical associations with this program. It also is eligible under Criterion C in the area of Engineering as an example of a multiple-span arch deck bridge designed by the Luten Bridge Company.

Photo 5-18. Philippe Parkway Bridge, Pinellas County (No. 150009)

<u>Philippe Parkway over Mullet Creek</u>
Pinellas County
FDOT #150009, 8PI8742

This 1926 arch deck bridge carries Philippe Parkway over Mullet Creek in Safety Harbor. It was designed and constructed by the Luten Bridge Company, as designated by the plaques on the northwest and southeast corners of the railings reading "1926 Luten Bridge Co. York, PA." The 57-foot long, single-span, reinforced concrete arch deck bridge features a Neoclassical Revival style balustrade along its western railing and a simple rectangular concrete balustrade along its eastern railing. Five lampposts stand atop each railing. In 2007, the City of Safety Harbor enhanced this bridge to serve as the northern gateway into the city. These enhancements included restoring the historic appearance of the bridge, stamping the roadway surface with a brick pattern, and adding bollocks along the sidewalk to protect pedestrians from automobile traffic.

This bridge retains its historic physical integrity and is an excellent example of a Luten bridge. Therefore, it was determined NRHP-eligible during the 2000 survey under Criterion C in the areas of Architecture and Engineering as an example of an early arch deck bridge designed with Neoclassical Revival style features by the Luten Bridge Company.

Photo 5-19. Moss Rainbow Arch, Pinellas County (No. 150113)

<u>Moss Rainbow Arch</u>
Pinellas County
FDOT #150113, 8PI8730

The Moss Rainbow Arch carries Coachman Road (SR-590) over Alligator Creek. It was erected in 1927 by the Luten Bridge Company, the most active and widespread builder of concrete arch bridges in Florida through the 1920s. Made of reinforced concrete, the 37-foot long, single-span bridge uses a design in which the arch springs from the abutment and passes through the railing to cross over the waterway. Hangers suspended from the arch connect with the floor beams that support the concrete deck. While the design is believed to have the advantage of permitting the floor to expand and contract, it makes widening the roadway virtually impossible.

This rainbow arch, a type of reinforced concrete through arch, is the only one of its type in Florida. Similar bridges, including the Luten-designed Liberty Street Bridge in Jefferson County, Ohio and the Big Soldier Creek Bridge in Shawnee County, Kansas are among the few surviving examples of this type nationwide.112 As a bridge form, the rainbow arch, also known as the Marsh arch, primarily owed its design and promotion, as well as its construction in various states of the Midwest, to engineer and bridge builder James Marsh of Iowa. Although the Luten Bridge Company seems to have constructed a number of rainbow arch bridges in southeastern states, including Virginia and West Virginia, the use of this design by Luten was surprising given that Luten and Marsh were great rivals in bridge building, as well as personal foes. They battled long and hard in the courts about patent rights on concrete designs and quarreled about proper conduct by professional men.

The Moss Rainbow Arch retains its historic physical integrity, and was determined NRHP-eligible during the 2000 survey. It is considered eligible under Criterion C in the area of Engineering as the only example of a through arch in Florida and for its association with the Luten Bridge Company, and under Criterion C in the area of Architecture for the aesthetics of its design.

<u>Luten "Half-Arch" Bridge</u>
Pinellas County
FDOT #159901, 8PI8749

Photo 5-20. Luten "Half-Arch" Bridge, Pinellas County (No. 159901)

A unique and historically important bridge stands on a private drive over Ike's Creek (now Golf Course Creek) in Belleair. Built in 1915 by the Luten Bridge Company, it once controlled the entranceway to the 600-room Belleview Hotel – a vast, luxurious resort developed by railroad magnate Henry B. Plant. The complex later became the Belleview Biltmore Casino, regarded by many as the grandest resort on Florida's Gulf Coast.

In what was then an experimental project, pioneer designer and builder of reinforced concrete bridges Daniel B. Luten constructed the bridge with a 46-foot main span and two half-spans of 23 feet each. While the half-arches appear to be cantilevered, Luten made them as true arches, meaning they are supported by abutments. He claimed to have achieved stability, greater efficiency in the use of materials, as well, as a more pleasing appearance in crossing the ravine at Belleview. It is not known if he built any others like this in the nation. No others are believed to have been built in Florida.

Keeping with Luten's desire for an artistic appearance, the structure possessed a classical balustrade and decorative lampposts at each corner of the entrances. Later, perhaps at the time a new bridge was built

[112] "Historic Bridges of the U.S." Accessed at: www.bridgehunter.com.

immediately adjacent to it, the original railings were removed and replaced with a modern type. Dense undergrowth obscures the structure.

Because of its cultural and technical worth, the structure rates as a principal historic bridge in Florida. It is a demonstration of the unique and experimental half-arch construction undertaken by an important Florida bridge builder. The highly visible role assigned the bridge at the entrance to the Belleview Hotel gives it additional importance. Despite the removal of the original railing and the construction of the new adjacent bridge, the significant substructure remains undisturbed. The Luten Half-Arch Bridge was determined NRHP-eligible during the 2000 survey under Criteria A and C in the areas of Community Planning and Development and Engineering and Architecture, respectively.

Frame Bridges

Atlanta and St. Andrews Bay Railway Frame Bridge
Jackson County
FDOT #530003, 8JA1849

This 1940 rigid frame bridge carries the present-day Bay Line Railroad corridor over US-90/SR-10 in Cottondale, Jackson County. It was constructed by the Atlanta and St. Andrews Bay Railway. The bridge features a single 52-foot reinforced concrete slab span cast in place with its two abutments and wingwalls. A slotted railing, typical of the era, flanks the railroad deck. A Masonry Vernacular style control house is located on the northwest side of the bridge.

Photo 5-21. Atlanta and St. Andrews Bay Railway Frame Bridge, Jackson County (No. 530003)

Completed in 1908, the Atlanta and St. Andrews Bay Railway ran between Panama City and Dothan, Alabama. It provided connections to the Louisville and Nashville, Central of Georgia, and Atlantic Coast Line railroads. The line was renamed the Bay Line Railroad in 1994.

This bridge is newly recommended as NRHP-eligible. It is significant for its role in railroad transportation history, and thus, meets NRHP Criterion A in the area of Transportation. As one of the oldest remaining early examples of this bridge type, and one of only two rigid frame bridges in Florida, it also is significant under Criterion C in the area of Engineering as a rare example of its type.

Slab Bridges

Photo 5-22. CR-721A over Harney Pond Canal, Glades County (No. 054015)

CR-721A over Harney Pond Canal
Glades County
FDOT #054015, 8GL0458

This 1958 prestressed concrete slab bridge carries CR-721A over Harney Pond Canal near Moore Haven in Glades County. The five-span bridge has a precast concrete panel deck and is 170 feet in length. One of more than 570 prestressed concrete bridges identified in this study, the CR-721A Bridge is considered the best example of its kind, and distinguished by its high integrity. Most bridges of this type have been compromised by maintenance and safety upgrades through the addition of guardrails, lighting and other features, and/or are in a compromised setting. The CR-721A bridge is newly recommended NRHP-eligible under Criterion C in the area of Engineering as an early example of a prestressed concrete slab bridge that retains its integrity.

Hill Road over Little Mills Creek
Nassau County
FDOT #744006, 8NA1246

Photo 5-23. Hill Road over Little Mills Creek, Nassau County (No. 744006)

This 1931 wood slab bridge carries Hill Road over Little Mills Creek near Callahan in Nassau County. It is the only remaining historic timber slab bridge in Florida that retains its integrity. This two-span bridge has a vertically-laid wood slat deck and is 40-feet in length. It features a wooden post and lintel railing, and is supported by circular wooden posts with cross-bracing. Although reconstructed in 1982, work was done with in-kind materials and construction methods. Thus, the bridge retains its historic and structural integrity, and is newly recommended NRHP-eligible under Criterion C in the area of Engineering as the only remaining example of its type.

<u>Old US-17 over Crescent Lake Outflow</u>
Putnam County
FDOT #764044, 8PU1631

Photo 5-24. Old US-17 over Crescent Lake Outflow, Putnam County (No. 764044)

This 1922 concrete slab bridge carries Old US-17 (historic State Road No. 3) over Crescent Lake Outflow near Crescent City in Putnam County. It is the only historic concrete slab bridge constructed in Putnam County prior to 1954. The other remaining historic bridges are common concrete slab bridges built in the 1950s. This 42-foot long, two-span bridge has a cast-in-place concrete deck. Rectangular recessed panels decorate the solid concrete railings, a typical feature of bridges from the 1920s. It was constructed by the Florida Engineering and Contracting Company of Oviedo, and designed by state highway engineer, W. F. Cocke, and bridge engineer James A. Mortland.

The historic bridge plaque commemorates its construction by the State Road Department in cooperation with the U.S. Bureau of Public Roads. The Old US-17 Bridge is newly recommended as NRHP-eligible under Criterion C in the area of Engineering as the only early example of a reinforced concrete slab bridge in Putnam County that retains its integrity.

Tee-Beam Bridges

Photo 5-25. Whitaker Bayou Bridge, Sarasota County (No. 175660)

<u>Whitaker Bayou Bridge</u>
Sarasota County
FDOT #175660, 8SO2375

This 1926 concrete tee-beam bridge carries Riverside Drive over Whitaker Bayou in Sarasota County. It was designed and built by the Luten Bridge Company. The decorative railings exhibit Neoclassical Revival style urn-shaped balusters. This early example of a concrete tee-beam bridge is newly recommended NRHP-eligible under Criterion C in the areas of Engineering and Architecture. It is distinguished by its age, type, and association with the Luten Bridge Company.

<u>Hanson Bayou Bridge</u>
Sarasota County
FDOT #170060, 8SO2373

This 1928 concrete tee-beam bridge carries Siesta Drive over Hanson Bayou in Sarasota County. The railings exhibit Neoclassical Revival style urn-shaped balusters. It is newly recommended NRHP-eligible under Criterion A in the area of Community Planning and Development for its association with the development of Siesta Key. It is also eligible under Criterion C in the areas of Engineering and Architecture as an example of an early concrete tee-beam with an aesthetically pleasing decorative railing.

Photo 5-26. Hanson Bayou Bridge, Sarasota County (No. 170060)

Photo 5-27. Myrtle Avenue Bridge, Duval County (No. 724258)

<u>Myrtle Avenue Bridge</u>
Duval County
FDOT #724258, 8DU11915

This 39-foot long, concrete tee-beam bridge, completed in 1930, carries Myrtle Avenue over McCoy Creek in Jacksonville. Though of standard design and construction methods, it is distinguished as a high integrity example of its type that features a concrete railing with a unique stylized Maltese Cross pattern in each panel, the hallmark of district bridge engineer T.B. Carrick. Carrick's bridges are becoming increasingly rare due to bridge replacement or maintenance alterations. For example, of the group of five Carrick-designed bridges built along Old Kings Road during the mid-1920s, four (FDOT #s 724072, 724180, 724181, and 724182) have been replaced. Thus, the Myrtle Avenue Bridge is among the few remaining examples of its type which embody the work of Carrick. It was determined NRHP-eligible during the 2000 survey under Criterion C in the areas of Engineering and Architecture for its age, type, aesthetics and association with T.B. Carrick.

Photo 5-28. SR-109/University Avenue over SR-10A, Duval County (No. 720075)

<u>SR-109/University Avenue over SR-10A</u>
Duval County
FDOT #720075, 8DU21151

This 1952 reinforced concrete tee-beam bridge carries SR-109/University Blvd. over SR-10A/Arlington Expressway in Jacksonville. The four-span bridge has a cast-in-place concrete deck and is 196-feet in length. The bridge railing and support piers feature the stepped and rounded forms and triple-striped decorative elements characteristic of the Art Deco movement. The bridge railing has stepped segmental arch piers where the slotted concrete railing integrates with the substructure. The support piers also have shallow arched voids. These decorative elements are distinct from common AASHTO bridges of this period.

The bridge remains in good condition and possesses unique architectural detailing which distinguishes it from other bridges of its type and age. Therefore, it is newly recommended NRHP-eligible under Criterion

C in the area of Architecture for its embodiment of Art Deco detailing applied to a high-integrity concrete tee-beam bridge.

Ten Mile Creek Bridge
Levy County
FDOT #340045, 8LV0513

This 1933 reinforced concrete tee-beam bridge carries CR-336 over Ten Mile Creek near Inglis in Levy County. It is the only 1930s bridge of its type in Levy County, and one of only 11 unaltered historic 1930s concrete tee-beam bridges remaining in Florida.

The historic plaque commemorates the bridge construction which was a joint effort between the State Road Department and the U.S. Bureau of Public Roads.

Photo 5-29. Ten Mile Creek Bridge, Levy County (No. 340045)

The bridge is newly recommended NRHP-eligible under Criterion A in the area of Transportation for its historical associations with the Florida State Road Department and the U.S. Bureau of Public Roads. It also is eligible under Criterion C in the area of Engineering as a high integrity example of a reinforced concrete tee-beam bridge in rural Levy County.

Photo 5-30. US-90 over Macavis Bayou, Santa Rosa County (No. 580013)

US-90 (SR-10) over Macavis Bayou
Santa Rosa County
FDOT #580013, 8SR1930

This 1937 reinforced concrete tee-beam bridge carries US-90 (SR-10) over Macavis Bayou, just east of Milton. The Tidewater Construction Company and the George D. Auchter Construction Company built this bridge from approved State Road Department plans. At 264 feet long, this eight-span bridge features a cast-in-place concrete deck with a tee-beam superstructure. The cast concrete railings along the deck feature a slotted design often seen in 1930s bridges in Florida. The bridge is supported by seven precast concrete pile bents.

The construction of the US-90 (SR-10) Bridge over Macavis Bayou was part of a larger $225,000 road and bridge project undertaken east of Milton in the 1930s, which also included the relocation of a portion of SR-1, the construction of an overpass (no longer extant) that carried SR-1 over the L&N Railroad corridor, and the dredging of Macavis Bayou (then called Marquis Bayou). This bridge was determined NRHP-eligible by the SHPO on January 25, 2010. It is significant under Criterion A in the area of Community Planning and Development.

Poinsettia Avenue Bridge
Orange County
FDOT #755807, 8OR6033

This 1942 concrete tee-beam bridge carries Poinsettia Avenue over Lake Ivanhoe in Orlando. It was determined NRHP eligible by the SHPO in January 2007. The bridge is significant under Criterion A in the areas of Community Planning and Development and Transportation for its historical associations with the development of the historic residential College Park neighborhood and for its association with the WPA. According to historian Eve Bacon, the 30-foot bridge was constructed across the west end of Lake Ivanhoe as part of an Ivanhoe Park beautification program begun by WPA workers.

Photo 5-31. Poinsettia Avenue Bridge, Orange County (No. 755807)

Photo 5-32. Lake Conway Bridge, Orange County (No. 755100)

Lake Conway Bridge
Orange County
FDOT #755100, 8OR8339

This 1926 continuous concrete tee-beam bridge carries Nela Avenue over the Lake Conway Connector in Belle Isle, Orange County. It is one of only 18 bridges of its type in Florida, and the only historic continuous concrete tee-beam bridge in District 5. The bridge features arched closed spandrels and slotted concrete railings. In 1986 and 2000, rehabilitations included structural improvements, in-kind light replacement, a brick-paved deck, and commemorative plaques.

This bridge is newly recommended NRHP-eligible under Criterion C in the area of Engineering as a high integrity example of a 1920s continuous concrete tee-beam bridge.

Photo 5-33. Indian Creek Bridge, Miami-Dade County (No. 876100)

Indian Creek Bridge
Miami-Dade County
FDOT #876100, 8DA6439

The 1930 Indian Creek Bridge carries Surfside Boulevard over Indian Creek, providing access to the village of Indian Creek, an island community in Biscayne Bay. Designed by engineer Richard A. Belsham with assistance by construction architect Robert A. Taylor, both local men, the structure was built for the Indian Creek Golf Club. Construction was undertaken by the R. G. Lassiter Company of North Carolina, whose president, Robert G. Lassiter, owned a home in the Miami Beach area and may have been a club member.

A 13-span, 367-foot long reinforced concrete tee-beam bridge, the Indian Creek Bridge represents a common bridge type of its time. Designers lavished attention on the aesthetic qualities of the bridge, transforming a technologically standard bridge type into an impressive architectural structure. The outermost concrete beams are arched and the central span has been lengthened to suggest a stylized bascule. Extending up the face of the bridge are pilasters that connect the piers to the short, square columns that form a part of the ornate railings. Tapered pylons stand on top of each column, and alternating pylons function as light fixtures. The railings feature a Neoclassical Revival style motif, with urn-shaped balusters topped by a heavy concrete cap.

The Indian Creek Bridge is a historically important structure. It represents a superior example of decorative architectural treatment of a standard concrete bridge. In addition, its age, prominent place in the Indian Creek community, and construction by an important builder substantially enhance its value. The bridge retains its historic physical integrity. Therefore, it was determined NRHP-eligible during the 2000 survey under Criteria A and C in the areas of Community Planning and Development, as well as Architecture and Engineering, respectively.

Snell Isle Bridge
Pinellas County
FDOT #157191, 8PI8748

Photo 5-34. Snell Isle Bridge, Pinellas County (No. 157191)

The Snell Isle Bridge carries Snell Island Boulevard over Coffee Pot Bayou in St. Petersburg. The designer/builder is unknown. The 216-foot structure consists of six concrete tee-beam girder approach spans and a main steel, double-leaf bascule central span measuring 65 foot long. The bascule has been locked in a closed position. Built in 1928 to serve a growing residential area, the bridge exhibits a number of elegant architectural features, including curved brackets that support the railings of sculpted balusters, arched girders, textured fascia, and gracefully curved entrances. Short, squat columns anchor the balustrade; the columns originally supported eight tall lampposts. The Snell Isle Bridge was renovated in 1981 and reconstructed in 1996. It is historically important because of its age, its original bascule technology, and for the effective way it expresses the classical architectural treatment favored by many Florida developers during the 1920s. Therefore, it was determined NRHP-eligible during the 2000 survey under Criterion C in the areas of Engineering and Architecture.

Burlington Avenue Bridge
Pinellas County
FDOT #157127, 8PI8747

Photo 5-35. Burlington Avenue Bridge, Pinellas County (No. 157127)

This small, standard reinforced continuous concrete tee-beam bridge, which carries Burlington Avenue over Booker Creek, was built by the City of St. Petersburg in 1942. It measures 51 feet long. The railing panels on each side of the central pilaster exhibit typical features of the Art Moderne architectural style: curved ends and horizontal lines in the walls. The Art Moderne styling makes the bridge unique in Florida, particularly since the removal of the NW 27th Avenue Bridge in Miami.

Although the structure is a standard tee-beam type, the bridge should be considered an important historic resource because of its architectural styling. The Burlington Avenue Bridge retains its historic physical integrity, and was determined NRHP-eligible during the 2000 survey under Criterion C in the area of Architecture.

Box Beam Bridges

Photo 5-36. SR-115A Flyover to SR-10A, Duval County (No. 720100)

SR-115A Flyover to SR-10A
Duval County
FDOT #720100, 8DU21149

Improvements and innovations to transportation engineering and design included the introduction of the flyover. The introduction of this bridge type connects two roadways and crosses an existing roadway. It is often included at urban interchanges where space constraints exist and/or there are multiple roadways to connect at a critical transportation juncture. This 1961 flyover connects SR-115A to SR-10A over Gator Bowl Blvd. and the Martin Luther King Jr. Parkway in downtown Jacksonville.

This small, reinforced concrete box beam bridge measures 545 feet in length. It features typical mid-century railings and a cast-in-place concrete deck. This structure is notable as Florida's earliest box beam, a type that did not become common until the 1980s. Similarly, the use of reinforced concrete appears to be unique, as this material presents construction challenges for this bridge type. Casting reinforced concrete in place in a continuous arced form is counterintuitive as concrete does not like to bend. This material constraint undoubtedly presented some construction challenges. For this reason, most box beams today are constructed of steel, a material with more malleable properties.

The SR-115A Flyover is newly recommended NRHP-eligible under Criterion A in the area of Transportation and under Criterion C in the area of Engineering as an early excellent example of reinforced concrete box beam that retains its integrity. It is one of three bridges of its type in Florida that date to the 1960s, and is the earliest of the three.

Girder Bridges

Photo 5-37. Haines City Overpass, Polk County (No. 165700)

<u>Haines City Overpass</u>
Polk County
FDOT #165700, 8PO3013

The Haines City Overpass carries Lilly Avenue over the Atlantic Coast Line (ACL) Railroad corridor in Haines City, Polk County. It was constructed in 1927 as a joint project between Haines City and the ACL Railroad. The 125- feet long, three-span steel girder features a concrete deck and railings with rectangular recessed panels; this decorative element commonly appeared on bridges at that time.

The Haines City Overpass exhibits a graceful arched look that sets it apart from most railroad overpasses. Though conventional in engineering and construction, the overpass appears to be the oldest example of a grade separation remaining in Florida, and retains its historic physical integrity. The Haines City Overpass was determined NRHP-eligible during the 2000 survey under Criterion A in the area of Transportation.

<u>SR-78 over Kissimmee River Bridge</u>
Okeechobee County
FDOT #910009, 8OB0321

Photo 5-38. SR-78 Bridge, Okeechobee County (No. 910009)

This 1964 continuous steel girder bridge carries SR-78 over the Kissimmee River near Okeechobee at the Okeechobee and Glades County Line. It was designed and built by the U.S. Army Corps of Engineers. The 665-foot long bridge includes eight approach spans and one main span, and has concrete post and lintel railings typical of midcentury bridges. The cast-in-place concrete deck features a removable span (**Photo 5-39**) with a metal deck supported by a concrete girder superstructure. The nine girder spans are supported by a substructure of bents featuring two strutted columns topped by a single cap and supported by piles. The abutments consist of mounded fill topped with mixed graded gravel. The SR-78 Bridge also features an

Photo 5-39. SR-78 Bridge (No. 910009) - Removable Span

early form of a strutted pier, an engineering development that provides additional lateral bracing in the event of a flood. This continuous strut also serves as a hydraulic guide wall to funnel water and debris which could collapse a bridge in the event of a flood. Pier struts have since changed from solid walls to slimmer, horizontal braces.

The SR-78 Bridge over the Kissimmee River in Okeechobee County is an excellent example of a continuous steel girder bridge that also includes a removable deck and early-form strutted piers, elements intrinsic to a bridge over a channel designed for both navigable and hydrological purposes. The SR-78 Bridge is newly recommended eligible for listing in the NRHP under Criterion A in the areas of Community Planning and Development and Transportation and under Criterion C in the area of Engineering as a high integrity example of a continuous steel girder bridge that contains a removable span and an early form of strutted piers.

Photo 5-40. US-1/SR-5 Bridge over Miami Road, Looking Southwest, Duval County (No. 720087)

<u>US-1/SR-5 over Miami Road</u>
Duval County
FDOT #720087, 8DU21150

This 1968 continuous steel girder bridge carries US-1/SR-5 over Miami Road in downtown Jacksonville. Engineered by C.P. Coker and constructed by the Wainer Construction Company, it measures 984 feet in length and incorporates 16 concrete spans with a cast-in-place concrete deck.

Although continuous steel girder bridges are a common type, the US-1/SR-5 Bridge is distinguished by its elevated design, incorporated brick-paved plazas, and forced perspective vantage point created by its pier configuration. Each of these elements is significant in its own right; together they create a bridge design with distinct modern architectural influences. The elevated rather than at-grade design, as well as the brick-paved plazas, are uncommon and expensive features. The plazas beneath an elevated bridge encourage the use of this space for more than pedestrian traffic. Also noteworthy are the pier configuration and style, which represent a major divergence from the typical AASHTO girders. The girder design features a clean, rectilinear form indicative of a modernist influence. Similarly, a forced perspective which manipulates visual perception is formed by the voids between the pier columns due to their design and configuration. Knowing “the spaces along an under elevated highways affect the way we experience (a) city,” it is obvious the space beneath this bridge was

Photo 5-41. Plaza beneath Bridge No. 720087, Duval County

specifically designed to counteract the undesirable views and physical and psychological barriers that plagued similar urban bridges.[113] Incorporating a pleasant pedestrian experience and a multi-purpose space beneath this bridge creates an aesthetic experience which not only deters unwanted activity beneath it, it positively affects the value of adjacent properties and the psychological demeanor of its passersby.

This bridge is newly recommended NRHP-eligible under Criterion A in the areas of Community Planning and Development and Transportation for its significant associations with the urban development of Jacksonville. It is also eligible under Criterion C in the area of Architecture for its high-integrity embodiment of modern architecture in bridge design.

SR-A1A over Sebastian Inlet
James H. Pruitt Memorial Bridge
Indian River County
FDOT #880005, 8IR1493

The 1964 prestressed concrete girder James H. Pruitt Memorial Bridge carries SR-A1A over the Sebastian Inlet near Vero Beach in Indian River County. It was built by the Clearly Brothers Construction Co. The 19-span bridge extends 1548 feet in length, and features lightweight concrete prestressed side spans of 100 feet and a main span of 180 feet.

Photo 5-42. SR-A1A over Sebastian Inlet, Indian River County (No. 880005)

The superstructure of the three-span main unit is made of variable depth I-girders. Each line of the I-girders is made of five precise beam elements whose end beams reach from the side piers to splice locations 35 feet from the main piers. The 65-foot long cantilever beams located over the channel piers vary from six- to nine-feet in depth and are spliced with the end beams and cantilever 30 feet into the main span. The fifth beam is a 120-foot

[113] Irizarry, Ramón. *Restructuring the Spaces under Elevated Expressways: A Case Study of the Spaces Below the Interstate-10 Overpass at Perkins Road in Baton Rouge, Louisiana*. Accessed at: http://etd.lsu.edu/docs/available/etd-0530103-085516/unrestricted/Irizarry_thesis.pdf.

pretensioned drop-in beam supported by cantilever beams resting on the main piers. The end beams of the side spans and the drop-in span were designed to be entirely pretensioned with ½-inch diameter straight and deflected strands. The variable depth portion that cantilevers over each pier was designed to be post-tensioned using 15 tendons. The tendons draped over the top at the pier and anchor at the ends of the variable depth cantilever portion. Two of these tendons were to be post-tensioned after casting for shipping and erection, and the rest were post-tensioned in phases as the construction of the deck proceeded. During construction, the contractor made use of special provisions that permitted changing the prestressing of the variable depth members from post-tensioned to pretensioned.[114]

According to the *New Direction for Florida Post-Tensioned Bridges* published for the FDOT in 2002, the Sebastian Inlet Bridge represents a significant early post-tensioned bridge design in Florida although it was eventually built as a pre-tensioned bridge. Therefore, the Sebastian Inlet Bridge is newly recommended NRHP-eligible under Criterion C in the area of Engineering for its high-integrity embodiment of a prestressed concrete bridge in Florida.

CR-316 over Proposed Cross Florida Canal
Marion County
FDOT #364040, 8MR3585

This 1969 continuous steel girder bridge carries CR-316 over the proposed Cross Florida Canal near Fort McCoy in Marion County. It was designed and built by the U.S. Army Corps of Engineers. The bridge incorporates 52 concrete approach spans and three main spans with a cast-in-place concrete deck; it measures 4,449 feet in length. The bridge features a vertical clearance of nearly 150 feet, which allows the structure to have a low environmental impact on the natural resource below and around it, the Ocala National Forest.

Photo 5-43. CR-316 over Proposed Cross Florida Canal, Marion County (No. 364040)

This structure is a remarkable example of an ordinary bridge elevated to a higher status for the design of its "common" components within its natural setting. Most bridges of this type span large bodies of water like the St. Johns or Hillsborough Rivers whereas this one spans a forest. Nestled in the southwest corner of the Ocala National Forest, experiencing the approach with its apparent vanishing point and suspended feeling above the forest canopy at its crest is memorable. The selection of this bridge design not only respects its natural surroundings but was also done in anticipation of the proposed Cross Florida Barge Canal. Although never completed, the Cross Florida Barge Canal was intended to cross northern Florida, connecting the Gulf Intracoastal Waterway with the Atlantic Intracoastal Waterway. Authorized by

[114] Corven Engineering, Inc., *New Directions for Florida Post-Tensioned Bridges – Volume 1 of 10: Post-Tensioning in Florida Bridges.* Tallahassee, FL: Corven Engineering, Inc., 2002. pp.7-8.

Congress in 1942, construction of the canal did not begin until 1964. The project was halted by President Nixon in 1971 after several lawsuits based on environmental concerns were filed seeking an injunction to the project. About 25 miles of the 110-mile project were built: the cross-country section from the St. Johns River to the Ocklawaha River, part of the route along the Ocklawaha River, and a small section at the Gulf of Mexico ending at the dammed Lake Rousseau. The completed infrastructure included three of the five planned locks, all three planned dams, and four of the 11 planned bridges. High bridges like this one were built over the canal, as well as several over the Ocklawaha River where it was not widened to the canal.[115]

This bridge exists as a living relic to the planned endeavors of Congress to connect the Gulf and Atlantic Intracoastal waterways through the Cross Florida Barge Canal. It remains one of the four constructed bridges for the project. The bridge is newly recommended NRHP-eligible under Criterion A in the areas of Community Planning and Development and Transportation for its association with the proposed Cross Florida Barge Canal. It is also eligible under Criterion C in the area of Engineering as a high integrity example of a continuous steel girder bridge.

Photo 5-44. SW 117th Avenue Bridge, Miami-Dade County (No. 874307)

<u>SW 117th Avenue Bridge over North Canal</u>
Miami-Dade County
FDOT #874307, 8DA11918

This 1937 through girder bridge carries SW 117th Avenue over the North Canal (C-104) near Homestead. The single 51-foot span carries a cast-in-place concrete deck between two simple steel girders, which also serve as the bridge railings. The bridge rests on rubble and poured concrete retaining walls. The non-navigable North Canal predates the 1948 U.S. Army Corps of Engineers' Central and Southern Florida flood control project, but was later incorporated into this system. This may be Florida's only remaining steel through girder bridge that is used to carry automobile traffic. The SW 117th Avenue Bridge appears to retain its historic physical integrity. Therefore, this bridge is newly recommended NRHP-eligible under Criterion C in the area of Engineering as a rare example of its type.

[115] Department of the Army, *Cross Florida Barge Canal Restudy Report Summary* (Jacksonville, FL: Jacksonville District Corps of Engineers, 1976), 1, 7.

Cable Bridges

Hal Adams Bridge
Lafayette County
FDOT #330009, 8LF0022

Photo 5-45. Hal Adams Bridge, Lafayette County (No. 330009)

Florida added its only suspension bridge to the highway system in 1946-1947 when the L.J. and W.J. Cobb Construction Company of Tampa built the Hal Adams Bridge over the Suwannee River near Luraville in Lafayette County. Hal Adams was a veteran circuit court judge from northern Florida. This structure replaced a 40-year-old, multiple-span through truss bridge on the site where a ferry previously had operated. Measuring only 420 feet between the towers, this bridge is small among structures of this type. Nevertheless, it makes an impressive appearance in its rural, forested setting on the road between Mayo and Live Oak.

Designers in the State Road Department's engineering division chose the suspension type because of the unstable river bottom and deep potholes that made setting foundations difficult. The suspended span utilizes a Warren-type stiffening truss. Four steel beam towers, approximately 50 feet high and braced by cross girders, support steel wire cables which are fastened to steel shoes embedded in concrete anchorages. Although placed within the area between the anchorages and the towers, the approaches themselves are not suspended. The south end rests on the embankment, while the northern approach consists of eight concrete girder spans on concrete supports. Because of this arrangement, the cables extending between the towers and the anchors have differing lengths and angles, a distinguishing feature of this bridge.

The Hal Adams Bridge is distinguished by its high-style, technologically-advanced design applied to a small scale. This bridge was determined NRHP-eligible during the 2000 survey under Criterion C in the area of Engineering as the only suspension span bridge in Florida.

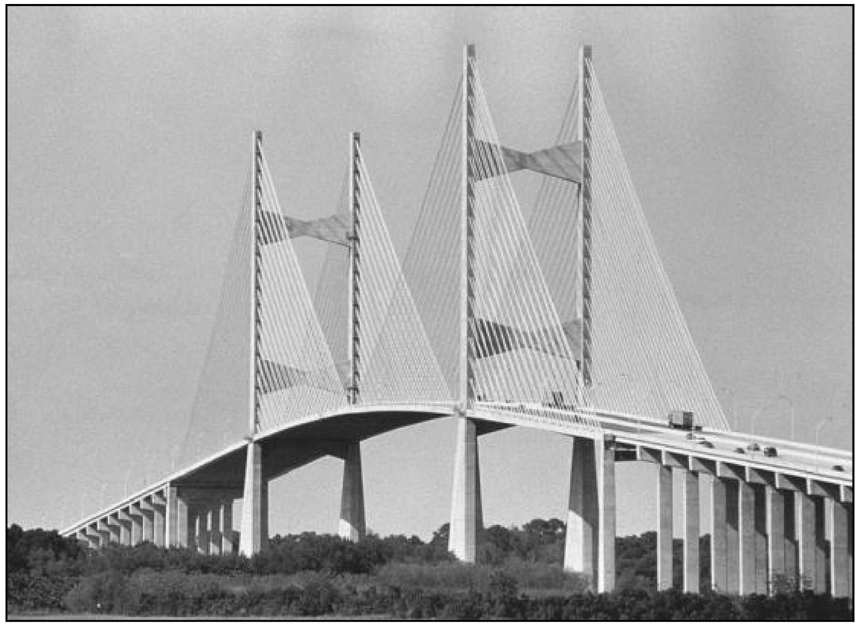

Photo 5-46. Dames Point Bridge, Duval County (No. 720518)

Napoleon Bonaparte Broward Bridge
"Dames Point Bridge"
Duval County
FDOT #720518, 8DU21148

The Napoleon Bonaparte Broward Bridge at Dames Point spans the St. Johns River northeast of downtown Jacksonville. Two miles long and 175 feet above the main channel of the river, the Napoleon Bonaparte Broward Bridge connects northern Duval County with the Arlington and Beaches area of Jacksonville via SR-9A. In 1979, the Jacksonville Transit Authority hired Howard, Needles, Tammen and Bergendoff (HNTB) to design the main span. HNTB, in consultation with Dr. Ulrich Finsterwalker, developed the cable-stayed design. In 1985, the contract for bridge construction was awarded to the joint-venture contractor Pensacola-Tyger.[116] Opened to traffic in 1989, it is a distinguished example of the simplicity of the cable-stayed bridge.

The central span of the bridge is 1,300 feet between the two "H-shaped" towers, which are 471 feet above the waterline at the top. The towers "embody some very architecturally pleasing shapes with rectangular columns having their main axis rotated from an east-west orientation at the water and twisting through a 90 degree arc as they rise to a north-south orientation at the deck."[117] The concrete and steel deck is suspended by 168 steel cables that extend from the towers and connect to the edge girder of the span at 35-foot intervals. The cables consist of steel cable sheathed within steel pipe.

It is the second cable-stayed bridge to be built in Florida. Until 2003, when the Sidney Lanier Bridge in Brunswick, Georgia was completed, the Napoleon Bonaparte Broward Bridge at Dames Point was the only bridge in the United States to feature the harp (parallel) stay arrangement on two vertical planes, a design that rivals suspension bridges for strength and beauty. While this bridge is less than 50 years old, it has been excluded by the FHWA from the Advisory Council for Historic Preservation's Section 106 Exemption Regarding Effects to the Interstate Highway System, and it is eligible for listing in the NRHP under Criteria C in the area of Engineering. Because it has achieved exceptional significance within the past 50 years, Criterion Consideration G applies.

[116] "Keeping Up Your End," *SPANS* (Volume 4, July 2006), 1-3.
[117] "Keeping Up Your End," 2000, 2.

Photo 5-47. Bob Graham Sunshine Skyway Bridge (No. 150189)

Bob Graham Sunshine Skyway Bridge
Pinellas and Manatee Counties
FDOT #150189, 8PI11962, 8MA1798

The 1986 Bob Graham Sunshine Skyway Bridge carries I-275 over Tampa Bay to link Pinellas and Manatee Counties. Construction began in 1982 and was completed in February 1987 at a cost of $244 million. The bridge was opened to traffic on April 20, 1987. The new Sunshine Skyway Bridge replaced the original 1954 steel cantilevered truss bridge, and its sister bridge, added to the east in 1971, following the partial collapse of the 1971 southbound main pier resulting from the May 9, 1980 collision of the Summit Venture freighter. The approach spans of the 1954 northbound and 1971 southbound bridges are used as fishing piers.

The Sunshine Skyway Bridge is 29,040 feet in length, with a main span measuring 1,200 feet and a vertical clearance of 193 feet. Eight approach spans fabricated from precast concrete flank the cable-stayed spans, four at each side. The main span features 21 steel cables in a harp design, which carry the weight of the structure. The cables are encased in yellow-painted steel pipes. It is one of the first cable-stayed bridges constructed with the cables attached at the center of the roadway instead of at the outer edges. It was awarded the Presidential Design Award from the National Endowment for the Arts in 1988.

The new bridge features a precast deck superstructure designed by the renowned Figg & Muller Engineering Group and built by the American Bridge Company. It includes a bridge protection system designed by Parsons Brinckerhoff. This protection system consists of large concrete bumpers, called dolphins, located around the piers and designed to withstand an impact from an 87,000-ton tanker traveling at 10 knots.

Several significant modern bridges in Florida were designed by Eugene C. Figg. He graduated in 1958 from The Citadel, the military university in South Carolina, and was introduced to prestressed concrete by William Dean, then the chief engineer for FDOT, during a three-year bridge design training program. After Figg left FDOT in 1964, he went on to work with the architectural/engineering firm of Barrett, Daffin and Figg in Tallahassee. Later, he began his own firm, Figg and Muller Engineers, with French engineer Jean Muller. Their firm promoted the idea of segmental bridge construction with prestressed concrete as an economically viable option. When Figg and Muller coupled the prestressed concrete segmental technology with cable-stayed supports, they increased the effective use of high-strength concrete in long-span bridges and changed the way bridges were built in America.

While this bridge is less than 50 years old, it has been excluded by the FHWA from the Advisory Council for Historic Preservation's Section 106 Exemption Regarding Effects to the Interstate Highway System, and was determined eligible for listing in the NRHP in 2007 in the area of Engineering. Because it has achieved exceptional significance within the past 50 years, Criterion Consideration G is applicable.

Culverts

Photo 5-48. CR-18 over Braggs Branch, Bradford County (No. 280036)

County Road 18 Arch Culverts
Bradford County
FDOT #280036 (Braggs Branch), 8BF00730
FDOT #280037 (Gum Branch), 8BF00731
FDOT #280038 (Branch of Sampson River), 8BF00732

The three unadorned 1940 corrugated steel arch culverts along CR-18 in Bradford County are interesting late examples of their type. In contrast to the arched, stone-faced New Deal era culverts, these three have smooth concrete facades. Their intermediate piers feature fluted boots to assist with water flow. Structure Nos. 280036 (**Photo 5-48**) and 280038 have two spans and measure 26 feet and 27 feet in length, respectively. The three-span culvert over Gum Creek (No. 280037) (**Photo 5-49**) extends 43 feet.

The Bauhaus and International movement influence and the cost-constraints of the Great Depression meant an end to high-style, ornate structures in the built environment. After the 1930s, adorned structures became a rarity. Specifically with culverts, this was manifested in a shift from an arched to boxed form and a stone-faced to unadorned façade. As concrete gained further acceptance as a bridge building material, cast-in-place, unadorned concrete box culverts emerged in the 1930s and have been prevalent ever since.

Photo 5-49. CR-18 over Gum Creek, Bradford County (No. 280037)

The corrugated steel arch culverts featured here represent a continuum in the design trends for its type but are also included for additional consideration as representatives that mark the end of a design paradigm. Due to their integrity, increasing rarity, and at-risk condition, the three culverts are noteworthy examples of their type. Further in-depth research may reveal that the 1940s arched culverts are associated with the WPA or CCC. They are newly recommended NRHP-eligible under

Criterion C in the area of Engineering as high integrity examples of corrugated steel arch culverts and good representatives of the culmination of a design trend for arched culverts witnessed through the 1940s.

Blackwater Creek Overflow Bridge
Hillsborough County
FDOT #100647 (formerly #100037), 8HI5042

Photo 5-50. Blackwater Creek Relief Structure, Hillsborough County (No. 100647)

This steel arch culvert carries SR-39 over the overflow of Blackwater Creek in Hillsborough County. The culvert is supported by three corrugated steel arches, and its sides are faced with local stone rubble. This structure is estimated to have been constructed circa 1936, probably as part of a public work program; however, the actual date of construction is unknown. It is similar in appearance to others that appeared in literature of the period, such as *Florida Public Works*. Corrugated steel was frequently used in the 1930s. While the design and construction were common throughout Florida at the time, this culvert is the only remaining example of its type in west-central Florida.

The Blackwater Creek Overflow Bridge was determined eligible for listing in the NRHP by the Florida SHPO in 1993. It is significant under Criterion A in the area of Community Planning and Development due to its association with the expansion of paved roads to link rural communities, and under Criterion C in the area of Engineering as a unique structure in an inland rural Florida landscape.[118]

Prior to rehabilitation in 2002, the structure was documented to HAER Level II standards. Carried out in accordance with the Secretary of the Interior's Standards, rehabilitation included the use of in-kind materials on the facades, and retention and re-use of as much of the original concrete rubble and granite block veneer facades as possible. During this process, the stone rubble was removed and replaced piece by piece.[119] The elevations of the culvert retain their historic physical integrity.

[118] Fiore, Francesca Moran, Blackwater Creek Overflow Bridge, National Register of Historic Places Registration Form, May 1992.
[119] PBS&J and Stevenson Architects, Inc., Monitoring of the State Road 39 Blackwater Creek Relief Structure (8HI5402) Rehabilitation, Hillsborough County, Florida. FDOT, District Seven, Tampa, 2002.

FLORIDA'S SIGNIFICANT MOVABLE BRIDGES

Vertical Lift Bridges

Photo 5-51. Billy Creek Lift Bridge, Lee County (No. 120001)

<u>Billy Creek Lift Bridge</u>
Lee County
FDOT #120001, 8LL0705

The Billy Creek Lift Bridge, one of only four surviving bridges of its type in Florida, was built in 1941 by the St. Petersburg firm of C.T. Felix Construction Company according to designs from the State Road Department. The Joyce-Cridland Company of Dayton, Ohio provided the hydraulic equipment. The structure consists of two concrete girder approach spans and a 32-foot long steel girder main span. Interestingly, the lift mechanisms for the structure consist of four separate jacking units housed in each of the four lift towers. Prior to 1987 when the bridge was operable, these jacks hoisted the main span only about five feet. The bridge was raised by the flow of pressurized oil, and as the oil was drained from the unit, gravity lowered the deck.

With a total length just under 120 feet, the Billy Creek Lift is the smallest lift bridge in Florida. The bridge's most distinctive features are its four hydraulic lift towers, rare elements on vertical lift bridges. The structure never possessed a tender station because local merchants operated the lift on a prearranged schedule. As a result of its technology, its scale and the rarity of this bridge type, the Billy Creek Lift Bridge was determined NRHP-eligible during the 2000 survey under Criterion A in the area of Community Planning and Development and under Criterion C in the area of Engineering as a rare extant example of a vertical lift bridge.

Photo 5-52. The Billy Creek Lift Bridge in Lee County is the Smallest Lift Bridge in Florida.

Photo 5-53. Main Street Vertical Lift Bridge, Duval County (No. 720022)

<u>Main Street Vertical Lift Bridge</u>
J.T. Alsop Bridge
Duval County
FDOT #720022, 8DU1553

One of the premier historic bridges in Florida, the 1941 Main Street Vertical Lift Bridge, also known as the J.T. Alsop Bridge, crosses the St. Johns River in Jacksonville. This bridge is significant not only for its technology, but also for its visual importance as a defining element in the Jacksonville skyline. The entire bridge consists of 14 spans (11 steel girder spans and 3 Warren through truss spans) and extends a total of 1,680 feet. The steel frame lift towers rise to 200 feet, and the central lift span alone measures 365 feet in length. The lift mechanism is operated via a span drive system located on the movable span. The towers house the concrete counterweights. It is the largest of the four remaining vertical lift bridges in Florida, and it remains operable.

Construction of the Main Street Bridge cost approximately $1.5 million and required 3,800 tons of steel, 460 tons of metal reinforcements, and 30,000 tons of concrete to create the appearance of strength, endurance, and grace possessed by this structure. Duval County voters approved the project in 1935. In 1938, the U.S. Bureau of Roads agreed to pay one-half of the costs associated with the project. In 1941, the Shell Products Company of Ohio, the Foundation Company of New York City, and the Mt. Vernon Bridge Company of Ohio contributed money to complete the construction of the bridge.

The Main Street Bridge retains its historic physical integrity, and was determined NRHP-eligible during the 2000 survey under Criterion A in the area of Community Planning and Development for its role in facilitating the development of Jacksonville. It also meets Criterion C in the area of Engineering as a rare example of an extant vertical lift bridge associated with the Mt. Vernon Bridge Company of Ohio.

Photo 5-54. **Hialeah-Miami Springs Vertical Lift Bridge, Miami-Dade County (No. 874129)**

<u>Hialeah-Miami Springs Vertical Lift Bridge</u>
Miami-Dade County
FDOT #874129, 8DA0099

The oldest of Florida's surviving vertical lift bridges, the Hialeah-Miami Springs Vertical Lift Bridge was designed and constructed by the Champion Bridge Company of Ohio in 1927. This bridge is also known as the Miami Canal Bridge and East 1st Avenue Bridge. It carries southbound Curtiss Parkway across the Miami River Canal and connects the cities of Miami Springs and Hialeah. The bridge originally carried NW 36th Street over the Miami Canal, but it was moved to its current location in 1954.

The lift span features a Parker through truss, and the operating system incorporates span drive technology. As with most lift bridges, the towers at each end of the main span visually dominate the structure. The drive machinery originally stood in the towers, but it was removed at the time of relocation. The truss consists of I-beam chords, posts-with-ladder-type bracing, and riveted posts. Both the towers and truss consist of steel with a concrete substrate, and both maintain their original appearance. The wooden decking was replaced with asphalt in 1954, and in 1983, the bridge was reconstructed, during which time the 125,000-pound counterweights were removed. Reconstruction did not diminish the historic character of the bridge.

Despite its alterations, and although no longer operable, this bridge retains its historic physical integrity. It is the oldest example of vertical lift technology extant in Florida, and the only example of a Parker through truss lift span. The Hialeah-Miami Springs Vertical Lift Bridge was determined eligible for listing in the NRHP by the SHPO in 1995. It is significant under Criterion C in the area of Engineering; Criteria Consideration B for moved properties is applicable.[120] It also represents a rare example of an extant vertical lift bridge associated with the Champion Bridge Company.

[120] Anderson, Sherry, Hialeah-Miami Springs Vertical Lift Bridge, National Register of Historic Places Registration Form, September 1997.

Hillsborough River Lift Bridge
T.N. Henderson Bridge
Hillsborough County
FDOT #100920, 8HI6669

Photo 5-54. Hillsborough River Lift Bridge, Hillsborough County (No. 100920)

The 1939 Hillsborough River Lift Bridge, also known as the T. N. Henderson Bridge, carries Hillsborough Avenue (SR-600/US-92) over the Hillsborough River in Tampa. It was designed by J.H. Dowling of the State Road Department, and built by the Cone Brothers Construction Company of Tampa. The bridge consists of nine spans that extend 358 feet. The eight concrete girder approach spans are flanked by slotted concrete railings, indicative of the bridge's 1930s construction date. The lift span features a 94-foot-long Warren pony truss, and the lift mechanism remains in excellent condition. The main span is hoisted by cable from machinery housed in two steel towers, which also contain the concrete counterweights.

The bridge underwent rehabilitation in 1999 and remains in use alongside a newer bascule bridge. The Hillsborough River Lift Bridge was built as part of a road expansion project that connected the northern suburbs of Tampa. It is the only tower-driven, mechanical lift bridge remaining in the state, and it is one of only two operable vertical lift bridges in Florida. This bridge retains its historic physical integrity As a result of its technology, its association with the historic growth of the Tampa area, and the rarity of this bridge type, the Hillsborough River Lift Bridge represents one of Florida's important historic highway bridges. It was determined NRHP-eligible during the 2000 survey under Criterion A in the area of Community Planning and Development and under Criterion C in the area of Engineering as a rare extant example of a vertical lift bridge.

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Swing Bridges

Photo 5-55. Ft. Denaud Swing Bridge, Hendry County (No. 070013)

<u>Fort Denaud Swing Bridge</u>
Hendry County
FDOT #070013, 8HN0632

The Fort Denaud Bridge over the Caloosahatchee River consists of five prestressed concrete slab approach spans, with a low concrete railing. The spans are joined to a 132-foot-long Warren pony swing span on a rim-bearing pivot. The total length of this bridge is 435 feet. The Powell Brothers Construction Company of Fort Lauderdale, established by former Champion Bridge Company engineer Hugh Quinn, built the structure in 1940. The State Road Department dismantled the bridge in 1958 and re-erected it at its present location in 1963.[121] The structure was rehabilitated in 1987. The most important alteration during the rehabilitation was the addition of shallow cable stay supports along the top chords of the truss. Despite its alterations, this bridge retains its historic physical integrity. It was determined NRHP-eligible during the 2000 survey under Criterion C in the area of Engineering as a rare example of a rim-bearing swing bridge.

<u>Blackburn Point Swing Bridge</u>
Sarasota County
FDOT #170064, 8SO1890

This Warren pony truss swing span bridge carries Blackburn Point Road over the Intracoastal Waterway, linking Tamiami Trail (US-41) with Casey Key. This bridge was constructed in 1925 by the Champion Bridge Company of Ohio. Essential repairs were made over the years, notably in 1981, after the bridge was struck by a barge. Subsequent repairs were made in 1987 and 1995. The 142-foot-long, single-span Warren pony truss swing bridge operates on a center-bearing pivot located in the middle of the channel. Rigidly connected and sturdily built, the truss

Photo 5-56. Blackburn Point Swing Bridge, Sarasota County (No. 170064)

[121] Atkins and Keeler (1981) date this reconstruction to 1959, but departmental records indicate 1963.

uses steel beam chords and angle bars, strengthened with stay plates, for the verticals. At only 19 feet wide, the roadway carries only one lane of traffic in one direction at a time.

Sarasota County built this bridge as part of an effort to spur development and tourism on the Gulf Beaches. For the sum of $22,890 in 1925, the Champion Bridge Company supplied Sarasota County with one of its typical swing bridge designs. A second Champion bridge (now demolished) crossed Little Sarasota Bay north of the Blackburn Point Bridge.

The Blackburn Point Bridge represents one of seven remaining pony truss swing bridges in the state. It is one of two single-lane swing bridges in Florida. Repairs include the replacement of the majority of its structural steel truss members and its entire fender system. The mechanical and electrical components also have been repaired. Despite its many repairs and alterations over the years, the Blackburn Point Bridge remains in good condition and retains its historic physical integrity. This bridge was listed in the NRHP in 2001 under Criterion A in the area of Transportation and Criterion C in the area of Engineering.[122]

St. Mary's River Swing Bridge
Nassau County
FDOT #740008, 8NA0240

Photo 5-57. St. Mary's River Swing Bridge, Nassau County (No. 740008)

The 1927 St. Mary's River Bridge carries US-17, also known as the Atlantic Coastal Highway, across the border of Florida and Georgia. When constructed, US-17 was the principal federal highway providing northern access into Florida. A 563-foot-long structure consisting of six concrete girder approach spans and three steel trusses, this bridge helped open Florida to travelers from the northeastern part of the nation.

Also a part of the Dixie Highway, this unusual structure reputedly made possible the "only ferry-less route to Florida," by replacing an undependable ferry at what was called Wilds Landing.

Although partially owned by Georgia, the State of Florida, with federal aid, constructed the St. Mary's River Bridge and continues to maintain the bridge. The St. Mary's River Bridge was constructed by the Pensacola Shipbuilding Company. Acting as subcontractors, A. Bentley and Sons of Ohio built the substructure and approaches, and the Virginia Bridge and Iron Company of Roanoke fabricated and erected the trusses. The bridge opened to traffic in February 1927 after approximately 11 months of construction. Both states conducted ceremonies to mark its opening. For several years after its construction, Florida State Road Department publications featured this bridge in its publications for its engineering and because it opened the border between the two states.

[122] Spain Schwarz, Rebecca and Robert Jones. Blackburn Point Bridge, National Register of Historic Places Registration Form, 2001.

The structure is unusual within Florida for its combination of a Warren through truss span (202-foot) with a polygonal top chord and pony truss secondary spans. Another distinctive feature is the camelback design used on the pony trusses. The camelback derives from the curvature found in the top chord resulting from changing the inclination of the chord in each panel. The bridge used a channel bar for the chords, beams for the vertical posts, and angle bar in the struts, sway braces and diagonals. The center-bearing pivot mechanism is manually operated, but rarely, if ever, used. A solid concrete railing, with rectangular panels cast in for detail, runs along the approaches.

A significant structure for both engineering and historical reasons, the St. Mary's River Bridge played a crucial part in opening Florida to tourists and settlers from northern areas and enabled Jacksonville to become a gateway to Florida's Atlantic Coast. Furthermore, it is one of only two bridges remaining that the Virginia Bridge and Iron Company constructed, both of which are manually operated structures (the other one being the Belle Glade Swing Bridge in Palm Beach County). The distinctive technical features of the bridge and its combination of truss styles make it an interesting example of truss building and swing span design from the 1920s.

The St. Mary's swing bring retains a high level of historic physical integrity. This bridge was determined NRHP-eligible during the 2000 survey under Criterion A in the areas of Community Planning and Development and Transportation and under Criterion C in the area of Engineering as a rare example of a center-bearing pivot swing bridge with unique camelback pony trusses and with historical associations to the Virginia Bridge and Iron Company.

Photo 5-58. Belle Glade Swing Bridge, Palm Beach County (No. 930072)

<u>Belle Glade Swing Bridge</u>
Palm Beach County
FDOT #930072, 8PB0212

The Belle Glade Swing Bridge crosses the Okeechobee Rim Canal at Point Chosen. It provides access from Belle Glade on the mainland to Torry Island, located on the southeastern edge of Lake Okeechobee. Constructed in 1916, this bridge is one of only two structures remaining in the state built by the Virginia Bridge and Iron Company. The project was completed by the W. S. Lockman Company. The bridge originally stood over the St. Lucie River at Stuart and was reconstructed at its present site in 1935. At that time, a new concrete pivot pier and timber approach spans were added.

The 446-foot Belle Glade Bridge consists of 9 approach spans and a 154-foot-long, center-bearing main swing span. What appears to be essentially a Pratt truss has been set at approximately three-quarter level with the roadway, leaving the top chord about 3 feet above the deck. Channel bars are used in the top and bottom chords and in the parallel end posts, and angles compose the diagonals and counterbraces. In a technique rarely found, lacing bars on the exterior sides of the members reinforce the verticals. Such reinforcement is typically located on the interior. The single lane bridge still has a timber plank deck and remains manually operated. It is the last functioning example of a hand swivel in the state. Rehabilitation of the Belle Glade Swing Bridge in 1983 and 1998 resulted in the replacement of the wood pilings and beams with concrete and steel ones. The swing span and gear system also were refurbished. None of the rehabilitation significantly affected the historical integrity of the bridge.

Despite its alterations, this bridge retains its historic character and "embodies the distinctive character of a type, period, and method of construction."[123] It was determined "potentially eligible" for NRHP listing by the Florida SHPO in October 2002. This bridge is significant under Criterion A in the area of Community Planning and Development for its importance in providing the first land access to Torry Island. It is also eligible under Criterion C in the area of Engineering as a rare example of a center-bearing pivot swing bridge with historical associations to the Virginia Bridge and Iron Company. It is the earliest example of a swing deck truss bridge in Florida and one of two surviving Virginia Bridge and Iron Company bridges.[124]

Photo 5-59. Snow-Reed Swing Bridge/Southwest 11th Street Swing Bridge, Broward County (No. 865748)

Snow-Reed Swing Bridge/ Southwest 11th Street Swing Bridge
Broward County
FDOT #865748, 8BD3171

This swing bridge, a Warren pony truss with verticals, was constructed in 1925 by the Champion Bridge Company of Ohio to carry Southwest 11th Street across the North Fork of the New River in a growing residential area of Fort Lauderdale. The 148-foot structure exhibits the standard construction technology of Champion in its swing bridges. The truss is constructed of steel beams for the chords and end posts, angles in the vertical posts and diagonals, stay plates in the columns, and gussets at the joints. It is rigidly connected. A rim-bearing assembly sits on the concrete pivot pier in mid-channel. Initially hand-operated, a Ford gasoline engine was installed in the 1930s and an electric motor in the 1950s. Renovations that took place during 1983-1984 left the structure's original appearance intact.

The Snow-Reed Swing Bridge was determined NRHP-eligible during the 2000 survey under Criterion A in the areas of Community Planning and Development as well as Transportation, and under Criterion C in the area of Engineering. It is significant for its historical associations with the development of Fort Lauderdale during the 1920s boom era, and for its association with the Champion Bridge Company, a major bridge builder. It is also noteworthy for its age and type, and is a rare example of a metal truss swing bridge surviving in South Florida.

[123] Estabrook, Richard W., An Addendum to the Cultural Resource Reconnaissance of the Florida National Scenic Trail, Lake Okeechobee Segment Project, Palm Beach County, Florida, 2002.
[124] Estabrook, 2002.

Photo 5-60. Loxahatchee Bridge/Twenty Mile Bend Bridge, Palm Beach County (No. 930040)

Loxahatchee Bridge/ Twenty Mile Bend Bridge
Palm Beach County
FDOT #930940, 8PB0231

The Loxahatchee Bridge, also known as the Twenty Mile Bend Bridge, was completed by the State Road Department in 1937. It carries US-98/US-441 over the West Palm Beach Canal (Loxahatchee River) near Twenty Mile Bend and the town of Loxahatchee in Palm Beach County. The original Warren through truss swing structure is now a fixed bridge. The three-span bridge, which extends a total length of 221 feet, is comprised of two steel frame approach spans and the 187-foot long main Warren through truss span with verticals and a parallel topchord. The main span is mounted on a center-bearing pivot that sits on a concrete cylinder pier. Some of the steel members carry the mill mark of "Carnegie U.S.A."

Constructed by the state when swing bridges were becoming less common, the structure is a particularly fine example of an unusual type, the Warren through truss swing span. In addition, the evidence of careful workmanship combined with a high degree of original integrity makes the bridge historically valuable.

The Loxahatchee Bridge was determined eligible by the SHPO on October 25, 1990. It is significant under Criteria A and C in the areas of Transportation and Engineering, respectively. It is distinguished as the only remaining truss bridge in Palm Beach County, and the only Warren truss bridge in Florida with parallel topchords.

Sharpe's Ferry Swing Bridge
Marion County
FDOT #364110, 8MR2539

Photo 5-61. Sharpe's Ferry Swing Bridge, Marion County (No. 364110)

The Austin Brothers Bridge Company of Atlanta originally constructed this 117-foot-long swing span in 1928 at CR-316 and the Oklawaha River near Eureka. Subsequently, the bridge was removed and re-erected in 1971 in a similar setting downstream at Sharpe's Ferry, east of Ocala on the edge of the Ocala National Forest in Marion County. At the time of relocation, the bridge underwent a major renovation that primarily affected the secondary spans. Three steel stringer approach spans, supported on concrete pile bents, connect with the swing. The additions also included aluminum safety rails as well as a new, angularly-shaped concrete pivot pier. These changes maintained the original appearance of the bridge. The structure bears the typical features of Austin Brothers' swing bridges. The Warren pony truss, with verticals, uses steel structural members with joints that are rigidly connected; the center-bearing assembly is mounted on a concrete pivot pier. The swing span is no longer is operation, but the bridge remains in use.

The Sharpe's Ferry Bridge is the only remaining swing bridge with a Warren pony truss main span built by the Austin Brothers Bridge Company in Florida. The other Austin Brothers bridges, the Moss Bluff Bridge and the Linadale Bridge, are no longer extant. Despite its alterations, this bridge retains its historic integrity. It was determined eligible for listing in the NRHP by the Florida SHPO in November 2007. The Sharpe's Ferry Bridge is significant under Criterion C in the area of Engineering as a rare example of a swing bridge, and for its historical associations with the Austin Brothers Bridge Company. Criteria Consideration B also applies.[125]

[125] Kenneally, Michael, Sharpe's Ferry Swing Bridge, National Register of Historic Places Registration Form, 2007.

Photo 5-62. Miami River Canal Swing Bridge, Miami-Dade County (No. 874130)

Miami River Canal Swing Bridge
Miami-Dade County
FDOT #874130, 8DA100

This 1924 bridge, also known as the NW 54th Street Bridge, carries northbound Curtiss Parkway across the Miami Canal and connects the cities of Hialeah and Miami Springs. Designed by the Pompano and Dania Bridge Company of Broward County, the bridge was fabricated and installed by the Champion Bridge Company of Ohio. This bridge underwent major alterations in 1941 due to the damming of the Miami River. The "swing mechanism was removed and the swing span foundation reconstructed. The pivot cap was enlarged and twelve treated timber piles were added as support."[126]

The 112-foot, single-span swing bridge features a Warren pony truss with verticals that include steel beam top and bottom chords and end posts, angles in the vertical posts and diagonals, rigid connections, and gusset plates. Rather than placing the pivot pier in the usual location at mid-channel, the bridge was built as a bob-tail swing span with the pivot pier located near the bank to provide extra clearance for vessels using the canal. The rack and pinion of the swing mechanism was removed, and the bridge was widened in 1941. The wooden sidewalks originally appended to the outside of the truss also were removed in 1941. In 1981, asphalt replaced the original wooden deck.

Few bob-tailed spans remain in Florida. They represent a noteworthy adaptation of a major and important bridge technology. The Miami River Canal Swing Bridge also derives significance from its builder, age, technological type, and association with the rapid growth of Hialeah and Miami Springs during the 1920s. This bridge represents a central symbol of the downtown centers of the communities it connects. In 1995, the bridge was determined eligible for listing in the NRHP by the SHPO. It is significant under Criterion A in the area of Community Planning and Development and under Criterion C in the area of Engineering as a rare example of a bob-tailed swing bridge constructed by the Champion Bridge Company. FDOT rehabilitated the bridge in 2003 while maintaining its historic character.

[126] Anderson, Sherry, The Miami River Canal Swing Bridge, National Register of Historic Places Registration Form, September 1997.

The Tamiami Canal/NW South River Drive Swing Bridge
Miami-Dade County
FDOT #874135, 8DA6431

Photo 5-63. Tamiami Canal/NW South River Dr. Swing Bridge, Miami-Dade County (No. 874135)

This 120-foot long Warren pony truss swing bridge carries NW South River Drive across the Tamiami Canal in Miami. Built in 1921, it originally was located at NW 27th Avenue and the Miami Canal. In 1938, the bridge was removed, and subsequently erected at its current site in 1940, approximately 2000 feet northeast of the original location.[127] At this time, the bridge was "truncated," that is, shortened from its original length of 150 feet to 120 feet. The size reduction was the result of the removal of three bays. In 1963, new decking material was added, and in the late 1980s, part of the fender system was removed.

The steel pony truss consists of beams used for the chords and end posts with angles utilizing the truss web. All joints are rigidly connected. The rim-bearing pivot is placed on a concrete pier near the bank in bob-tailed fashion to provide greater horizontal clearance in the navigable channel. The associated tender station is non-historic.

The historic alterations and move have not diminished the bridge's integrity. The Tamiami Canal/NW South River Drive Swing Bridge is a rare surviving example of its type. It is one of only three bob-tailed swing bridges remaining in Florida, and one of four Warren pony truss spans. This bridge was determined NRHP-eligible during the 2000 survey under Criterion C in the area of Engineering as a rare example of a bob-tailed swing bridge. It also is eligible under Criterion A in the areas of Community Planning and Development and Transportation. The bridge "is inextricably linked to the evolution of the City of Miami, as its initial construction was necessitated by the City's expansion westward into the Everglades as a result of a statewide drainage project. Its significance in Transportation is exhibited by its relocation and replacement, which are evidence of the exponential growth in population and the increasing use of automobiles in Miami at the beginning and after World War II."[128]

[127] Streelman, Amy and Ellen Uguccione. Miami Canal and N.W. 27th Avenue Bridge, National Register of Historic Places Registration Form, March 2005.
[128] Streelman and Uguccione, 2005.

Photo 5-64. Columbus Drive Swing Bridge, Hillsborough County (No. 105504)

<u>Columbus Drive Swing Bridge</u>
Hillsborough County
FDOT #105504, 8HI6672

The 1926 Columbus Drive Swing Bridge carries Columbus Drive (formerly known as Michigan Avenue) over the Hillsborough River. This bridge was designed by consulting engineer Norman S. Sprague, and the steel truss swing span was built by the Mt. Vernon Bridge Company.

This 12-span bridge measures 470 feet long and 55 feet wide. The 164-foot long movable span of this swing bridge features a pony truss placed at three-quarters level with the deck. This truss deepens at the pivot point, which is a feature that seems particular to this bridge and no other in Florida. The swing span rests on a rim-bearing pivot, located on the west side of the Hillsborough River channel, resulting in a configuration known as a bob-tail swing span. The main span is flanked by 11 reinforced concrete tee-beam approach spans. The Columbus Drive Bridge features Neoclassical Revival-style urn-shaped balusters. An unembellished wood frame tender station is located at the northeastern corner of the bridge.

Built as a neighborhood bridge between two communities that were just getting established in the mid-1920s, the Columbus Drive Swing Bridge connected upper West Tampa and western Tampa Heights along what was then known as Michigan Avenue. The bridge was a catalyst to the simultaneous development of the historic communities. It was completed at a cost of $420,000 on January 20, 1927. The bridge was designed by Norman S. Sprague of Pittsburgh, a consultant, and approved by R.D. Martin, the City of Tampa engineer. The majority of the bridge was constructed by Roberts Supply Company, Contractors, of Lima, Ohio. The fabricator of the steel truss swing span was Mt. Vernon Bridge Company of Mt. Vernon, Ohio. This bridge is one of two bridges by this company in Florida. The other bridge is FDOT #720022, which is the vertical lift US-1/Main Street Bridge over the St. Johns River in Duval County. The contractor was Roberts Supply Company of Lima, Ohio. The Columbus Drive Swing Bridge was developed as a joint project between the City of Tampa, the Tampa Developers Corporation and the Florida Interurban Rapid Transit Railway Company.

The Columbus Drive Swing Bridge, rehabilitated in 2012, retains its historic physical integrity. It is one of 10 remaining swing bridges in the state and one of three bob-tailed swing bridges. Additionally, it may be the only swing bridge in Florida featuring a pony truss both below and above the deck. This bridge was determined NRHP-eligible by the SHPO in 2005. It is eligible under Criterion A in the areas of Transportation and Community Planning and Development and under Criterion C in the area of Engineering as a rare example of a bob-tailed swing bridge.[129]

[129] Hinder, Kimberly, West Columbus Drive Bridge, National Register of Historic Places Register Form, 2005.

Bascule Bridges

Photo 5-65. Ortega River Bridge, Duval County (No. 720005)

<u>Ortega River Bridge</u>
Duval County
FDOT #720005, 8DU11167

The Ortega River Bridge consists of 27 concrete girder spans joined to a double-leaf, rolling lift bascule main span operated by an electric motor. Crossing the Ortega River, sometimes referred to as McGirts Creek, the 1,143-foot-long structure replaced a wooden bridge in the 1920s. Bentley and Sons Construction Company of Ohio built the structure between 1924 and 1927, with the rolling lift span supplied by the American Bascule Bridge Company of Pensacola. High tides and difficult working conditions contributed to a long construction period. The Ortega River Bridge opened to traffic in early 1927. On July 1, 1929, the City of Jacksonville accepted the bridge as a "gift" from the Duval Board of County Commissioners.

The Ortega River Bridge is the largest of a group of six bridges that were designed by the Duval County bridge engineer T.B. Carrick during the Florida Boom period in the 1920s.[130] It was designed to provide better access to the southern suburbs of Jacksonville, such as Ortega and Venetia. Although it utilizes standard concrete girder spans, the bridge possesses interesting architectural details. Each panel in the concrete railing features two stylized Maltese crosses (**Photo 5-67**). The railings themselves extend outward along the bridge on cantilevered floor beams that support the deck. Ornamental sentry booths with pyramidal roofs stand at each entrance and at each corner of the bascule span, one of which serves as the tender station.

Photo 5-66. Detail of Maltese Cross Motif.

In 1978, this bridge underwent minor alterations including rehabilitation of the machinery, the renovation of the tender station, and replacement of its grating. However, the bridge continues to maintain a high level of integrity and has undergone further rehabilitation work aimed at the restoration of its principal historical features. Despite these alterations, the Ortega River Bascule Bridge retains its integrity. It was determined eligible for listing in the NRHP by the Florida SHPO in 1995. It is significant under Criterion A in the area of Community Planning and Development for its role in the development of the City of Jacksonville. The bridge is located adjacent to the NRHP-listed Old Ortega Historic District. It is also eligible under Criterion C in the area of Engineering as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design, a design historically significant for its

[130] Stevenson, Linda, Bridges on Old Kings Highway, National Register of Historic Places Registration Form, 1993.

associations with William Scherzer. It is further distinguished in the area of Architecture/Aesthetics for its historical associations with notable bridge engineer T.B. Carrick, whose trademark was the Maltese cross design. It is the largest of the six Carrick-designed bridges. Its age, design, and role in the development of Jacksonville contribute to its importance.

Bridge of Lions
SR-A1A over Matanzas River
St. Johns County
FDOT #780074, 8SJ2460

Photo 5-67. Bridge of Lions, St. Johns County (No. 780074)

As one of Florida's best known bridges, often used to advertise the state to tourists, the Bridge of Lions is one of the most highly visible and distinctive bridges. The historical value of the Bridge of Lions has been recognized by its listing in the NRHP in 1982. Also known as the Matanzas River Highway Bridge, it consists of 23 approach spans and an 87-foot, double-leaf, rolling lift bascule main span. The bridge totals 1,538 feet in length and carries SR-AlA over the Matanzas River, or the Intracoastal Waterway, to link St. Augustine with Anastasia Island.

Architectural qualities were emphasized in all parts of the bridge design, from the graceful steel arched-girder approaches to the features meant to beautify the superstructure. The reinforced concrete roadway is lined by a classically-styled concrete railing that uses urn-shaped balusters set in panels. At the ends of the panels stand short, square columns that project above the railing. These columns serve as end posts for the balustrade, delineate the concrete piers, and support ornamental lampposts. The most prominent features on the structure are four towers, one used as a control house, that mark the corners of the bascule span. The towers reflect a Mediterranean Revival style through their octagonal shape and tiled roofs. Two large Carrera marble lions, donated by a local citizen, guard the west end and account for the more popular Bridge of Lions name.

Discussions began as early as 1917 on the need to replace an 1895 wooden bridge located on the site. Greater urgency for the project came with the booming expansion of Florida in the 1920s, when St. Augustine hoped to share in the rising tourist trade and the new resort industry, particularly with the development of Davis Shores on Anastasia Island. In 1925, the public approved building a bridge that could fit the historical character of St. Augustine, but also provide downtown with a new centerpiece and a modern transportation facility. The project, undergoing changes during construction, cost $1,008,735, an enormous expense for a small community.

The highly regarded engineering firm of J. E. Greiner in Baltimore provided plans for the structure, designed to serve both promotional needs and artistic purposes. The city awarded the construction contract to the P. T. Cox Company of New York City, who selected the Virginia Bridge and Iron Company to fabricate and install the rolling lift bascule. Construction was completed in February 1927 after 21 months, which included the challenge of placing the timber pile supports in the Matanzas River. The "million dollar bridge" almost at once became a prominent local landmark and a new symbol for the "oldest city."

During the 1970s, over $2.2 million in substantial mechanical and structural repairs were made. Almost three decades later, in order to address safety requirements and to correct structural problems, the Bridge of Lions underwent an extensive rehabilitation. A contract was awarded to Tidewater-Skanska on June 8, 2004, for the rehabilitation project, and following approximately five years of work, the Bridge of Lions was opened on March 17, 2010. During the rehabilitation process, much of the bridge was removed, then reassembled as it was rehabilitated. Work was designed to preserve the necessary structures and elements to maintain its historic value. Replica light fixtures and traffic railings similar to the 1927 originals were added to enhance the historic aesthetics.[131]

Photo 5-68. View of the Rehabilitated Bridge of Lions
(From RS&H, "Bridge of Lions Rehabilitation" at http://www.rsandh.com/Sustainability/susProj-BOL.asp.)

<u>Davie Boulevard Bridge</u>
Broward County
FDOT #860038, 8BD4772

Photo 5-69. Davie Boulevard Bridge, Broward County (No. 860038)

This 410-foot double-leaf, Scherzer type rolling lift bascule bridge carries Davie Boulevard (SW 12th Street) over the South Fork of the New River in Ft. Lauderdale. Built in 1960 by Powell Brothers, Inc., it is one of only nine remaining rolling-lift bascule bridges in Florida. The structure is comprised of eight concrete beam and girder approach spans and a steel, open grid deck main bascule span measuring 93 feet in length.

The Davie Boulevard Bridge is newly recommended NRHP-eligible under Criterion A in the area of Community Planning and Development for its significant associations to the historical development of Ft. Lauderdale, and under Criterion C in the area of Engineering, as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design.

[131] FDOT. "Bridge of Lions Rehabilitation Project." Accessed at: http://www.fdotbridgeoflions.com.

Photo 5-70. William H. Marshall Memorial Bridge, Broward County (No. 864072)

<u>William H. Marshall Memorial Bridge</u>
Broward County
FDOT # 864072, 8BD4771

This Scherzer type, double-leaf rolling lift bascule bridge carries SW 7th Avenue over the New River and 5th Place in Ft. Lauderdale. The William H. Marshall Memorial Bridge was designed by the J.E. Greiner Company and built in 1964 by Powell Brothers, Inc. The 366-foot long bridge is composed of six concrete beam and girder approach spans and a 93-foot main bascule span.

This bridge is newly recommended NRHP-eligible under Criterion A in the area of Community Planning and Development for its significant associations to the historical development of Ft. Lauderdale, and under Criterion C in the area of Engineering, as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design. It is one of only nine remaining rolling-lift bascule bridges in Florida, of which three are located in Broward County.

<u>SE 3rd Avenue over New River & S. New River Drive</u>
Broward County
FDOT #864071, 8BD4770

This 1960, seven span, four-lane, double-leaf Scherzer type rolling-lift bascule bridge carries SE 3rd Avenue over the New River in downtown Fort Lauderdale. It is one of only nine remaining rolling-lift bascule bridges in Florida. It was designed by the J.E. Greiner Company of Tampa and constructed by general contractor Powell Brothers, Inc.

Photo 5-71. SE 3rd Avenue Bridge, Broward County (No. 864071)

The SE 3rd Avenue Bridge is 366 feet long and features a cast-in-place concrete deck. The bridge is composed of a 93-foot long main movable steel span and six prestressed, precast concrete girder approach spans. The double-leaf bascule span has two main girders, three floor beams, 18 stringers, two counterweight trusses, and lateral bracing. Two solid reinforced concrete breast walls rest on reinforced concrete footers and are flanked by retaining walls. The two-story tender station is mounted to the west side of the north pier. The tender station walls feature decorative tile work, and the hipped roof features red barrel tiles and exposed rafter tails. It also retains its original commemorative plaques, and a stylized wall with circular voids abuts its entrance.

The SE 3rd Avenue Bridge is newly recommended NRHP-eligible under Criterion A, in the area of Community Planning and Development, for its significant associations to the historical development of Ft. Lauderdale, and under Criterion C in the area of Engineering, as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design. It is one of only nine remaining rolling-lift bascule bridges in Florida, of which three are located in Broward County.

Photo 5-72. Boca Inlet Bridge, Palm Beach County (No. 930060)

Haven Ashe/Boca Inlet Bridge
Palm Beach County
FDOT #930060, 8PB14789

This 1963, single-leaf bascule bridge carries A1A over the Boca Inlet in Boca Raton, Palm Beach County. It was selected by the FDOT District 4 bridge engineers as a notable bridge for its Hanover skew bascule design which incorporates a unique counterweight designed in 1943 by Clinton D. Hanover, Jr. of Little Neck, New York. Clinton Hanover is a founding member of the renowned engineering firm Hardesty & Hanover, LLP.

The Boca Inlet Bridge extends 540 feet in length and consists of 11 prestressed concrete girder spans joined to a single-leaf, trunnion-style bascule main span operated by an electric motor. Hardesty & Hanover consulting engineers of New York designed the structure in 1958. The design enables the bridge to cross the Boca Inlet at its sharp, 45-degree skew. Cleary Brothers Construction Company built the structure in 1963.The tender station is a flat-roofed two-story structure located above the direction counterweight.

The significance of the Hanover Skew is to overcome the physical constraints posed by skewed crossings. Prior to the Hanover Skew design, skewed bridge crossings resulted in uneven load distributions, awkwardly placed girders, restricted space for counterweights and their machinery which resulted in a lack of rigidity in the entire structure. A few of the objectives of the Hanover Skew design were to “provide a skew bascule bridge with the shortest feasible span for a given skewed crossing, having simple and rigid framing; and to provide a skew bascule bridge such that a satisfactory single-leaf skew bascule bride can be used where otherwise much more expensive double-leaf bascule bridge without skew, swing bridge, or retractable drawbridge, would be necessary.”[132] Upon operation, the angle of the single-leaf is apparent and the jagged pivot joint on the deck is noticeable when walking across the bridge.

The Boca Inlet Bridge is one of only four bridges of its type built in the U.S. using the Hanover skew design, also known as a knee-girder bascule. The first, and only one constructed outside of Florida, is the 1942 Hamilton Avenue Bridge in Brooklyn, New York. The Hamilton Avenue Bridge was replaced in 2007-2008. The span and approach superstructure of each span was demolished and replaced with a new

[132] Hanover, Clinton D. “United States Patent Office 2,337,994 - Skew Bascule Bridge.” United States Patent Office. Application May 3, 1943, Serial No. 485,505. Accessed at: http://patft.uspto.gov/netahtml/PTO/srchnum.htm.

structure.[133] The three other bridges of this type include two in Miami and the Boca Inlet Bridge.[134] The SE 4th Avenue Hanover Skew Bascule Bridge (FDOT #874131) was completely demolished and replaced in 2003 by Bridge No. 874145. The 1950 NW 36th Street Hanover Bascule Bridge over the Miami Canal (FDOT #870625), while extant, has had its machinery removed, and is no longer operational as a bascule bridge.[135]

The Boca Inlet Bridge is newly recommended NRHP-eligible under Criterion C in the area of Engineering as the only intact and functioning bascule bridge in the United States possessing the patented Hanover skew design. In addition to its importance to Florida, this bridge is significant at the national level as an extremely unique and complex moveable structure in terms of both design and structure.

George Bush Boulevard Bridge/NE 8th Street Bridge
Palm Beach County
FDOT #930026, 8PB13707

Photo 5-73. George Bush Boulevard Bridge/NE 8th Street Bridge, Palm Beach County (No. 930026)

This double-leaf, rolling lift bascule bridge, completed in 1949, carries George Bush Boulevard (formerly NE 8th Street) over the Intracoastal Waterway in Delray Beach. It was built by the Murphy Brothers Construction Company based on plans approved by the Palm Beach County Engineer, J.M. Boyd. Bridge construction was funded by municipal bonds, as well as the County Commission and the State Road Department. The 270-foot long by 33-foot wide structure is comprised of the 80-foot main steel bascule span and four approach spans of reinforced concrete. The original slotted rail concrete balustrade was covered, in 2003, with recessed metal panels. The tender station, completed in 1950, is located on the south side of the bridge. The concrete building features a metal hipped roof (ca. 2005), center hipped cupola, and a quatrefoil design on the north elevation.

The George Bush Boulevard Bridge was determined eligible for listing in the NRHP by the SHPO on April 16, 2008. It is significant under Criterion A in the area of Community Planning and Development for its historical associations with the post-World War II land boom in Delray Beach. It played a major role in promoting the growth of the city by providing the improved access which was instrumental in shaping the area's development. It is also eligible under Criterion C in the area of Engineering, as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design. Bridges of this type are very rare in Florida, with only nine remaining. Of these, three are located in Palm Beach County.

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[133] "Replacement of Rare Hanover Skewed Bascule, The Hamilton Avenue Bridge." Accessed at: http://www.ascemetsection.org/content/view/414/129.
[134] NSBA (National Steel Bridge Alliance). "NSBA 2009: Prize Bridge Competition" in Structure: A Joint Publication of NCSEA/CASE/SEI. October 2008. Accessed at: http://www.structuremag.org/article.aspx?articleID=775.
[135] Noles, Timothy, P.E.. Personal communication. Principal, Hardesty & Hanover - Miami, FL. October 13, 2010.

Photo 5-74. Clarence Geist Memorial Bridge/Camino Real Bridge/Boca Raton Club Bridge, Palm Beach County (No. 934408)

<u>Clarence Geist Memorial Bridge/Camino Real Bridge/Boca Raton Club Bridge</u>
Palm Beach County
FDOT #934408, 8PB8111

Completed in 1939, this double-leaf rolling lift bascule bridge carries E. Camino Real Boulevard over the Intracoastal Waterway in Boca Raton. The steel bascule was manufactured by the Nashville Bridge Company. The bridge was constructed by the Cleary Brothers Construction Company from plans approved by the Palm Beach County Bridge Engineer, J.M. Boyd. Funding was provided by the Federal Emergency Administration of Public Works under Project No. FLA-1338-F.

The 256-foot long by 32-foot wide structure is comprised of a steel bascule main span extending 87 feet, and 4 concrete girder approach spans supported by a concrete pier substructure. The bridge features common slotted concrete railings topped by a heavy concrete cap. Non-historic alterations in 1984 and 2007 included tender station modifications, painting, and electrical upgrades.

This bridge was determined eligible for listing in the NRHP by the SHPO on December 13, 2007. It is significant under Criterion A in the area of Community Planning and Development for its historical associations with the post-World War II development in Boca Raton and its associations with the federal Depression-era program. It is also eligible under Criterion C in the area of Engineering, as it embodies the distinguishing engineering characteristics of a mid-twentieth century rolling lift bascule design. It is one of only nine remaining rolling-lift bascule bridges in Florida, and thus, represents a rare bridge type. This bridge also is part of the county-designated Palm Beach County Camino Real and Camino Real Bridge historic district.

SW 1st Street Bridge
Miami-Dade County
FDOT #870660, 8DA6222

Photo 5-75. SW 1st Street Bridge, Miami-Dade County (No. 870660)

This double-leaf steel bascule span bridge carries SW 1st Street Bridge over the Miami River in downtown Miami. After a successful $2.15 million bond election in 1926, Miami established plans to construct five bridges over the Miami River to facilitate expansion to the south and west of downtown. As a navigable waterway often crowded with vessels hauling supplies into the city, the river required movable spans. For the bridge design and specifications, Miami selected the engineering firm of Harrington, Howard and Ash of Kansas City, nationally recognized for its work in planning drawbridges. The contract to build the foundation and approaches went to the W.S. Lockman Company of West Palm Beach. The Tampa Shipbuilding and Engineering Company supplied the steel bascule. The SW 1st Street Bridge was completed in 1929 at an approximate cost of $300,000.

Thirteen steel stringer approach spans join a 150-foot, trunnion-type, double-leaf bascule main span, bringing the entire bridge to a total of 651 feet. Plain concrete abutments house the operating machinery, and a concrete balustrade runs along the approaches.

The SW 1st Street Bridge, along with the NW 17th Avenue Bridge, represents one of two remaining bascule bridges associated with the Harbor Bond Issue of 1926, a major bond initiative passed for the sole purpose of constructing bridges in the Miami area. It retains its historic physical integrity. This bridge was determined NRHP-eligible by the SHPO in 2007. It is eligible under Criterion A in the areas of Transportation and Community Planning and Development and under Criterion C in the area of Engineering as an early example of a bascule bridge designed by a notable engineering firm.

NW 17th Avenue Bridge
Miami-Dade County
FDOT #874161, 8DA5886

This trunnion-type, double-leaf bascule bridge was constructed in 1928 to carry NW 17th Avenue over the Miami River in Miami. It shares its history with the SW 1st Street and the NW 12th Avenue bridges, all built as part of the Harbor Bond Issue of 1926. The NW 17th Avenue Bridge was designed by the Kansas City engineering firm Harrington, Howard, and Ash and constructed by Lockman Construction Company. The bascule span was supplied by the Central Station Equipment Company of Miami.

Photo 5-76. NW 17th Avenue Bridge, Miami-Dade County (No. 874161)

The entire structure measures 391 feet in length and has five concrete tee-beam approach spans. In most respects it is a conventional bascule structure. It has a functional appearance that is exhibited by the simple steel railings and plain concrete abutments housing the operating equipment. Though essentially a utilitarian structure, the designers added some details reflecting a slight Mediterranean Revival orientation. The terra cotta coloring of the bascule span further highlights these elements.

This bridge, along with the SW 1st Street bascule bridge, is one of the two remaining bridges constructed as part of the Harbor Bond Issue of 1926. It retains its historic physical integrity. This bridge was determined NRHP-eligible during the 2000 survey under Criterion A in the areas of Transportation and Community Planning and Development and under Criterion C in the area of Engineering as an early example of a bascule bridge designed by a notable engineering firm.

Kennedy Boulevard Bridge
Hillsborough County
FDOT #100100, 8HI0640

Photo 5-77. Kennedy Boulevard Bridge, Hillsborough County (No. 100100)

One of Florida's premier historic bridges, the 1913 steel bascule Kennedy Boulevard Bridge (originally the Lafayette Street Bridge) crosses the Hillsborough River in downtown Tampa. It was the third bridge built on the site, having replaced a narrow swing span that replaced an earlier 1888 structure. The bridge consists of a patented, double-leaf, Scherzer rolling lift main span and two reinforced concrete arch deck approach spans.

The Kennedy Boulevard Bridge is the oldest bascule span in Florida. An architectural centerpiece of downtown Tampa, the bridge exhibits Neoclassical Revival styling, which was popular from the late 19th to mid-20th centuries. The Neoclassical Revival style was an eclectic renewal of Georgian, Adam, Early Classical Revival and Greek Revival architecture, and its academic approach was related to the Beaux Arts tradition. This style was commonly used as part of the City Beautiful Movement to improve the aesthetic quality of metropolitan areas. The effort at beautification shows in the sculpted, urn-shaped balusters in the concrete railings, the handsome steel railing on the bascule span, and particularly in the tender stations. Each house has a terra cotta roof and sits in a curved bay at the entrances to the bridge. Efforts to retain the original appearance have succeeded. The most noticeable changes have occurred in the removal of light fixtures from the railings and the metal frames that held wires for the streetcars.

The bridge's attractiveness may be due to Alexander Twombley of New York City who, associated with engineers Bolles, Hodges and Baird, selected plans for the structure. He seems to have purchased patents and design rights from the Luten Bridge Company, a dominant influence on Florida concrete bridges at the time. Building the project, however, went to the Edwards Construction Company of Tampa, a well-respected and active firm in the city. The Pennsylvania Steel Company fabricated the bascule spans at their Steelton plant from designs supplied by the Scherzer Rolling Lift Bridge Company of Chicago. The project began in 1912, ended in 1913, and cost $240,000. The Tampa Electric Company shared in the expense in order to run streetcars across the structure. During the 1920s, the increasing demands of traffic led to the construction of four additional bridges in proximity to Lafayette Street.

The Kennedy Boulevard Bridge was determined NRHP-eligible by the SHPO in 1987. It is significant under Criterion A in the areas of Transportation and Community Planning and Development. Like the other bridges over the Hillsborough River in downtown Tampa, it served to strengthen the connection between the east and west sides of the Hillsborough River as Tampa developed, particularly around the Land Boom years.[136] It is also eligible under Criterion C in the areas of Architecture and Engineering as the earliest example of a bascule bridge in the state.

[136] City of Tampa, Historic Bridges on the Hillsborough River, Local Multiple Properties Landmark Designation Report, Tampa, 2006.

In 1995, FDOT rehabilitated the bridge, including much of the operating machinery, and restored its historic appearance. Consequently, the bridge maintains its historic physical integrity and continues to represent a structure of distinctive quality and high historical importance.

<u>The Platt Street Bridge</u>
Hillsborough County
FDOT #105500, 8HI0862

Photo 5-78. Platt Street Bridge, Hillsborough County (No. 105500)

The 1926 Platt Street Bridge over the Hillsborough River was designed by the Strauss Bascule Bridge Company of Chicago. The City of Tampa Engineer, R.D. Martin, prepared the specifications, and the bridge was constructed by Tibbets, Pleasant, Green and Beckman, general contractors of Oklahoma City. This firm also constructed the upriver Cass Street Bridge, almost identical in design, and these are likely their only structures in Florida. The Lakeside Bridge and Steel Company of Milwaukee fabricated the spans.

The original bridge structure, which extended 518 feet, consisted of 10 arched concrete tee-beam girder approach spans joined to a double-leaf Strauss trunnion bascule main span, 103 feet in length. In 1990, when the adjacent Tampa Convention Center was under construction, the railings on the south side and the bridge approach spans were removed. "Additionally, it appears that the easternmost 4 approach spans that were located over land are no longer extant or have been filled in so they are not readily visible."[137] As a result, the bridge currently extends 336 feet, and is composed of eight spans. The main bascule span is 82.5 feet in length.

Photo 5-79. Detail of Eight-Point Star Railing Decoration.

A distinctive concrete railing featuring a geometric pattern that resembles an eight-point star (**Photo 5-80**) continues to the seawall and balustrade along Bayshore Boulevard, which intersects Platt Street near the west end of the bridge, and Tony Jannus Park, located on the northwest side of the bridge. The same design appears on the metal railing along the bascule span. The Bayshore Boulevard sidewalk continues as a pedestrian walkway under the western end of the bridge. The Mediterranean Revival style influences found on the bridge reflect Florida's fascination with that architectural theme during the Land Boom period of the 1920s. The style is reflected in the two octagonally-shaped and stuccoed tender stations, which feature hipped roofs clad in metal shingles with highly ornate metal trim including projecting acanthus

[137] Janus Research, FMSF form for 8HI862 (update), September 27, 2004.

leaves and lion's heads. These two-story buildings stand at each end of the bascule and on opposite sides of the roadway.

As Bayshore Boulevard became the main artery on the east side of south Tampa, the Platt Street Bridge served as the southernmost connection between the east and west banks of the Hillsborough River and as south Tampa's link with the central business district. As part of a major bridge building program initiated by the city in 1924, the Platt Street Bridge was intended to relieve the congestion on the Lafayette Street Bridge (now the Kennedy Boulevard Bridge), as well as to connect Bayshore Boulevard to downtown. Platt Street was named after O. H. Platt. Platt came to Tampa in the late 1880s and developed the Hyde Park area. He named his new development after his hometown of Hyde Park, Illinois.

The Platt Street Bridge was determined NRHP-eligible by the SHPO in 2005. The architectural embellishments signify both the affluence of the era and the importance given to the bridge's place at the confluence of Hillsborough Bay and the Hillsborough River. Thus, age, type, aesthetic qualities, landmark position, and association with the 1920s expansion of Tampa all contribute to the bridge's historical value. This bridge retains its historic integrity. It is significant under Criterion A in the area of Transportation and Community Planning and Development, primarily based on its association with the growth and development of Tampa during the early part of the 20^{th} century. It also meets NRHP Criterion C in the areas of Architecture and Engineering as an early example of a double-leaf trunnion bascule bridge designed by the Strauss Bascule Bridge Company, and for the aesthetics of the Mediterranean Revival style detailing.

<u>Cass Street Bridge</u>
Hillsborough County
FDOT #105502, 8HI6670

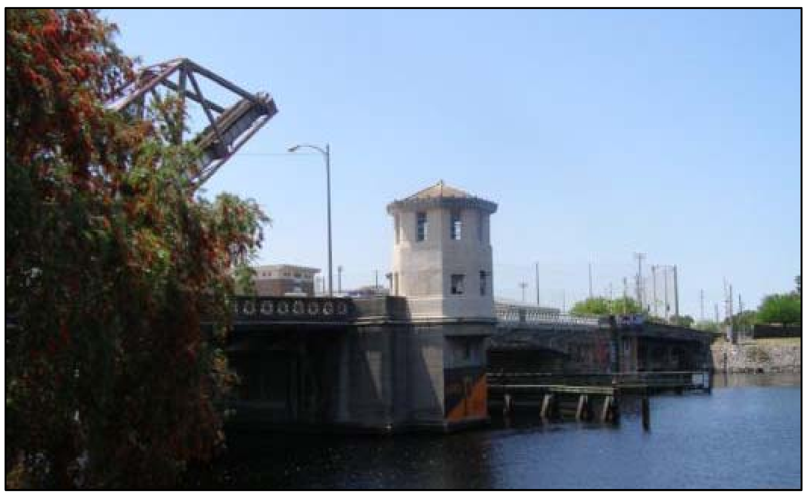

Photo 5-80. Cass Street Bridge, Hillsborough County (No. 105502)

The 1927 Cass Street Bridge over the Hillsborough River was designed by the Strauss Bascule Bridge Company of Chicago and constructed by Tibbets, Pleasant, Green and Beckman, of Oklahoma City. It is near identical in all of its major architectural and historical characteristics to the Platt Street Bridge. It also features 10 reinforced concrete tee-beam approach spans and a double-leaf Strauss trunnion bascule main span, as well as the distinctive eight-point star railing and Mediterranean Revival style tender stations.

Tampa's need to expand its road system across the Hillsborough River and into the western suburbs during the great spurt in growth of the 1920s led to the construction of the Cass Street and Platt Street Bridges, which were erected under the same contract that spanned 1925 and 1926. Although reconstructed in 1949, this bridge maintains its historic physical integrity. The Cass Street Bridge was determined NRHP-eligible by the SHPO in 2002. It is significant under Criterion A in the areas of Transportation and Community Planning and Development and under Criterion C in the areas of Architecture and Engineering as an early example of a bascule bridge with Mediterranean Revival detailing.

Laurel Street Bridge
Hillsborough County
FDOT #105503, 8HI6671

Photo 5-81. Laurel Street Bridge, Hillsborough County (No. 105503)

The Laurel Street Bridge (originally Fortune Street Bridge) is a unique, imposing, and historically important single-leaf trunnion bascule bridge across the Hillsborough River in Tampa. The City of Tampa constructed this bridge during 1927 after receiving voter approval in 1924 to issue bonds for several new Hillsborough River bridges. The contract went to the United Gas Improvement Company's construction division, the UGI Contracting Company of Philadelphia. Its unusual name led the company to write city officials explaining that it had built dams, power plants, factories, and defense installations during World War I, thus attesting to its ability to do this job. The Strauss Bascule Bridge Company of Chicago designed the movable span. The project cost was $401,343.

Its most distinguishing characteristic is its 99-foot-long main span, a Warren pony truss with verticals that comprises the single leaf of an unusual overhead counterweight, Strauss trunnion bascule bridge. With 10 concrete girder approach spans, the bridge measures 368 feet in length. While the single-leaf design has the advantage of only one set of lifting machinery, the length of the span in this case seemed to require the truss as a strengthening element, along with the use of three bowed members (two together at the west end) that arch over the leaf to give torsional support. Choosing not to build a counterweight pit, designers put the huge counterweight above the deck in a framed steel tower that guides the weight up and down during an opening cycle.

The Laurel Street Bridge underwent major alterations in 1969. The two original wooden bridge tender stations were replaced by a modernistic, glass enclosed tower that sits on a new concrete addition above the original abutment, which holds the operating mechanism. The new girder spans have plain concrete parapets topped by a pair of steel tubular handrails.

Despite the alterations to the bridge’s tender stations and railings, the character-defining elements of this bridge, especially the Warren pony truss and the overhead counterweight, remain and the bridge retains its historic physical integrity. It was determined NRHP-eligible during the 2000 survey under Criterion A in the areas of Transportation and Community Planning and Development and under Criterion C in the area of Engineering as a rare example of an early trunnion bascule bridge with a Warren pony truss bascule span and an overhead counterweight.

Photo 5-82. Brorein Street Bridge, Hillsborough County (No. 105501)

Brorein Street Bridge
Hillsborough County
FDOT #105501, 8HI11540

Construction of the Brorein Street Bridge was initiated in early 1958 and completed on July 7, 1959. This double-leaf bascule bridge carries Brorein Street over the Hillsborough River in Tampa. W.I. Nolen, the city bridge engineer, oversaw the bridge design implementation by the Paul Smith Construction Company. Composed of four spans, for a total length of 318.3 feet, this bridge rests on concrete abutments on both embankments. The width of the bridge at 54.5 feet incorporates a four-lane roadway, two 5-foot-wide sidewalks, and aluminum guard railing. Approach spans are constructed of prestressed concrete girders with concrete-cast-in-place decking. The bascule mechanisms hidden within the pier systems, by historical account, are powered by two 15-horsepower motors. The boat fenders within the river on the north side of the bridge are composed of rounded wood pilings and wood and steel beams. The boat fenders on the south side have been modified to protect the foundation of the adjacent Crosstown Expressway, and now consist of squared concrete pilings and wood plank board. Twelve lampposts, six each on the north and south sides, once flanked the roadway over the bridge, as indicated in historic photographs. Currently, only their mounting brackets or lamppost bases remain; the lampposts were removed at an unknown date.

The tender house located on the south side of the bridge is a small, one-room building with a flat roof, stucco walls, and twelve-over-eight and nine-over-six single-hung-sash windows in ribbon arrangements, giving the operator a clear view of his surroundings. Metal awnings protect the east-facing window and the entry door on the west elevation. Both the tender house and the adjacent striped traffic gates are cantilevered over the sides of the bridge on wedge-shaped platforms.

The Brorein Street Bridge was first proposed in early 1958 as a means of relieving the traffic congestion in downtown Tampa. At that time, only two bridges provided access from the residential area west of the Hillsborough River and downtown Tampa to the east. The Lafayette (later Kennedy) Bridge carried traffic through mid-town and the Platt Street Bridge channeled traffic at downtown's southernmost apex. The Brorein Street Bridge was the first completed project from the $20 million Public Improvement Program for the City of Tampa.[138]

The Brorein Street Bridge has suffered a loss of integrity with respect to its original design elements. Despite these alterations, in 2009, the SHPO determined it eligible for listing in the NRHP under Criterion A in the areas of Community Planning and Development and Transportation as a mid-century example of a movable bascule bridge over a navigable waterway constructed through a unique source of funding. The bridge is also eligible under Criterion C in the area of Engineering.

[138] "788,000 River Bridge Opened in Downtown Tampa," *Tampa Tribune* Wednesday July 8, 1959.

UNIQUE TRANSPORTATION RESOURCES

In addition to the bridges included in this 2010 Historic Highway Bridge Survey update, two unique transportation resources were identified: the Henry E. Kinney Tunnel, in Broward County, and the Fort Gates Ferry Slip in Putnam County. A description and evaluation of each resource follows.

Henry E. Kinney Tunnel
US-1/SR-5 under New River
Broward County
FDOT #860003, 8BD4504

Photo 5-83. Henry Kinney Tunnel, Broward County (No. 764039)

The 1960 Henry E. Kinney Tunnel carries US-1/SR-5 under the New River in downtown Ft. Lauderdale. It is the only tunnel in the state of Florida. Constructed by the Rhode Island firm, Thorington Construction Company, Inc. and Alfred Spear, the 864-foot long tunnel replaced a double-leaf bascule bridge that operated from 1926 to 1958. Construction began in October 1958 and was completed in 1960. The tunnel opened on December 9, 1960.

US-1/SR-5 is a critical transportation artery for Ft. Lauderdale. The former bascule bridge proved problematic due to the low vertical clearance which required frequent and disruptive openings to both boat and vehicular traffic. This junction was known as the worst bottleneck on US-1 from Main to Florida.[139] Although debate ensued over whether this bridge replacement should be with another bridge or a tunnel, public majority vote favored a tunnel and the State Road Department began plans for it in 1957. The tunnel was designed by New York engineering firm Singstad and Baillie, who also designed the Baltimore Harbor Tunnel. Originally known as the New River Tunnel, it was renamed in 1986 after Henry E. Kinney, editor of the Broward County edition of the *Miami Herald* whose determination and coverage of the tunnel weighed heavily in its final selection. Kinney had further local significance as a founding trustee of Nova University and his role in the resolution of other local issues; he passed away in 1985.

The 864-foot long tunnel is anchored to the riverbed bedrock by 3000 reinforcing rods. The distance from walled approach to walled approach is over 2000 feet.[140] At its midpoint, the tunnel roadway is 35 feet beneath the surface of the river.. The tube side walls are constructed of 33-inch thick reinforced class “A” concrete surrounded by 4-inch thick poured-in-place reinforced class “B” tunnel concrete. The east (northbound) tube contains a pedestrian sidewalk. To prevent flooding, the tunnel is equipped with electric sump pumps.

[139] Panamerican Consultants, Inc., *Recordation of the Henry E. Kinney Tunnel in Fort Lauderdale, Broward County, Florida*, (Tampa, FL: Panamerican Consultants, Inc., 2008), 5.
[140] Williams, Verne, “They Said Nobody Could Do IT . . .” *The Miami News*, December 1, 1960.

Photo 5-84. Henry Kinney Tunnel - Interior, Broward County (No. 764039)

Architecturally, the Henry E. Kinney Tunnel derives its significance from its Art Deco elements. Although this style was popular in the 1920s and 1930s, the tiling, shaped and stepped pilasters, and scored vertical lining are Art Deco elements that adorn the tunnel. The tunnel walls and ceiling are clad with over one million four-inch-square yellow enamel tiles, its most distinguishing feature. The streamlined, bright and durable tiles and vertically scored concrete walls at the north and south approaches exemplify the Art Deco theme. The sloping concrete entrance walls also have decorative panels that have rounded, stepped tops, a characteristic Art Deco feature.

The Henry Kinney Tunnel is the only resource of its type in Florida. It was determined "potentially eligible" for listing in the NRHP by the SHPO in July 2009. "Because of its unique design and advanced engineering,"[141] the tunnel is significant under Criterion C in the areas of Architecture and Engineering. It also is eligible under Criterion A in the area of Community Planning and Development for its significant historical role in the development of Fort Lauderdale.

Photo 5-85. Fort Gates Ferry, Putnam County (No. 764039)

<u>Fort Gates Ferry Timber Girder Slip over the St. Johns River</u>
Putnam County
FDOT #764039, 8PU1629

This 34-foot timber girder slip is located on the east bank of the St. Johns River near Crescent City in Putnam County. In the absence of a bridge, it supports the one-half mile passage of vehicles across the St. Johns River. The only resource of its type in Florida, the timber girder was constructed in 1924. It consists of two spans and features a vertically-laid wood slat deck. Although reconstructed in 1985, it retains its historical integrity as repairs used in-kind materials and construction methods. It was possibly also lengthened at the time of reconstruction.

This historic location and cross point for ferry service dates to the mid-19th century. Before it was a fish camp or ferry port, Fort Gates was a federal encampment during the Second Seminole War (1835-1842). The Confederate Army operated a man-powered crossing for troops during the Civil War. Public ferry

[141] Knowles, Jeanette, 8BD4504 FMSF form, November 18, 2008.

service began in 1853 to help farmers, livestock, wagons and eventually motor vehicles cross the St. Johns River at this strategic point. Today, the $10 crossing fee saves passengers a fifty-mile trek to cross the St. Johns River at this strategic point.

The 1946, one-ton metal barge is propelled by a composite 1912 small Sharpie tugboat, which is attached to the barge on a pivot. The ferry service is associated with the Gateway Fish Camp located on the east bank of the river. It is considered part of the Florida Black Bear Scenic Byway. One of four remaining ferries in the state,[142] it may have the richest history.[143] In October 2010, Putnam County received a $816,000 grant to improve the ferry launch and landing facilities. Funding was through the U.S. DOT, FHWA's Ferry Boat Program.[144]

Photo 5-86. Barge Operation: Fort Gates Ferry, Putnam County (No. 764039)

The ferry holds two cars at a time. A hand-operated control wheel raises and lowers the ramp that allows vehicles to drive onto the ferry. About 1500 vehicles per year use the Fort Gates Ferry to cross the St. Johns River. During the 1998 wildfires, state officials used the ferry to move fire fighters across the river, rather than drive the 60-mile distance between bridges.

The Fort Gates Ferry Timber Girder Slip is newly recommended NRHP-eligible under Criterion A in the areas of Community Planning and Development, Social History and Transportation for its significant historical associations to the development of Putnam County and waterway navigation dating as far back as the Second Seminole War. The structure supports one of the last remaining water shuttles in Florida.

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[142] The other Florida ferries are the Drayton Island Ferry, Mayport Ferry, and Don Pedro Island Ferry, established in 1943, 1948, and 1984, respectively. See

[143] Klinkenberg, Jeff. "Fort Gates Ferry still crossing the St. Johns River" in *St. Petersburg Times.* August 23, 2009. Accessed at: http://www.tampabay.com/features/humaninterest/fort-gates-ferry-still-crossing-the-st-johns-river/1029732; White, Gary. "Long-Serving Ferry has Local, International Appeal" in *The Ledger.* April 18, 2006. Accessed at: *http://www.theledger.com/article/20060418/NEWS/604180381*.

[144] "Upgrades to Fort Gates and Drayton Island Ferries on the Way," EMAILWIRE.COM, October 18, 2010, Accessed at: http://www.emailwire.com/release/50101-Upgrades-to-Fort-Gates-and -Drayton-Island-Ferries-on-the-way.html.

CHAPTER 6 - THEMATICALLY AND GEOGRAPHICALLY RELATED BRIDGES

INTRODUCTION

Historic resources exist all around us. Usually we think of them as individual resources, such as the first school in a city. Sometimes we think of them as collections of sites, such as the old shops and restaurants in a community's original downtown area. Bridges often are considered as individual resources, significant for their role in development as they span a waterway or as representations of a type of technology or style of architecture. Much like individual bridges, these bridge groups include structures important for their technology, aesthetics, and/or association with a specific historical development or notable individual or company. A thematically-linked bridge group may be represented by bridges located throughout the state; other groups may be clustered within a single community or small geographical area.

The post-World War II development of coastal residential communities is a prominent theme in Florida's history. At its extreme, as the demand for waterfront property began to exceed supply, new land was "manufactured" through dredge-and-fill operations. Infrastructure improvements, including new bridges, developed in tandem with the growth of new beachfront communities. There are many examples of bridges that, as a group, are notable for their significant historical associations in the area of Community Planning and Development. Four such bridge groups located in southeast Florida are highlighted in this chapter:

- Nurmi Island Bridges, Broward County
- Duck Key Bridges, Monroe County
- Sunset Island Bridges, Miami-Dade County
- Venetian Causeway Bridges, Miami-Dade County

Perhaps the most interesting of the thematically and geographically related bridges are those that were designed by the same individual for the same community or purpose and that share common physical features. For example, many concrete arch deck bridges constructed in the 1920s exhibit the distinctive and aesthetically pleasing styling of Daniel Luten; bridge railings decorated with a Maltese cross motif showcase the work of Duval County engineer T.B. Carrick. Two bridge groups which illustrate the work of two other individual masters, Henry Klutho and Freeman Horton, are contained in this chapter:

- Klutho-designed bridges along Hogan's Creek in Duval County
- Horton-designed bridges over Wares Creek in Manatee County

While some bridge groups contain structures that are clustered geographically, others are linked by historical theme or function, and thus, may contain examples from various parts of Florida. For example, a group of bridges may be defined by the local, state, or federal program which provided the funds for construction. Under the New Deal programs of the late 1930s to early 1940s, for example, thousands of bridges and culverts in Florida were newly constructed or improved. This chapter examines selected:

- New Deal Bridges and Culverts

Other bridge groups are distinguished by their engineering innovation and/or architectural features, built in response to a particular functional need. For example, some bridges were constructed as grade separations to move vehicular traffic over railroad corridors or urban centers. Over water, bridges with removable spans provided a cost-effective alternative to movable spans in situations requiring only temporary openings for the passage of vehicles through a navigable waterway. Three functionally distinctive bridge groups are illustrated:

- Railroad Grade Separations (Statewide)
- Removable Span Bridges, South Florida
- Commodore Point Expressway Bridges, Duval County

Bridges also may be significant for their associations with other bridges. The most obvious example is a group of contemporaneous bridges that stretches across the same body of water. Highlighted are the:

- Overseas Highway Bridges in Monroe County

DESCRIPTION OF BRIDGE GROUPS

Among the groups of bridges described below are individual bridges of merit, meeting the criteria of eligibility for listing in the NRHP. In other cases, the individual bridge lacks distinction, but may be significant as a contributing resource to a historic district; the definition of such districts was beyond the scope of this inventory survey.

Nurmi Isles Bridges, Broward County

The four bridges that make up the Nurmi Isles Neighborhood group (**Table 6-1**) were constructed in 1948 across the Las Olas Canal to provide access to the Nurmi Isles neighborhood in Fort Lauderdale.[145] The Nurmi Isles are part of a larger Land Boom development known as the Las Olas Islands. In 1920, the New River Development Company began its project by dredging the wetlands and building up land with the spoil. Charles G. Rhodes and William F. Morang pioneered the creation of finger islands with their subdivisions, Riviera and Venice, further south of Nurmi Isles. Their finger island concept would be copied extensively; the human-designed, narrow strips of dredge fill alternating with channels of water offered every home waterfront property. Bridges were built to the Las Olas Islands, but development did not occur until after World War II. In 1944, Victor Nurmi purchased the undeveloped islands for $250,000 and planned 250 homes. Construction began with deeper dredging of the existing waterways, constructing more bridges, replacing the existing seawalls with five miles of new concrete walls, the paving of boulevards, and landscaping.[146] Architects Clinton Gamble and Robert E. Hansen and their firms produced many of the home designs, choosing to deliberately stray from the then more popular Mediterranean Revival style to a style characterized by simple geometric planes and lines, white stucco walls, large glass openings, and circular windows trimmed with hand-wrought iron motifs.

Table 6-1. Nurmi Isle Bridges.

FDOT No.	FMSF No.	Year Built	Route Carried / Feature Intersected
865734	8BD3149	1948	Isle of Venice over Las Olas Canal
865735	8BD3150	1948	Fiesta Way over Las Olas Canal
865736	8BD3168	1948	Nurmi Drive over Las Olas Canal
865737	8BD3169	1948	Royal Palm Drive over Las Olas Canal

[145] SEARCH, Historic Structure Assessment of the Nurmi Isles Bridges, 2007.
[146] SEARCH, 2007.

Stylistically, the four Nurmi Isles bridges are compatible in design with the Art Moderne style of the neighborhood. Each contains three 24-foot spans, with solid concrete railings with large rectangular and smaller square balusters set in a uniform pattern on each bridge. In addition, all four structures feature planters at each corner of their approaches. **Photos 6-1 and 6-2** illustrate the basic bridge design.

Photo 6-1. Isle of Venice Bridge (No. 865734)

Photo 6-2. Royal Palm Drive Bridge (No. 865737)

In 2008, the four Nurmi Isles bridges were determined NRHP-eligible by the SHPO as contributing elements to the Nurmi Isles Resource Group and to the larger NRHP-eligible Las Olas Islands under Criteria A and C.

Duck Key Bridges, Monroe County

Duck Key remained virtually unsettled after the 1830 collapse of the island's salt-producing industry until the mid-1950s and the establishment of the Indies Inn, a fashionable resort on Duck Key. In 1955, developers constructed the four historic Duck Key Bridges. An additional bridge, which does not exhibit the same level of architectural detail, was constructed on Duck Key in 1967; it does not contribute to the group of 1955 Duck Key Bridges. The building of the Duck Key Bridges was related to the development of the Indies Inn and to the opening of Duck Key to residential development. The Indies Inn is no longer in business, but the site remains in operation as Hawks Cay Resort.

In the decades following World War II, bridge design tended towards strict functionality and uniform design standards. Aesthetic considerations were, for the most part, not commonly addressed in the design of bridge structures. As a result, these four bridges (**Table 6-2**) are significant for their aesthetics as well as their historical association with the real estate development of Duck Key. All were determined individually NRHP-eligible in the 2000 survey under Criterion A in the area of Community Planning and Development and under Criterion C in the area of Architecture.

Table 6-2. Duck Key Bridges.

FDOT No.	FMSF No.	Bridge* Type	Date	Name/Route Carried/Feature Intersected
904602	8MO2137	Concrete arch deck	1955/82	Truman Bridge/Duck Key Drive / Unnamed channel
904603	8MO2136	PSC channel beam	1955/82	Bimini Drive/Sam's Canal
904604	8MO2135	PSC channel beam	1955/82	Harbour Drive/Joe's Canal
904606	8MO2138	PSC channel beam	1955/82	Rosen Bridge/Seaview Drive/ Unnamed canal

* PSC – Pretressed Concrete

The four Duck Key bridges are located in Monroe County on the southeast side of the Overseas Highway at approximate Mile Marker 61. This bridge group includes one concrete arch deck bridge and three concrete channel beam bridges, all constructed in 1955 and rehabilitated in 1982. The rehabilitation left their historic appearances intact. As part of the planned development of Duck Key, each was designed with a view towards appearance. As a result, these four bridges represent historically notable resources for their aesthetics as well as their historical association with the real estate development of Duck Key. The various aesthetic treatments on the bridges give them a unity of design without sacrificing the unique character of each bridge's individual appearance. All structures feature concrete balusters interspersed with rectangular concrete piers. These piers, in turn, are topped with a decorative element. The designs of these decorative elements, as well as the balusters and piers, are unique to each bridge.

Dedicated to President Harry S. Truman in 1964 to commemorate his many visits to Duck Key, the **Truman Bridge** carries Duck Key Drive across the unnamed waterway that separates Indies Island from the remainder of Duck Key. The 76-foot long reinforced concrete structure consists of three arch deck spans. Its balustrade consists of urn-shaped balusters bounded by rectangular concrete piers topped with concrete pineapples (**Photo 6-3**). In addition, a sign commemorating the naming of the bridge is set in molded concrete flanking the approach to the bridge. The **Bimini Drive Bridge**, a reinforced concrete channel beam structure, is 41 feet long and carries Bimini Drive over Sam's Canal. As on the Truman Bridge, the bridge railings feature urn-shaped balusters and rectangular concrete piers (**Photo 6-4**); however, the piers are topped with sculpted concrete papayas rather than pineapples.

Photo 6-3. Truman Bridge (No. 904602)

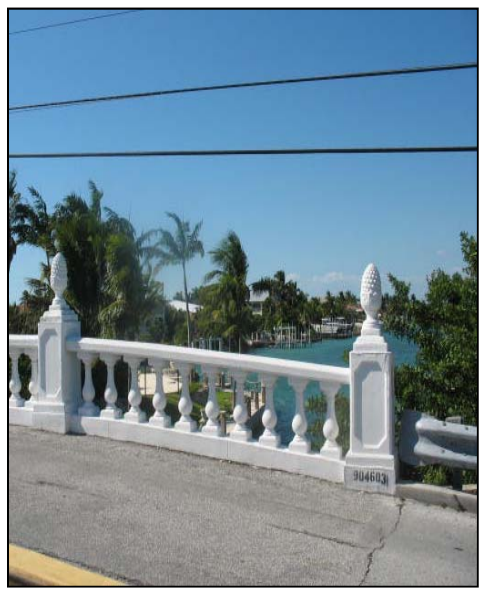

Photo 6-4. Bimini Bridge (No. 904603)

The **Harbour Drive Bridge**, a 55-foot long reinforced concrete channel beam bridge, crosses Joe’s Canal. Though the concrete papayas and rectangular piers of its balustrade exist on other bridges, the lace-like balusters (**Photo 6-5**) on the Harbour Drive Bridge are only found on this one of the four Duck Key Bridges. In addition, six relief diamonds decorate both sides of the bridge. The reinforced concrete channel beam **Rosen Bridge** carries Seaview Drive over an unnamed channel and presents yet another unique blend of features on its bridge railings. On this 55-foot long structure, the balusters are cylindrical concrete columns covered with sculpted concrete ivy (**Photo 6-6**). On this bridge, the posts are topped with molded concrete pineapples. A metal bridge plaque dedicating the bridge "In Memory of Cathy Rosen Duck Key Bridge Tender" is located on a railing post at the east approach.

Photo 6-5. Harbour Bridge (No. 904604)

Photo 6-6. Rosen Bridge (No. 904606)

Sunset Island Bridges, Miami-Dade County

Three reinforced concrete tee-beam bridges (**Table 6-3**) connect the Sunset Islands in Biscayne Bay with Miami Beach. These bridges were constructed by the Sunset Island Company in 1926. A fourth bridge connecting these islands, Sunset Island Bridge Number 3, was replaced in 1995. Sunset Island Bridge Nos. 1 and 2 were determined NRHP-eligible by the Florida SHPO in 2010. They are significant under Criterion A in the area of Community Planning and Development and under Criterion C in the area of Architecture. Although development on the islands did not actually begin until 1936, their association with the 1920s development of the Sunset Islands heightens the importance of these bridges. The Sunset Island Company planned these bridges, with an emphasis on their appearance, in hopes of attracting development to the islands. While simple from an engineering perspective, the decorative balustrades and ornate, wrought iron lampposts provide these bridges with a notably elegant appearance, and thus lend aesthetic significance. Sunset Island Bridges Nos. 2 and 4 were rehabilitated in the 1990s. In general, these rehabilitations improved both structures in order to meet current roadway safety standards while maintaining their historical integrity. In addition, both bridges had suffered a great deal of deterioration since 1929, especially along the balustrades. All four balustrades were replaced with matching balustrades in accordance with the Secretary of the Interior’s rehabilitation standards.

Table 6-3. Sunset Island Bridges.

FDOT No.	FMSF No.	Year Built	Route Carried / Feature Intersected
876707	8DA6441	1926	Sunset Drive over Sunset Lake Canal (Bridge No. 1)
876708	8DA5828	1926	Sunset Drive over Sunset Lake Canal (Bridge No. 2)
876710	8DA5829	1926	W. 29th Street over Sunset Lake Canal (Bridge No. 4)

Sunset Island Bridge No. 1 (No. 876707; **Photo 6-7**) is a fine example of a curved concrete tee-beam bridge. In developing its real estate holdings on small islands in Biscayne Bay, the Sunset Island Company built this 128-foot long, three-span bridge across Sunset Lake Canal. The bridge's most notable features are the curved tee-beams and the cast concrete railings with spindle-shaped balusters.

Photo 6-7. Sunset Island Bridge No. 1 (No. 876707)

Photo 6-8. Sunset Island Bridge No. 4 (No. 876710)

The Sunset Island Company constructed **Sunset Island Bridge No. 2** (No. 876708) in essentially the same style that it built Sunset Island Bridge No. 1. This second bridge also carries Sunset Drive over the Sunset Lake Canal. At 146 feet in length, this structure represents the longest of the three remaining historic Sunset Island Bridges. The curved tee-beams, classical treatment on the cast concrete railings, and the decorative lampposts combine to make it an attractive structure.

Sunset Islands Bridge No. 4 (No. 876710; **Photo 6-8**) carries W. 29th Street across Sunset Canal. The 144-foot-long bridge features curved concrete tee-beams, a decorative, classical-style railing with cast concrete balusters, and period lampposts. The structure retains its original character and provides a good example of an aesthetically pleasing treatment of a standard girder bridge.

Venetian Causeway Bridges, Miami-Dade County

Twelve bridges (Nos. 874459 - 874461, 874463, 874465, 874466, 874471 - 874474, 874477, and 874481) carry the Venetian Causeway over Biscayne Bay, linking Miami and Miami Beach. The 12 bridges (numbered 1-12 from west to east) cut across one natural and five man-made islands. The entire causeway runs about 2.5 miles in length, from NE 15th Street in Miami to Dade Boulevard in Miami Beach.

In 1913, on the same site as the current causeway, Miami Beach pioneer John Collins built one of the longest timber deck trestles in the nation to link his beach community with the mainland. This was replaced in 1926 with the Venetian Causeway, constructed by the Bay Biscayne Improvement Company and its contractor, the Raymond Concrete Pile Company of New York City. The functional purpose of the causeway was to provide access to the Venetian Island communities, also constructed by the Biscayne Bay Improvement Company. The Venetian Causeway (collectively assigned the FMSF No. 8DA4736) was listed in the NRHP in 1989. The 12 bridges are significant under Criterion A in the areas of Transportation and Community Planning and Development and under Criterion C in the areas of Architecture and Engineering.[147]

[147] Welcher, Vicki L., Venetian Causeway, National Register of Historic Places Registration Form, May 1989.

In 1996 and 1997, FDOT undertook a major rehabilitation and reconstruction project on the Venetian Causeway bridges, including the in-kind replacement of damaged and deteriorated components. In addition, the rehabilitation project resulted in the restoration of a number of historic elements that had either been altered or removed over the years. Circa 1920s-style lampposts were installed, and the tender stations were restored. The principal alterations to the causeway were to Bridge 1 (No. 874459); the historic bascule span was replaced, along with a portion of the adjoining fixed spans, in order to supply a wider clearance for watercraft on the Intracoastal Waterway. In 2009 and 2010, Miami-Dade County undertook another project to rehabilitate the curved tee-beams, the concrete deck, and the piers.

Two of the bridges, Bridges 1 (No. 874459) and 10 (No. 874474), feature movable steel bascule spans. The 40 approach spans on Bridge 1 and the four approach spans on Bridge 10 are supported by curved concrete tee-beams that give the appearance of shallow arches. Mediterranean Revival style tender stations are located on the south sides of Bridges 1 and 10.

Photo 6-9. Venetian Causeway Bridge (No. 874481)

The decks of Bridges 2-9, 11, and 12 are also supported by curved concrete tee-beams. Each span has five beams placed 8.5 feet on center. The deck cantilevers are 3.25 feet on each side of the exterior tee-beams. The superstructures of the bridges are supported on square pier columns that rest on concrete pile caps.

The curved concrete tee-beams and the distinctive railings link the bridges stylistically. The concrete railings feature a pierced geometric design at a low height, which allows a continuous view of the bay from the cast-in-place concrete decks. Each railing panel consists of radiating diagonals, which form a double-X pattern. These panels are divided by square capped posts, with larger posts located at the end of each span. The ends of the railings are splayed over the concrete wing-walls of the abutments.

Photo 6-10. Venetian Causeway Bridge 5 (No. 874465)

Photo 6-11. Venetian Causeway Bridge 7 (No. 874471)

At the western end of the causeway is a pair of tapering octagonal concrete towers that flank the roadway's entrance onto Bridge 1. These fixtures are topped by lights and resemble lighthouses. The north and south towers are inscribed with the words "Short Way" and "Venetian Way," respectively.

The Henry J. Klutho Bridges over Hogan's Creek, Duval County

Six historic bridges span Hogan's Creek in Confederate and Springfield Parks within the historic Springfield neighborhood of Jacksonville in Duval County. Their aesthetic designs joined to their associations with the historic development of Jacksonville and with Henry J. Klutho, a notable Florida architect, establish the historic importance of these unique and beautiful bridges. Henry J. Klutho gained repute by introducing the Prairie School style of architecture into north Florida during the early 20th century. His designs helped rebuild Jacksonville after a fire destroyed the downtown in 1901. A student of Frank Lloyd Wright and Louis Sullivan, he became one of Florida's most accomplished architects. Working with civil engineer Charles V. Imeson, Klutho prepared plans in 1929 for a city project to transform Hogan's Creek, a waterway that had become little more than an open sewer, into a "Grande Canal" within a large park.

Their plans focused upon beautifying and renewing Springfield, the city's oldest neighborhood and, through Springfield, contributing to the improvement of Jacksonville. However, since the Great Depression followed the project almost immediately, Klutho's hope of generally improving Jacksonville was not fully realized at the time. But what remains of the attempt leaves an impression of sensitivity to the interrelationship between man-made and natural aesthetics. The Robert G. Lassiter Company of Oxford, North Carolina, an important bridge builder in Florida and the Southeast, constructed the project. Ultimately, the project drew praise from the local newspaper as Klutho's masterpiece which involved rechanneling the creek, building locks, lakes, and a pumping plant, and constructing six reinforced concrete bridges for automobile traffic, as well as several pedestrian bridges. The Klutho-designed vehicular bridges over Hogan's Creek are listed in **Table 6-4**.

Table 6-4. Hogan's Creek Improvement Bridges and Associated Resources.

FDOT No.	FMSF No.	Route Carried over Hogan's Creek	Comments
724171	8DU7540	Newnan Street	Operating bridge
724149 (formerly)	8DU7537	Julia Street (W. Second St.)	Now a pedestrian bridge in Springfield Park
724172	8DU7539	Market Street	Operating bridge
724175	8DU7538	Laura Street	Operating bridge
724359 (formerly 724173	8DU7551	Liberty Street	Operating bridge
n/a	8DU7541	US-1/Main Street	Operating bridge

Collectively, these structures represent a historically important group associated with their role in the historic development of the Springfield and Confederate Park areas of Jacksonville, as well as their relationship to each other. Although the bridges present the standard structural design of concrete girders and slabs, they exhibit the artistic touches of Henry Klutho. He designed all of these bridges in a Beaux Arts/Neoclassical Revival style. The shared decorative elements include solid concrete railings supporting obelisks, urns, decorative lighting, and relief sculptures.

The Julia Street Bridge was determined NRHP-eligible during the 2000 survey; the SHPO evaluated the Market Street and Liberty Street bridges as potentially eligible in 2006; and the Newnan Street, Laura Street, and Main Street bridges are newly recommended as NRHP-eligible under Criteria A and C.

At a length of just more than 46 feet, the **Laura Street Bridge** represents the longest of these ornate bridges across Hogan's Creek. The **Liberty Street Bridge** consists of a small concrete slab structure decorated with the ornamentation characteristic of its five sister bridges in the park. A relief sculpture with the date "1929" inscribed upon it appears on the outside of the balustrade.

The balustrade on **Main Street Bridge** features a sculpted cartouche (**Photo 6-12**). It is also inscribed with "Hogan Creek Improvements" and commemoratively features Klutho, Imeson, the Lassiter Company and the Arnold Stone Company in its text. The most significant alteration to the structure occurred prior to 1991, when a portion of the bridge railing was removed in order to provide space for an adjacent building. The **Market Street Bridge** (**Photo 6-13**) is a 41-foot-long concrete slab with a 40.5-foot roadway. As on the Liberty Street Bridge, the exterior of the railings carry ornamental tablets inscribed with the year "1929."

Photo 6-12. Main Street Bridge.

The **Newnan Street Bridge** (**Photo 6-14**) and the **Julia Street/West Second Street Bridge** each possess many distinguishing aesthetic features such as relief sculptures, urns, and obelisks. Only one resource, the Julia Street/West 2nd Street Bridge, no longer carries vehicular traffic due to a change in the urban grid to accommodate Florida Community College's downtown campus and other establishments.

Photo 6-13. Market Street Bridge (No. 724172)

Photo 6-14. Newnan Street Bridge - Molding (No. 724171)

The Freeman H. Horton Bridges over Wares Creek, Manatee County

Three bridges over Ware's Creek in Manatee County were constructed by the City of Bradenton Public Works Department in 1938, 1945, and 1949 as replacements for previous iron and wooden structures. These replacement bridges were likely built using federal relief funds. All three bridges are situated within a NRHP-eligible historic neighborhood, which developed over the first half of the twentieth century. As a group, the three bridges helped maintain the integration of the neighborhood as a whole community. In addition, they continued to support the growth of the neighborhood by accommodating the increased automobile traffic following World War II. However, the most notably significant historical association is with the bridge designer, Freeman H. Horton.

Civil engineer Freeman H. Horton was the first Massachusetts Institute of Technology (MIT) graduate from Manatee County. Upon graduation from college, Mr. Horton operated his own office, Horton Company Inc., in Manatee County. Following a brief period of work in Cincinnati during the early part of the Depression, he returned to Manatee County in 1933. In order to qualify for WPA and other federally funded projects, Horton partnered with George and Ralph Bail to create Bail and Horton Associates. During World War II, Horton designed every Army Air Corps Training Field in Florida, including Avon Park, Drew Field, and what is now Sarasota-Bradenton Airport. After the Bail and Horton partnership ended in 1955, he began Horton and Associates with his son and son-in-law, which continued until 1970.

A few of Horton's projects have been noted around the world such as his Tampa Bay Hyde Park Seawall. Leiden University in Holland uses this seawall as part of their engineering curriculum due to Horton's innovative adaptation of a Dutch engineering strategy in creating stable foundations for structures in water. Other noteworthy projects by Horton include the Sarasota Civic Center, the Manatee County Memorial Hospital, the Railroad Vertical Lift Bridge in Jacksonville, and an original design for the Sunshine Skyway. Horton also worked internationally, and at one point, had offices in Cuba and Haiti. His work was influential enough that he was once offered the position of Chief of Engineering in the Philippines; however, he declined the offer to remain in Florida. Recently, Freeman H. Horton was listed as one of the twenty most influential people in the history of Manatee County. Despite being known for his bigger projects, Horton would frequently do smaller bridge and highway work for the Department of Transportation. This work included the Seventh, Ninth, and Twelfth Avenue Bridges over Wares Creek.[148] Horton used concrete in the design of these bridges, but insisted that no Florida limestone be used as aggregate. He felt that it was too porous and weak for use in highways and bridges and favored the limestone or granite from Georgia or further north.

The **Twelfth Avenue Bridge over Ware's Creek** (No. 135252; **Photo 6-15**) is a simple and small, 28-foot long concrete tee-beam bridge built in 1938. Poured concrete abutments support the bridge, both of which have drainage culverts at their base. The superstructure is poured concrete, and the deck is covered in asphalt. Horton chose to give its railings a Neo-Classical feel by incorporating a balustrade (**Photo 6-16**), a somewhat common aesthetic treatment on bridges from the 1920s and 1930s. Horton both designed the structure and supervised its construction, perhaps with federal relief assistance. The earliest of the three Ware's Creek bridges, the Twelfth Avenue Bridge was determined eligible for listing in the NRHP by the SHPO in 2007. It is located within the Wares Creek Historic District.

[148] Archaeological Consultants, Inc., Section 106 Consultation Case Study Report for the 9th Avenue West Bridge Replacement at Wares Creek, Manatee County, Florida. Evaluation of Effects to the 9th Avenue West Bridge at Wares Creek and a Wares Creek Historic District, 2009.

Photo 6-15. North Guardrail and Deck of the Twelfth Avenue Bridge (No. 135252)

Photo 6-16. South elevation of the Twelfth Avenue Bridge, Looking Northwest.

The **Ninth Avenue Bridge over Ware's Creek** (No. 135251; **Photo 6-17**), a 1945 concrete arch deck, was the second Horton-designed bridge constructed over Wares Creek. Its 1945 construction date makes it a relatively late example of the use of an arch deck bridge. The 36-foot long structure is supported by two abutments of poured concrete faced with solid concrete panels with a horizontal ribbed pattern. The superstructure of the bridge is poured concrete while the deck is asphalt. This bridge features deck railings that contain a "w" or "zig zag" pattern (**Photo 6-18**), found only on one other Florida bridge, the Seventh Avenue Bridge over Ware's Creek. In 2009, the SHPO determined the Ninth Avenue Bridge eligible for the NRHP under Criterion B for its association with Bradenton engineer, Freeman Horton, and under Criterion C in the area of Engineering.

Photo 6-17. The Ninth Avenue Bridge (No. 135251), Looking Southwest.

Photo 6-18. Zigzag Railing Detail on the Ninth Avenue Bridge.

The third Horton-designed bridge is the **Seventh Avenue Bridge over Wares Creek** (No. 135250), a steel girder bridge constructed in 1949. It consists of three spans, for a total length of 63 feet. The concrete rails of this bridge are similar to those on the 9th Avenue West Bridge. This Ware's Creek Bridge also was determined NRHP-eligible by the SHPO in 2009.

New Deal Era Bridges and Culverts: Statewide

The Great Depression of the 1930s was an economic storm that paralyzed the industrialized countries of the western world and, most of all the United States. In Florida, the economic problems were compounded by the collapse of the state's 1920s Land Boom. In response, the federal government, under the leadership of President Franklin Roosevelt, launched a number of government relief programs under the name "New Deal." They included programs for the construction of bridges, parks, and roads and helped revive U.S. productivity by providing employment for the jobless and infusing capital into the American economy.

The Works Progress Administration (WPA) and the Civilian Conservation Corps (CCC) were two major components of Roosevelt's program, and they included road building programs that produced several bridges across the state. These efforts to stimulate the national economy through government programs represent one of the major historical trends of the twentieth century. Between 1935 and 1943, the WPA constructed 78,000 new bridges and viaducts and improved more than 46,000 others. In the later years of the program, timber and masonry were often used in bridge construction in order to conserve critical materials. Many of the bridges were small, replacement structures, typically consisting of two-lane bridges built to replace one-lane bridges.[149] In Florida, the WPA built and improved 1,483 bridges and viaducts plus 7,049 culverts through the period ending June 30, 1943.[150]

The bridges and culverts included in this group share two important features: they were all built during the Great Depression, and they all have stone or rubble facades. In every case, the stone or rubble is of local origin, which is a feature seen in many WPA and CCC undertakings nationwide. The Blackwater Creek Overflow Bridge was determined eligible by the SHPO in 1993; the other four were determined NRHP-eligible during the 2000 survey. These bridges generally are eligible for listing in the NRHP under Criterion A in the area of Government and under Criterion C in the area of Engineering. The five New Deal era bridges and culverts listed in **Table 6-5** are discussed below.

Table 6-5. Stone or Rubble-Façade New Deal Bridges and Culverts.

FDOT No.	FMSF No.	Year Built	County / District	Route Carried / Feature Intersected
n/a	8LI338	1940	Liberty / 3	Torreya Stone Arch Bridge over Rock Creek
100647 (formerly 100037)	8HI5042	c.1936	Hillsborough / 1	SR-39 over Blackwater Creek Relief
364150	8MR3603	1940	Marion / 3	NE 145th Avenue over Unnamed Canal
364120	8MR3602	1940	Marion / 3	SE 137th Avenue over Unnamed Creek
364060	8MR3601	1940	Marion / 3	NE 105th Street over Daisy Creek

The **Torreya Stone Arch Bridge** spans Rock Creek in Torreya State Park in Liberty County. The CCC erected the bridge in 1940 as part of the development of the park. Originally, this bridge carried the park entrance drive over the small creek, but the entrance has been reoriented and the bridge now serves as part of the park's trail system. The bridge consists of a concrete structure with limestone facing and a concrete curb. The limestone façade gives the bridge a rustic appearance that harmonizes with the rural park setting.

In Hillsborough County, a steel arch culvert carries SR-39 over the Blackwater Creek Relief. The **Blackwater Creek Overflow Bridge** (No. 100647, formerly 100037) is described and illustrated in Chapter 5 (see page 5-34).

Marion County provides three examples of WPA construction. The **Southeast 137th Avenue culvert** over an unnamed creek (No. 364120; **Photo 6-19**) has three spans and extends a total length of 44 feet. The **NE**

[149] United States Federal Works Agency, *Final report on the WPA Program, 1935-43* (Washington, D.C.: U.S. Government Printing Office, 1947), 53.
[150] United States Federal Works Agency, 1947, 135.

105th Street culvert over Daisy Creek (No. 364060; **Photo 6-20**) is the largest, with five spans and a length of 109 feet. The smallest of the three is the two-span, 34-foot, **NE 145th Avenue culvert** over an unnamed canal (No. 364150). These three structures are all stone-faced, and each possesses an engraving of the initials "WPA" following "Marion County" and "1940" on the interior surfaces of their bridge railings. They are the only bridges identified in the state on which the WPA left such a marking.

Photo 6-19. SE 137th Avenue Creek Culvert, Marion County (No. 364120)

Photo 6-20. NE 105th Street Culvert over Daisy Creek, Marion County (No. 364060)

In addition to the New Deal-era arched bridges and culverts, other similar resources constructed in the 1930s and 1940s were identified. These concrete and steel arch culverts exhibit uncommon design trends for their type during this time. The Bauhaus and International style influences and cost-constraints of the Great Depression meant an end to high-style, ornate structures seen throughout America's built environment. Beginning in the 1930s, adorned structures became increasingly rare. For concrete culverts, this was exhibited as a shift from an arched to a boxed form and from a stone-faced to an unadorned façade. As concrete gained further acceptance as a bridge building material, cast-in-place, unadorned concrete box culverts emerged in the 1930s as the dominant culvert type; box culverts have been the prevalent form ever since.

Seven corrugated steel arch culverts located in Bradford and Suwannee Counties (**Table 6-6**) exhibit the changing design trends that mark the end of an era. Due to their integrity, increasing rarity, and at-risk condition, with the exception of No. 374002, the culverts are newly recommended NRHP-eligible under Criterion C in the area of Engineering. They are considered high integrity examples of a dwindling resource type. Further in-depth research, beyond the scope of this inventory survey, may reveal that the 1940s stone-faced arched culverts are associated with the WPA, CCC, or other New Deal-era road building programs. Both the **Braggs Branch culvert** (No. 280036) and the **Gum Creek culvert** (No. 280037) are described and illustrated in Chapter 5 (See page 5-33).

Table 6-6. Steel and Concrete Arch Culverts

FDOT No.	FMSF No.	Year Built	County / District	Route Carried / Feature Intersected
280036^	8BF00730	1940	Bradford /2	CR-18 over Braggs Branch
280037^	8BF00731	1940	Bradford /2	CR-18 over Gum Creek
280038^	8BF00732	1940	Bradford /2	CR-18 over Branch of Sampson River
374002*	8SU00394	1940	Suwannee / 2	180th Street over Little Creek
374004*	8SU00395	1940	Suwannee / 2	164th Street over Little Creek
374006*	8SU00396	1919 / 1943	Suwannee / 2	61st Road over Little Creek
374012*	8SU00397	1932	Suwannee / 2	98th Terrace over Rocky Creek

^ Unadorned, arched culvert.
* Stone-faced, arched culvert.

Photo 6-21. CR-18/Sampson River Branch Culvert, Bradford County (No. 280038)

Photo 6-22. 164th Street / Little Creek Culvert, Suwannee County (No. 370004)

Railroad Grade Separation Bridges: Statewide

The six bridges featured in this category (**Table 6-7**) are either simple concrete tee-beam or steel girder railroad grade separations that conform to State Road Department standard plans. Most feature the slotted concrete railings common to this bridge type. With one exception, these bridges, constructed between 1934 and 1940, are considered the best surviving examples of a dwindling resource type; three railroad grade separations (Dunnellon Overpass in Marion County [1936]; Milton Overpass in Santa Rosa County [1937]; and the Maxville Overpass in Duval County [1937]) have been lost since the 2000 survey. Therefore, due to their age, integrity, increasing rarity, and at-risk condition, all six are newly recommended as NRHP-eligible under Criteria A and C in the areas of Transportation and Engineering, respectively.

Table 6-7. Railroad Grade Separation Bridges.

FDOT No.	FMSF No.	Year Built/ Recons.	County/ District	Name/Route Carried /Feature Intersected
080001	8HE389	1936	Hernando/7	SR-45 over CSX Railroad
114089	8LA2043	1934	Lake / 5	Mt. Dora Overpass/Highland Street over SCL RR
270001	8BA0423	1936	Baker / 2	Sanderson Overpass/US-90/SR-10 over CSX RR
720026	8DU11299	1940	Duval / 2	Baldwin Overpass/US-301/SR-200 over abandoned CSX RR
740022	NA1270	1936	Nassau / 2	US-301/SR-200 over SCL RR
880001	8IR1516	1928 / 34	Indian River / 4	US-1 SB/SR-5 over Old Dixie Highway/FEC RR

The Mt. Dora Overpass/Highland Street Bridge is one of the best examples of this group (**Photo 6-23**). This 183-foot long bridge consists of four concrete tee-beam spans. It has a 4-foot pedestrian walkway and features the slotted concrete railing characteristic of its type. The concrete piers feature strut bracing for additional support.

Photo 6-23. Mt. Dora Overpass/Highland Street Bridge, Lake County (No. 114089)

Photo 6-24. US-301/SR-200 over SCL RR, Nassau County (No. 740022)

Photo 6-25. 1940 Baldwin Overpass, Duval County (No. 720026)

Photo 6-26. 1936 Sanderson Overpass, Baker County (No. 270001)

Removable Span Bridges

In his book, *Movable Bridge Engineering*, Terry L. Koglin notes that of the approximately 1900 operable movable bridges in the U.S., only 80 include removable spans.[151] The earliest bridges of this type were located in California and included the 1904 Alamitos Bay and Anaheim Bay railroad bridges in Long Beach and Seal Beach, California, respectively. Florida's earliest bridges of this type date to the 1920s and crossed the West Palm Beach Canal. The original Shands Bridge which carried SR-15 over the St. Johns River in St. Johns County also was identified by Koglin as having a removable span. Florida's extant removable span bridges include the four girder bridges listed in **Table 6-8.** The bridge that carries SR-78

[151] Koglin, Terry L. *Movable Bridge Engineering*, (Hoboken, NJ: John Wiley & Sons, Inc., 2003), 21. Accessed at: http://books.google.com/books.

over the Kissimmee River in Okeechobee County (No. 910009) is considered the best example of its type, and is newly recommended as NRHP-eligible. A description and photographs of this bridge are contained in Chapter 5 (See page 5-25). Photos of No. 090016 in Highlands County follow.

Table 6-8. Extant Removable Span Bridges.

FDOT No.	FMSF No.	Year Built	County/ District	Route Carried / Feature Intersected
794016	VO9392	1964	Volusia / 5	Old Dixie Highway / Tomoka River
910009	8OB321	1964	Okeechobee / 1	SR-78 / Kissimmee River
090016	8HG1770	1953/66	Highlands / 1	US-90 (SR-700) / Kissimmee River
910001	8OB336/ 8HG1236	1966	Okeechobee and Highlands / 1	SR-70 / Kissimmee River

Photo 6-27. US-90 (SR-700) Bridge over the Kissimmee River, Highlands County (No. 090016)

Photo 6-28. Bridge No. 090016 with Detail View of Removable Span.

Removable span bridges require the complete removal of a span by means other than machinery installed on the bridge to open it to navigation. For example, a span can be removed temporarily by use of a crane. In general, because of the difficulty in opening, they are "practical only for spans that seldom open for navigation . . ."[152] Bridges that include removable spans are constructed with a simple span that is fit for temporary removable or hinging in an upright position. The spans themselves tend to be small, ranging from 20- to 50-ft.[153] Three of the removable span bridges identified during this survey cross inland navigable waterways which may require periodic routine maintenance or navigation from the Army Corps of Engineers or the U.S. Coast Guard. Removable decks are included as a construction contingency should an inland navigable waterway need to be bypassed by a larger vessel. According to both Corps of Engineers and FDOT District 4 personnel, this contingency is a cost-effective strategy as opposed to an operable span, which would be too expensive to operate and staff for the limited amount of traffic that navigate such waterways. Most removable spans are hinged at one end and operated by an on-site crane that hooks and lifts the movable span as needed. This contingency is also associated with military

[152] Koglin, 2003, 27.
[153] Koglin, 2003, 27-28.

maneuverability that might be required for severe and unique defense measures; this is more common for the Intracoastal Waterway bridges.

Commodore Point Expressway Bridges: Duval County

One could argue that the design and implementation of any roadway is intended to be an expressway. It is simply the magnitude of the system itself which has become increasingly more complex and expensive with time. The 1967 Commodore Point Expressway in Jacksonville is one such system. The complex of bridges and linear roadways included in this expressway represent an early form of a new trend in transportation engineering. In contrast to the multi-county 312-mile long Florida's Turnpike, the Commodore Point/Hart Bridge Expressway carries five miles of SR-228 from downtown Jacksonville to its intersection with US-90/SR-212. This transportation artery represents the result of overlapping urban planning and transportation engineering to forecast and devise the best system to efficiently and safely move people and goods.

Twenty bridges are incorporated into the Commodore Point Expressway (**Table 6-9**). Of these, the most notable is the **Isaiah D. Hart Bridge** (No. 720107) (See Chapter 5, page 5-4) designed by the civil engineering firm Sverdrup & Parcel of St. Louis, Missouri. The partially-elevated expressway features an assortment of well-maintained, 1960s bridge types and construction methods including: steel stringers, steel floor beam/girder system, and cantilevered truss bridges. This group of bridges is collectively notable for embodying achievements in transportation engineering and development, in addition to the design and engineering association with Sverdrup & Parcel, an American civil engineering company. However, at this time, none is newly recommended as NRHP-eligible.

Table 6-9. Identified Commodore Point Expressway (SR-228) Bridges.

FDOT No.	FMSF No.	Year Built	Feature Intersected w/SR-228	Bridge Type*
720488	DU21387	1967	Adams Street from Hart Ramp	CS Girder
720489	DU21388	1967	Monroe Street to Hart Ramp	PSC Girder
720490	DU21389	1967	Duval Street from Hart Ramp	CS Girder
720493	DU21390	1967	Talley Rand Avenue	PSC Girder
720494	DU21391	1967	Duval Street	CS Girder
720495	DU21392	1967	Adams Street	Steel Girder
720496	DU21393	1967	Adams Street	PSC Slab
"Isaiah D. Hart" Bridge / 720107	**8DU1555**	**1967**	**St. Johns River**	**CS Through Truss (Cantilevered)**
720113	DU21372	1967	US-90 (SR-10)	Steel Girder
720114	DU21373	1967	Washington Street	CS Girder
720283	DU21383	1967	Ryar Road	PSC Girder
720112	DU21371	1967	Ryar Road	PSC Girder
720276	DU21378	1967	SR-115	CS Girder
720105	DU21366	1967	SR-115	CS Girder
720280	DU21380	1967	Little Pottsburg Creek	PSC Girder
720109	DU21368	1967	Little Pottsburg Creek	PSC Girder
720284	DU21384	1967	US-90/SR-10/Beach Blvd.	PSC Girder
720115	DU21374	1967	US-90/SR-10/Beach Blvd.	PSC Girder
720285	DU21385	1967	Highland & Art Museum Drive	PSC Girder
720116	DU21375	1967	Highland & Art Museum Drive	PSC Girder

* CS – Continuous Steel; PSC – Prestressed Concrete

Photo 6-29. SR-228 at Adams Street Prestressed Concrete Bridge (No. 720496)

Photo 6-30. SR-228 at US-90 Steel Girder Bridge (No. 720113)

Photo 6-31. SR-228 (Leg G) Bridge (No. 720490)

Photo 6-32. SR-228 at Ryar Road Prestressed Concrete Girder Bridge Pair (Nos. 720112/720283)

Overseas Highway Bridges, Monroe County

The Overseas Highway is a system of 23 bridges (**Table 6-10**) in Monroe County connecting the islands of the Florida Keys to the Florida mainland. The group includes one steel through truss bridge (Bahia Honda, No. 900016/900045) and 22 concrete arch deck bridges. The **Bahia Honda Bridge** (Nos. 90016/900045), **Long Key Viaduct** (No. 900094), and **Seven Mile Bridge/Knight's Key Bridge** (No. 900101) were listed in the NRHP in 1979; the other 20 concrete arch deck structures were listed in 2004. The Overseas Highway bridges are eligible under Criterion A in the areas of Transportation and Community Planning and Development.

Table 6-10. Overseas Highway Bridges.

FDOT No.	FMSF	Date	Route Carried / Feature Intersected
900016 (SB)/ 900045 (NB)	8MO01231	1972	SR-5/US-1 / Bahia Honda
900080	8MO01490	1979	SR-5/US-1 / Rockland Channel
900081	8MO01489	1979	SR-5/US-1 / Shark Channel
900090	8MO03953	1980	SR-5/US-1 / Saddlebunch #5
900091	8MO03954	1980	SR-5/US-1 / Saddlebunch #4
900092	8MO03955	1981	SR-5/US-1 / Saddlebunch #3
900093	8MO03956	1981	SR-5/US-1 / Saddlebunch #2
900094	8MO01229	1981	SR-5/US-1 / Long Key Channel
900097	8MO03476	1981	SR-5/US-1 / Channel #2
900098	8MO03968	1982	SR-5/US-1 / Channel #5
900099	8MO03967	1980	SR-5/US-1 / Tom’s Harbor Cut
900100	8MO03966	1980	SR-5/US-1 / Tom’s Harbor Channel
900101	8MO01230	1982	SR-5/US-1 / Moser Channel (Knight Key Bridge; Seven Mile Bridge)
900102	8MO03957	1981	SR-5/US-1 / Lower Sugarloaf Channel
900103	8MO03965	1981	SR-5/US-1 / Missouri -Little Duck Channel
900104	8MO03964	1981	SR-5/US-1 / Ohio-Missouri Channel
900105	8MO03963	1981	SR-5/US-1 / Ohio-Bahia Honda
900106	8MO01484	1982	SR-5/US-1 / Spanish Harbor Channel
900111	8MO03962	1982	SR-5/US-1 / South Pine Channel
900112	8MO03958	1982	SR-5/US-1 / Park Channel
900115	8MO03959	1982	SR-5/US-1 / Bow Channel
900116	8MO03960	1982	SR-5/US-1 / Kemp Channel
900117	8MO03961	1983	SR-5/US-1 / Niles Channel

Most of the structures built for the FEC Railway at the beginning of the 20th century continued in service until the 1980s, when the FDOT undertook the construction of a new Overseas Highway. The state removed much of the old Overseas Highway at that time, and left 23 structures in place. Several of these were converted into fishing piers. The historical importance of these structures arises from many sources, both technological and historical. They are associated with the historical development of southeast Florida and the Florida Keys. In addition, they are associated with the Florida Land Boom of the 1920s, a horrific Labor Day hurricane that struck Florida in 1935, and the Great Depression of the 1930s. Finally, they stand as representatives of two massive engineering efforts, the construction of the Overseas Railway and its Depression-era conversion into the Overseas Highway. All of these factors combine to make this entire linear resource one of Florida's most important resources in terms of technological history. The continuing importance of the Overseas Highway is reflected in the present effort aimed at bringing these structures back into service as part of a historic and recreational trail.

Railroad magnate Henry Flagler sponsored the construction of the Overseas Railway in 1904, as an extension of his FEC Railway. In 1912, the extension was completed, thereby providing a rail link from Key West to Miami and, from there, to the rest of the United States. The railroad continued to function despite periodic interruptions due to hurricanes and other storms until a tremendous 1935 hurricane, spawning winds of 200 miles per hour, irrevocably damaged it. Following this storm, the FEC Railway could no longer afford to maintain the Overseas Railway. In an effort to keep a transportation link between the mainland and the Keys, the rail line was converted into a roadway facility by the Overseas Highway and Bridge Authority and integrated into the state highway system. To do this, a massive engineering effort, second only to the original construction of the railroad bridges, was initiated. As the majority of the structures inherited from the railroad were arch structures, the Overseas Highway and Bridge Authority added decking to the top of the rail bed in order to widen the structures from 11 to 22 feet.

Four of the replacement bridges were designed with a precast, segmental, concrete box girder alternate.[154] The Niles Channel, Long Key, and Channel #5 bridges were built by the Michaels Construction Company using precast segments; the fourth segmental bridge, the Seven Mile Bridge, was built by Misener Marine and designed by Figg & Muller, Inc.

The **Bahia Honda Bridge,** which opened in 1972, connects Bahia Honda Key with Spanish Harbor Key. It replaced the original Bahia Honda Rail Bridge, which was converted to automobile use in 1938. The old bridge remains the most distinctive and impressive span of the Overseas Highway. Since a through truss provided the support system for this bridge, the Overseas Highway and Bridge Authority could not widen this bridge without removing or widening the truss. As a result, the Authority chose to construct the highway deck on the top of the truss, thereby converting the railroads' through truss into a deck truss for the highway. After the new bridge opened in 1972, two of the truss span sections were moved to facilitate boat traffic. The former bridge is now used as a fishing pier.

The **Seven Mile Bridge** (No. 900101), also known as the Knight's Key Bridge, links Marathon in the Middle Keys to Little Duck Key in the Lower Keys. The original bridge, known as the Knights Key-Pigeon Key-Moser Channel-Pacet Channel Bridge, was constructed between 1909 and 1912 as part of the FEC Railway. This bridge featured a swing span over the Moser Channel of the ICWW; it has been permanently removed. The replacement bridge parallels the still extant original bridge, which is used as a fishing pier. Construction of the new $45 million bridge began in 1979 and opened on May 24, 1982. At this time, it was the longest segmental bridge in the world. The Seven Mile Bridge extends 6.765 miles long by 38 feet wide, and has a vertical clearance of 65 feet. The longest span measures 135 feet. It is one of four segmental bridges built to withstand winds of up to 200 miles per hour.

The **Spanish Harbor Channel Bridge** connects Big Pine Key to Spanish Harbor Key. This 0.6 mile bridge is in deteriorated condition and is no longer open to traffic. Small portions of the original railings, consisting of the old rails taken from the railroad bed, still exist on the eastern approach.

The concrete arch deck bridges tend to be primarily functional, with little ornamentation. The **Long Key Viaduct**, which joins Long and Conch Keys, is an 11,950-foot-long concrete arch deck viaduct with a 20-foot-wide roadway. It features concrete abutments, a concrete slab deck, and a concrete railing.

[154] "US Route 1 Restrings Florida Keys," *SPANS* (October 2008, Volume 6), 1.

CHAPTER 7 - ANALYSIS AND CONCLUSIONS

INTRODUCTION

The 2010 inventory began with the identification of 4160 Florida highway bridges constructed prior to 1971, exclusive of the Interstate Highway System bridges. In general, the most common types of pre-1971 bridges are concrete slab (33 percent), steel or concrete culverts (31 percent), and steel or concrete girders (21 percent), which collectively represent 85 percent of the bridges. The rarest types are movable swing and vertical lift bridges, as well as fixed metal truss bridges. Overall, these findings are consistent with the previous statewide survey.

With its focus on 1960s bridges, this third statewide inventory demonstrated the ubiquity of concrete beam and girder type bridges built to standard plans during this decade. By and large, 1960s bridge construction was driven by cost and safety considerations. Structures distinguished by their design and construction innovations are rare. Only 10 bridges built between 1960 and 1970 are newly recommended as eligible for listing in the NRHP. These structures, highlighted by yellow shading in **Table 7-1**, include four steel bascules, four girders (two steel and two prestressed concrete), one concrete box beam, and one through truss.

In addition to updating the statewide inventory to include significant bridges built during the 1960s, another main objective was to update the findings of the 1991 and 2000 surveys. As a result, 33 pre-1960s bridges are newly recommended NRHP-eligible, largely due to their diminishing numbers and/or changing interpretation of bridge significance. Nineteen of these, denoted by the pound symbol (#) in **Table 7-1**, were previously evaluated as ineligible. Fifteen bridges that pre-date 1960, not included in the 2000 survey, were newly recommended as NRHP-eligible.

The 2010 update survey results indicated that 59 previously identified bridges are no longer extant (**Appendix C**). Also, some bridges determined eligible during the 2000 survey have undergone substantial alterations which may change their continued NRHP eligibility. The following sections highlight some of the major changes to the overall inventory of Florida's historic highway bridges.

A COMPARISON OF CURRENT AND PREVIOUS SURVEY FINDINGS

Initial study of previous bridge surveys, FMSF records, and NRHP listings indicated that 39 historic bridges were listed in the NRHP, and an additional 82 were determined eligible or potentially eligible by the SHPO. The update survey resulted in the overall addition of 45 newly recommended NRHP-eligible bridges, including 12 dating to the 1960s and later, plus 33 built prior to 1960. Accounting for bridge attrition and the different methods of enumerating the number of surveyed bridges (e.g., each individual Venetian Isles and Overseas Highway bridge is not counted in the 2000 survey), Florida's inventory of significant historic highway bridges now stands at 167 extant structures. These significant historic highway bridges are listed in **Table 4-1**, contained in Chapter 4.

A comparison of overall survey results with those of the 2000 statewide inventory, organized by FDOT District, is presented in **Table 7-2.**

Table 7-1. Newly Eligible Historic Highway Bridges, with Applicable NRHP eligibility Criteria.

County	Bridge No.	Name/Location	Date	Material-Type	Criterion A: TR	Criterion A: CPD	Criterion A: OT	Criterion C: EN	Criterion C: AR	Comments
LEGEND: # indicates previously evaluated as ineligible; Yellow shading indicates 1960s bridge										
#Alachua	264126	Rocky Creek Bridge	1924	C-Tee-Beam				X		Rare intact early Example
Baker	270001	US-90/CSXRR	1936	C-Tee-Beam	X			X		RR grade separation
Bradford	280036	CR-18/Braggs Br.	1940	S- Culvert				X		
#Bradford	280037	CR 18/Gum Br.	1940	S- Culvert				X		
Bradford	280038	CR-18/Br. of Sampson River	1940	S- Culvert				X		
Broward	860038	Davie Blvd./South Fork of New River	1960	S- Bascule		X		X		1 of 9 rolling lift bascules
Broward	864071	SE 3rd Ave./ New River	1960	S- Bascule		X		X		1 of 9 rolling lift bascules
Broward	864072	William H. Marshall Memorial Bridge	1964	S- Bascule		X		X		1 of 9 rolling lift bascules
#Duval	720026	SR-200/CSXRR	1940	S-Girder	X			X		RR grade separation
Duval	720075	University Blvd./ SR-10A	1952	C- Tee-Beam					X	Art Deco detailing
Duval	720087	US-1 (SR-5)/Miami Rd	1968	CS-Girder		X		X	X	
Duval	720100	SR-115A Flyover/ SR-10A	1961	C-Box Beam				X		Rare intact early example
Duval	720107	Hart Bridge/SR-228/St. Johns River	1967	CS-Through Truss	X	X		X		Rare cantilevered fixed Through truss
Duval	720518	Napoleon Bonaparte Broward Bridge/Dames Point Bridge/SR-9A/St. Johns River	1989	CS-Through Truss				X	X	Rare cable-stayed; Criteria G applies
Duval	724076	Smith Street Bridge	1929	C-Slab		X				
Duval	724077	Stockton Street/McCoy's Creek	1930	C-Slab		X			X	
#Duval	724171	Newnan Street/ Hogan Creek	1929	C-Slab		X		X	X	Assoc. with Klutho and Confederate Park
#Duval	724175	Laura Street/ Hogan Creek	1929	C-Slab		X		X	X	Assoc. with Klutho and Confederate Park
#Duval	None	Main Street/ Hogan Creek	1929	C-Slab		X		X	X	Assoc. with Klutho and Confederate Park
Glades	054015	CR-721A/Harney Pond Canal	1958	PSC - Slab				X		Early example of its type
#Hernando	080001	SR-45/CSXRR	1936	S-Girder	X			X		RR grade separation
Indian River	880001	SR-5/Old Dixie Hwy and FEC RR	1928/ 1934	C-Tee -Beam	X			X		RR grade separation
Indian River	880005	James H. Pruitt Memorial Bridge/ Sebastian Inlet	1964	PSC-Girder				X		Early post-tensioned design
Jackson	530003	Atlanta & St. Andrews Bay Railway Bridge/ US- 90 (SR-10)	1940	C- Frame	X			X		Rare example of its type

County	Bridge No.	Name/Location	Date	Material-Type	Criterion A			Criterion C		Comments
					TR	CPD	OT	EN	AR	
LEGEND: # indicates previously evaluated as ineligible; Yellow shading indicates 1960s bridge										
#Lake	114089	Highland St./SCL RR	1934	C-Tee -Beam	X			X		RR grade separation
#Levy	340045	Ten Mile Creek Bridge	1933	C- Tee-Beam	X			X		
Marion	364040	CR 316/ Proposed Cross Florida Barge Canal	1969	CS- Girder	X	X		X		Assoc. with FL Barge Canal
#Miami-Dade	874307	SW 117th Ave over North Canal	1937	S- Through Girder				X		Rare example of its type
Nassau	744006	Hill Road/Little Mills Creek	1931	T-Slab				X		Only one of its type
Nassau	740022	SR-200/SCL RR	1936	C-Tee- Beam	X			X		RR grade separation
Okeechobee	910009	SR 78/ Kissimmee River	1964	PSC- Girder	X	X		X		Removable span; early strutted piers
#Orange	755100	Lake Conway Bridge/Nela Ave.	1926	CC-Tee-Beam				X		Early example of its type
Palm Beach	930005	Jupiter US-1 (SR-5)/ ICWW	1958	S- Bascule				X		Rare four-leaf double bascule
Palm Beach	930060	Haven Ashe/Boca Inlet	1963	S- Bascule				X		Rare Hanover skew design; only intact example in U.S.
#Pasco	144002	North Crystal Springs Rd./ Hillsborough River	1923	C- Arch Deck		X		X		Assoc. with Luten Bridge Co.
#Pinellas	150009	Philippe Parkway/ Mullet Creek	1926	C- Arch Deck				X	X	Assoc. with Luten Bridge Co.
#Polk	160064	John Singletary/ US-98 (SR-700)	1931	C- Tee-Beam				X		
Putnam	764039	Fort Gates Ferry Slip/St. Johns River	1924	T-Girder	X	X	X			Supports ferry service across St. Johns River
Putnam	764044	Old US-17/ Crescent Lake Outflow	1922	C- Slab				X		Rare intact early example of its type
#Sarasota	170060	Hanson Bayou Bridge	1928	C- Tee-Beam		X		X	X	Early example of its type
#Sarasota	175660	Whitaker Bayou Bridge	1926	C- Tee-Beam				X	X	Early example of its type
#Sumter	184000	CR-558/Big Prairie Canal	1926	C- Tee-Beam				X		Early example of its type
#Suwannee	374004	164th St./Little River	1940	S- Culvert				X	X	Aesthetics of stone-facing
Suwannee	374006	61th Rd./Little Creek	1919	S- Culvert				X	X	Aesthetics of stone-facing
#Suwannee	374012	98th Terr./Rocky Creek	1932	S- Culvert				X	X	Aesthetics of stone-facing

Table 7-2. 2000 and 2010 Surveys: Comparison by Number of Surveyed and Significant Bridges, by FDOT District.

	2000 Survey		2010 Survey	
FDOT District	**No. Bridges Surveyed***	**No. Significant Bridges***	**No. Bridges Surveyed**	**No. Newly Significant Bridges**
1	26	12	64	5
2	52	17	155	24
3	12	7	30	1
4	21	9	48	7
5	27	9	59	4
6	38	22	84	1
7	49	18	70	3
Total	**225***	**94**	**510**	**45**

**Compiled from Table 1 in *Historic Highway Bridges of Florida* (2004). Does not count each of the individual Venetian Isles and Overseas Highway bridges.

Six bridges identified in the 2000 study were not field surveyed because of either inaccessibility or absence of locational information. As a result, their current condition and NRHP status is undetermined. Five were previously identified as significant:

- Apalahoochee River Pony Truss (No. 324302), Hamilton County
- Jennings Bridge (No number), Hamilton County
- Baggett Creek Arch Bridge (No number), Okaloosa County
- Bellamy Bridge (No number), Jackson County
- Aerojet Truss (No number), Miami-Dade County

Descriptions and photographs taken from the previous survey reports follow.

Photo 7-1. The Apalahoochee River Pony Truss Bridge in Hamilton County.

The Apalahoochee River Pony Truss Bridge in Hamilton County (8HA87) is a Pratt pony truss built in 1911. It was determined NRHP-eligible in the 2000 survey as the oldest Pratt pony truss in Florida and one of only two such structures in the state. At that time, it was noted that unchecked deterioration threatens the bridge.

Photo 7-2. Jennings Bridge in Hamilton County.

The Jennings Bridge (No number) in Hamilton County (8HA89) is a 1902-1903 Pratt through truss built for the county by the American Bridge Company of New York City. It has been documented as the oldest highway bridge in Florida. As described in the first statewide historic highway bridge survey, by ca. 1989, the bridge had lost its timber plank deck, most of the floor beams and stringers, and its approaches. "It now stands abandoned on the Alapaha River east of Jennings. Nature has reclaimed the site . . ." (King 1992:64). Despite its serious deterioration, it was considered "historically significant on many counts, including its age, type, and association with early efforts at building permanent bridges on county roads when horse-drawn transportation still predominated" (King 1992:65).

Photo 7-3. Jennings Bridge, Hamilton County in 1981.

The **Bellamy Bridge** (No number) in Jackson County (8JA399) is a Pratt through truss constructed in 1914 by the Converse Bridge Company of Chattanooga. It spans the Chipola River north of Marianna. At the time of the first statewide bridge survey in the late 1990s, it was described as abandoned and seriously deteriorated. The timber deck and stringers were gone, and parts of the lower chords were removed. Despite its poor condition, the Bellamy Bridge was considered to have historical value (King 1992:74); it was determined NRHP-eligible during the 2000 survey, and considered to represent an important phase in the development of American bridge building.

The **Baggett Creek Arch Bridge** (No number) in Okaloosa County was described in the 2000 survey as a 1924 concrete arch deck bridge. It is the lone remnant of the first federal aid project in Florida launched under the *Federal Aid Road Act of 1916*. It carried a narrow road from the town of Milligan to just east of the small town of Galliver. The Baggett Creek Arch Bridge was designed by George Derrick, who would later serve as the State Bridge Engineer. The bridge's only decorations consist of rectangular designs carved into the interior and exterior faces of the railings. Perhaps the most interesting aspect of the site is the continued survival of many stubs from the wooden frame used during the construction of the bridge which can be seen in the waterway below the structure. As of 2000, although this bridge had been abandoned for some time, it remained in good condition with little evidence of wear.

The 2000 Survey described the **Aerojet Truss** (No number) in Miami-Dade County as a 1910 steel pony truss that carries vehicular traffic for the South Florida Water Management District (SFWMD). The former railway bridge features steel members fabricated by Bethlehem Steel. The truss bridge was relocated to its site just outside of the Everglades National Park at an unknown date. It was still in service at the time of the 2000 survey. More recently, research by Amy Streelman of Janus Research confirmed that the bridge is owned by the SFWMD. It was apparently moved to its location on SW 288th Street, directly west of the Homestead General Aviation Airport; it spans a large canal. Reportedly, the bridge was moved there in 1975 by a farmer who once owned the land. Scott Thorp, superintendent of the Homestead Field Station for SFWMD, stated that the agency is removing the bridge since it cannot be used for traffic any longer.[155]

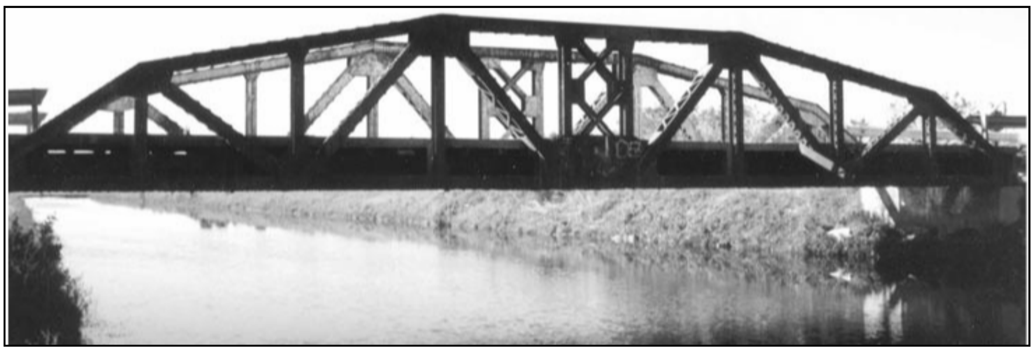

Photo 7-4. Aerojet Truss in Miami-Dade County.

FLORIDA'S SIGNIFICANT HIGHWAY BRIDGES: GAINS AND LOSSES

The evaluation of Florida's historic highway bridges is a dynamic process, with updates performed every 10 years over the past three decades. With each update, in addition to the identification of newly eligible bridges for the new period of significance, previously assessed bridges are reevaluated. As a result, bridges considered ineligible at the time they were originally surveyed may be reevaluated as significant based upon such factors as changed perceptions of what makes a historic bridge significant, as well as the loss of bridges of a particular age, type or material. Thus, a bridge once considered to lack historical and/or technological distinction, may now be distinguished as among the best surviving examples of its type, or may possess important historical associations with a significant event of the recent past.

Changes in status may also result from the loss of integrity. Thus, while a particular bridge may continue to meet one or more of the NRHP eligibility criteria, demolition, unsympathetic reconstructions not done in accordance with the Secretary of the Interior's Standards for Rehabilitation, relocation, abandonment in place, and/or the removal of character-defining elements may render a bridge no longer eligible. The following examples highlight selected bridges that have undergone a change in status.

[155] Streelman, Amy. Electronic mail to Barbara J. Culhane and Ginny L. Jones RE: Bridge in Homestead, March 20, 2012.

Newly Recommended NRHP-Eligible Bridges: Pre-1960

Some bridges which lacked distinction during the 2000 survey were reevaluated as significant. The majority of these (See **Table 7-1)** are concrete tee-beam and arch deck bridges dating to the 1920s and 1930s. Other newly recommended NRHP-eligible bridges have attained historicity since the previous inventory. The Big Prairie Canal Bridge in Sumter County, a tee-beam, and the Jupiter US-1/SR-5 Bascule Bridge in Palm Beach County are two noteworthy examples.

The **Big Prairie Canal Bridge** (No. 184000) in Sumter County carries CR-558/Old Leesburg Road over Big Prairie Canal. Constructed in 1926, this one-span, 30-foot long reinforced concrete tee-beam bridge features rectangular recessed panels on solid concrete railings (**Photo 7-5**), a typical feature of 1920s bridges. The bridge was reconstructed in 1982 with in-kind materials. While previously described as “small, plain, and utilitarian,” and thus, ineligible for listing in the NRHP, as a result of the 2010 update, the Big Prairie Canal Bridge is now recommended eligible as an early example of its type. It is the only 1920s reinforced concrete tee-beam bridge in Sumter County that retains integrity.

Photo 7-5. Big Prairie Canal Bridge, Sumter County (No. 184000).

The **Jupiter US-1/SR-5 Bascule Bridge** (No. 930005) over the ICWW in Palm Beach County was built in 1958. This trunnion style bascule bridge consists of 17 prestressed concrete approach spans and a 725-foot-long steel main span. Total length of the structure is 843 feet. The bridge, distinguished by the four-leaf, double bascule design, is newly recommended NRHP-eligible under Criterion C in the area of Engineering as a rare example of its type.

Photo 7-6. Main Four-Leaf Bascule Span of Jupiter US-1/SR-5 Bascule Bridge, Palm Beach County (No. 930005).

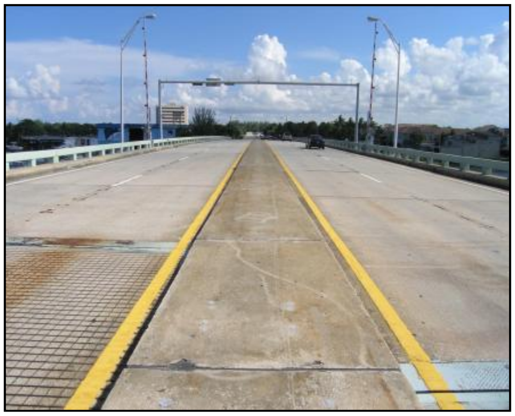

Photo 7-7. Looking East from the Main Span of the Jupiter US-1/SR-5 Bascule Bridge.

Change of Status: Lost Integrity

While some bridges have attained significance during the past decade, others previously considered NRHP-eligible may no longer meet the eligibility criteria due to substantial changes to their character-defining elements. The Log Lake Bridge in Okaloosa County, both the Madonna Boulevard Bridge and the 13th Street Bridge in Pinellas County, and the Granada Bridge in Miami-Dade County, are examples of bridges that no longer retain sufficient physical integrity. Therefore, they are newly recommended ineligible for listing in the NRHP.

The **Log Lake Bridge** in Okaloosa County (No number; formerly No. 100033), a steel Warren pony truss, was constructed ca. 1915. The bridge, which once carried traffic over the Yellow River, had wood beam support approach spans and pine board decking. It was used as a vehicle and pedestrian bridge until it was abandoned, possibly in the late 1940s to 1950s. The Log Lake Bridge was recorded in 2000 during a survey of water management district land, but not evaluated due to insufficient information.[156] In the 2000 historic highway bridge survey, the Log Lake Bridge was described as abandoned and deteriorated, with a disintegrating wooden deck and no connection to either side of the river. In circa 2008, the truss was removed from its location over the Yellow River to a site on the northwest bank of the river, within a local park. Although it is one of only three fixed pony trusses in Florida, the Log Lake Bridge has suffered a complete loss of integrity of location, setting, materials, workmanship, design, feeling, and association. **Photo 7-8** depicts its historic appearance and setting; the conditions observed in 2010 are shown in **Photos 7-9 and 7-10**.

Photo 7-8. Historic View of the Log Lake Truss Bridge.

[156] Panamerican Consultants, Inc., "Archaeological Survey of the Lower Yellow River NWFWMD Land in Okaloosa and Santa Rosa Counties, Florida," 2000.

Photo 7-9. Original Setting of the Log Lake Bridge.

Photo 7-10. Current Location of Log Lake Bridge Remains (June 2010).

The **Madonna Boulevard Bridge** (No. 154700) is a three-span, 120-foot-long, standard prestressed concrete girder. It was built for Pinellas County in 1957 to serve the community of Tierra Verde. While not noteworthy for its engineering, the original bridge was distinguished by its unique sculpted concrete railing which gave the bridge a space-age appearance (**Photo 7-11**). This design was in keeping with the general design of the streetscape throughout the neighborhood. At the time of the previous historic highway bridge survey, the Madonna Boulevard Bridge was unaltered. The nearby **13th Street Bridge** (No. 154701), also built in 1957, is nearly identical to the Madonna Boulevard Bridge, and similarly distinguished by the same unique, sculpted concrete railings (**Photo 7-12**). In 1993, some rehabilitation work was completed on this bridge, but it did not affect the overall integrity of design.

Photo 7-11. The Unique Railings of the Madonna Boulevard Bridge Reflect a Neo-Expressionist Styling.

Photo 7-12. The 13th Street Bridge from its Western Approach.

However, in 2005, the character-defining railings of both the Madonna Boulevard Bridge and the 13th Street Bridge were removed and replaced with a concrete wall topped with aluminum rails. **Photo 7-13** shows the new railing on the Madonna Boulevard Bridge. These dramatic alterations effectively destroyed the significance of each bridge, which derived their importance under NRHP Criterion C in the area of Architecture.

Photo 7-13. Madonna Boulevard Bridge with Replaced Railing, June 2010.

A similar fate has adversely affected the historic **Granada Boulevard Bridge** (No. 875306) which carries Granada Boulevard over the Coral Gables Canal in Miami-Dade County. The original 1930 concrete arch deck bridge, associated with the residential development of Coral Gables, featured a slotted cast concrete railing designed to give an appearance of greater length and style to the structure (**Photo 7-14**). The narrow, high, and pointed slots resulted in a distinctly different appearance than the oval slots used in standard design railings during the 1930s and later. In ca. 2005, the aesthetically pleasing railing was replaced with concrete posts and aluminum rails, thereby destroying the significant character-defining feature of the bridge which qualified the structure for listing in the NRHP under Criterion C in the area of Architecture. The Granada Bridge, shown with the non-historic rail in **Photo 7-15**, no longer meets the NRHP eligibility criteria.

Photo 7-14. Original Appearance of the Granada Boulevard Bridge.

Photo 7-15. The Granada Boulevard Bridge with Replaced Railing, 2010.

BRIDGE ATTRITION

"Half our historic bridges have been lost in the last 40 years."
Eric DeLony, *Landmark American Bridges*, 1993

Demolished Bridges

Fifty-nine historic bridges (**Appendix C**) have been demolished since the previous statewide historic bridge survey. Of these, the majority were constructed in the 1920s and 1930s. **Table 7-3** provides a summary of bridge loss by FDOT District; **Table 7-4** summarizes bridge loss by bridge type and FDOT District.

Table 7-3. Bridge Loss by FDOT District

FDOT District	No. Demolished Bridges	Total Bridges Surveyed	Percent of surveyed now demolished
1	8	64	12.7
2	16	155	10.3
3	6	30	20.0
4	5	48	10.4
5	7	59	11.9
6	5	84	5.9
7	12	70	15.7
Total	**59**	**510**	**11.4**

Table 7-4. Bridge Loss By Type and FDOT District.

Bridge Type	1	2	3	4	5	6	7	Totals
Girder	4	10	4	0	2	1	5	26
Bascule	0	3	1	2	2	4	2	14
Arch	2	0	0	3	0	0	1	6
Slab	2	1	0	0	0	0	2	5
Tee-Beam	0	0	1	0	1	0	2	4
Swing	0	0	0	0	2	0	0	2
Culvert	0	1	0	0	0	0	0	1
Lift	0	1	0	0	0	0	0	1
Totals	**8**	**16**	**6**	**5**	**7**	**5**	**12**	**59**

Most devastating to Florida is the loss of 17 of its rare movable bridges, including 14 bascule bridges, two swing bridges, and one vertical lift bridge. Over the past decade, the greatest attrition has been among the girder and bascule bridges. Among the demolished bridges are nine (**Table 7-5**) determined NRHP-eligible by the SHPO, including the following types:

- 4 concrete girder bridges dating to the 1920s and 1930s
- 4 bascules dating to the 1920s and 1930s
- 1 swing bridge dating to 1949

Table 7-5. Significant Florida Historic Highway Bridges Demolished Since 2000.

County/ District	Bridge No.	Name/Facility Carried	Year Built	Material- Bridge Type	Comments
Duval/2	724072	Little Creek Mile Six Bridge	1926	Concrete Girder	Replaced in 2005
Duval/2	724180	Old King Road Bridge No. 2	1926	Concrete Girder	Replaced in 2001
Duval/2	724181	Old King Road Bridge No. 3	1926	Concrete Girder	Replaced in 2001
Duval/2	724182	Trout River Bridge/ Old King Road Bridge No. 4	1926	Concrete Girder	Replaced in 2005
Brevard/5	704049	CR-402/Indian River	1949	Swing	Replaced in 2010
Miami-Dade/ 6	870662	SW 12th Street Bridge	1928	Steel Bascule	Replaced in 2009
Pinellas/7	157820	Treasure Island Cswy	1939	Concrete Girder	Replaced in 2004
Pinellas/7	157840	Treasure Island Cswy	1939	Concrete Girder	Replaced in 2004
Pinellas/7	157800	Treasure Island Cswy	1939	Steel Bascule	Replaced in 2007

Off-System Bridges

Where continued use is no longer a viable option, and as an alternative to demolition and replacement, some of Florida's historic highway bridges have been taken off-system and reused as fishing piers or hiking, biking and pedestrian bridges. Five bridges, while still extant, have been removed from the Florida highway system; all are currently used as pedestrian bridges. These off-system bridges include:

- Julia Street/West Second Street Bridge (Former No. 724149), Duval County – 1929 Slab
- Ellaville Hillman Bridge (Former No. 350910), Madison County – 1925 Truss
- Suwannee Springs Bridge (Former No. 374014), Suwannee County – 1931 Truss
- Lake Monroe Swing Bridge (Former No. 770009), Seminole County – 1934 Swing
- McArther Fishler Bridge (Former No. 740055), Nassau County – 1948 Swing

Structurally Deficient and Functionally Obsolete Bridges

As of 2003, only 889 movable bridges remained in the entire U.S., including 169 vertical lift bridges, 236 swing bridges, and 484 bascule bridges. Of these, roughly two-thirds are classified as structurally deficient (N=288) or functionally obsolete (N=301).[157] In looking at all 11,803 of Florida's bridges listed in the NBI[158] as of December 2009, 303 are classified as structurally deficient (SD) and 1620 as functionally obsolete (FO). Thus, roughly 16 percent may require repair or replacement. The FHWA's data regarding SD and FO bridges in Florida, by structure type, as of December 1999, are summarized in **Table 7-6.**

[157] USDOT, FHWA. "Bridge Technology: Count of Bridges by Structure Types, 12/2003." Accessed at www.fhwa.dot.gov/bridge/strtyp03.htm.
[158] Of the 11,803 bridges, approximately 6300 are state highway bridges and 4800 are local bridges.

Table 7-6. Summary Tabulation of Structurally Deficient and Functionally Obsolete Bridges, by Type.

Bridge Type	Count (as of 12/99)	No. FO	No. SD	Total No. FO + SD	Percent of FO +SD
Arch - Deck	38	19	4	23	60.5
Arch - Through	4	3	0	3	75.0
Box beam or girder	94	11	1	12	12.8
Channel beam	304	103	9	112	36.8
Culvert	2059	52	22	74	3.6
Frame	25	3	0	3	12.0
Girder (Stringer/Multi-beam)	4905	945	144	1089	22.2
Movable – Bascule	139	65	9	74	53.2
Movable – Lift	3	2	0	2	66.7
Movable – Swing	12	10	1	11	91.7
Slab	3053	656	89	745	24.4
Stayed girder	2	0	0	0	0
Suspension	1	1	0	1	100
Tee-beam	357	138	30	168	47.0
Truss – Through	11	2	4	6	54.5
Others	46	4	1	5	10.9
Totals	**11,053**	**2014**	**314**	**2328**	

Florida's Threatened and Endangered Bridge Types

The future of Florida's historic highway bridges is in peril, and four types of bridges are at risk of disappearing. The most **Endangered** historic bridge types are:

- Vertical lift bridges;
- Swing bridges;
- Pre-1950 bascule bridges; and
- Truss bridges

The survival of Florida's swing bridges is of particular cause for alarm. Based upon the findings of the current and previous Florida bridge inventories, a total of 14 swing bridges have been lost, at the rate of about four per decade. Today, only 11 extant swing bridges still function as highway bridges. Similarly, five vertical lift bridges have been lost during the last 30 years. The total number of lost lift bridges exceeds the number of extant ones today. Metal truss bridges, at one time the most common type built, have become increasingly rare; many stand abandoned in place, devoid of most of their structural elements.

Also vulnerable and of special concern are all pre-1945 stone-faced culverts, as well as arch deck bridges with decorative railings and other noteworthy architectural features. These bridge types are now **Threatened** by demolition and replacement, or unsympathetic alterations.

In the final analysis, the number of lost historic highway bridges in Florida over the past decade exceeds the number of significant 1960s-era bridges added to the inventory by many-fold. If the rate of attrition continues at its current pace, and the use of standard designs for new construction progresses, adapting Florida's historic bridges for non-vehicular uses may be the only way to save them from extinction.

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APPENDIX A:
All Field Surveyed Bridges

ALL SURVEYED BRIDGES - 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 510							
LEGEND: * - eligible; ** - newly eligible; ++ -potentially eligible/insufficient information; ^ - demolished; ^^ - no longer eligible; IN: inaccessible; F: former DOT bridge, new ownership SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
FDOT DISTRICT 1: Total - 64							
1	030148	Collier	SR-951 (Collier Blvd) / Big Marco Pass	1969	CS: Girder	8CR1301	
2	030161	Collier	CR-29 (Copeland Ave) / Chokoloskee Bay	1955	C: Girder	8CR1302	
3	040005	DeSoto	Brownville Rd / Peace River	1964	PSC: Girder	8DE852	
4	040009	DeSoto	Cubitus Ave / Mare Branch	1936	S: Girder	8DE853	
5	040010	DeSoto	CR-760 / Peace River	1967	PSC: Girder	8DE854	
6	040016	DeSoto	CR-661 / Green Canal	1960	S: Culvert	8DE855	
7	040029	DeSoto	CR-760 / Muddy Creek	1967	PSC: Slab	8DE856	
8	** 054015	Glades	CR-721A / Harney Pond Canal	1958	PSC: Slab	8GL458	
9	^ 060005	Hardee	Doyle Carleton Bridge	1933	C: Girder	8HR371	
10	^ 060013	Hardee	Peace River Bridge	1934	C: Girder	8HR168	
11	^ 060014	Hardee	Peace River Overflow Bridge	1934	C: Girder	8HR169	
12	060017	Hardee	Heard Bridge Road / Peace River	1954	S: Girder	8HR905	
13	060021	Hardee	SR-64 / Peace River	1956	PSC: Girder	8HR906	
14	060022	Hardee	SR-64 / Peace River Overflow	1956	PSC: Girder	8HR907	
15	* 060034	Hardee	CR-664 / Little Payne Creek	1915	C: Arch-Deck	8HR374	P-EL: 2009
16	* 064069	Hardee	Hobb Rd / Payne Creek	1920	C: Arch-Deck	8HR375	EL: 2000
17	064080	Hardee	Heard Bridge Road / Peace River	1965	S: Culvert	8HR908	
18	* 070013	Hendry	Fort Denaud Swing Bridge / Caloosahatchee	1940/1963	S: Movable - Swing	8HN632	EL: 2000
19	070033	Hendry	SR-29 (Bridge St) / Caloosahatchee River	1959	S: Movable - Bascule	8HN412	
20	^ 074001	Hendry	Tanya's Crossing	1920	C: Arch-Deck	8HN630	
21	074002	Hendry	Ft. Denaud Rd. (CR-78A) / Donna's Crossing	1930/1955	C: Arch-Deck	8HN631	
22	090004	Highlands	US-27 NB (SR-25) / Josephine Creek	1968	C: Slab	8HG1232	
23	090016	Highlands/ Okeechobee	US-98 (SR-700) / Kissimmee River	1953/1966	S: Girder	8HG1170/ 8OB323	IN-EL: 2010
24	090023	Highlands	US-98 (SR-700) / Spring Lake Canal	1949	C: Slab	8HG1233	
25	090029	Highlands	US-98 (SR-700) / Arbuckle Creek	1949	CS: Girder	8HG1234	
26	^ 090030	Highlands	Lake Jackson Bridge	1927	C: Arch-Deck	8HG893	
27	* 120001	Lee	SR-80 WB (Palm Bch) / Billy's Creek	1941	S: Movable - Lift	8LL705	EL: 2000
28	120011	Lee	US BUS 41 (SR-739) / Deans Ditch	1927/1951	C: Slab	8LL2611	
29	120028	Lee	CR-865 / Big Carlos Pass	1965	S: Movable - Bascule	8LL2612	
30	120042	Lee	Broadway St / Caloosahatchee River	1969	S: Movable - Bascule	8LL2613	

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
31	120050	Lee	Pine Island Road (CR-78) / Matlacha Pass	1968	S: Movable - Bascule	8LL2614	
32	120064	Lee	SR-31 / Caloosahatchee River	1960	S: Movable - Bascule	8LL2615	
33	124014	Lee	Whiskey Creek Dr. / Whiskey Creek	1920/1970	Aluminum, Wrought Iron, Cast Iron Culvert	8LL2616	
34	124038	Lee	Persimmon Ridge Rd / Spanish Creek	1950/1994	T: Slab	8LL2617	
35	130006	Manatee	SR-684 (Cortez Rd) / Sarasota Pass	1956	S: Movable - Bascule	8MA1822	
36	130016	Manatee	SR-70 / Myakka River	1965	PSC: Girder	8MA1823	
37	130019	Manatee	US-19 NB (SR-55) / Terra Ceia Bay	1969	PSC: Girder	8MA1824	
38	130054	Manatee	SR-64 / Sarasota Pass	1957	S: Movable - Bascule	8MA1825	
39	130057	Manatee	SR-789 / Longboat Key Pass	1957/2005	S: Movable - Bascule	8MA1826	
40	* 135250	Manatee	7th Avenue West / Wares Creek	1949	CS: Girder	8MA992	P-EL: 2009
41	* 135251	Manatee	9th Avenue West / Wares Creek	1945	C: Arch-Deck	8MA993	P-EL: 2007
42	* 135252	Manatee	12th Avenue West / Wares Creek	1938	C: Tee-Beam	8MA994	P-EL: 2007
43	135253	Manatee	14th Avenue West / Wares Creek	1949	S: Girder	8MA1827	
44	135254	Manatee	17th Avenue West / Wares Creek	1926	C: Slab	8MA995	
45	135256	Manatee	19th Avenue West / Wares Creek	1926	C: Tee-Beam	8MA996	
46	** 160064	Polk	US-98 (SR-700) / Peace River	1931	C: Tee-Beam	8PO5440	
47	^ 164336	Polk	Old Lake Wales Road Bridge	1928/1998	S: Girder	8PO4047	
48	164402	Polk	District Line Rd / Whidden Creek	1960	PSC: Tee-Beam	8PO7576	
49	* 165700	Polk	Lilly Avenue / ACL RR	1927	S: Girder	8PO3013	EL: 2000
50	^ 170031	Sarasota	US-41 NB (SR-45) / Dona Bay	1928/1950	C: Slab	none	
51	^ 170033	Sarasota	US-41 NB (SR-45) / Shakett Creek	1928/1950	C: Slab	none	
52	170052	Sarasota	SR-72 EB / ICWW	1968	S: Movable - Bascule	SO6930	
53	170054	Sarasota	Venice Ave (CR-772) / ICWW	1966/2004	S: Movable - Bascule	SO6931	
54	170057	Sarasota	Albee Road / ICWW	1963/2002	S: Movable - Bascule	SO6932	
55	170058	Sarasota	CR-774 / ICWW	1964	S: Movable - Bascule	SO6933	
56	** 170060	Sarasota	Siesta Dr (SR-758) / Hanson Bayou	1928	C: Tee-Beam	8SO2373	
57	*** 170064**	**Sarasota**	**CR-789 (Blackburn Point) / ICWW**	**1925/1995**	**S: Movable - Swing**	**8SO1890**	**L: 2001**
58	170065	Sarasota	SR-72 WB / ICWW	1968	S: Movable - Bascule	SO6934	

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
59	** 175660	Sarasota	Riverside Drive / Whitaker Bayou	1926	C: Tee-Beam	8SO2375	
60	* 175950	Sarasota	Osprey Avenue / Hudson Bayou	1916/1973	C: Arch-Deck	8SO2376	EL: 2000
61	* 450001	DeSoto	Peace River Bridge at Arcadia	1925	C: Arch-Deck	8DE381	EL: 2000
62	++ 910001	Okeechobee/ Highlands	SR-70/Kissimmee River	1966	S: Girder	8OB336/ 8HG1236	
63	** 910009	Okeechobee	SR-78 / Kissimmee River	1964	S: Girder	8OB321	
64	* 910054	Okeechobee	US-441 / US-98 (SR-700) / Taylor Creek	1948	S: Movable - Bascule	8OB56	EL: 2000
FDOT DISTRICT 2: Total – 155							
1	^ 260005	Alachua	Santa Fe River	1934	S: Girder	8AL3276	IN-EL: 2003
2	260006	Alachua/ Columbia	US-27 (SR-20) / Santa Fe River	1932/ 1965	CS: Girder	8AL5667/ 8CO1237	
3	** 264126	Alachua	NW 58th Terrace / Branch of Rocky Creek	1924	C: Tee-Beam	8AL3510	
4	** 270001	Baker	Sanderson Overpass/US-90 (SR-10) / CSX RR	1936	C: Tee-Beam	8BA423	
5	270002	Baker	US-90 (SR-10) / Hells Bay	1923/ 1995	C: Culvert	8BA628	
6	270004	Baker	US-90 (SR-10) / Barber Bay	1935/ 1995	C: Culvert	8BA629	
7	** 280036	Bradford	CR-18 / Braggs Branch	1940	S: Culvert	8BF730	
8	** 280037	Bradford	CR-18 / Gum Creek	1940	S: Culvert	8BF731	
9	** 280038	Bradford	CR-18 / Branch of Sampson River	1940	S: Culvert	8BF732	
10	290003	Columbia	US-41 (SR-25) / Clay Hole Creek	1932/ 1946	C: Slab	8CO1234	
11	290004	Columbia	US-441 (SR-47) / Falling Creek	1936/ 1979	C: Culvert	8CO1235	
12	290007	Columbia/ Suwannee	US-27 (SR-20) / Ichetucknee River	1929/ 1963	C: Tee-Beam	8CO1236/ 8SU420	
13	310002	Gilchrist/ Dixie	CR-340 / Suwannee River	1965	S: Girder	8GI232/ 8DI264	
14	310005	Gilchrist/ Suwannee	US-129 (SR-49) / Santa Fe River	1939	S: Girder	8GI236/ 8SU421	
15	320001	Hamilton	US-41(SR-25 & 100) / Swift Creek	1927/ 1947	C: Tee-Beam	8HA439	
16	320002	Hamilton	US-41(SR-25 & 100) / Cat Creek	1927/ 1994	C: Culvert	8HA440	
17	320004	Hamilton	US-41 (SR-6 & 25) / Alapaha River Overflow	1922/ 1947	C: Slab	8HA441	
18	IN: 324302	Hamilton	Apalahoochee River Pony Truss	1911	S: Truss - Pony (Pratt)	8HA87	EL: 2000
19	* 330009	Lafayette	Hal Adams / SR-51 Suwannee River	1947	Cable - Suspension	8LF22	EL: 2000
20	* 334001	Lafayette	Camp Grade Road / Steinhatchee River	1921/ 1989	S: Truss - Pony (Pratt)	8LF21	EL: 2000
21	** 340045	Levy	CR-336 / Ten Mile Creek	1933	C: Tee-Beam	8LV513	
22	350001	Madison/ Jefferson	US-90 (SR-10) / Aucilla River	1928/ 1954	C: Tee-Beam	8MD294/ 8JE1759	

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
23	350016	Madison	CR-158 / Sundown Creek	1919/ 1958	C: Culvert	8MD295	
24	F: 350910	Madison	Ellaville / Hillman Bridge	1925	S: Truss - Through (Pratt)	8MD185	EL: 2000
25	370007	Suwannee	CR-49 / Little River	1945	C: Culvert	8SU419	
26	^ 373013	Suwannee	Hogan Road Bridge	1940	S: Culvert	none	
27	374002	Suwannee	180th Street / Little River	1940	S: Culvert	8SU394	
28	** 374004	Suwannee	164th Street / Little River	1940	S: Culvert	8SU395	
29	** 374006	Suwannee	61st Road / Little Creek	1919/ 1943	C: Culvert	8SU396	
30	** 374012	Suwannee	98th Terrace / Rocky Creek	1932	S: Culvert	8SU397	
31	F: 374014	Suwannee	Suwannee Springs	1931	S: Truss - Through (Parker)	8SU116	EL: 2000
32	380009	Taylor	US-221 (SR-55) / Woods Creek	1939	CS: Girder	8TA504	
33	380011	Taylor	US-221 (SR-55) / Two Pines Creek	1939	CS: Girder	8TA505	
34	380012	Taylor	US-221 (SR-55) / Cypress Creek	1939	S: Girder	8TA506	
35	380013	Taylor	US-221 (SR-55) / Angel Creek	1939	CS: Girder	8TA507	
36	380014	Taylor	US-221 (SR-55) / Lori Creek	1939	CS: Girder	8TA508	
37	380015	Taylor	US-221 (SR-55) / Econfina River	1939	CS: Girder	8TA272	IN-EL: 2010
38	380059	Taylor	US-19 NB (SR-55) / Fenholloway River	1934/ 1958	C: Tee-Beam	8TA509	
39	380910	Taylor	US-221 (SR-55) / Rocky Creek	1939	CS: Girder	8TA510	
40	390001	Union/ Bradford	SR-100 / New River	1930/ 1966	C: Tee-Beam	8UN177/ 8BF774	
41	710036	Clay	SR-21 / Clear Cut Creek	1934	C: Culvert	8CL1543	
42	710039	Clay	SR-21 / Clay Pit Creek	1934	C: Culvert	8CL1544	
43	720003	Duval	US-90 (SR-10) / Marietta Branch	1931/ 1984	S: Girder	8DU21357	
44	^ 720004	Duval	Beaver Street Viaduct	1930	S: Girder	8DU9170	
45	* 720005	Duval	SR-211 / Ortega River	1927/ 1996	S: Movable - Bascule	8DU11167	EL: 2000
46	720006	Duval	SR-211 / Fishweir Creek	1924/ 1966	C: Tee-Beam	8DU21358	
47	720007	Duval	SR-211 / Azalea Creek	1922	C: Tee-Beam	8DU11895	
48	IN: 720013	Duval	Inconstantion Creek Bridge	1932	C: Girder	8DU11302	
49	^ 720014	Duval	Nassau River Bridge	1932	S: Girder	8DU11303	IN-EL: 1997
50	720017	Duval	US-1 SB (SR-5) / Little Trout River	1939/ 1982	C: Tee-Beam	8DU21359	
51	720019	Duval	US-1 (SR-5) / Big Davis Creek	1934/ 1998	C: Culvert	8DU21360	
52	720021	Duval	US-1 (SR-5) / Julington Creek	1934/ 1998	C: Culvert	8DU21361	

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53	* 720022	Duval	US-1 (Main St.) / St. Johns River	1941	S: Movable - Lift	8DU1553	EL: 2000
54	**720026	Duval	US-301 (SR-200) / CSXRR(ABND) Deep Creek Tributary	1940	S: Girder	8DU11299	
55	^ 720030	Duval	Acosta Bridge / SR-13 / St. Johns River	1919	S: Movable - Lift	8DU1556	
56	720042	Duval	SR-10 (Atlantic) / Big Pottsburg Creek	1927/ 1969	PSC: Girder	DU21362	
57	^ 720045	Duval	Maxville Overpass	1937	S: Girder	8DU11301	IN-EL: 1997
58	720046	Duval	SR-228 / Yellow Water Creek	1936	C: Culvert	8DU21363	
59	720047	Duval	SR-228 / Ortega River	1936/ 1972	C: Culvert	8DU21364	
60	720049	Duval	SR-228 / Cedar Creek	1936/ 1972	C: Culvert	8DU21365	
61	^ 720056	Duval	SR-105 (Heckscher) / Broward River	1948	S: Movable - Bascule	8DU11899	IN-EL: 2006
62	720061	Duval	SR-105 / Sisters Creek	1952	S: Movable - Bascule	8DU14138	
63	^ 720068	Duval	B.B. McCormick Bridge 1	1949	S: Movable - Bascule	8DU11900	IN-EL: 2005
64	^ 720069	Duval	B.B. McCormick Bridge 2	1949	S: Movable - Bascule	8DU11900	IN-EL: 2005
65	** 720075	Duval	SR-109 (University Blvd.) / SR-10A	1952	C: Tee-Beam	8DU21151	
66	* 720076	Duval	Mathews Bridge / SR-10A / St. Johns River & US-1	1953	CS: Truss - Through (Warren)	8DU1554	P-EL: 2007
67	** 720087	Duval	US-1 (SR-5) / Miami Rd.	1968	CS: Girder	8DU21150	
68	** 720100	Duval	SR-115A / SR-10A	1961	C: Box Beam	8DU21149	
69	++ 720105	Duval	SR-228 WB / SR-115	1967	CS: Girder	8DU21366	
70	** 720107	Duval	Hart Bridge / SR-228 /St. Johns River	1967	CS: Truss - Through (Cantilevered)	8DU1555	
71	++ 720108	Duval	US-ALT-1(SR-228 WB) / SR-10	1967	CC: Slab	8DU21367	
72	++ 720109	Duval	SR-228A WB / Little Pottsburg Creek	1967	PSC: Girder	8DU21368	
73	++ 720110	Duval	US-ALT-1(SR-228 WB) / Little Pottsburg Creek	1967/ 1975	PSC: Girder	8DU21369	
74	++ 720111	Duval	US-ALT-1(SR-228 WB) / University Blvd.	1967	PSC: Girder	8DU21370	
75	++ 720112	Duval	SR-228 WB / Ryar Rd.	1967	PSC: Girder	8DU21371	
76	++ 720113	Duval	SR-228 / US-90 (SR-10)	1967	S: Girder	8DU21372	
77	++ 720114	Duval	SR-228 / Washington St.	1967	CS: Girder	8DU21373	
78	++ 720115	Duval	SR-228A WB / US-90(SR-10) Beach Blvd.	1967	PSC: Girder	8DU21374	
79	++ 720116	Duval	SR-228A WB / Highland & Art Museum Dr.	1967	PSC: Girder	8DU21375	

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80	720137	Duval	US-90 (SR-10) / Cedar River	1935/ 1984	C: Culvert	8DU21376	
81	720142	Duval	SR-228 / Moore Branch	1938	C: Culvert	8DU21377	
82	^ 720149	Duval	Ribault River Bridge	1955	C: Girder	none	
83	* 720163	Duval	I-95 (SR-9) / Myrtle Ave / I-95 / I-10 RMP	1955	S: Arch - Through	8DU17724	P-EL: 2006
84	++ 720276	Duval	SR-228 EB / SR-115	1967	CS: Girder	8DU21378	
85	++ 720279	Duval	US-ALT-1(SR-228 EB) / SR-10	1967	CC: Slab	8DU21379	
86	++ 720280	Duval	SR-228A EB / L. Pottsburg Creek. & SR-228	1967	PSC: Girder	8DU21380	
87	++ 720281	Duval	US-ALT-1(SR-228 EB) / Little Pottsburg Creek	1967	PSC: Girder	8DU21381	
88	++ 720282	Duval	US-ALT 1(SR-228 EB) / University Blvd.	1967	PSC: Girder	8DU21382	
89	++ 720283	Duval	SR-228 EB / Ryar Rd.	1967	PSC: Girder	8DU21383	
90	++ 720284	Duval	SR-228A EB / US-90(SR-10) Beach Blvd.	1967	PSC: Girder	8DU21384	
91	++ 720285	Duval	SR-228A EB / Highland & Art Museum Dr	1967	PSC: Girder	8DU21385	
92	720407	Duval	US-90 (SR-10) / McCoy Creek	1933	C: Culvert	8DU21386	
93	++ 720488	Duval	SR-228 (LEG E) / Adams St. from Hart Ramp	1967	CS: Girder	8DU21387	
94	++ 720489	Duval	SR-228 / Monroe St. to Hart Ramp	1967	PSC: Girder	8DU21388	
95	++ 720490	Duval	SR-228 (LEG G) / Duval St. from Hart Ramp	1967	CS: Girder	8DU21389	
96	++ 720493	Duval	SR-228 / Talleyrand Ave.	1967	PSC: Girder	8DU21390	
97	++ 720494	Duval	SR-228 / Duval St.	1967	CS: Girder	8DU21391	
98	++ 720495	Duval	SR-228 / Adams St	1967	S: Girder	8DU21392	
99	++ 720496	Duval	SR-228 / Adams St.	1967	PSC: Slab	8DU21393	
100	** 720518	Duval	SR-9A (Dames Pt.) / St. Johns River & Mill Cove	1989	Cable-Stayed	8DU21148	
101	720910	Duval	US-17 (SR-5) / Long Branch Creek	1925/ 1940	C: Tee-Beam	8DU21394	
102	720920	Duval	US-1 (SR-5) / Sweetwater Creek	1934/ 2000	C: Culvert	8DU21395	
103	720940	Duval	SR-10 / Millers Creek	1924/ 1968	PSC: Slab	8DU21396	
104	720941	Duval	SR-10 / Little Pottsburg Creek	1926/ 1969	PSC: Slab	8DU21397	
105	^ 724072	Duval	Little Six Mile Creek Bridge	1926	C: Girder	8DU11902	P-EL: 2000
106	724074	Duval	King Street / McCoy Creek	1960	C: Slab	8DU21398	
107	++ 724075	Duval	Hollybrook Ave. / McCoy Creek	1940	C: Tee-Beam	8DU21399	

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108	**724076	Duval	Smith Street Bridge	1929	C: Slab	8DU11903	
109	** 724077	Duval	Stockton Street / McCoy Creek	1930	C: Slab	8DU11904	
110	++ 724078	Duval	McCoy Creek Blvd. / McCoy Creek	1940	C: Tee-Beam	8DU21400	
111	724080	Duval	Edison Ave / McCoy Creek	1929	S: Girder	8DU11905	
112	F: 724149	Duval	Julia Street / West Second Street Bridge	1929	C: Slab	8DU7537	P-EL: 2004
113	** 724171	Duval	Newnan Street / Hogan Creek	1929	C: Slab	8DU7540	
114	* 724172	Duval	Market Street / Hogan Creek	1929	C: Slab	8DU7539	P-EL: 2006
115	* 724359 (formerly 724173)	Duval	Liberty Street / Hogan Creek	1929	C: Slab	8DU7551	P-EL: 2007
116	** 724175	Duval	Laura Street / Hogan Creek	1929	C: Slab	8DU7538	
117	^ 724180	Duval	Old King Road Bridge	1926	C: Girder	8DU8114	P-EL: 2000
118	^ 724181	Duval	Old King Road Bridge	1926	C: Girder	8DU8115	P-EL: 2000
119	^ 724182	Duval	Trout River Bridge	1926	C: Girder	8DU11913	P-EL: 2000
120	724183	Duval	Old Kings Road / Little Trout River	1926	S: Girder	8DU11914	
121	^ 724249	Duval	East Duval Street Viaduct	1915	C: Girder	8DU11892	
122	^ 724251	Duval	Greenwood Avenue Bridge	1950	C: Slab	8DU11277	
123	* 724258	Duval	Myrtle Avenue / McCoy Creek	1930	C: Tee-Beam	8DU11915	EL: 2000
124	IN: 740002	Nassau	Deep Creek Bridge	1934	C: Girder	none	
125	F: 740055	Nassau	McArther Fishler Bridge	1948	S: Movable - Swing	none	
126	* 740008	Nassau	US-17 (SR-5) / St. Marys River	1927/ 2005	S: Movable - Swing	8NA240	EL: 2000
127	740011	Nassau	US-1 SB (SR-15) / Braddock Creek	1924/ 1987	C: Slab	8NA1267	
128	740014	Nassau	US-1 SB (SR-15) / Car Seat Creek	1924/ 1989	C: Slab	8NA1268	
129	740021	Nassau	US-301 (SR-200) / Branch of Thomas Creek	1939	CS: Girder	8NA1269	
130	**740022	Nassau	US-301 (SR-200) / SCLRR	1936	C: Tee-Beam	8NA1270	
131	740023	Nassau	US-301 (SR-200) / Branch of Funks Creek	1939	CS: Girder	8NA1271	
132	740024	Nassau	US-301 (SR-200) / Funks Creek	1939	CS: Girder	8NA1272	
133	740058	Nassau	SR-A1A & SR-200 / Nann Swamp	1936/ 2006	C: Culvert	8NA1273	
134	740059	Nassau	US-1 SB (SR-15) / Funks Creek	1924/ 1960	C: Culvert	8NA1274	
135	740069	Nassau	CR-200A / Lofton Creek	1958	C: Slab	8NA1275	
136	740073	Nassau	CR-115 / Little Mills Creek	1938	C: Culvert	8NA1276	

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
137	** 744006	Nassau	Hill Road / Little Mills Creek	1931/ 1982	T: Slab	8NA1246	
138	744007	Nassau	Mussel White Road / Mills Creek	1931/ 1962	C: Slab	8NA1277	
139	760021	Putnam	SR-100 / Canal	1933/ 2001	C: Culvert	8PU1696	
140	760034	Putnam	SR-21 / Lake Melrose	1932/ 1965	S: Culvert	8PU1697	
141	* 764024	Putnam	Old San Mateo Road / Mill Branch	1916/ 2002	C: Arch-Deck	8PU1210	EL: 2000
142	764037	Putnam	Memorial Causeway / St. Johns River Overflow	1940	C: Arch-Deck	8PU1699	
143	764038	Putnam	Memorial Causeway / St. Johns River Overflow	1940	C: Arch-Deck	8PU1700	
144	** 764039	Putnam	Fort Gates Ferry / St. Johns River	1924/1985	Ferry T: Girder	8PU1629	
145	** 764044	Putnam	Old US-17 / Crescent Lake Overflow	1922	C: Slab	8PU1631	
146	780056	St. Johns/ Clay	Shands Bridge / SR-16/ St. Johns River	1961	S: Girder	8CL1308/ 8SJ5416	IN-EL:2010
147	*** 780074**	**St. Johns**	**B.O.LIONS / SR-A1A /Matanzas River Intracoastal Waterway**	**1927/ 1979/ 2004**	**S: Movable - Bascule**	**8SJ2460**	**L: 1982**
148	784002	St. Johns	CR-13 / Branch of Deep Creek	1938	S: Girder	8SJ5563	
149	784006	St. Johns	CR-13 / Little Fish Tail Creek	1937	C: Culvert	8SJ5564	
150	784012	St. Johns	CR-13 / Moccasin Branch	1928	S: Culvert	8SJ5565	
151	784020	St. Johns	CR-13A / Branch of Six Mile Creek	1926	C: Culvert	8SJ5566	
152	None	St. Johns	Durbin Creek Bridge (Old Dixie Highway)	1925	C: Slab	8SJ4868	
153	IN: none	Hamilton	Jennings Bridge	1902	S: Truss - Through (Pratt)	8HA89	EL: 2000
154	** none	Duval	Main Street / Hogan Creek	1929	C: Slab	8DU7541	
155	* none	Duval	St. Johns Avenue / Willow Branch	1935	C: Slab	8DU11274	P-EL: 2007
FDOT DISTRICT 3: Total – 30							
1	++ 460019	Bay	US-98 (SR-30) / ICWW	1965	CC: Girder	8BY1632	
2	* 460053	Bay	Beach Drive / Massalina Bayou	1951	S: Movable - Bascule	none	EL: 2000
3	* 470029	Calhoun	Blountstown Truss/SR-20 / Apalachicola River	1938/1998	CS: Truss - Through (Warren)	8CA37	EL: 2000
4	^ 480002	Escambia	Eleven Mile Creek Bridge	1940	C: Tee-Beam	none	
5	480003	Escambia	US-90 (SR-10A) / Eight Mile Creek	1939/1965	C: Slab	8ES3732	
6	^ 480006	Escambia	Cervantes Street Viaduct	1940	S: Girder	none	
7	480035	Escambia/ Santa Rosa	US-98 (SR-30) / Pensacola Bay	1960	CS: Girder	8ES3733/ 8SR2172	

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
8	^ 480037	Escambia	Bayou Chico Draw Bridge	1949	S: Movable - Bascule	8ES2515	
9	480110	Escambia	CR-184 / Perdido River	1960	PSC: Girder	8ES3734	
10	++ 494096	Franklin	River Road / Trout Creek	1959/2000	T: Girder	8FR1283	
11	** 530003	Jackson	US-90 (SR-10) / Bayline RR	1940	C: Frame	8JA1849	
12	530022	Jackson	CR-162 / Chipola River	1963	C: Slab	8JA1865	
13	530026	Jackson	CR-278 / Chipola River	1966	PSC: Girder	8JA1866	
14	^ 564102	Liberty	FR-115 / River Styx Floodplain	1937	T: Girder	8LI515	II: 2004
15	^ 564103	Liberty	FR-115 / River Styx Floodplain	1937	T: Girder	8LI516	II: 2004
16	570028	Okaloosa	CR-393 / Pond Creek	1930/1960	C: Slab	8OK2911	
17	++ 570034	Okaloosa	US-98 (SR-30) / ICWW & Brooks St	1964	CS: Girder	8OK2912	
18	574009	Okaloosa	Bone Creek Road / Bone Creek #3	1930/1976	T: Girder	8OK2913	
19	574012	Okaloosa	West Dodson Road / Penny Creek	1930/1967	T: Girder	8OK2914	
20	574088	Okaloosa	Peacock Road / Bailey Branch	1935/1980	T: Girder	8OK2915	
21	* 580013	Santa Rosa	US-90 (SR-10) / Macavis Bayou	1937	C: Tee-Beam	8SR1930	P-EL: 2010
22	^ 580014	Santa Rosa	Milton Overpass	1937	C: Girder	none	
23	580019	Santa Rosa	Broad St. / Collins Mill Creek	1969	S: Girder	8SR2168	
24	580910	Santa Rosa	SR-399 / Navarre Relief	1960	PSC: Girder	8SR2169	
25	++ 580951	Santa Rosa	SR-399 / ICWW at Navarre	1960	CS: Girder	8SR2171	
26	^^ none	Santa Rosa	Coldwater Creek Truss	1910	S: Truss - Through (Pratt)	none	EL: 2000
27	* none	Jackson	Bellamy Bridge	1914	S: Truss - Through (Pratt)	8JA399	EL: 2000
28	^^ none	Okaloosa	Log Lake	1915	S: Truss - Pony (Warren)	8OK1662	EL: 2000
29	IN: none	Okaloosa	Baggett Creek Arch Bridge	1924	C: Arch-Deck	none	EL: 2000
30	* none	Liberty	Torreya Stone Arch Bridge	1940	C: Arch-Deck	8LI338	EL: 2000
FDOT DISTRICT 4: Total – 48							
1	* 860003	Broward	US-1 (SR-5) / New River	1960	C: Tunnel	8BD4504	P-EL: 2009
2	860008	Broward	SR-84 / S. Fork New River	1956	S: Movable - Bascule	8BD4866	
3	860011	Broward	SR-A1A / Hillsboro Inlet	1966	S: Movable - Bascule	8BD4867	
4	860018	Broward	Las Olas Boulevard / Intracoastal Waterway	1958	S: Movable - Bascule	8BD4868	
5	** 860038	Broward	Davie Blvd. / South Fork of New River	1960	S: Movable - Bascule	8BD4772	
6	860043	Broward	SR-822/ICWW	1962	S: Movable - Bascule	8BD4869	
7	860060	Broward	14 Street Causeway / ICWW	1967/2006	S: Movable - Bascule	8BD4870	

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
8	860144	Broward	Commercial Blvd. / ICWW	1964	S: Movable - Bascule	8BD4871	
9	860146	Broward	Hillsboro Blvd. / ICWW	1957	S: Movable - Bascule	8BD4872	
10	860157	Broward	Atlantic Blvd. / ICWW	1955	S: Movable - Bascule	8BD4873	
11	^ 860319	Broward	Andrews Avenue Bridge	1915/1981	Stone Arch-Deck	8BD4372	II: 2007
12	^ 860470	Broward	Northeast 4th Avenue Bridge	1942	C: Arch-Deck	none	
13	860920	Broward	Dania Beach Blvd. / ICWW	1956	S: Movable - Bascule	8BD4874	
14	860941	Broward	Oakland Park Blvd. / ICWW	1955	S: Movable - Bascule	8BD4875	
15	864028	Broward	Angler Ave (Ravenswood) / Dania Cut-off Canal	1928/1958	PSC: Girder	8BD4876	
16	** 864071	Broward	SE 3rd Ave. / New River & S New River Dr	1960	S: Movable - Bascule	8BD4770	
17	** 864072	Broward	William H. Marshall Memorial Bridge/SW 7th Ave. / New River and 5th Place	1964	S: Movable - Bascule	8BD4771	
18	865720	Broward	Old Dixie Hwy / S. Fork Middle River	1923/1959	C: Arch-Deck	8BD3164	
19	865729	Broward	East Las Olas Blvd / Himmarshee Canal	1930/1950	C: Arch-Deck	8BD4877	
20	* 865732	Broward	Coconut Isle / Grande Canal	1925	C: Arch-Deck	8BD3165	EL: 2000
21	* 865734	Broward	Isle of Venice / Las Olas Canal	1948	C: Slab	8BD3149	P-EL: 2008
22	* 865735	Broward	Fiesta Way / Las Olas Canal	1948	C: Slab	8BD3150	P-EL: 2008
23	* 865736	Broward	Nurmi Drive / Las Olas Canal	1947	C: Slab	8BD3168	P-EL: 2008
24	* 865737	Broward	Royal Palm Drive / Las Olas Canal	1946	C: Slab	8BD3169	P-EL: 2008
25	865752	Broward	SW 7th Street / Tarpon River	1929	S: Girder	8BD3172	
26	* 865748	Broward	Snow-Reed Swing Bridge/SW 11 Avenue / N Fork New River	1925	S: Movable - Swing	8BD3171	EL: 2000
27	** 880001	Indian River	US-1 SB (SR-5) / Old Dixie Hwy & FEC Railroad	1928/1934	C: Tee-Beam	8IR1516	
28	** 880005	Indian River	SR-A1A / Sebastian Inlet	1964	PSC: Girder	8IR1493	
29	890003	Martin	SR-707 (Dixie Hwy) / St. Lucie River	1964	S: Movable - Bascule	8MT1599	
30	^ 894026	Martin	Gaines Avenue Bridge	1928	C: Arch-Deck	8MT928	
31	^ 930004	Palm Beach	US-1 (SR-5) / ICWW	1956	S: Movable - Bascule	none	
32	** 930005	Palm Beach	US-1 (SR-5) / ICWW	1958	S: Movable - Bascule	8PB14878	
33	^ 930022	Palm Beach	Royal Palm Bridge	1928	S: Movable - Bascule	8PB6678	
34	* 930026	Palm Beach	George Bush Blvd (NE 8th Street) / ICWW	1949	S: Movable - Bascule	8PB13707	P-EL: 2008

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35	930053	Palm Beach	US-98 (SR-80) / FEC RR & Georgia Ave.	1939/1979	S: Girder	8PB15966	
36	930056	Palm Beach	CR-707 (Beach Rd) / ICWW	1969	S: Movable - Bascule	8PB15967	
37	** 930060	Palm Beach	Haven Ashe Bridge/A1A / Boca Inlet	1963	S: Movable - Bascule	8PB14879	
38	930064	Palm Beach	Atlantic Avenue / ICWW	1952/2002	S: Movable - Bascule	8PB15968	
39	* 930072	Palm Beach	CR-717 / Okeechobee Rim Canal	1916/1935/ 1998	S: Movable - Swing	8PB212	P-EL: 2002
40	930094	Palm Beach	Ocean Ave. (CR-812) / ICWW	1950	S: Movable - Bascule	8PB15969	
41	930097	Palm Beach	Southern Boulevard / ICWW	1950	S: Movable - Bascule	8PB8008	IN-EL: 2008
42	930106	Palm Beach	EB PGA Blvd. / ICWW	1966/2007	S: Movable - Bascule	8PB15970	
43	* 930157	Palm Beach	SR-A1A / ICWW	1938	S: Movable - Bascule	8PB9533	P-EL: 2007
44	930214	Palm Beach	Woolbright Road / ICWW	1967	S: Movable - Bascule	8PB15971	
45	* 930940	Palm Beach	Twenty Mile Bend/ Loxahatchee Bridge/CR-880 / C-51 Canal	1937	CS: Swing, Warren Through Truss	8PB231	P-EL: 1990
46	* 934408	Palm Beach	E. Camino Real / ICWW	1939/2007	S: Movable - Bascule	8PB8111	EL: 2007
47	940045	St. Lucie	SR-A1A / ICWW	1963	S: Movable - Bascule	8SL3159	
48	*** 945000**	**St. Lucie**	**North 2nd Street / Moore's Creek**	**1925/1997**	**C: Arch-Deck**	**8SL1141**	**L: 2001**
FDOT DISTRICT 5: Total - 59							
1	110004	Lake	US-27 / Helena Run	1927/1950	C: Tee-Beam	8LA4371	
2	110026	Lake	SR-19 / Little Lake Harris	1950	S: Girder	8LA2044	
3	110063	Lake/ Volusia	SR-44 / St. Johns River	1955	S: Movable - Bascule	8LA4372/ 8VO9394	
4	114052	Lake	Lois Drive / Unnamed Canal	1952	PSC: Tee-Beam	8LA4373	
5	** 114089	Lake	Highland St. / SCL RR	1934	C: Tee-Beam	8LA2043	
6	180021	Sumter	SR-50 / Abandoned RR	1951	S: Girder	8SM580	IN-EL: 2010
7	** 184000	Sumter	CR-558 / Big Prairie Canal	1926	C: Tee-Beam	8SM171	
8	184002	Sumter	CR-728 Tuscannooga / Big Prairie Canal	1963	PSC: Channel Beam	8SM648	
9	184005	Sumter	CR-48 / Big Prairie Canal	1937	C: Culvert	8SM649	
10	184006	Sumter/ Citrus	CR-48 / Withlacoochee River	1929/1952	S: Girder	8SM650/ 8CI1380	
11	184008	Sumter	CR-48 / Jumper Creek Canal	1955	C: Slab	8SM651	
12	184059	Sumter	CR-311 / Jumper Creek	1965	T: Girder	8SM566	IN-EL: 2009
13	^ 360003	Marion	Dunnellon Overpass	1936	C: Girder	8MR2537	
14	364002	Marion	CR-25A / SCL RR	1925/1962	C: Tee-Beam	8MR3721	
15	^ 364017	Marion	Moss Bluff Bridge (CR-464A) / Oklawaha River	1926	S: Movable - Swing	8MR2538	

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16	** 364040	Marion	CR-316 / Prop Cross Fla Canal	1969	CS: Girder	8MR3585	
17	* 364060	Marion	NE 105 Street / Daisy Creek	1940	S: Culvert	8MR3601	EL: 2000
18	* 364110	Marion	CR-314 / Oklawaha River	1928/1971	S: Movable - Swing	8MR2539	P-EL: 2007
19	* 364120	Marion	SE 137th Ave Road / Creek	1940	S: Culvert	8MR3602	EL: 2000
20	* 364150	Marion	NE 145th Ave Road / Canal	1940	S: Culvert	8MR3603	EL: 2000
21	700030	Brevard	SR-401 SB Bridge I/ Barge Canal	1965	S: Movable - Bascule	8BR3009	
22	700031	Brevard	SR-401 SB Bridge II / Barge Canal	1965	S: Movable - Bascule	8BR3010	
23	700061	Brevard	SR-520 WB / Indian River	1966	CS: Girder	8BR3011	
24	700072	Brevard	SR-3 / Barge Canal	1961/1998	S: Movable - Bascule	8BR3012	
25	700110	Brevard	SR-528 / Indian River	1970	CS: Girder	8BR3013	
26	700137	Brevard	SR-520 EB / Indian River	1969	CS: Girder	8BR3014	
27	704016	Brevard	Girard Blvd / Navigable Sykes Creek	1962/1980	PSC: Channel Beam	8BR3015	
28	^ 704049	Brevard	CR-402 / Indian River	1949	S: Movable - Swing	8BR1699	P-EL: 2002
29	* 704063	Brevard	Mathers Bridge/Banana River Drive / Banana River	1927/2005	S: Movable - Swing	8BR1700	EL: 2000
30	705911	Brevard	Port Malabar WB / Turkey Creek	1965	PSC: Tee-Beam	8BR3016	
31	^ 730000	Flagler	Shell Bluff Bridge	1933	C: Tee-Beam	8FL214	IN-EL: 2000
32	730004	Flagler	US-1 SB / Black Branch	1948	C: Slab	8FL909	
33	730011	Flagler	SR-100 / Water Oak Canal	1936/1996	C: Culvert	8FL910	
34	730053	Flagler	SR-100 / Black Swamp Canal	1936/2002	C: Culvert	8FL911	
35	734003	Flagler	CR-305 / Canal	1949	S: Girder	8FL912	
36	734004	Flagler	CR-305 / Canal	1949	CS: Girder	8FL913	
37	734005	Flagler	CR-305 / Canal	1949	S: Girder	8FL914	
38	734008	Flagler	CR-305 / Middle Haw Creek	1949	CS: Girder	8FL915	
39	734024	Flagler	CR-13 / Canal	1952/2006	C: Culvert	8FL916	
40	750058	Orange	SR-528 / Dallas Blvd	1967	PSC-C: Girder	8OR10053	
41	750059	Orange	SR-528 / Farm Access Road	1967	PSC-C: Girder	8OR10054	
42	750213	Orange	SR-528 / Dallas Blvd	1967	PSC-C: Girder	8OR10055	
43	750214	Orange	SR-528 / Farm Access Road	1967	PSC-C: Girder	8OR10056	
44	754003	Orange	Bates Road / Crane Strand Canal	1962	PSC: Channel Beam	8OR10057	
45	754005	Orange	Buck Road / Little Econ River	1932/1956	C: Slab	8OR10058	
46	754057	Orange	Taylor Creek Road / Tosohatchee Creek	1965/1986	T: Girder	8OR10059	

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47	** 755100	Orange	Nela Avenue / Lake Conway Connector	1926/1982	CC: Tee-Beam	8OR8339	
48	* 755806	Orange	Washington Street / Fern Creek	1926	C: Arch-Deck	8OR3190	EL: 2000
49	* 755807	Orange	Poinsettia Ave. / Lake Ivanhoe	1942	C: Tee-Beam	8OR6033	P-EL: 2007
50	770002	Seminole	US-17-92 / Mills Creek	1935	C: Tee-Beam	8SE1949	
51	F: 770009	Seminole/ Volusia	Lake Monroe	1934	S: Swing, Warren Through Truss	8SE77 / 8VO7174	P-EL: 1985
52	^ 790014	Volusia	Tomoka River Bridge	1932	C: Girder	8VO7101	IN-EL: 1998
53	^ 790098	Volusia	Carleton-Blank Bridge	1948	S: Movable - Bascule	8VO7102	
54	^ 794003	Volusia	Orange Avenue Bridge /Halifax River	1954	S: Movable - Bascule	8VO9193	IN-EL: 2009
55	794004	Volusia	Main Street / Halifax River	1959	S: Movable - Bascule	8VO9391	
56	++ 794016	Volusia	Old Dixie Hwy. / Tomoka River	1964	S: Girder	8VO9392	
57	794022	Volusia	Turnbull Bay Road / Turnbull Creek	1967	PSC: Channel Beam	8VO9393	
58	794065	Volusia	Old Daytona Rd / Little Haw Creek	1937	S: Girder	8VO7104	
59	* 794081	Volusia	CR-3 / Deep Creek	1920	C: Arch-Deck	8VO7105	P-EL: 2006
FDOT DISTRICT 6: Total - 84							
1	^ 870001/ 870759	Miami-Dade	Brickell Avenue Bridge/US-1/ Miami River	1929/ 1995	S: Moveable-Bascule	8DA5098	
2	870002	Miami-Dade	Biscayne Blvd (SR-5) / Little River Canal C-7	1928/1996	C: Slab	8DA5096	
3	870013	Miami-Dade	SB US-1 (SR-5) / Black Creek Canal C-1-W	1962/2005	PSC: Slab	8DA12606	
4	870057	Miami-Dade	Comp SR-9336 / Aerojet Canal C-111	1967	C: Slab	8DA12607	
5	870058	Miami-Dade	Comp SR-9336 / Canal C-111-E	1967	C: Slab	8DA12608	
6	^ 870097	Miami-Dade	NW 27th Avenue Bridge / Miami River	1938	S: Movable - Bascule	8DA6426	
7	870613	Miami-Dade	63 St. / Indian Creek Canal	1953	S: Movable - Bascule	8DA9896, 8DA9897	
8	870625	Miami-Dade	NW 36 St. / Miami River	1950	S: Movable - Bascule	8DA11508	IN-EL: 2009
9	870628	Miami-Dade	Comp SR-994 / Canal C-102	1966	PSC: Slab	8DA12609	
10	^ 870659	Miami-Dade	NW 5th Avenue	1924	S: Movable - Bascule	8DA6218	IN-EL: 2002
11	* 870660	Miami-Dade	SW 1 St / Miami River	1929	S: Movable - Bascule	8DA6222	P-EL: 2007
12	870661	Miami-Dade	W Flagler St. / Miami River	1967	S: Movable - Bascule	8DA12610	
13	^ 870662	Miami-Dade	NW 12th Avenue	1928	S: Movable - Bascule	8DA6341	EL: 2000
14	870665	Miami-Dade	COMP SR-907 / Collins Canal	1956/1962	C: Arch-Deck	8DA12365	
15	* 874129	Miami-Dade	Curtiss Pkwy SB/ Miami Canal	1927/ 1954	S: Movable - Lift	8DA99	P-EL: 1995

ALL SURVEYED BRIDGES - 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 510							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
16	* 874130	Miami-Dade	Curtiss Parkway NB / Miami Canal	1924/ 1941	S: Movable - Swing	8DA100	P-EL: 1995
17	* 874135	Miami-Dade	NW South River Dr. / Tamiami Canal	1921/1940	S: Movable - Swing	8DA6431	EL: 2000
18	* 874161	Miami-Dade	NW 17th Avenue / Miami River	1928	S: Movable - Bascule	8DA5886	EL: 2000
19	* 874218	Miami-Dade	Atlantic Isle / Ocean Canal	1925	C: Arch-Deck	8DA6433	EL: 2000
20	** 874307	Miami-Dade	SW 117th Avenue / North Canal	1937	S: Through Girder	8DA11918	
21	874308	Miami-Dade	SW 147th Avenue / Canal C-103	1966	PSC: Slab	8DA12611	
22	874310	Miami-Dade	SW 312th Street / Canal C-103	1966/1976	PSC: Slab	8DA12612	
23	++ 874351	Miami-Dade	N River Dr Flyover / NW 17th Avenue	1969	CC: Box Beam	8DA11919	
24	874383	Miami-Dade	NW 22nd Avenue / Miami River	1964	S: Movable - Bascule	8DA12613	
25	*** 874425**	**Miami-Dade**	**SW 72nd Avenue / Gully**	**1920**	**C: Tee-Beam**	**8DA2815C**	**L: 1986**
26	874443	Miami-Dade	SW 147th Avenue / Canal C-102	1966	PSC: Slab	8DA12614	
27	874444	Miami-Dade	SW 216th Street / Canal C-102	1966	PSC: Slab	8DA12615	
28	874445	Miami-Dade	SW 232nd Street / Canal C-102	1966	PSC: Slab	8DA12616	
29	874448	Miami-Dade	SW 107th Avenue / Canal C-102	1965	PSC: Slab	8DA12617	
30	874456	Miami-Dade	SW 117th Avenue / Canal C-103	1966	PSC: Slab	8DA12618	
31	*** 874459**	**Miami-Dade**	**Venetian Causeway / ICWW (Fracture Critical)**	**1927**	**S: Movable - Bascule**	**8DA4736**	**L: 1989**
32	*** 874460**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
33	*** 874461**	**Miami-Dade**	**Venetian Way / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
34	*** 874463**	**Miami-Dade**	**Venetian Way / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
35	*** 874465**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
36	*** 874466**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
37	*** 874471**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
38	*** 874472**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
39	*** 874473**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
40	*** 874474**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay (Frac. Crit)**	**1927**	**S: Movable - Bascule**	**8DA4736**	**L: 1989**
41	874476	Miami-Dade	SW 328th Street / Levee L-31-E (C-107)	1967	PSC: Slab	8DA12619	
42	*** 874477**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**
43	*** 874481**	**Miami-Dade**	**Venetian Causeway / Biscayne Bay**	**1927**	**CC: Tee-Beam**	**8DA4736**	**L: 1989**

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LEGEND: * - eligible; ** - newly eligible; ++ -potentially eligible/insufficient information; ^ - demolished; ^^ - no longer eligible; IN: inaccessible; F: former DOT bridge, new ownership SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
44	874706	Miami-Dade	West 23 Street / Collins Canal	1926	C: Arch-Deck	8DA6436	
45	874998	Miami-Dade	Seaport Causeway / Biscayne Bay (Frac. Crit)	1964	S: Movable - Bascule	8DA12620	
46	++ 875101	Miami-Dade	NE123rd St. / ICWW (Fracture Critical)	1951	S: Movable - Bascule	8DA12621	
47	* 875305	Miami-Dade	Hardee Rd (64th St) / Coral Gables Canal	1930	C: Arch-Deck	8DA6437	EL: 2000
48	^^ 875306	Miami-Dade	Granada Blvd / Coral Gables Canal	1930	C: Arch-Deck	8DA6438	EL: 2000
49	* 876100	Miami-Dade	Surfside Blvd / Indian Creek	1930	CC: Tee-Beam	8DA6439	EL: 2000
50	* 876400	Miami-Dade	NW 7th Street / Wagner Creek Canal	1919	C: Arch-Deck	8DA2384	P-EL: 1987
51	876415	Miami-Dade	NW 17th Street / Wagner Creek Canal	1967	C: Slab	8DA12622	
52	876705	Miami-Dade	Washington Ave. / Collins Canal	1937	C: Frame	8DA12623	
53	* 876707	Miami-Dade	Sunset Drive / Sunset Lake Canal	1926	CC: Tee-Beam	8DA6441	P-EL: 2010
54	* 876708	Miami-Dade	Sunset Drive / Sunset Lake Canal	1926	CC: Tee-Beam	8DA5828	P-EL: 2010
55	* 876710	Miami-Dade	West 29th Street / Sunset Lake Canal	1926	CC: Tee-Beam	8DA5829	EL: 2000
56	* 904602	Monroe	Duck Key Drive / Un-Named Channel	1955/1982	C: Arch-Deck	8MO2137	EL: 2000
57	* 904603	Monroe	Bimini Drive / Sams Canal	1955/1982	PSC: Channel Beam	8MO2136	EL: 2000
58	* 904604	Monroe	Harbour Drive / Joes Canal	1955/1982	PSC: Channel Beam	8MO2135	EL: 2000
59	* 904606	Monroe	Seaview Drive / Un-Named Canal	1955/1982	PSC: Channel Beam	8MO2138	EL: 2000
60	^ 874312	Miami-Dade	Southwest 147th Avenue Bridge	1937	S: Through Girder	none	
61	*** 900016**	**Monroe**	**Bahia Honda***	**1909/ 1972**	**S: Truss - Through (Pratt, Camelback)**	**8MO1231**	**L: 1979**
62	*** 900080**	**Monroe**	**Rockland Channel**	**1911/1979**	**C: Arch-Deck**	**8MO1490**	**L: 2004**
63	*** 900081**	**Monroe**	**Shark Channel Bridge**	**1911/1979**	**C: Arch-Deck**	**8MO1489**	**L: 2004**
64	*** 900090**	**Monroe**	**Saddlebunch #5 Bridge**	**1943/1980**	**C: Arch-Deck**	**8MO3953**	**L: 2004**
65	*** 900091**	**Monroe**	**Saddlebunch #4 Bridge**	**1943/1980**	**C: Arch-Deck**	**8MO3954**	**L: 2004**
66	*** 900092**	**Monroe**	**Saddlebunch #3 Bridge**	**1943/1981**	**C: Arch-Deck**	**8MO3955**	**L: 2004**
67	*** 900093**	**Monroe**	**Saddlebunch #2 Bridge**	**1943/1981**	**C: Arch-Deck**	**8MO3956**	**L: 2004**
68	*** 900094**	**Monroe**	**Long Key Viaduct**	**1906/1981**	**C: Arch-Deck**	**8MO1229**	**L: 1979**
69	*** 900097**	**Monroe**	**Channel Two Viaduct**	**1909/1981**	**C: Arch-Deck**	**8MO3476**	**L: 2004**
70	*** 900098**	**Monroe**	**Channel #5 Bridge**	**1909/1982**	**C: Arch-Deck**	**8MO3968**	**L: 2004**
71	*** 900099**	**Monroe**	**Toms Harbor Cut Bridge**	**1909/1980**	**C: Arch-Deck**	**8MO3967**	**L: 2004**
72	*** 900100**	**Monroe**	**Toms Harbor Channel Bridge**	**1909/1980**	**C: Arch-Deck**	**8MO3966**	**L: 2004**
73	*** 900101**	**Monroe**	**Knight Key Bridge / Seven Mile Bridge**	**1909/1982**	**C: Arch-Deck**	**8MO1230**	**L: 1979**

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
74	*** 900102**	**Monroe**	**Lower Sugarloaf Channel Bridge**	**1943/1981**	**C: Arch-Deck**	**8MO3957**	**L: 2004**
75	*** 900103**	**Monroe**	**Little Duck-Missouri Channel Bridge**	**1943/1981**	**C: Arch-Deck**	**8MO3965**	**L: 2004**
76	*** 900104**	**Monroe**	**Ohio-Missouri Channel Bridge**	**1943/1981**	**C: Arch-Deck**	**8MO3964**	**L: 2004**
77	*** 900105**	**Monroe**	**Ohio-Bahia Honda Bridge**	**1943/1981**	**C: Arch-Deck**	**8MO3963**	**L: 2004**
78	*** 900106**	**Monroe**	**Spanish Harbor Channel Bridge**	**1912/1982**	**C: Arch-Deck**	**8MO1484**	**L: 2004**
79	*** 900111**	**Monroe**	**South Pine Channel Bridge**	**1943/1982**	**C: Arch-Deck**	**8MO3962**	**L: 2004**
80	*** 900112**	**Monroe**	**Park Channel Bridge**	**1943/1982**	**C: Arch-Deck**	**8MO3958**	**L: 2004**
81	*** 900115**	**Monroe**	**Bow Channel Bridge**	**1943/1982**	**C: Arch-Deck**	**8MO3959**	**L: 2004**
82	*** 900116**	**Monroe**	**Kemp Channel Bridge**	**1943/1982**	**C: Arch-Deck**	**8MO3960**	**L: 2004**
83	*** 900117**	**Monroe**	**Niles Channel Bridge**	**1943/1983**	**C: Arch-Deck**	**8MO3961**	**L: 2004**
84	none	Miami-Dade	Aerojet Truss	1910	S: Truss - Pony	none	EL: 2000
FDOT DISTRICT 7: Total - 70							
1	^ 20001	Citrus	US-19 (SR-55) / Cross FL Barge Canal	1966	CS: Girder	none	
2	20002	Citrus	US-41 (SR-45) / FL Nature Trail	1925/1950	C: Tee-Beam	8CI853	
3	20008	Citrus	SR-200 / Withlacoochee River	1935	C: Tee-Beam	8CI824	
4	**80001	Hernando	US-41 (SR-45) / CSX RR	1936	S: Girder	8HE389	
5	100001	Hillsborough	US-41 (SR-45) / Hillsborough River	1923/1965	C: Tee-Beam	8HI11791	
6	^ 100005	Hillsborough	US-301 / Little Bullfrog Creek	1922/1971	C: Tee-Beam	8HI11792	
7	^ 100006	Hillsborough	US-301 / Tadpole Creek	1924/1953	C: Slab	8HI1566	IN-EL: 2009
8	^ 100028	Hillsborough	Lafayette Street Viaduct	1926	C: Girder	8HI6663	
9	^^ 100033	Hillsborough	SR-574 / Lake Weeks Creek	1915	C: Tee-Beam	8HI5704	EL: 2000
10	100045	Hillsborough	US-41 SB (SR-45) / Alafia River	1959	PSC: Girder	8HI11793	
11	^ 100065	Hillsborough	SR-676 / Delaney Creek	1928	C: Tee-Beam	8HI4543	IN-EL: 1992
12	^ 100066	Hillsborough	SR-676 / Delaney Creek Tributary	1928	C: Tee-Beam	8HI4541	IN-EL: 1992
13	* 100069	Hillsborough	James N. Holmes Bridge/US-41 Bus / Hillsborough River	1926	C: Tee-Beam	8HI6668	EL: 2000
14	100098	Hillsborough	US-92 (SR-600) / Pemberton Creek Slough	1930/1943	C: Slab	8HI11794	
15	* 100100	Hillsborough	SR-60 Kennedy Blvd. / Hillsborough River	1913/1995	S: Movable - Bascule	8HI640	P-EL: 1987
16	* 100647 (previously 100037)	Hillsborough	SR-39 / Blackwater Creek Relief	1936/2002	S: Culvert	8HI5042	P-EL: 1993
17	* 100920	Hillsborough	US-92 (SR-600 EB) / Hillsborough River	1939/1999	S: Movable - Lift	8HI6669	EL: 2000
18	104333	Hillsborough	CR-41A (Old Bayshore) / Raceway Canal	1925	C: Culvert	8HI11795	

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19	104426	Hillsborough	Old Mulberry Road / English Creek	1940/1965	C: Arch-Deck	8HI11796	
20	*105500	Hillsborough	Platt Street / Hillsborough River	1926	S: Movable - Bascule	8HI862	P-EL: 2005
21	* 105501	Hillsborough	Brorein Street / Hillsborough River	1959	S: Movable - Bascule	8HI11540	P-EL: 2009
22	* 105502	Hillsborough	Cass Street / Hillsborough River	1927/1949	S: Movable - Bascule	8HI6670	P-EL: 2002
23	* 105503	Hillsborough	Laurel Street / Hillsborough River	1927/1969	S: Movable - Bascule	8HI6671	EL: 2000
24	* 105504	Hillsborough	Columbus Drive / Hillsborough River	1926/2012	S: Movable - Swing	8HI6672	EL: 2000
25	105608	Hillsborough	West Davis Blvd / Canal	1927	S: Girder	8HI6673	
26	105616	Hillsborough	Sylvan Ramble Bridge	1931	C: Arch-Deck	8HI6677	
27	105617	Hillsborough	Swann Circle Bridge	1930	C: Arch-Deck	8HI6678	
28	105909	Hillsborough	CR-587 (Westshore Blvd.) / Drainage Canal	1935/2005	C: Culvert	8HI11797	
29	140004	Pasco	US-41 (SR-45) / Scotts Canal	1939	C: Tee-Beam	8PA2807	
30	** 144002	Pasco	N. Crystal Springs / Hillsborough River	1923	C: Arch-Deck	8PA637	
31	144022	Pasco	Old Cypress Cr. Rd / Cypress Creek	1925	C: Arch-Deck	8PA635	
32	150007	Pinellas	SR-590 / Stevensons Creek	1927/1970	C: Arch-Deck	8PI8740	
33	** 150009	Pinellas	Philippe Pkwy / Mullet Creek Bridge No. 2	1926	C: Arch-Deck	8PI8742	
34	* 150022	Pinellas	4th St. South / Salt Creek	1935	C: Arch-Deck	8PI8726	EL: 2000
35	150023	Pinellas	4th Street South / Booker Creek	1926	C: Tee-Beam	8PI8727	
36	150028	Pinellas	SR-666 / ICWW	1962	S: Movable - Bascule	8PI12056	
37	150030	Pinellas	SR-693 / Corey Ave / ICWW	1966	S: Movable - Bascule	8PI12057	
38	150046	Pinellas	Alt US-19 (SR-595) / Curlew Creek	1923/1958	C: Arch-Deck	8PI12058	
39	150049	Pinellas	Bayway Structure E/SR-679 / Boca Ciega Bay	1961/1996	S: Movable - Bascule	8PI11994	
40	150050	Pinellas	SR-682 / ICWW	1962	S: Movable - Bascule	8PI12059	
41	150062	Pinellas	Indian Rocks Road / Ikes Creek	1927	C: Arch-Deck	8PI8729	
42	150068	Pinellas	Causeway Blvd. / St. Joseph Sound (ICWW)	1963	S: Movable - Bascule	8PI12060	
43	150112	Pinellas	SR-688 (Walsingham) / ICWW	1958/1999	S: Movable - Bascule	8PI12061	
44	* 150113	Pinellas	SR-590 (Coachman Rd.) / Alligator Creek	1926	C: Arch - Through	8PI8730/ 8MA1798	EL: 2000
45	* 150189	Pinellas/ Manatee	Bob Graham Sunshine Skyway/I-275 (SR-93) / Tampa Bay	1986	Cable-Stayed	8PI11962	EL: 2007
46	150910	Pinellas	SR-590 / Bishop Creek	1926	C: Arch-Deck	8PI8731	
47	154000	Pinellas	Beckett Bridge/N Spring Blvd. / Minetta Branch	1924/1996	S: Movable - Bascule	none	

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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
48	^^ 154100	Pinellas	Shore Drive / Shore Drive Canal	1923	C: Arch-Deck	8PI8732	EL: 2000
49	154101	Pinellas	Orange Street / Minnow Creek	1923	C: Arch-Deck	8PI8733	
50	^ 154208	Pinellas	Belleair Causeway / CR-416 /ICWW	1950	C: Girder	8PI2728	IN-EL: 2004
51	^ 154209	Pinellas	Belleair Causeway / CR-416 / ICWW	1950	S: Movable - Bascule	8PI2729	IN-EL: 2004
52	154252	Pinellas	Old Coachman Rd / Alligator Creek	1925	C: Arch-Deck	8PI8736	
53	^^ 154700	Pinellas	Madonna Blvd. / Pine Key Cutoff	1957/2005	PSC: Girder	8PI8737	EL: 2000
54	^^ 154701	Pinellas	13th / Sands Pt Dr / Pine Key Cutoff	1957/1993	PSC: Girder	8PI8738	EL: 2000
55	157001	Pinellas	North Bayshore Dr. / Mullet Creek Bridge No. 1	1927	C: Arch-Deck	8PI8742	
56	157101	Pinellas	3rd Street South / Salt Creek	1926	C: Arch-Deck	8PI8743	
57	157117	Pinellas	9th St. South / Booker Creek	1920	C: Tee-Beam	8PI8746	
58	157123	Pinellas	Central Ave / Booker Creek	1921/2002	C: Tee-Beam	8PI12063	
59	157124	Pinellas	1st Ave N / Booker Creek	1926	C: Tee-Beam	8PI12064	
60	157125	Pinellas	16th Street N / Booker Creek	1925	C: Tee-Beam	8PI12065	
61	* 157127	Pinellas	Burlington Ave. / Booker Creek	1942	CC: Tee-Beam	8PI8747	EL: 2000
62	157189	Pinellas	Overlook Dr NE / Smacks Bayou	1965	CC: Slab	8PI12066	
63	++ 157191	Pinellas	Snell Isle Blvd / Coffee Pot Bayou	1928/1996	C: Slab	8PI8748	EL: 2000
64	157197	Pinellas	45th Ave South / Little Bayou	1961/1999	CC: Slab	8PI12067	
65	^ 157800	Pinellas	Treasure Island Causeway	1939	S: Movable - Bascule	8PI10574	EL: 2000
66	^ 157820	Pinellas	Treasure Island Causeway / Boca Ciega Way W	1939	C: Girder	8PI10574	EL: 2000
67	^ 157840	Pinellas	Treasure Island Causeway / Boca Ciega Way E	1939	C: Girder	8PI10574	EL: 2000
68	* 159901	Pinellas	Luten "Half-Arch"	1915	C: Arch-Deck	8PI8749	EL: 2000
69	none	Hillsborough	Beach Park Bridge	1930	C: Arch-Deck	none	
70	^ none	Hillsborough	Beachway Drive Bridge	1930	C: Arch-Deck	none	

APPENDIX B:
All Field Surveyed Bridges by FDOT District

FDOT DISTRICT 1 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 64							
LEGEND: ^^ - no longer eligible SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
NRHP Listed and Determined Eligible							
1	060034	Hardee	CR-664 / Little Payne Creek	1915	C: Arch-Deck	8HR374	P-EL: 2009
2	064069	Hardee	Hobb Rd / Payne Creek	1920	C: Arch-Deck	8HR375	EL: 2000
3	070013	Hendry	Fort Denaud Swing Bridge / Caloosahatchee	1940/1963	S: Movable - Swing	8HN632	EL: 2000
4	120001	Lee	Billy Creek Lift Bridge / Billy's Creek	1941	S: Movable - Lift	8LL705	EL: 2000
5	135250	Manatee	7th Avenue West / Wares Creek	1949	CS: Girder	8MA992	P-EL: 2009
6	135251	Manatee	9th Avenue West / Wares Creek	1945	C: Arch-Deck	8MA993	P-EL: 2007
7	135252	Manatee	12th Avenue West / Wares Creek	1938	C: Tee-Beam	8MA994	P-EL: 2007
8	165700	Polk	Haines City Overpass/ Lilly Avenue / ACL Railroad	1927	S: Girder	8PO3013	EL: 2000
9	170064	Sarasota	CR-789 (Blackburn Point) / ICWW	1925/1995	S: Movable - Swing	8SO1890	L: 2001
10	175950	Sarasota	Osprey Avenue / Hudson Bayou	1916/1973	C: Arch-Deck	8SO2376	EL: 2000
11	450001	DeSoto	Peace River Bridge at Arcadia	1925	C: Arch-Deck	8DE381	EL: 2000
12	910054	Okeechobee	US-441 / US-98 (SR-700) / Taylor Creek	1948	S: Movable - Bascule	8OB56	EL: 2000
2010 Recommended NRHP Eligible							
13	054015	Glades	CR-721A / Harney Pond Canal	1958	PSC: Slab	8GL458	
14	160064	Polk	US-98 (SR-700) / Peace River	1931	C: Tee-Beam	8PO5440	
15	170060	Sarasota	Siesta Dr (SR-758) / Hanson Bayou	1928	C: Tee-Beam	8SO2373	
16	175660	Sarasota	Riverside Drive / Whitaker Bayou	1926	C: Tee-Beam	8SO2375	
17	910001	Okeechobee/ Highlands	SR-70/ Kissimmee River	1966	S: Girder	8OB336/ 8HG1236	
18	910009	Okeechobee	SR-78 / Kissimmee River	1964	S: Girder	8OB321	
2010 Ineligible for NRHP							
19	030148	Collier	SR-951 (Collier Blvd) / Big Marco Pass	1969	CS: Girder	8CR1301	
20	030161	Collier	CR-29 (Copeland Ave) / Chokoloskee Bay	1955	C: Girder	8CR1302	
21	040005	DeSoto	Brownville Rd / Peace River	1964	PSC: Girder	8DE852	
22	040009	DeSoto	Cubitus Ave / Mare Branch	1936	S: Girder	8DE853	
23	040010	DeSoto	CR-760 / Peace River	1967	PSC: Girder	8DE854	
24	040016	DeSoto	CR-661 / Green Canal	1960	S: Culvert	8DE855	
25	040029	DeSoto	CR-760 / Muddy Creek	1967	PSC: Slab	8DE856	
26	060017	Hardee	Heard Bridge Road / Peace River	1954	S: Girder	8HR905	

FDOT DISTRICT 1 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 64							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
27	060021	Hardee	SR-64 / Peace River	1956	PSC: Girder	8HR906	
28	060022	Hardee	SR-64 / Peace River Overflow	1956	PSC: Girder	8HR907	
29	064080	Hardee	Heard Bridge Road / Peace River	1965	S: Culvert	8HR908	
30	070033	Hendry	SR-29 (Bridge St) / Caloosahatchee River	1959	S: Movable - Bascule	8HN412	
31	074002	Hendry	Ft. Denaud Rd. (CR-78A) / Donna's Crossing	1930/1955	C: Arch-Deck	8HN631	
32	090004	Highlands	US-27 NB (SR-25) / Josephine Creek	1968	C: Slab	8HG1232	
33	090016	Highlands/ Okeechobee	US-98 (SR-700) / Kissimmee River	1953/1966	S: Girder	8HG1170/ 8OB323	IN-EL: 2010
34	090023	Highlands	US-98 (SR-700) / Spring Lake Canal	1949	C: Slab	8HG1233	
35	090029	Highlands	US-98 (SR-700) / Arbuckle Creek	1949	CS: Girder	8HG1234	
36	120011	Lee	US BUS 41 (SR-739) / Deans Ditch	1927/1951	C: Slab	8LL2611	
37	120028	Lee	CR-865 / Big Carlos Pass	1965	S: Movable - Bascule	8LL2612	
38	120042	Lee	Broadway St / Caloosahatchee River	1969	S: Movable - Bascule	8LL2613	
39	120050	Lee	Pine Island Road (CR-78) / Matlacha Pass	1968	S: Movable - Bascule	8LL2614	
40	120064	Lee	SR-31 / Caloosahatchee River	1960	S: Movable - Bascule	8LL2615	
41	124014	Lee	Whiskey Creek Dr. / Whiskey Creek	1920/1970	Aluminum, Wrought Iron, Cast Iron Culvert	8LL2616	
42	124038	Lee	Persimmon Ridge Rd / Spanish Creek	1950/1994	T: Slab	8LL2617	
43	130006	Manatee	SR-684 (Cortez Rd) / Sarasota Pass	1956	S: Movable - Bascule	8MA1822	
44	130016	Manatee	SR-70 / Myakka River	1965	PSC: Girder	8MA1823	
45	130019	Manatee	US-19 NB (SR-55) / Terra Ceia Bay	1969	PSC: Girder	8MA1824	
46	130054	Manatee	SR-64 / Sarasota Pass	1957	S: Movable - Bascule	8MA1825	
47	130057	Manatee	SR-789 / Longboat Key Pass	1957/2005	S: Movable - Bascule	8MA1826	
48	135253	Manatee	14th Avenue West / Wares Creek	1949	S: Girder	8MA1827	
49	135254	Manatee	17th Avenue West / Wares Creek	1926	C: Slab	8MA995	
50	135256	Manatee	19th Avenue West / Wares Creek	1926	C: Tee-Beam	8MA996	
51	164402	Polk	District Line Rd / Whidden Creek	1960	PSC: Tee-Beam	8PO7576	
52	170052	Sarasota	SR-72 EB / Intracoastal Waterway	1968	S: Movable - Bascule	8SO6930	
53	170054	Sarasota	Venice Ave (CR-772) / Intracoastal Waterway	1966/2004	S: Movable - Bascule	8SO6931	

FDOT DISTRICT 1 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 64							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
54	170057	Sarasota	Albee Road / Intracoastal Waterway	1963/2002	S: Movable - Bascule	8SO6932	
55	170058	Sarasota	CR-774 / Intracoastal Waterway	1964	S: Movable - Bascule	8SO6933	
56	170065	Sarasota	SR-72 WB / Intracoastal Waterway	1968	S: Movable - Bascule	8SO6934	
2010 – Demolished							
57	060005	Hardee	Doyle Carleton Bridge	1933	C: Girder	8HR371	
58	060013	Hardee	Peace River Bridge	1934	C: Girder	8HR168	
59	060014	Hardee	Peace River Overflow Bridge	1934	C: Girder	8HR169	
60	074001	Hendry	Tanya's Crossing	1920	C: Arch-Deck	8HN630	
61	090030	Highlands	Lake Jackson Bridge	1927	C: Arch-Deck	8HG893	
62	164336	Polk	Old Lake Wales Road Bridge	1928/1998	S: Girder	8PO4047	
63	170031	Sarasota	US-41 NB (SR-45) / Dona Bay	1928/1950	C: Slab	none	
64	170033	Sarasota	US-41 NB (SR-45) / Shakett Creek	1928/1950	C: Slab	none	

FDOT DISTRICT 2 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 155							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
NRHP Listed and Determined Eligible							
1	IN: 324302	Hamilton	Apalahoochee River Pony Truss	1911	S: Truss-Pony (Pratt)	8HA87	EL: 2000
2	330009	Lafayette	SR-51 (Hal Adams) / Suwannee River	1947	Cable-Suspension	8LF22	EL: 2000
3	334001	Lafayette	Camp Grade Road / Steinhatchee River	1921/ 1989	S: Truss - Pony (Pratt)	8LF21	EL: 2000
4	720005	Duval	SR-211 / Ortega River	1927/ 1996	S: Movable - Bascule	8DU11167	EL: 2000
5	720022	Duval	US-1 (Main St.) / St. Johns River	1941	S: Movable - Lift	8DU1553	EL: 2000
6	720076	Duval	SR-10A (Mathews Bridge) / St. Johns River & USA-1	1953	CS: Truss - Through (Warren)	8DU1554	P-EL: 2007
7	720163	Duval	I-95 (SR-9) / Myrtle Ave / I-95 / I-10 RMP	1955	S: Arch - Through	8DU17724	P-EL: 2006
8	724172	Duval	Market Street / Hogan Creek	1929	C: Slab	8DU7539	P-EL: 2006
9	724359 (formerly 724173)	Duval	Liberty Street / Hogan Creek	1929	C: Slab	8DU7551	P-EL: 2007
10	724258	Duval	Myrtle Avenue / McCoy Creek	1930	C: Tee-Beam	8DU11915	EL: 2000
11	740008	Nassau	US-17 (SR-5) / St. Marys River	1927/ 2005	S: Movable - Swing	8NA240	EL: 2000
12	764024	Putnam	Old San Mateo Road / Mill Branch	1916/ 2002	C: Arch-Deck	8PU1210	EL: 2000
13	780074	St. Johns	B.O.LIONS / SR-A1A / Matanzas River Intracoastal Waterway	1927/ 1979/ 2004	S: Movable - Bascule	8SJ2460	L: 1982
14	IN: none	Hamilton	Jennings Bridge	1902	S: Truss - Through (Pratt)	8HA89	EL: 2000
15	none	Duval	St. Johns Avenue / Willow Branch	1935	C: Slab	8DU11274	P-EL: 2007
2010 Recommended NRHP Eligible							
16	264126	Alachua	NW 58th Terrace / Branch of Rocky Creek	1924	C: Tee-Beam	8AL3510	
17	270001	Baker	Sanderson Overpass/US-90 (SR-10) / CSXRR	1936	C: Tee-Beam	8BA423	
18	280036	Bradford	CR-18 / Braggs Branch	1940	S: Culvert	8BF730	
19	280037	Bradford	CR-18 / Gum Creek	1940	S: Culvert	8BF731	
20	280038	Bradford	CR-18 / Branch of Sampson River	1940	S: Culvert	8BF732	
21	340045	Levy	CR-336 / Ten Mile Creek	1933	C: Tee-Beam	8LV513	
22	374004	Suwannee	164th Street / Little River	1940	S: Culvert	8SU395	
23	374006	Suwannee	61st Road / Little Creek	1919/ 1943	C: Culvert	8SU396	
24	374012	Suwannee	98th Terrace / Rocky Creek	1932	S: Culvert	8SU397	
25	720026	Duval	US-301 (SR-200) / CSXRR(ABND) Deep Creek Tributary	1940	S: Girder	8DU11299	

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26	720075	Duval	SR-109 (University Blvd.) / SR-10A	1952	C: Tee-Beam	8DU21151	
27	720087	Duval	US-1 (SR-5) / Miami Rd.	1968	CS: Girder	8DU21150	
28	720100	Duval	SR-115A / SR-10A	1961	C: Box Beam	8DU21149	
29	720107	Duval	Hart Bridge / SR-228 / St. Johns River	1967	CS: Truss - Through (Cantilevered)	8DU1555	
30	720518	Duval	SR-9A (Dames Pt.) / St. Johns River & Mill Cove	1989	Cable-Stayed	8DU21148	
31	724076	Duval	Smith Street Bridge	1929	C: Slab	8DU11903	
32	724077	Duval	Stockton Street / McCoy Creek	1930	C: Slab	8DU11904	
33	724171	Duval	Newnan Street / Hogan Creek	1929	C: Slab	8DU7540	
34	724175	Duval	Laura Street / Hogan Creek	1929	C: Slab	8DU7538	
35	740022	Nassau	US-301 (SR-200) / SCLRR	1936	C: Tee-Beam	8NA1270	
36	744006	Nassau	Hill Road / Little Mills Creek	1931/ 1982	T: Slab	8NA1246	
37	764039	Putnam	Fort Gates Ferry / St. Johns River	1924/1985	Ferry T: Girder	8PU1629	
38	764044	Putnam	Old US-17 / Crescent Lake Overflow	1922	C: Slab	8PU1631	
39	none	Duval	Main Street / Hogan Creek	1929	C: Slab	8DU7541	
2010 Ineligible for NRHP							
40	260006	Alachua/ Columbia	US-27 (SR-20) / Santa Fe River	1932/ 1965	CS: Girder	8AL5667/ 8CO1237	
41	270002	Baker	US-90 (SR-10) / Hells Bay	1923/ 1995	C: Culvert	8BA628	
42	270004	Baker	US-90 (SR-10) / Barber Bay	1935/ 1995	C: Culvert	8BA629	
43	290003	Columbia	US-41 (SR-25) / Clay Hole Creek	1932/ 1946	C: Slab	8CO1234	
44	290004	Columbia	US-441 (SR-47) / Falling Creek	1936/ 1979	C: Culvert	8CO1235	
45	290007	Columbia/ Suwannee	US-27 (SR-20) / Ichetucknee River	1929/ 1963	C: Tee-Beam	8CO1236/ 8SU420	
46	310002	Gilchrist/ Dixie	CR-340 / Suwannee River	1965	S: Girder	8GI232/ 8DI264	
47	310005	Gilchrist/ Suwannee	US-129 (SR-49) / Santa Fe River	1939	S: Girder	8GI236/ 8SU421	
48	320001	Hamilton	US-41(SR-25 & 100) / Swift Creek	1927/ 1947	C: Tee-Beam	8HA439	
49	320002	Hamilton	US-41(SR-25 & 100) / Cat Creek	1927/ 1994	C: Culvert	8HA440	
50	320004	Hamilton	US-41 (SR-6 & 25) / Alapaha River Overflow	1922/ 1947	C: Slab	8HA441	
51	350001	Madison/ Jefferson	US-90 (SR-10) / Aucilla River	1928/ 1954	C: Tee-Beam	8MD294/ 8JE1759	
52	350016	Madison	CR-158 / Sundown Creek	1919/ 1958	C: Culvert	8MD295	
53	370007	Suwannee	CR-49 / Little River	1945	C: Culvert	8SU419	

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54	374002	Suwannee	180th St. / Little River	1940	S: Culvert	8SU394	
55	380009	Taylor	US-221 (SR-55) / Woods Creek	1939	CS: Girder	8TA504	
56	380011	Taylor	US-221 (SR-55) / Two Pines Creek	1939	CS: Girder	8TA505	
57	380012	Taylor	US-221 (SR-55) / Cypress Creek	1939	S: Girder	8TA506	
58	380013	Taylor	US-221 (SR-55) / Angel Creek	1939	CS: Girder	8TA507	
59	380014	Taylor	US-221 (SR-55) / Lori Creek	1939	CS: Girder	8TA508	
60	380015	Taylor	US-221 (SR-55) / Econfina River	1939	CS: Girder	8TA272	IN-EL: 2010
61	380059	Taylor	US-19 NB (SR-55) / Fenholloway River	1934/ 1958	C: Tee-Beam	8TA509	
62	380910	Taylor	US-221 (SR-55) / Rocky Creek	1939	CS: Girder	8TA510	
63	390001	Union/ Bradford	SR-100 / New River	1930/ 1966	C: Tee-Beam	8UN177/ 8BF774	
64	710036	Clay	SR-21 / Clear Cut Creek	1934	C: Culvert	8CL1543	
65	710039	Clay	SR-21 / Clay Pit Creek	1934	C: Culvert	8CL1544	
66	720003	Duval	US-90 (SR-10) / Marietta Branch	1931/ 1984	S: Girder	8DU21357	
67	720006	Duval	SR-211 / Fishweir Creek	1924/ 1966	C: Tee-Beam	8DU21358	
68	720007	Duval	SR-211 / Azalea Creek	1922	C: Tee-Beam	8DU11895	
69	IN: 720013	Duval	Inconstantion Creek Bridge	1932	C: Girder	8DU11302	
70	720017	Duval	US-1 SB (SR-5) / Little Trout River	1939/ 1982	C: Tee-Beam	8DU21359	
71	720019	Duval	US-1 (SR-5) / Big Davis Creek	1934/ 1998	C: Culvert	8DU21360	
72	720021	Duval	US-1 (SR-5) / Julington Creek	1934/ 1998	C: Culvert	8DU21361	
73	720042	Duval	SR-10 (Atlantic) / Big Pottsburg Creek	1927/ 1969	PSC: Girder	8DU21362	
74	720046	Duval	SR-228 / Yellow Water Creek	1936	C: Culvert	8DU21363	
75	720047	Duval	SR-228 / Ortega River	1936/ 1972	C: Culvert	8DU21364	
76	720049	Duval	SR-228 / Cedar Creek	1936/ 1972	C: Culvert	8DU21365	
77	720061	Duval	SR-105 / Sisters Creek	1952	S: Movable - Bascule	8DU14138	
78	720137	Duval	US-90 (SR-10) / Cedar River	1935/ 1984	C: Culvert	8DU21376	
79	720142	Duval	SR-228 / Moore Branch	1938	C: Culvert	8DU21377	
80	720407	Duval	US-90 (SR-10) / McCoy Creek	1933	C: Culvert	8DU21386	
81	720910	Duval	US-17 (SR-5) / Long Branch Creek	1925/ 1940	C: Tee-Beam	8DU21394	
82	720920	Duval	US-1 (SR-5) / Sweetwater Creek	1934/ 2000	C: Culvert	8DU21395	
83	720940	Duval	SR-10 / Millers Creek	1924/ 1968	PSC: Slab	8DU21396	

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84	720941	Duval	SR-10 / Little Pottsburg Creek	1926/ 1969	PSC: Slab	8DU21397	
85	724074	Duval	King Street / McCoy Creek	1960	C: Slab	8DU21398	
86	724080	Duval	Edison Ave / McCoy Creek	1929	S: Girder	8DU11905	
87	724183	Duval	Old Kings Road / Little Trout River	1926	S: Girder	8DU11914	
88	IN: 740002	Nassau	Deep Creek Bridge	1934	C: Girder	none	
89	740011	Nassau	US-1 SB (SR-15) / Braddock Creek	1924/ 1987	C: Slab	8NA1267	
90	740014	Nassau	US-1 SB (SR-15) / Car Seat Creek	1924/ 1989	C: Slab	8NA1268	
91	740021	Nassau	US-301 (SR-200) / Branch of Thomas Creek	1939	CS: Girder	8NA1269	
92	740023	Nassau	US-301 (SR-200) / Branch of Funks Creek	1939	CS: Girder	8NA1271	
93	740024	Nassau	US-301 (SR-200) / Funks Creek	1939	CS: Girder	8NA1272	
94	740058	Nassau	SR-A1A & SR-200 / Nann Swamp	1936/ 2006	C: Culvert	8NA1273	
95	740059	Nassau	US-1 SB (SR-15) / Funks Creek	1924/ 1960	C: Culvert	8NA1274	
96	740069	Nassau	CR-200A / Lofton Creek	1958	C: Slab	8NA1275	
97	740073	Nassau	CR-115 / Little Mills Creek	1938	C: Culvert	8NA1276	
98	744007	Nassau	Mussel White Road / Mills Creek	1931/ 1962	C: Slab	8NA1277	
99	760021	Putnam	SR-100 / Canal	1933/ 2001	C: Culvert	8PU1696	
100	760034	Putnam	SR-21 / Lake Melrose	1932/ 1965	S: Culvert	8PU1697	
101	764037	Putnam	Memorial Causeway / St. Johns River Overflow	1940	C: Arch-Deck	8PU1699	
102	764038	Putnam	Memorial Causeway / St. Johns River Overflow	1940	C: Arch-Deck	8PU1700	
103	780056	St. Johns/ Clay	Shands Bridge / SR-16 / St. Johns River	1961	S: Girder	8CL1308/ 8SJ5416	IN-EL:2010
104	784002	St. Johns	CR-13 / Branch of Deep Creek	1938	S: Girder	8SJ5563	
105	784006	St. Johns	CR-13 / Little Fish Tail Creek	1937	C: Culvert	8SJ5564	
106	784012	St. Johns	CR-13 / Moccasin Branch	1928	S: Culvert	8SJ5565	
107	784020	St. Johns	CR-13A / Branch of Six Mile Creek	1926	C: Culvert	8SJ5566	
108	None	St. Johns	Durbin Creek Bridge (Old Dixie Highway)	1925	C: Slab	8SJ4868	
Insufficient Information for Evaluation							
109	720105	Duval	SR-228 WB / SR-115	1967	CS: Girder	8 DU21366	
110	720108	Duval	US-ALT-1(SR-228 WB) / SR-10	1967	CC: Slab	8DU21367	
111	720109	Duval	SR-228A WB / Little Pottsburg Creek	1967	PSC: Girder	8DU21368	

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112	720110	Duval	US-ALT-1(SR-228 WB) / Little Pottsburg Creek	1967/ 1975	PSC: Girder	8DU21369	
113	720111	Duval	US-ALT-1(SR-228 WB) / University Blvd.	1967	PSC: Girder	8DU21370	
114	720112	Duval	SR-228 WB / Ryar Rd.	1967	PSC: Girder	8DU21371	
115	720113	Duval	SR-228 / US-90 (SR-10)	1967	S: Girder	8DU21372	
116	720114	Duval	SR-228 / Washington St.	1967	CS: Girder	8DU21373	
117	720115	Duval	SR-228A WB / US-90(SR-10) Beach Blvd.	1967	PSC: Girder	8DU21374	
118	720116	Duval	SR-228A WB / Highland & Art Museum Dr.	1967	PSC: Girder	8DU21375	
119	720276	Duval	SR-228 EB / SR-115	1967	CS: Girder	8DU21378	
120	720279	Duval	US-ALT-1(SR-228 EB) / SR-10	1967	CC: Slab	8DU21379	
121	720280	Duval	SR-228A EB / L. Pottsburg Creek. & SR-228	1967	PSC: Girder	8DU21380	
122	720281	Duval	US-ALT-1(SR-228 EB) / Little Pottsburg Creek	1967	PSC: Girder	8DU21381	
123	720282	Duval	US-ALT 1(SR-228 EB) / University Blvd.	1967	PSC: Girder	8DU21382	
124	720283	Duval	SR-228 EB / Ryar Rd.	1967	PSC: Girder	8DU21383	
125	720284	Duval	SR-228A EB / US-90 (SR-10) Beach Blvd.	1967	PSC: Girder	8DU21384	
126	720285	Duval	SR-228A EB / Highland & Art Museum Dr	1967	PSC: Girder	8DU21385	
127	720488	Duval	SR-228 (LEG E) / Adams St. from Hart Ramp	1967	CS: Girder	8DU21387	
128	720489	Duval	SR-228 / Monroe St. to Hart Ramp	1967	PSC: Girder	8DU21388	
129	720490	Duval	SR-228 (LEG G) / Duval St. from Hart Ramp	1967	CS: Girder	8DU21389	
130	720493	Duval	SR-228 / Talleyrand Ave.	1967	PSC: Girder	8DU21390	
131	720494	Duval	SR-228 / Duval St.	1967	CS: Girder	8DU21391	
132	720495	Duval	SR-228 / Adams St	1967	S: Girder	8DU21392	
133	720496	Duval	SR-228 / Adams St.	1967	PSC: Slab	8DU21393	
134	724075	Duval	Hollybrook Ave. / McCoy Creek	1940	C: Tee-Beam	8DU21399	
135	724078	Duval	McCoy's Creek Blvd. / McCoy Creek	1940	C: Tee-Beam	8DU21400	
2010 – Demolished							
136	260005	Alachua	Santa Fe River	1934	S: Girder	8AL3276	IN-EL: 2003
137	373013	Suwannee	Hogan Road Bridge	1940	S: Culvert	none	
138	720004	Duval	Beaver Street Viaduct	1930	S: Girder	8DU9170	
139	720014	Duval	Nassau River Bridge	1932	S: Girder	8DU11303	IN-EL: 1997
140	720030	Duval	Acosta Bridge / SR-13 / St. Johns River	1919	S: Movable - Lift	8DU1556	

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141	720045	Duval	Maxville Overpass	1937	S: Girder	8DU11301	IN-EL: 1997
142	720056	Duval	SR-105 (Heckscher) / Broward River	1948	S: Movable - Bascule	8DU11899	IN-EL: 2006
143	720068	Duval	B.B. McCormick Bridge 1	1949	S: Movable - Bascule	8DU11900	IN-EL: 2005
144	720069	Duval	B.B. McCormick Bridge 2	1949	S: Movable - Bascule	8DU11900	IN-EL: 2005
145	720149	Duval	Ribault River Bridge	1955	C: Girder	none	
146	724072	Duval	Little Six Mile Creek Bridge	1926	C: Girder	8DU11902	P-EL: 2000
147	724180	Duval	Old King Road Bridge	1926	C: Girder	8DU8114	P-EL: 2000
148	724181	Duval	Old King Road Bridge	1926	C: Girder	8DU8115	P-EL: 2000
149	724182	Duval	Trout River Bridge	1926	C: Girder	8DU11913	P-EL: 2000
150	724249	Duval	East Duval Street Viaduct	1915	C: Girder	8DU11892	
151	724251	Duval	Greenwood Avenue Bridge	1950	C: Slab	8DU11277	
Off-System							
152	F: 350910	Madison	Ellaville / Hillman Bridge	1925	S: Truss - Through (Pratt)	8MD185	EL: 2000
153	F: 374014	Suwannee	Suwannee Springs	1931	S: Truss - Through (Parker)	8SU116	EL: 2000
154	F: 724149	Duval	Julia Street / West Second Street Bridge	1929	C: Slab	8DU7537	P-EL: 2004
155	F: 740055	Nassau	McArther Fishler Bridge	1948	S: Movable - Swing	none	

FDOT DISTRICT 3 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 30							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
NRHP Listed and Determined Eligible							
1	460053	Bay	Beach Drive / Massalina Bayou	1951	S: Movable - Bascule	none	EL: 2000
2	470029	Calhoun	Blountstown Truss/SR-20 / Apalachicola River	1938/1998	CS: Truss - Through (Warren)	8CA37	EL: 2000
3	580013	Santa Rosa	US-90 (SR-10) / Macavis Bayou	1937	C: Tee-Beam	8SR1930	P-EL: 2010
4	none	Jackson	Bellamy Bridge	1914	S: Truss - Through (Pratt)	8JA399	EL: 2000
5	none	Liberty	Torreya Stone Arch Bridge	1940	C: Arch-Deck	8LI338	EL: 2000
6	none	Okaloosa	Baggett Creek Arch Bridge	1924	C: Arch-Deck	none	EL: 2000
2010 Recommended NRHP Eligible							
7	530003	Jackson	US-90 (SR-10) / Bayline RR	1940	C: Frame	8JA1849	
2010 Ineligible for NRHP							
8	480003	Escambia	US-90 (SR-10A) / Eight Mile Creek	1939/1965	C: Slab	8ES3732	
9	480035	Escambia/ Santa Rosa	US-98 SR-30 / Pensacola Bay	1960	CS: Girder	8ES3733/ 8SR2172	
10	480110	Escambia	CR-184 / Perdido River	1960	PSC: Girder	8ES3734	
11	530022	Jackson	CR-162 / Chipola River	1963	C: Slab	8JA1865	
12	530026	Jackson	CR-278 / Chipola River	1966	PSC: Girder	8JA1866	
13	570028	Okaloosa	CR-393 / Pond Creek	1930/1960	C: Slab	8OK2911	
14	574009	Okaloosa	Bone Creek Road / Bone Creek #3	1930/1976	T: Girder	8OK2913	
15	574012	Okaloosa	West Dodson Road / Penny Creek	1930/1967	T: Girder	8OK2914	
16	574088	Okaloosa	Peacock Road / Bailey Branch	1935/1980	T: Girder	8OK2915	
17	580019	Santa Rosa	Broad St. / Collins Mill Creek	1969	S: Girder	8SR2168	
18	580910	Santa Rosa	SR-399 / Navarre Relief	1960	PSC: Girder	8SR2169	
19	^^ none	Santa Rosa	Coldwater Creek Truss	1910	S: Truss - Through (Pratt)	none	EL: 2000
20	^^ none	Okaloosa	Log Lake	1915	S: Truss - Pony (Warren)	8OK1662	EL: 2000
Insufficient Information for Evaluation							
21	460019	Bay	US-98 (SR-30) / ICWW	1965	CC: Girder	8BY1632	
22	494096	Franklin	River Road / Trout Creek	1959/2000	T: Girder	8FR1283	
23	570034	Okaloosa	US-98 (SR-30) / ICWW & Brooks St	1964	CS: Girder	8OK2912	
24	580951	Santa Rosa	SR-399 / ICWW at Navarre	1960	CS: Girder	8SR2171	

FDOT DISTRICT 3 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 30							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
2010 – Demolished							
25	480002	Escambia	Eleven Mile Creek Bridge	1940	C: Tee-Beam	none	
26	480006	Escambia	Cervantes Street Viaduct	1940	S: Girder	none	
27	480037	Escambia	Bayou Chico Draw Bridge	1949	S: Movable - Bascule	8ES2515	
28	564102	Liberty	FR-115 / River Styx Floodplain	1937	T: Girder	8LI515	II: 2004
29	564103	Liberty	FR-115 / River Styx Floodplain	1937	T: Girder	8LI516	II: 2004
30	580014	Santa Rosa	Milton Overpass	1937	C: Girder	none	

FDOT DISTRICT 4 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 48							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
NRHP Listed and Determined Eligible							
1	860003	Broward	US-1 (SR-5) / New River	1960	C: Tunnel	8BD4504	P-EL: 2009
2	865732	Broward	Coconut Isle / Grande Canal	1925	C: Arch-Deck	8BD3165	EL: 2000
3	865734	Broward	Isle of Venice / Las Olas Canal	1948	C: Slab	8BD3149	P-EL: 2008
4	865735	Broward	Fiesta Way / Las Olas Canal	1948	C: Slab	8BD3150	P-EL: 2008
5	865736	Broward	Nurmi Drive / Las Olas Canal	1947	C: Slab	8BD3168	P-EL: 2008
6	865737	Broward	Royal Palm Drive / Las Olas Canal	1946	C: Slab	8BD3169	P-EL: 2008
7	865748	Broward	Snow-Reed Swing Bridge/SW 11 Avenue / N Fork New River	1925	S: Movable - Swing	8BD3171	EL: 2000
8	930026	Palm Beach	George Bush Blvd (NE 8th Street) / ICWW	1949	S: Movable - Bascule	8PB13707	P-EL: 2008
9	930072	Palm Beach	CR-717 / Okeechobee Rim Canal	1916/1935/ 1998	S: Movable - Swing	8PB212	P-EL: 2002
10	930157	Palm Beach	SR-A1A / ICWW	1938	S: Movable - Bascule	8PB9533	P-EL: 2007
11	930940	Palm Beach	Twenty Mile Bend/ Loxahatchee Bridge/CR-880 / C-51 Canal	1937	CS: Swing, Warren Through Truss	8PB231	P-EL: 1990
12	934408	Palm Beach	E. Camino Real / ICWW	1939/2007	S: Movable - Bascule	8PB8111	EL: 2007
13	945000	St. Lucie	North 2nd Street / Moore's Creek	1925/1997	C: Arch-Deck	8SL1141	L: 2001
2010 Recommended NRHP Eligible							
14	860038	Broward	Davie Blvd. / South Fork of New River	1960	S: Movable - Bascule	8BR4772	
15	864071	Broward	SE 3rd Ave. / New River & S New River Dr	1960	S: Movable - Bascule	8BR4770	
16	864072	Broward	William H. Marshall Memorial Bridge/SW 7th Ave. / New River and 5th Place	1964	S: Movable - Bascule	8BR4771	
17	880001	Indian River	US-1 SB (SR-5) / Old Dixie Hwy & FEC Railroad	1928/1934	C: Tee-Beam	8IR1516	
18	880005	Indian River	SR-A1A / Sebastian Inlet	1964	PSC: Girder	8IR1493	
19	930005	Palm Beach	US-1 (SR-5) / ICWW	1958	S: Movable - Bascule	8PB14878	
20	930060	Palm Beach	Haven Ashe Bridge/ A1A / Boca Inlet	1963	S: Movable - Bascule	8PB14879	
2010 Ineligible for NRHP							
21	860008	Broward	SR-84 / S. Fork New River	1956	S: Movable - Bascule	8BD4866	

FDOT DISTRICT 4 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 48							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
22	860011	Broward	SR-A1A / Hillsboro Inlet	1966	S: Movable - Bascule	8BD4867	
23	860018	Broward	Las Olas Boulevard / ICWW	1958	S: Movable - Bascule	8BD4868	
24	860043	Broward	SR-822/ICWW	1962	S: Movable - Bascule	8BD4869	
25	860060	Broward	14 Street Causeway / ICWW	1967/2006	S: Movable - Bascule	8BD4870	
26	860144	Broward	Commercial Blvd. / ICWW	1964	S: Movable - Bascule	8BD4871	
27	860146	Broward	Hillsboro Blvd. / ICWW	1957	S: Movable - Bascule	8BD4872	
28	860157	Broward	Atlantic Blvd. / ICWW	1955	S: Movable - Bascule	8BD4873	
29	860920	Broward	Dania Beach Blvd. / ICWW	1956	S: Movable - Bascule	8BD4874	
30	860941	Broward	Oakland Park Blvd. / ICWW	1955	S: Movable - Bascule	8BD4875	
31	864028	Broward	Angler Ave (Ravenswood) / Dania Cut-off Canal	1928/1958	PSC: Girder	8BD4876	
32	865720	Broward	Old Dixie Hwy / S. Fork Middle River	1923/1959	C: Arch-Deck	8BD3164	
33	865729	Broward	East Las Olas Blvd / Himmarshee Canal	1930/1950	C: Arch-Deck	8BD4877	
34	865752	Broward	SW 7th Street / Tarpon River	1929	S: Girder	8BD3172	
35	890003	Martin	SR-707 (Dixie Hwy) / St. Lucie River	1964	S: Movable - Bascule	8MT1599	
36	930053	Palm Beach	US-98 (SR-80) / FEC RR & Georgia Ave.	1939/1979	S: Girder	8PB15966	
37	930056	Palm Beach	CR-707 (Beach Rd) / ICWW	1969	S: Movable - Bascule	8PB15967	
38	930064	Palm Beach	Atlantic Avenue / ICWW	1952/2002	S: Movable - Bascule	8PB15968	
39	930094	Palm Beach	Ocean Ave. (CR-812) / ICWW	1950	S: Movable - Bascule	8PB15969	
40	930097	Palm Beach	Southern Boulevard / ICWW	1950	S: Movable - Bascule	8PB8008	IN-EL: 2008
41	930106	Palm Beach	EB PGA Blvd. / ICWW	1966/2007	S: Movable - Bascule	8PB15970	
42	930214	Palm Beach	Woolbright Road / ICWW	1967	S: Movable - Bascule	8PB15971	
43	940045	St. Lucie	SR-A1A / ICWW	1963	S: Movable - Bascule	8SL3159	
2010 – Demolished							
44	860319	Broward	Andrews Avenue Bridge	1915/1981	Stone Arch-Deck	8BD4372	II: 2007
45	860470	Broward	Northeast 4th Avenue Bridge	1942	C: Arch-Deck	none	
46	894026	Martin	Gaines Avenue Bridge	1928	C: Arch-Deck	8MT928	
47	930004	Palm Beach	US-1 (SR-5) / ICWW	1956	S: Movable - Bascule	none	
48	930022	Palm Beach	Royal Palm Bridge	1928	S: Movable - Bascule	8PB6678	

FDOT DISTRICT 5 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 59							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
NRHP Listed and Determined Eligible							
1	364060	Marion	NE 105 Street / Daisy Creek	1940	S: Culvert	8MR3601	EL: 2000
2	364110	Marion	Sharpe's Ferry Swing Bridge/CR-314 / Oklawaha River	1928/1971	S: Movable - Swing	8MR2539	P-EL: 2007
3	364120	Marion	SE 137th Ave Road / Creek	1940	S: Culvert	8MR3602	EL: 2000
4	364150	Marion	NE 145th Ave Road / Canal	1940	S: Culvert	8MR3603	EL: 2000
5	704063	Brevard	Mathers Bridge/Banana River Drive / Banana River	1927/2005	S: Movable - Swing	8BR1700	EL: 2000
6	755806	Orange	Washington Street / Fern Creek	1926	C: Arch-Deck	8OR3190	EL: 2000
7	755807	Orange	Poinsettia Ave. / Lake Ivanhoe	1942	C: Tee-Beam	8OR6033	P-EL: 2007
8	794081	Volusia	Deep Creek Arch Deck Bridge/CR-3 / Deep Creek	1920	C: Arch-Deck	8VO7105	P-EL: 2006
2010 Recommended NRHP Eligible							
9	114089	Lake	Highland St. / SCL Railroad	1934	C: Tee-Beam	8LA2043	
10	184000	Sumter	CR-558 / Big Prairie Canal	1926	C: Tee-Beam	8SM171	
11	364040	Marion	CR-316 / Prop Cross Fla Barge Canal	1969	CS: Girder	8MR3585	
12	755100	Orange	Nela Avenue / Lake Conway Connector	1926/1982	CC: Tee-Beam	8OR8339	
2010 Ineligible for NRHP							
13	110004	Lake	US-27 / Helena Run	1927/1950	C: Tee-Beam	8LA4371	
14	110026	Lake	SR-19 / Little Lake Harris	1950	S: Girder	8LA2044	
15	110063	Lake/ Volusia	SR-44 / St. Johns River	1955	S: Movable - Bascule	8LA4372/ 8VO9394	
16	114052	Lake	Lois Drive / Unnamed Canal	1952	PSC: Tee-Beam	8LA4373	
17	180021	Sumter	SR-50 / Abandon RR	1951	S: Girder	8SM580	IN-EL: 2010
18	184002	Sumter	CR-728 (Tuscannooga) / Big Prairie Canal	1963	PSC: Channel Beam	8SM648	
19	184005	Sumter	CR-48 / Big Prairie Canal	1937	C: Culvert	8SM649	
20	184006	Sumter/ Citrus	CR-48 / Withlacoochee River	1929/1952	S: Girder	8SM650/ 8CI1380	
21	184008	Sumter	CR-48 / Jumper Creek Canal	1955	C: Slab	8SM651	
22	184059	Sumter	CR-311 / Jumper Creek	1965	T: Girder	8SM566	IN-EL: 2009
23	364002	Marion	CR-25A / SCL Railroad	1925/1962	C: Tee-Beam	8MR3721	
24	700030	Brevard	SR-401 SB Bridge I/ Barge Canal	1965	S: Movable - Bascule	8BR3009	

FDOT DISTRICT 4 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 48							
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#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
25	700031	Brevard	SR-401 SB Bridge II / Barge Canal	1965	S: Movable - Bascule	8BR3010	
26	700061	Brevard	SR-520 WB / Indian River	1966	CS: Girder	8BR3011	
27	700072	Brevard	SR-3 / Barge Canal	1961/1998	S: Movable - Bascule	8BR3012	
28	700110	Brevard	SR-528 / Indian River	1970	CS: Girder	8BR3013	
29	700137	Brevard	SR-520 EB / Indian River	1969	CS: Girder	8BR3014	
30	704016	Brevard	Girard Blvd / Navigable Sykes Creek	1962/1980	PSC: Channel Beam	8BR3015	
31	705911	Brevard	Port Malabar WB / Turkey Creek	1965	PSC: Tee-Beam	8BR3016	
32	730004	Flagler	US-1 SB / Black Branch	1948	C: Slab	8FL909	
33	730011	Flagler	SR-100 / Water Oak Canal	1936/1996	C: Culvert	8FL910	
34	730053	Flagler	SR-100 / Black Swamp Canal	1936/2002	C: Culvert	8FL911	
35	734003	Flagler	CR-305 / Canal	1949	S: Girder	8FL912	
36	734004	Flagler	CR-305 / Canal	1949	CS: Girder	8FL913	
37	734005	Flagler	CR-305 / Canal	1949	S: Girder	8FL914	
38	734008	Flagler	CR-305 / Middle Haw Creek	1949	CS: Girder	8FL915	
39	734024	Flagler	CR-13 / Canal	1952/2006	C: Culvert	8FL916	
40	750058	Orange	SR-528 / Dallas Blvd	1967	PSC-C: Girder	8OR10053	
41	750059	Orange	SR-528 / Farm Access Road	1967	PSC-C: Girder	8OR10054	
42	750213	Orange	SR-528 / Dallas Blvd	1967	PSC-C: Girder	8OR10055	
43	750214	Orange	SR-528 / Farm Access Road	1967	PSC-C: Girder	8OR10056	
44	754003	Orange	Bates Road / Crane Strand Canal	1962	PSC: Channel Beam	8OR10057	
45	754005	Orange	Buck Road / Little Econ River	1932/1956	C: Slab	8OR10058	
46	754057	Orange	Taylor Creek Road / Tosohatchee Creek	1965/1986	T: Girder	8OR10059	
47	770002	Seminole	US-17-92 / Mills Creek	1935	C: Tee-Beam	8SE1949	
48	794004	Volusia	Main Street / Halifax River	1959	S: Movable - Bascule	8VO9391	
49	794022	Volusia	Turnbull Bay Road / Turnbull Creek	1967	PSC: Channel Beam	8VO9393	
50	794065	Volusia	Old Daytona Rd / Little Haw Creek	1937	S: Girder	8VO7104	
Insufficient Information							
51	794016	Volusia	Old Dixie Hwy. / Tomoka River	1964	S: Girder	8VO9392	
2010 – Demolished							
52	360003	Marion	Dunnellon Overpass	1936	C: Girder	8MR2537	
53	364017	Marion	Moss Bluff Bridge (CR-464A) / Oklawaha River	1926	S: Movable - Swing	8MR2538	
54	704049	Brevard	CR-402 / Indian River	1949	S: Movable - Swing	8BR1699	P-EL: 2002

FDOT DISTRICT 4 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 48							
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55	730000	Flagler	Shell Bluff Bridge	1933	C: Tee-Beam	8FL214	IN-EL: 2000
56	790014	Volusia	Tomoka River Bridge	1932	C: Girder	8VO7101	IN-EL: 1998
57	790098	Volusia	Carleton-Blank Bridge	1948	S: Movable - Bascule	8VO7102	
58	794003	Volusia	Orange Avenue Bridge /Halifax River	1954	S: Movable - Bascule	8VO9193	IN-EL: 2009
2010 – Off-System							
59	F: 770009	Seminole/ Volusia	Lake Monroe	1934	S: Swing, Warren Through Truss	8SE77 / 8VO7174	P-EL: 1985

FDOT DISTRICT 6 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 84							
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NRHP Listed and Determined Eligible							
1	870660	Miami-Dade	SW 1 St / Miami River	1929	S: Movable - Bascule	8DA6222	P-EL: 2007
2	874129	Miami-Dade	Curtiss Pkwy SB/ Miami Canal	1927/ 1954	S: Movable - Lift	8DA99	P-EL: 1995
3	874130	Miami-Dade	Curtis Parkway NB / Miami Canal	1924/ 1941	S: Movable - Swing	8DA100	P-EL: 1995
4	874135	Miami-Dade	NW South River Dr. / Tamiami Canal	1921/1940	S: Movable - Swing	8DA6431	EL: 2000
5	874161	Miami-Dade	NW 17th Avenue / Miami River	1928	S: Movable - Bascule	8DA5886	EL: 2000
6	874218	Miami-Dade	Atlantic Isle / Ocean Canal	1925	C: Arch-Deck	8DA6433	EL: 2000
7	874425	Miami-Dade	SW 72nd Avenue / Gully	1920	C: Tee-Beam	8DA2815C	L: 1986
8	874459	Miami-Dade	Venetian Causeway / ICWW (Fracture Critical)	1927	S: Movable - Bascule	8DA4736	L: 1989
9	874460	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
10	874461	Miami-Dade	Venetian Way / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
11	874463	Miami-Dade	Venetian Way / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
12	874465	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
13	874466	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
14	874471	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
15	874472	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
16	874473	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
17	874474	Miami-Dade	Venetian Causeway / Biscayne Bay (Frac. Crit)	1927	S: Movable - Bascule	8DA4736	L: 1989
18	874477	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
19	874481	Miami-Dade	Venetian Causeway / Biscayne Bay	1927	CC: Tee-Beam	8DA4736	L: 1989
20	875305	Miami-Dade	Hardee Rd (64th St) / Coral Gables Canal	1930	C: Arch-Deck	8DA6437	EL: 2000
21	876100	Miami-Dade	Surfside Blvd / Indian Creek	1930	CC: Tee-Beam	8DA6439	EL: 2000
22	876400	Miami-Dade	NW 7th Street / Wagner Creek Canal	1919	C: Arch-Deck	8DA2384	P-EL: 1987
23	876707	Miami-Dade	Sunset Drive / Sunset Lake Canal	1926	CC: Tee-Beam	8DA6441	P-EL: 2010
24	876708	Miami-Dade	Sunset Drive / Sunset Lake Canal	1926	CC: Tee-Beam	8DA5828	P-EL: 2010
25	876710	Miami-Dade	West 29th Street / Sunset Lake Canal	1926	CC: Tee-Beam	8DA5829	EL: 2000

FDOT DISTRICT 6 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 84							
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#	Structure Number	County	Feature Carried / Intersected	Year Built/ Recon.	Bridge Type	FMSF No.	SHPO Eval
26	904602	Monroe	Duck Key Drive / Un-Named Channel	1955/1982	C: Arch-Deck	8MO2137	EL: 2000
27	904603	Monroe	Bimini Drive / Sams Canal	1955/1982	PSC: Channel Beam	8MO2136	EL: 2000
28	904604	Monroe	Harbour Drive / Joes Canal	1955/1982	PSC: Channel Beam	8MO2135	EL: 2000
29	904606	Monroe	Seaview Drive / Un-Named Canal	1955/1982	PSC: Channel Beam	8MO2138	EL: 2000
30	900016	Monroe	Bahia Honda*	1909/ 1972	S: Truss - Through (Pratt, Camelback)	8MO1231	L: 1979
31	900080	Monroe	Rockland Channel	1911/1979	C: Arch-Deck	8MO1490	L: 2004
32	900081	Monroe	Shark Channel Bridge	1911/1979	C: Arch-Deck	8MO1489	L: 2004
33	900090	Monroe	Saddlebunch #5 Bridge	1943/1980	C: Arch-Deck	8MO3953	L: 2004
34	900091	Monroe	Saddlebunch #4 Bridge	1943/1980	C: Arch-Deck	8MO3954	L: 2004
35	900092	Monroe	Saddlebunch #3 Bridge	1943/1981	C: Arch-Deck	8MO3955	L: 2004
36	900093	Monroe	Saddlebunch #2 Bridge	1943/1981	C: Arch-Deck	8MO3956	L: 2004
37	900094	Monroe	Long Key Viaduct	1906/1981	C: Arch-Deck	8MO1229	L: 1979
38	900097	Monroe	Channel Two Viaduct	1909/1981	C: Arch-Deck	8MO3476	L: 2004
39	900098	Monroe	Channel #5 Bridge	1909/1982	C: Arch-Deck	8MO3968	L: 2004
40	900099	Monroe	Toms Harbor Cut Bridge	1909/1980	C: Arch-Deck	8MO3967	L: 2004
41	900100	Monroe	Toms Harbor Channel / Bridge	1909/1980	C: Arch-Deck	8MO3966	L: 2004
42	900101	Monroe	Knight Key Bridge / Seven Mile Bridge	1909/1982	C: Arch-Deck	8MO1230	L: 1979
43	900102	Monroe	Lower Sugarloaf Channel Bridge	1943/1981	C: Arch-Deck	8MO3957	L: 2004
44	900103	Monroe	Little Duck-Missouri Channel Bridge	1943/1981	C: Arch-Deck	8MO3965	L: 2004
45	900104	Monroe	Ohio-Missouri Channel Bridge	1943/1981	C: Arch-Deck	8MO3964	L: 2004
46	900105	Monroe	Ohio-Bahia Honda Bridge	1943/1981	C: Arch-Deck	8MO3963	L: 2004
47	900106	Monroe	Spanish Harbor Channel Bridge	1912/1982	C: Arch-Deck	8MO1484	L: 2004
48	900111	Monroe	South Pine Channel Bridge	1943/1982	C: Arch-Deck	8MO3962	L: 2004
49	900112	Monroe	Park Channel Bridge	1943/1982	C: Arch-Deck	8MO3958	L: 2004
50	900115	Monroe	Bow Channel Bridge	1943/1982	C: Arch-Deck	8MO3959	L: 2004
51	900116	Monroe	Kemp Channel Bridge	1943/1982	C: Arch-Deck	8MO3960	L: 2004
52	900117	Monroe	Niles Channel Bridge	1943/1983	C: Arch-Deck	8MO3961	L: 2004
53	none	Miami-Dade	Aerojet Truss	1910	S: Truss-Pony	none	EL: 2000
2010 Recommended NRHP Eligible							
54	874307	Miami-Dade	SW 117th Avenue / North Canal	1937	S: Through Girder	8DA11918	
2010 Ineligible for NRHP							
55	870002	Miami-Dade	Biscayne Blvd SR-5 / Little River Canal C-7	1928/1996	C: Slab	8DA5096	
56	870013	Miami-Dade	SB SR-5 (US-1) / Black Creek Canal C-1-W	1962/2005	PSC: Slab	8DA12606	
57	870057	Miami-Dade	Comp SR-9336 / Aerojet Canal C-111	1967	C: Slab	8DA12607	

FDOT DISTRICT 6 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 84							
LEGEND: ^^ - no longer eligible SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
58	870058	Miami-Dade	Comp SR-9336 / Canal C-111-E	1967	C: Slab	8DA12608	
59	870613	Miami-Dade	63 St. / Indian Creek Canal	1953	S: Movable - Bascule	8DA9896, 8DA9897	
60	870625	Miami-Dade	NW 36 St. / Miami River	1950	S: Movable - Bascule	8DA11508	IN-EL: 2009
61	870628	Miami-Dade	Comp SR-994 / Canal C-102	1966	PSC: Slab	DA12609	
62	870661	Miami-Dade	W Flagler St. / Miami River	1967	S: Movable - Bascule	8DA12610	
63	870665	Miami-Dade	COMP SR-907 / Collins Canal	1956/1962	C: Arch-Deck	8DA12365	
64	874308	Miami-Dade	SW 147th Avenue / Canal C-103	1966	PSC: Slab	8DA12611	
65	874310	Miami-Dade	SW 312th Street / Canal C-103	1966/1976	PSC: Slab	8DA12612	
66	874383	Miami-Dade	NW 22nd Avenue / Miami River	1964	S: Movable - Bascule	8DA12613	
67	874443	Miami-Dade	SW 147th Avenue / Canal C-102	1966	PSC: Slab	8DA12614	
68	874444	Miami-Dade	SW 216th Street / Canal C-102	1966	PSC: Slab	8DA12615	
69	874445	Miami-Dade	SW 232nd Street / Canal C-102	1966	PSC: Slab	8DA12616	
70	874448	Miami-Dade	SW 107th Avenue / Canal C-102	1965	PSC: Slab	8DA12617	
71	874456	Miami-Dade	SW 117th Avenue / Canal C-103	1966	PSC: Slab	8DA12618	
72	874476	Miami-Dade	SW 328th Street / Levee L-31-E (C-107)	1967	PSC: Slab	8DA12619	
73	874706	Miami-Dade	West 23 Street / Collins Canal	1926	C: Arch-Deck	8DA6436	
74	874998	Miami-Dade	Seaport Causeway / Biscayne Bay (Frac. Crit)	1964	S: Movable - Bascule	8DA12620	
75	^^ 875306	Miami-Dade	Granada Blvd / Coral Gables Canal	1930	C: Arch-Deck	8DA6438 - update	EL: 2000
76	876415	Miami-Dade	NW 17th Street / Wagner Creek Canal	1967	C: Slab	8DA12622	
77	876705	Miami-Dade	Washington Ave. / Collins Canal	1937	C: Frame	8DA12623	
Insufficient Information for Evaluation							
78	874351	Miami-Dade	N River Dr Flyover / NW 17th Avenue	1969	CC: Box Beam	8DA11919	
79	875101	Miami-Dade	NE123rd St. / ICWW (Fracture Critical)	1951	S: Movable - Bascule	8DA12621	
2010 – Demolished							
80	870001/ 870759	Miami-Dade	Brickell Avenue Bridge/US-1/ Miami River	1929/ 1995	S: Moveable-Bascule	8DA5098	
81	870097	Miami-Dade	NW 27th Avenue Bridge / Miami River	1938	S: Movable - Bascule	8DA6426	
82	870659	Miami-Dade	NW 5th Avenue	1924	S: Movable - Bascule	8DA6218	IN-EL: 2002
83	870662	Miami-Dade	NW 12th Avenue	1928	S: Movable - Bascule	8DA6341	EL: 2000

FDOT DISTRICT 6 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 84							
LEGEND: ^^ - no longer eligible SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	Structure Number	County	Feature Carried / Intersected	Year Built/ Recon.	Bridge Type	FMSF No.	SHPO Eval
84	874312	Miami-Dade	Southwest 147th Avenue Bridge	1937	S: Through Girder	none	

FDOT DISTRICT 7 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 70							
LEGEND: ^^ - no longer eligible SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
NRHP Listed and Determined Eligible							
1	100069	Hillsborough	James N. Holmes Bridge/US-41 Bus / Hillsborough River	1926	C: Tee-Beam	8HI6668	EL: 2000
2	100100	Hillsborough	SR-60 Kennedy Blvd. / Hillsborough River	1913/1995	S: Movable - Bascule	8HI640	P-EL: 1987
3	100647 (previously 100037)	Hillsborough	SR-39 / Blackwater Creek Relief	1936/2002	S: Culvert	8HI5042	P-EL: 1993
4	100920	Hillsborough	US-92 (SR-600 EB) / Hillsborough River	1939/1999	S: Movable - Lift	8HI6669	EL: 2000
5	105500	Hillsborough	Platt Street / Hillsborough River	1926	S: Movable - Bascule	8HI862	P-EL: 2005
6	105501	Hillsborough	Brorein Street / Hillsborough River	1959	S: Movable - Bascule	8HI11540	P-EL: 2009
7	105502	Hillsborough	Cass Street / Hillsborough River	1927/1949	S: Movable - Bascule	8HI6670	P-EL: 2002
8	105503	Hillsborough	Laurel Street / Hillsborough River	1927/1969	S: Movable - Bascule	8HI6671	EL: 2000
9	105504	Hillsborough	Columbus Drive / Hillsborough River	1926/2012	S: Movable - Swing	8HI6672	EL: 2000
10	150022	Pinellas	4th St. South / Salt Creek	1935	C: Arch-Deck	8PI8726	EL: 2000
11	150113	Pinellas	SR-590 (Coachman Rd.) / Alligator Creek	1926	C: Arch - Through	8PI8730	EL: 2000
12	150189	Pinellas/ Manatee	Bob Graham Sunshine Skyway/I-275 (SR-93) / Tampa Bay	1986	Cable-Stayed	8PI11962/ 8MA1798	EL: 2007
13	157127	Pinellas	Burlington Ave. / Booker Creek	1942	CC: Tee-Beam	8PI8747	EL: 2000
14	159901	Pinellas	Luten "Half-Arch"	1915	C: Arch-Deck	8PI8749	EL: 2000
2010 Recommended NRHP Eligible							
15	080001	Hernando	US-41 (SR-45) / CSX	1936	S: Girder	8HE389	
16	144002	Pasco	N. Crystal Springs / Hillsborough River	1923	C: Arch-Deck	8PA637	
17	150009	Pinellas	Philippe Pkwy / Mullet Creek Bridge 2	1926	C: Arch-Deck	8PI8742	
2010 Ineligible for NRHP							
18	020002	Citrus	US-41 (SR-45) / FL Nature Trail	1925/1950	C: Tee-Beam	8CI853	
19	020008	Citrus	SR-200 /Withlacoochee River	1935	C: Tee-Beam	8CI824	
20	100001	Hillsborough	US-41 (SR-45) / Hillsborough River	1923/1965	C: Tee-Beam	8HI11791	
21	100033	Hillsborough	SR-574 / Lake Weeks Creek	1915	C: Tee-Beam	8HI5704	EL: 2000
22	100045	Hillsborough	US-41 SB (SR-45) / Alafia River	1959	PSC: Girder	8HI11793	
23	100098	Hillsborough	US-92 (SR-600) / Pemberton Creek Slough	1930/1943	C: Slab	8HI11794	
24	104333	Hillsborough	CR-41A (Old Bayshore) / Raceway Canal	1925	C: Culvert	8HI11795	

FDOT DISTRICT 7 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 70							
LEGEND: ^^ - no longer eligible SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
25	104426	Hillsborough	Old Mulberry Road / English Creek	1940/1965	C: Arch-Deck	8HI11796	
26	105608	Hillsborough	West Davis Blvd / Canal	1927	S: Girder	8HI6673	
27	105616	Hillsborough	Sylvan Ramble Bridge	1931	C: Arch-Deck	8HI6677	
28	105617	Hillsborough	Swann Circle Bridge	1930	C: Arch-Deck	8HI6678	
29	105909	Hillsborough	CR-587 (Westshore Blvd.) / Drainage Canal	1935/2005	C: Culvert	8HI11797	
30	140004	Pasco	US-41 (SR-45) / Scotts Canal	1939	C: Tee-Beam	8PA2807	
31	144022	Pasco	Old Cypress Cr. Rd / Cypress Creek	1925	C: Arch-Deck	8PA635	
32	150007	Pinellas	SR-590 / Stevensons Creek	1927/1970	C: Arch-Deck	8PI8740	
33	150023	Pinellas	4th Street South / Booker Creek	1926	C: Tee-Beam	8PI8727	
34	150028	Pinellas	SR-666 / ICWW	1962	S: Movable - Bascule	8PI12056	
35	150030	Pinellas	SR-693 (Corey Ave) / ICWW	1966	S: Movable - Bascule	8PI12057	
36	150046	Pinellas	Alt US-19 (SR-595) / Curlew Creek	1923/1958	C: Arch-Deck	8PI12058	
37	150049	Pinellas	Bayway Structure E / SR-679 / Boca Ciega Bay	1961/1996	S: Movable - Bascule	8PI11994	
38	150050	Pinellas	SR-682 / ICWW	1962	S: Movable - Bascule	8PI12059	
39	150062	Pinellas	Indian Rocks Road / Ikes Creek	1927	C: Arch-Deck	8PI8729	
40	150068	Pinellas	Causeway Blvd. / St.. Joseph Sound (ICWW)	1963	S: Movable - Bascule	8PI12060	
41	150112	Pinellas	SR-688 (Walsingham) / ICWW	1958/1999	S: Movable - Bascule	8PI12061	
42	150910	Pinellas	SR-590 / Bishop Creek	1926	C: Arch-Deck	8PI8731	
43	154000	Pinellas	Beckett Bridge/N Spring Blvd. / Minetta Branch	1924/1996	S: Movable - Bascule	none	
44	^^ 154100	Pinellas	Shore Drive / Shore Drive Canal	1923	C: Arch-Deck	8PI8732	EL: 2000
45	154101	Pinellas	Orange Street / Minnow Creek	1923	C: Arch-Deck	8PI8733	
46	154252	Pinellas	Old Coachman Rd / Alligator Creek	1925	C: Arch-Deck	8PI8736	
47	^^ 154700	Pinellas	Madonna Blvd. / Pine Key Cutoff	1957/2005	PSC: Girder	8PI8737	EL: 2000
48	^^ 154701	Pinellas	13th / Sands Pt Dr / Pine Key Cutoff	1957/1993	PSC: Girder	8PI8738	EL: 2000
49	157001	Pinellas	North Bayshore Dr. / Mullet Creek Bridge 1	1927	C: Arch-Deck	8PI8742	
50	157101	Pinellas	3rd Street South / Salt Creek	1926	C: Arch-Deck	8PI8743	
51	157117	Pinellas	9th St. South / Booker Creek	1920	C: Tee-Beam	8PI8746	
52	157123	Pinellas	Central Ave / Booker Creek	1921/2002	C: Tee-Beam	8PI12063	
53	157124	Pinellas	1st Ave N / Booker Creek	1926	C: Tee-Beam	8PI12064	

FDOT DISTRICT 7 - ALL SURVEYED BRIDGES – 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 70							
LEGEND: ^^ - no longer eligible SHPO Evaluation - L: Listed; EL: Determined eligible; P-EL: Determined potentially eligible; IN-EL: Determined ineligible for listing; II – Insufficient information for determination							
#	**Structure Number**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
54	157125	Pinellas	16th Street N / Booker Creek	1925	C: Tee-Beam	8PI12065	
55	157189	Pinellas	Overlook Dr NE / Smacks Bayou	1965	CC: Slab	8PI12066	
56	157197	Pinellas	45th Ave South / Little Bayou	1961/1999	CC: Slab	8PI12067	
57	none	Hillsborough	Beach Park Bridge	1930	C: Arch-Deck	none	
Insufficient Information							
58	157191	Pinellas	Snell Isle Blvd / Coffee Pot Bayou	1928/1996	C: Slab	8PI8748	EL: 2000
2010 – Demolished							
59	020001	Citrus	US-19 (SR-55) / Cross FL Barge Canal	1966	CS: Girder	none	
60	100005	Hillsborough	US-301 / Little Bullfrog Creek	1922/1971	C: Tee-Beam	8HI11792	
61	100006	Hillsborough	US-301 / Tadpole Creek	1924/1953	C: Slab	8HI1566	IN-EL: 2009
62	100028	Hillsborough	Lafayette Street Viaduct	1926	C: Girder	8HI6663	
63	100065	Hillsborough	SR-676 / Delaney Creek	1928	C: Tee-Beam	8HI4543	IN-EL: 1992
64	100066	Hillsborough	SR-676 / Delaney Creek Tributary	1928	C: Tee-Beam	8HI4541	IN-EL: 1992
65	154208	Pinellas	Belleair Causeway / CR-416 / ICWW	1950	C: Girder	8PI2728	IN-EL: 2004
66	154209	Pinellas	Belleair Causeway / CR-416 / ICWW	1950	S: Movable - Bascule	8PI2729	IN-EL: 2004
67	157800	Pinellas	Treasure Island Causeway / ICWW	1939	S: Movable - Bascule	8PI10574	EL: 2000
68	157820	Pinellas	Treasure Island Causeway / Boca Ciega Way W	1939	C: Girder	8PI10574	EL: 2000
69	157840	Pinellas	Treasure Island Causeway / Boca Ciega Way E	1939	C: Girder	8PI10574	EL: 2000
70	none	Hillsborough	Beachway Drive Bridge	1930	C: Arch-Deck	none	

APPENDIX C:
Demolished Bridges

DEMOLISHED BRIDGES - 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 59								
Legend: IN-EL: Determined ineligible for listing; II – Insufficient information for determination; P-EL: Determined potentially eligible * Replacement bridge selected by features carried/intersected due to insufficient original bridge location information. - Insufficient information on original bridge location to select replacement bridge.								
#	**Structure Number**	**Replacement Structure No. (Year)**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
FDOT DISTRICT 1								
1	060005	060052/53 ('01)	Hardee	Doyle Carleton Bridge	1933	C: Girder	8HR371	
2	060013	060054 ('99)	Hardee	Peace River Bridge	1934	C: Girder	8HR168	
3	060014	060055 ('99)	Hardee	Peace River Overflow Bridge	1934	C: Girder	8HR169	
	074001		Hendry	Tanya's Crossing	1920	C: Arch Deck	8HN630	
4	090030	090050/1 ('98)	Highlands	Lake Jackson Bridge	1927	C: Arch-Deck	8HG893	
5	170031	170171 ('08)	Sarasota	US-41 NB (SR-45) / Dona Bay	1928/ 1950	C: Slab	none	
6	170033	170172 ('08)	Sarasota	US-41 NB (SR-45) / Shakett Creek	1928/ 1950	C: Slab	none	
7	164336	164350 ('98)	Polk	Old Lake Wales Road Bridge	1928/ 1998	S: Girder	8PO4047	
FDOT DISTRICT 2								
1	260005	260112 ('02)	Alachua	Santa Fe River	1934	S: Girder	8AL3276	IN-EL: 2003
2	373013	374018 ('00)*	Suwannee	Hogan Road Bridge / Rocky Creek	1940	S: Culvert	none	
3	720004	-	Duval	Beaver Street Viaduct	1930	S: Girder	8DU9170	
4	720014	720688 ('01)	Duval	Nassau River Bridge	1932	S: Girder	8DU11303	IN-EL: 1997
5	720030	720570/71 ('91)	Duval	Acosta Bridge (SR-13) / St. Johns River	1919	S: Movable - Lift	8DU1556	
6	720045	720674 ('01)*	Duval	Maxville Overpass	1937	S: Girder	8DU11301	IN-EL: 1997
7	720056	in process	Duval	SR-105 (Heckscher) / Broward River	1948	S: Movable - Bascule	8DU11899	IN-EL: 2006
8	720068	720729 ('08)	Duval	B.B. McCormick Bridge 1	1949	S: Movable - Bascule	8DU11900	IN-EL: 2005
9	720069	720729 ('08)	Duval	B.B. McCormick Bridge 2	1949	S: Movable - Bascule	8DU11900	IN-EL: 2005
10	720149	720660 ('97)*	Duval	Ribault River Bridge	1955	C: Girder	none	
11	724072	724394 ('05)	Duval	Old King Road / Little Six Mile Creek Bridge	1926	C: Girder	8DU11902	P-EL: 2000
12	724180	724392 ('01)*	Duval	Old King Road Bridge / Nine Mile Creek	1926	C: Girder	8DU8114	P-EL: 2000
13	724181	724392 ('01)*	Duval	Old King Road Bridge / Nine Mile Creek	1926	C: Girder	8DU8115	P-EL: 2000
14	724182	724395 ('05)	Duval	Trout River Bridge	1926	C: Girder	8DU11913	P-EL: 2000
15	724249	-	Duval	East Duval Street Viaduct	1915	C: Girder	8DU11892	
16	724251	724365 ('04)	Duval	Greenwood Avenue Bridge	1950	C: Slab	8DU11277	
FDOT DISTRICT 3								
1	480002	Insuff. Info.	Escambia	Eleven Mile Creek Bridge	1940	C: Tee-Beam	none	
2	480006	480198 ('05)	Escambia	Cervantes Street Viaduct	1940	S: Girder	none	
3	480037	480191 ('98)	Escambia	Bayou Chico Draw Bridge	1949	S: Movable - Bascule	8ES2515	

DEMOLISHED BRIDGES - 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 59								
Legend: IN-EL: Determined ineligible for listing; II – Insufficient information for determination; P-EL: Determined potentially eligible * Replacement bridge selected by features carried/intersected due to insufficient original bridge location information. - Insufficient information on original bridge location to select replacement bridge.								
#	**Structure Number**	**Replacement Structure No. (Year)**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
4	564102	-	Liberty	FR-115 / River Styx Floodplain	1937	T: Girder	8LI515	II: 2004
5	564103	-	Liberty	FR-115 / River Styx Floodplain	1937	T: Girder	8LI516	II: 2004
6	580014	580175 ('03)*	Santa Rosa	Milton Overpass	1937	C: Girder	none	
FDOT DISTRICT 4								
1	860319	-	Broward	Andrews Avenue Bridge	1915/1981	Stone Arch Deck	8BD4372	II: 2007
2	860470	860567 ('00)*	Broward	Northeast 4th Avenue Bridge	1942	C: Arch-Deck	none	
3	894026	-	Martin	Gaines Avenue Bridge	1928	C: Arch Deck	8MT928	
4	930004	major rehab/repl in process	Palm Beach	US-1 (SR-5) / ICWW	1956	S: Movable - Bascule	none	
5	930022	950506/07 ('04)	Palm Beach	Royal Palm Bridge	1928	S: Movable - Bascule	8PB6678	
FDOT DISTRICT 5								
1	360003	Insuff. Info.	Marion	Dunnellon Overpass	1936	C: Girder	8MR2537	
2	364017	364130 ('90)	Marion	Moss Bluff Bridge (CR-464A) / Oklawaha River	1926	S: Movable - Swing	8MR2538	
3	704049	in process	Brevard	CR-402 / Indian River	1949	S: Movable - Swing	8BR1699	P-EL: 2002
4	730000	730066 ('02)	Flagler	Shell Bluff Bridge	1933	C: Tee-Beam	8FL214	IN-EL: 2000
5	790014	790185/86 ('00/'01)	Volusia	Tomoka River Bridge	1932	C: Girder	8VO7101	IN-EL: 1998
6	790098	790187/88 ('01)	Volusia	Carleton-Blank Bridge	1948	S: Movable - Bascule	8VO7102	
7	794003	-	Volusia	Orange Avenue Bridge/Halifax River	1954	S: Movable Bascule	8VO9193	IN-EL: 2009
FDOT DISTRICT 6								
1	870097	870731 ('97)	Miami-Dade	NW 27th Avenue Bridge / Miami River	1938	S: Movable - Bascule	8DA6426	
2	870659	in process	Miami-Dade	NW 5th Avenue	1924	S: Movable - Bascule	8DA6218	IN-EL: 2002
3	870662	871005 ('09)	Miami-Dade	NW 12th Avenue	1928	S: Movable - Bascule	8DA6341	
4	870001	870759 ('95)	Miami-Dade	Brickell Avenue Bridge / US-1 / Miami River	1929/1995	S: Movable - Bascule	8DA5098	
5	874312	874308 ('66)	Miami-Dade	Southwest 147th Avenue Bridge	1937	S: Through Girder	none	
FDOT DISTRICT 7								
1	020001	in process	Citrus	US-19 (SR-55) / Cross FL Barge Canal	1966	CS: Girder	none	
2	100005	In process	Hillsborough	US-301/Little Bullfrog Creek	1922/1971	C: Tee-Beam	none	
3	100006	-	Hillsborough	US-301/Tadpole Creek	1924/1953	C: Slab	8HI1566	IN-EL: 2009
4	100028	-	Hillsborough	Lafayette Street Viaduct	1926	C: Girder	8HI6663	

DEMOLISHED BRIDGES - 2010 FLORIDA'S HISTORIC HIGHWAY BRIDGES TOTAL: 59								
Legend: IN-EL: Determined ineligible for listing; II – Insufficient information for determination; P-EL: Determined potentially eligible * Replacement bridge selected by features carried/intersected due to insufficient original bridge location information. - Insufficient information on original bridge location to select replacement bridge.								
#	**Structure Number**	**Replacement Structure No. (Year)**	**County**	**Feature Carried / Intersected**	**Year Built/ Recon.**	**Bridge Type**	**FMSF No.**	**SHPO Eval**
5	100065	100813 ('09)	Hillsborough	SR-676 / Delaney Creek	1928	C: Tee-Beam	8HI4543	IN-EL: 1992
6	100066	100814 ('09)	Hillsborough	SR-676 / Delaney Creek Tributary	1928	C: Tee-Beam	8HI4541	IN-EL: 1992
7	154208	154311 ('09)	Pinellas	Belleair Causeway / CR-416 / ICWW	1950	C: Girder	8PI2728	IN-EL: 2004
8	154209	154311 ('09)	Pinellas	Belleair Causeway / CR-416 / ICWW	1950	S: Movable - Bascule	8PI2729	IN-EL: 2004
9	157800	157801 ('07)	Pinellas	Treasure Island Causeway / ICWW	1939	S: Movable - Bascule	8PI10574	
10	157820	157821 ('04)	Pinellas	Treasure Island Causeway / Boca Ciega Way W	1939	C: Girder	8PI10574	
11	157840	157841 ('04)	Pinellas	Treasure Island Causeway / Boca Ciega Way E	1939	C: Girder	8PI10574	
12	none	-	Hillsborough	Beachway Drive Bridge	1930	C: Arch-Deck	none	