

**CULTURAL RESOURCE ASSESSMENT SURVEY
IN SUPPORT OF THE SR 401 BRIDGE REPLACEMENT PD&E STUDY
BREVARD COUNTY, FLORIDA**

**FINANCIAL MANAGEMENT No. 444787-1
SEARCH PROJECT No. T21103**

PREPARED FOR

**PARSONS TRANSPORTATION GROUP, INC.
AND
FLORIDA DEPARTMENT OF TRANSPORTATION, DISTRICT 5
DELAND, FLORIDA**

BY

SEARCH

JANUARY 2022

THE ENVIRONMENTAL REVIEW, CONSULTATION, AND OTHER ACTIONS REQUIRED BY APPLICABLE FEDERAL ENVIRONMENTAL LAWS FOR THIS PROJECT ARE BEING, OR HAVE BEEN, CARRIED OUT BY THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) PURSUANT TO 23 U.S.C. § 327 AND A MEMORANDUM OF UNDERSTANDING DATED DECEMBER 14, 2016 AND EXECUTED BY THE FEDERAL HIGHWAY ADMINISTRATION AND FDOT.

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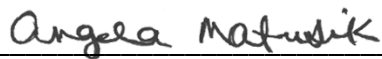
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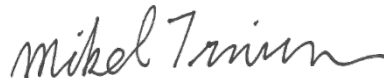
PREPARED BY

SEARCH

ANGELA MATUSIK, MIKEL TRAVISANO, AND KRISTINA ALTES



**ANGELA MATUSIK, MA
PRINCIPAL INVESTIGATOR, ARCHAEOLOGY**



**MIKEL TRAVISANO, MS
PRINCIPAL INVESTIGATOR, ARCHITECTURAL HISTORY**

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EXECUTIVE SUMMARY

This report presents the findings of a Phase I cultural resource assessment survey (CRAS) conducted in support of bridge replacement along State Road (SR) 401 (SR A1A) in Brevard County, Florida. The Florida Department of Transportation (FDOT), District 5, is proposing four possible alternatives, including a “No Build Alternative” for the replacement of three existing bascule bridges. In addition to the “No Build Alternative,” which would leave the existing bridges in place, the project proposes either a “Mid-Level Movable Bascule Bridge,” “Mid-Level Movable Lift Bridge,” or a “High-Level Fixed Bridge” over the Canaveral Barge Canal.

The “Mid-Level Movable Bascule Bridge” would replace the current three bascule bridges with two bascule bridges that would carry traffic northbound and southbound along the existing bridge alignment. The “Mid-Level Movable Lift Bridge” would replace the current three bascule bridges with two vertical-lift bridges that would carry traffic northbound and southbound along the existing bridge alignment. The “High-Level Fixed Bridge” would replace the current three bascule bridges with two fixed span bridges that would carry traffic northbound and southbound along the existing bridge alignment. Additional details about the four alternatives are included in **Appendix A**. Additional improvements include roadway widening and/or realignment of existing ramps. The bridge and associated roadway improvements will take place within the existing right-of-way; no additional right-of-way is proposed (**Appendix B**). The project is anticipated to be federally funded.

To encompass all potential improvements, the area of potential effects (APE) was defined to include the existing right-of-way where improvements are proposed, including the three bridges spanning the Canaveral Barge Canal, as well as the right-of-way along the SR 401 (SR A1A) interchange with SR 528 Causeway for a total length of approximately 0.7 miles (1.1 kilometers) of SR 401 (SR A1A) and 0.5 miles (0.8 kilometers) of SR 528 Causeway. This APE was extended to the back or side property lines of parcels adjacent to the right-of-way or a distance of no more than 100 meters (330 feet) from the right-of-way line. Given the absence of natural soils within the project right-of-way, no archaeological survey was conducted. The historic structure survey was conducted within the entire APE.

There are two historic bridges located within the SR 401 Bridge Replacement APE. The FDOT Bridge Nos. 700074 (ca. 1971) and 700140 (ca. 1971) are concrete stringer/multi-beam or girder bridges. These two bridges are located along SR 528 where it crosses over SR 401 (SR A1A). These two bridges fit the description of common bridges within the scope of the 2012 *Program Comment Issued for Streamlining Section 106 Review for Actions Affecting Post-1945 Concrete and Steel Bridges* and are excluded from Section 106 consideration (Federal Register 2012:68793). Further discussion of the application of the Program Comment is provided in the Methods section of this document. Finally, these two bridges meet the stipulation outlined in the aforementioned Program Comment; therefore, further evaluation of these bridges is beyond the scope of the current project.

The architectural survey resulted in the identification and evaluation of five previously recorded historic resources within the SR 401 Bridge Replacement APE (8BR03009, 8BR03010, 8BR02936, 8BR03394, and 8BR03395). Resources 8BR03009 (FDOT Bridge No. 700030), 8BR03010 (FDOT Bridge No. 700031), and 8BR03395 (FDOT Bridge No. 700117) were determined ineligible for inclusion in the National Register of Historic Places (NRHP) by the Florida State Historic Preservation Office (SHPO) (SEARCH 2017). The SR 528 Causeway (8BR03394) was determined ineligible for inclusion in the NRHP by the Florida SHPO (SEARCH 2019). Finally, the Canaveral Lock (8BR02936) resource group has previously been determined eligible for listing in the NRHP by the Florida SHPO (US Army Corps of Engineers [USACE] 2012, SEARCH 2017), and based upon the results of the current survey, 8BR02936 remains eligible for NRHP listing. No existing or potential historic districts were identified. No further architectural history survey is recommended.

Given the results of the CRAS, it is the opinion of SEARCH that the proposed SR 401 Bridge Replacement project will have no adverse effect to Resource 8BR02936, which is eligible for listing in the NRHP. No further work is therefore recommended according to current designs.

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INTRODUCTION

This report presents the findings of a Phase I cultural resource assessment survey (CRAS) conducted in support of proposed bridge replacement along State Road (SR) 401 (SR A1A) in Brevard County, Florida (**Figure 1**). The Florida Department of Transportation (FDOT), District 5, is proposing retrofit improvements or replacement of three existing bascule bridges with either a medium-level movable span bridge or a new fixed span bridge over the Canaveral Barge Canal. Additional improvements include roadway widening and/or realignment of existing ramps. The bridge and associated roadway improvements will take place within the existing right-of-way; no additional right-of-way is proposed.

The project area of potential effects (APE) was developed to consider any visual, audible, and atmospheric effects that the project may have on historic properties. The APE was defined to include the existing right-of-way where improvements are proposed, including the three bridges spanning the Canaveral Barge Canal, as well as the right-of-way along the SR 401 (SR A1A) interchange with SR 528 (Bennett Causeway) for a total length of approximately 0.7 miles (1.1 kilometers) of SR 401 (SR A1A) and 0.5 miles (0.8 kilometers) of SR 528 (Bennett Causeway) (**Figure 2**). This APE was extended to the back or side property lines of parcels adjacent to the right-of-way or a distance of no more than 100 meters (330 feet) from the right-of-way line. Given the absence of natural soils within the project right-of-way, no archaeological survey was conducted. The historic structure survey was conducted within the entire APE.

The purpose of the survey was to locate, identify, and bound any archaeological resources, historic structures, and potential districts within the project's APE and assess their potential for listing in the National Register of Historic Places (NRHP). This study was conducted to comply with Public Law 113-287 (Title 54 U.S.C.), which incorporates the provisions of the National Historic Preservation Act (NHPA) of 1966, as amended, and the Archeological and Historic Preservation Act of 1974, as amended. The study also meets the regulations for implementing NHPA Section 106 found in 36 CFR Part 800 (*Protection of Historic Properties*). This study also complies with Chapter 267 of the Florida Statutes and Rule Chapter 1A-46, Florida Administrative Code. All work was performed in accordance with Part 2, Chapter 8 of the FDOT's Project Development & Environment (PD&E) Manual (revised July 2020) as well as the Florida Division of Historical Resources' (FDHR) recommendations for such projects as stipulated in the FDHR's Cultural Resource Management Standards & Operations Manual, Module Three: Guidelines for Use by Historic Preservation Professionals. The Principal Investigator for this project meets the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716-42).

Angela Matusik, MA, served as the Principal Investigator for Archaeology for this project. Mikel Travisano, MS, served as the as the Principal Investigator for Architectural History for this project. The report was written by Kristina Altes, PhD, RPA, Mr. Travisano, and Ashley Parham, DPhil. The fieldwork was conducted by Mr. Travisano. Melissa Dye, MA, RPA, conducted the quality control review, and Ali Sundook, BA, edited and produced the document.

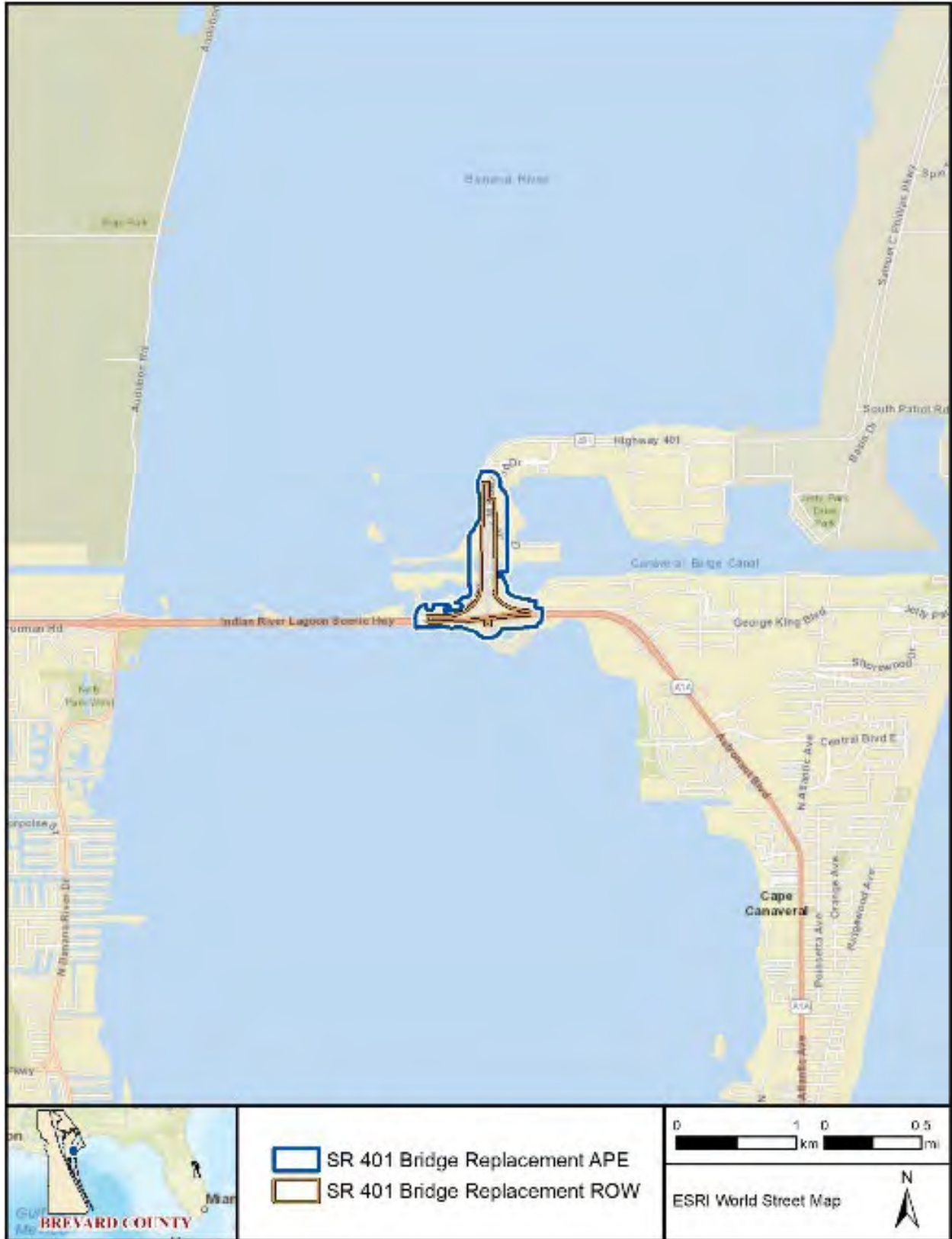


Figure 1. Location of the SR 401 Bridge Replacement project.



Figure 2. SR 401 Bridge Replacement APE.

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PROJECT LOCATION AND ENVIRONMENT

LOCATION AND MODERN CONDITIONS

The project area is located immediately northwest of the Cape Canaveral city limits in east-central Brevard County, Florida, within the waterway between Section 7 of Township 24 South, Range 37 East to the west and Section 15 of Township 24 South, Range 37 East to the east. The project is adjacent to Port Canaveral and extends west along the Bennett Causeway, which carries SR 528 (Bennett Causeway) over the Banana River. The terrain where the project approaches the SR 528/SR 401 interchange is relatively flat and reaches an elevation of approximately 7 feet (2 meters) above mean sea level (amsl). Geologically, the SR 401 Bridge Replacement APE is a part of the Cape Canaveral physiographic province within the larger Eastern Flatwoods District. This province is characterized by an accreted series of coastal ridges along the cape and coquina and sand shell underlying the Banana River (Brooks 1981). Soils within the APE are almost entirely mapped as Canaveral-Urban Land Complex, suggesting they are disturbed (**Figure 3**). This is supported by the results of the Historic Map and Aerial Photograph Review (see below), which indicates the project is on an artificially created landform. The project crosses over the Banana River, which joins the Indian River at the south end of Merritt Island approximately 19 miles (30 kilometers) south of the APE.

PALEOENVIRONMENT

Between 18,000 to 12,000 years before present (BP), Florida was a much cooler and drier place than it is today. Melting of the continental ice sheets led to a major global rise in sea level (summarized for long time scales by Rohling et al. 1998) that started from a low stand of -120 meters at 18,000 BP. The rise was slow while glacial conditions prevailed at high latitudes but became very rapid in the latest Pleistocene and earliest Holocene. It became warmer and wetter rapidly during the next three millennia. These changes were more drastic in northern Florida and southern Georgia than in southern Florida, where the “peninsular effect” and a more tropically influenced climate tempered the effects of the continental glaciers that were melting far to the north (Watts 1969, 1971, 1975, 1980). Sea levels, though higher, were still much lower than at present; surface water was limited, and extensive grasslands probably existed, which may have attracted mammoth, bison, and other large grazing mammals. By 6000–5000 BP, the climate had changed to one of increased precipitation and surface water flow. By the late Holocene, ca. 4000 BP, the climate, water levels, and plant communities of Florida attained essentially modern conditions. These have been relatively stable with only minor fluctuations over the past 4,000 years.



Figure 3. Soil types and drainage within the SR 401 Bridge Replacement right-of-way.

HISTORIC OVERVIEW

NATIVE AMERICAN CULTURE HISTORY

Given the limited potential for identification of intact archaeological deposits within the right-of-way (discussed below), a full discussion of the Precolumbian history of Brevard County is beyond the scope of this report. **Table 1** provides a summary of the Native American chronology of east and central Florida. Readers can refer to Milanich (1994) for a comprehensive treatment of the pre-contact history of Florida. Additional references are provided in **Table 1**.

Table 1. Precolumbian Culture History of Central Florida.

Name	Time Period	References
Paleoindian Period	10,000+–8000 BC	Cockrell and Murphy 1978; Clausen et al. 1979; Dunbar et al. 1988; Daniel and Wisenbaker 1987; Carbone 1983; Watts and Hansen 1988
Archaic Period	8000–500 BC	Milanich 1994; Smith 1986
Early	8000–5000 BC	Milanich and Fairbanks 1980; Smith and Bond 1984
Middle	5000–3000 BC	Smith and Bond 1984; Austin 1996
Late	3000–500 BC	Griffin 1945; Bullen 1972
Preceramic	3000–2000 BC	
Orange	2000–500 BC	Griffin 1945; Bullen 1972; Sassaman 1993; Milanich and Fairbanks 1980
Woodland Period	500 BC–AD 750	Milanich 1994
St. Johns I	500 BC–AD 100	Goggin 1952; Milanich 1994
St. Johns Ia	AD 100–500	
St. Johns Ib	AD 500–750	
Mississippian Period	AD 750–1565	Milanich 1994; Smith 1986; Miller 1991
St. Johns IIa	AD 750–1050	Goggin 1952; Milanich 1994
St. Johns IIb	AD 1050–1513	
St. Johns IIc	AD 1513–1565	

Due to the presence of historic resources within the project APE, a brief historic context for Brevard County is provided below. Additional detail regarding historic development within the project area is provided in the Historic Map and Aerial Review section.

POST-CONTACT HISTORY

European Exploration and Early Settlement, 1513–1821

The area that is now Brevard County served as an important stage for many early European expeditions in North America. Some historians believe that the Italian captain John Cabot sailed south along the Brevard coast during his 1498 explorations (Dovell 1952; Eriksen 1994). There is also evidence that Spanish slave traders raided indigenous coastal villages, because when Juan

Ponce de León came to Florida, he found a local who understood Spanish. Ponce de León left Puerto Rico on March 3, 1513, with three ships. After sailing on a northwesterly course for 30 days, the ships landed either north of Cape Canaveral (Milanich 1995) or in the vicinity of modern-day Melbourne Beach (Eriksen 1994; Gannon 1996). Ponce de León called this land *La Florida* since it was sighted during the Feast of Flowers (*Pascua Florida*) (Milanich 1995). Ponce de León remained at this initial landing place for six days before pulling anchor and sailing toward Jupiter Inlet, where he landed to restock firewood and water for the ships. The fleet rode the countercurrents of the Gulf Stream to Biscayne Bay and eventually rounded the southern tip of the peninsula (Gannon 1996; Milanich 1995). The island off the Brevard coast was named Canaveral, the Spanish term for canebrake. The Cape is found on many sixteenth century maps and is one of the oldest place names in North America (Eriksen 1994).

The Gulf Stream is located off the Brevard coast and was an important thoroughfare for transportation of New World supplies to Europe. The Spanish treasure galleons rode this warm current from Havana through the Bahama Channel. Wrecks were common in the treacherous shoals around Cape Canaveral, and the local indigenous tribe, the Ais, would often recover the cargo. The Spanish crown realized the importance of this trade route, and when they heard that the French were developing a colony, Fort Caroline on the St. Johns River near modern-day Jacksonville, they decided to act. Pedro Menéndez de Avilés, a highly respected officer in the Spanish navy, was issued the task of eradicating the French influence in the area and starting a colony in *La Florida* (Milanich 1995). The French colony was awaiting supplies and reinforcements coming from France under the command of Jean Ribault. Menéndez felt it was crucial to reach and destroy Fort Caroline before Ribault arrived. In August 1565, Menéndez, with his fleet of 10 ships, sighted Cape Canaveral (Gannon 1996; Milanich 1995). The Spanish force searched for six weeks along the northern Florida coast before they found the French fort. A tropical storm had scattered the French defenses and left the fort an easy target for Menéndez to destroy. During the gale, a ship of French colonists had wrecked somewhere near Cape Canaveral. While Menéndez marched south along the coast to meet the wayward French force, he kept a detailed description of the area, including Brevard County. The Spanish garrison Santa Lucia was constructed on the high plateau near Jupiter Inlet as a line of defense for the new colony (Eriksen 1994; Milanich 1995).

In 1605, the Spanish sent a delegation under the command of Alvaro Mexia to the Brevard area. The diplomat was charged with placating the aggressive Ais and mapping the region. His mission was a success. Mexia was named an honorary chief of the tribe, and the Indian and Banana Rivers (which the Spanish called Rio de Ais and Ulumay Lagoon) were explored and recorded. Mexia's maps detail many Native American settlements along the shores of Mosquito Lagoon (at the north end of the Banana River). It is possible that his entourage spread orange seeds along the banks of the Indian River (Eriksen 1994).

After the British victory in the Seven Years War in 1763, they traded their Havana conquest to Spain for Florida. The British divided the colony along the Apalachicola River into East and West Florida. In 1765, the botanist John Bartram and his son William searched for the St. Johns River headwaters (Eriksen 1994; Tebeau 1971). The two became the first Europeans to document the

Brevard region (Eriksen 1994). In 1783, the Treaty of Paris restored Florida to Spain, whose control of the territory was now quite tenuous (Tebeau 1971). Zespedes, the Spanish governor, wrote to the king in 1785 that isolated groups of Americans had settled in the area (Eriksen 1994; Tebeau 1971). Immigrants from the Native American tribes north of Florida now numbered 5,000 to 6,000 in the colony. The majority of these “Seminole” were confined west of the St. Johns River. Brevard County at this time was known as the Mosquito Coast (Eriksen 1994).

American Territorial Period through the Civil War, 1812–1861

Florida became a territorial possession of the United States after President James Monroe ratified the Adams-Onís Treaty on February 22, 1821. General Andrew Jackson was appointed governor of the territory later that same year (Eriksen 1994; Tebeau 1971). Jackson partitioned Florida into two counties, Escambia to the west and St. Johns to the east. In 1824, the area encompassing most of east-central Florida, including Brevard County, was designated as Mosquito County. Colonel James Gadsden led a survey party through the eastern portion of the county in 1825 to find a route for a road from St. Augustine to what is now Dade County (Eriksen 1994; Fernald and Purdum 1992). Close to 4 million acres of the interior of the state was the reservation of the Seminole, including the southwestern corner of modern-day Brevard County (Mahon 1985).

On Christmas Day 1835, the Second Seminole War brought conflict to East Florida when Native American forces razed Mosquito Lagoon plantations. Along with a severe freeze in 1835, the war decimated Mosquito County’s population, as most everyone fled to safe havens outside the county (Shofner 1995:36). The military erected forts throughout the Brevard area. Six hundred mounted militiamen under General Joseph Hernandez’s command constructed Fort Ann a mile south of modern-day Haulover Canal. Camp Hernandez was erected south of present-day Scottsmoor in northern Brevard. General Hernandez collected his troops at the camps on January 3, 1838, and proceeded to advance south along the eastern coast. Their path followed the high ground along the western side of the Indian River Lagoon before swinging west to meet Fort Taylor on Lake Winder, then angling southeast on a course parallel to what is now Interstate 95. Of all the military trails created in Brevard, this is the one historians are able to pinpoint most accurately (Eriksen 1994:38-39). The war ended in 1842, and on March 14, 1844, Saint Lucie County (present-day Brevard County) was created from Mosquito County (present-day Orange County) (Carter 1962:994-995; Dunn 1998:34).

Merritt Island was initially settled in the 1850s by Douglas Dummitt, an orange cultivator from Tomoka whose orange groves fueled the area’s economy (US Fish and Wildlife Service 2015). Cape Canaveral, which remained isolated and accessible only by boat, was first settled in the 1840s. In 1847, the settlement received a permanent lighthouse, recognizing the island’s centuries of use as a navigational point (Lethbridge 2000). Primary crops of the county as a whole included citrus and pineapple (Eriksen 1994:59-61; 2017), while seemingly inexhaustible game and fishing resources drew Northern sportsmen (Eriksen 1994).

On January 10, 1861, Florida seceded from the Union. Brevard County was far removed from the battlefields to the north but still played an important role in the war. Settlers along the Indian

River engaged in salt production for the Confederate Army, and the cattle range in western Brevard supplied beef. Blockade runners frequently utilized the inlets and bays of the Indian River and Mosquito Lagoon during their smuggling ventures (Tebeau 1971).

Late Nineteenth Century, 1861–1899

Prior to the 1880s, water transportation, both sea and river, was the dominant mode of long-distance travel for most of Florida's residents. Due to Florida's dearth of population, underdevelopment, and lack of capital, railroads penetrated into the state slowly. By the mid-1800s, Florida claimed only one successful rail line, and it connected Tallahassee to the Gulf of Mexico at St. Marks (Brown 1991:13-14). Most of Florida's roads were slow, bumpy, waterlogged (during summer months), sand-laden trails that even ox teams had a difficult time traversing. With the arrival of Henry Flagler and Henry Plant in the 1880s, trains began to cross the Florida landscape. Railroads generally brought growth to the communities and regions they touched (Covington 1957:136, 169; Johnson 1966:129).

Citizens elected Titusville as the permanent seat of government for Brevard County in 1879. The population of the Indian River area was rapidly expanding due to a solid economic base of agriculture and recreational fishing. Titusville was chosen as a stop on the Jacksonville, Tampa, and Key West Railway in 1885. In 1890, a group of wealthy Harvard graduates founded the 18,000-acre Canaveral Club, which is now the Merritt Island National Wildlife Preserve. In 1893, the Florida East Coast (FEC) Railway line came to Titusville and Eau Gallie (Eriksen 1994).

Twentieth Century to Present, 1900–Present

Not until the end of the nineteenth century did Florida realize any concerted effort in road development. With the proliferation of railroads, farmers, merchants, and others clamored for better roads to get goods and people to and from the railroad depots. Additionally, during the 1910s and 1920s, the number of automobiles in the state and nation increased exponentially, exerting more pressure on the government to develop roads. Prior to 1924, only 748 miles of hard-surfaced road existed in the state. By 1928, this number grew to 1,588 miles with an additional 59 miles in the process of being paved (Jackson 1992; Kendrick 1964; Tebeau 1971). As car ownership increased and roads improved, train dominance diminished.

In 1917, Brevard County achieved its modern-day dimensions when the southern portions of the county became St. Lucie and Okeechobee Counties, and the western portion became Osceola County (Fernald and Purdum 1992). The center of population in the county shifted from Titusville in the north to Eau Gallie, Cocoa, and Melbourne in the south. A bridge constructed from Cocoa to Merritt Island opened a link to the many small communities on the coast. By the mid-1920s, four bridges spanned the river and new towns sprouted up along the beaches as a result of these bridges (Eriksen 1994).

Cape Canaveral and the islands off the coast had been primarily isolated until the construction of bridges connecting them to the mainland (Lethbridge 2021); however, even after the construction of bridges, they would remain sparsely settled for several more decades (Hiller 2005). By 1936, only two settlements were evident near Cape Canaveral—Canaveral and Artesia (Florida State Road Department [FSRD] 1936). At the dawn of World War II, the total population of Cape Canaveral was about 100 (Lethbridge 2021). As World War II approached in 1939, the military chose land south of Cocoa Beach to build the Banana River Naval Air Station (Eriksen 1994). At war's end, Banana River Naval Air Station was deactivated (Morris 1948; Stone 1988). In 1949, President Harry S. Truman established the Joint Long Range Proving Ground at Cape Canaveral. Banana River Naval Air Station was renamed Patrick Air Force Base in 1950 and was the sight of experimental launches of hybrid rockets as a supporting base for Cape Canaveral (Archaeological Consultants, Inc. [ACI] 2010).

The arrival of the aeronautical industry fueled the development of the previously sparsely populated Cape Canaveral. In 1958, the island was chosen as the center for the newly created National Aeronautics and Space Administration (NASA), and it was from here that both the first manned spaceflight (1961) and the first lunar-landing flight (1969) were launched (Encyclopedia Britannica 2002). As the aeronautical industry developed, however, it posed a threat to natural resources of Cape Canaveral. An agreement between the US Fish and Wildlife Service, the National Park Service (NPS), and NASA resulted in the creation of the Merritt Island National Wildlife Refuge. This preserve set aside all land not used in the creation of the Kennedy Space Center (KSC) in 1963 as a natural refuge for Brevard County's wildlife (US Fish and Wildlife Service 2015). The coexistence of nature and industry within Brevard County that was created by this agreement continues to characterize the area. That same year the Emory L. Bennett Causeway was opened as a toll facility spanning the Indian and Banana Rivers as well as Merritt Island (Newman 1963:5A).

In recent years, the KSC and Cape Canaveral Air Force Station have been referred to under the name the Cape Canaveral Spaceport, showing the growing partnership KSC and the 45th Space Wing. Together they represent the future of Florida's Space Coast (NASA 2017). In addition, the KSC has begun a new era of space exploration. As the Space Shuttle Program reached its end in the 2010s, the KSC entered a new era of mostly unmanned flights but continued to host visitors and launches, becoming a tourist attraction (Beutel 2010). Brevard County continued to benefit from its location along the Space Coast, reaching over 500,000 in population by 2010 (US Census Bureau 2010). Starting in 2014, NASA sought to establish partnerships with private companies through their "Tipping Point" Awards and Commercial Crew Program (Sheetz 2019). Private companies have since assumed responsibility for many of the functions NASA performed in the past. In December 2019, the Department of Defense created a new branch of the military, the United States Space Force. That same month, Cape Canaveral Air Force Station and Patrick Air Force Base were redesignated as Space Force installations, and Cape Canaveral became Cape Canaveral Space Force Station (Wallace 2021).

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BACKGROUND RESEARCH

FLORIDA MASTER SITE FILE REVIEW

Florida Master Site File (FMSF) data from October 2021 were reviewed to identify previously recorded cultural resources within 1 mile the project APE. The FMSF review indicates that five previous cultural resource surveys have been conducted within 1 mile of the current project area (**Table 2, Figure 4**). In addition, FMSF Survey No. 20057, conducted by ACI in 2012, included documentation of all historic bridges in Florida, including three bridges (8BR03009, 8BR03010, and 8BR03395) within the current project APE.

Table 2. Previous Cultural Resources Assessment Surveys within 1 Mile of the SR 401 Bridge Replacement APE.

FMSF No.	Title	Year	Reference
260	Cultural Resource Reconnaissance of Merritt Island National Wildlife Refuge	1978	Cultural Resource Management, Inc. (CRM, Inc.)
11594	Cultural Resource Assessment Survey for the State Road 528 PD&E Study from State Road 520 to the Port Canaveral Terminal B Interchange, Orange and Brevard Counties	2005	Janus Research
20016	Cultural Resource Assessment of Proposed Navigational Improvements Canal Port Authority of Port Canaveral, Brevard County, Florida	2007	Post, Buckley, Schuh and Jernigan (PBS&J)
23234	Technical Memorandum: Marine Remote-Sensing Survey of SR 528 from West of SR 524 (Industry Road) to East of SR 3 and SR 528 from East of SR 3 to Port Canaveral Interchange, Brevard County, Florida	2016	SEARCH
23563	Technical Memorandum: Cultural Resource Assessment Survey of State Road 528 from East of State Road 3 to Port Canaveral Interchange, Brevard County, Florida	2017	SEARCH

FMSF Survey No. 260 was a CRAS conducted by CRM, Inc., in 1978. The survey was located to the north, east, and west of the current project APE. This archaeological survey identified historic structural and earthwork remains, none of which are within the current project APE.

FMSF Survey No. 11594 was a CRAS conducted by Janus Research in 2005. The survey included the southern half of the current project APE along SR 528. Archaeological survey was limited to pedestrian survey in this area, which was described in the report as being disturbed by highway construction and filling in of wetlands with dredge spoil. A total of three previously recorded historic resources and one newly recorded historic resource were documented as a result of this survey, none of which are within the current project APE.

FMSF Survey No. 20016 was a CRAS conducted by PBS&J in 2007. The survey was located to the east of the APE along a section of the Canaveral Barge Canal and Turning Basin. Archaeological survey was limited to pedestrian survey in this area, which was described in the report as being

heavily impacted by development, and no historic resources were documented as a result of this survey.

FMSF Survey No. 23234 was a CRAS completed by SEARCH in 2016. The survey was a marine remote-sensing survey located to the west of the APE at four bridge locations in the Indian and Banana Rivers. The survey identified a number of magnetic anomalies; however, they were all identified with modern materials associated with the bridges and seawalls, and none are within the current project APE.

FMSF Survey No. 23563 was a CRAS completed by SEARCH in 2017. The survey served as an addendum to the previous FMSF Survey No. 11594 and included architectural history survey of SR 528 from east of SR 3 to the Port Canaveral Interchange. No archaeological testing was conducted during this survey due to previous archaeological survey of the project right-of-way. A total of three previously recorded and four newly recorded historic resources were documented as a result of this survey, five of which (8BR02936, 8BR03009, 8BR03010, 8BR03394, and 8BR03395) are within the current project APE.

The FMSF review also indicates that two resource groups, three historic bridges, and one historic building have been recorded within 1 mile the project APE (**Table 3**; see **Figure 4**).

Table 3. Previously Recorded Cultural Resources within 1 Mile of the SR 401 Bridge Replacement APE.

<i>Historic Structures</i>			
FMSF No.	Name/Address	Year Built	SHPO Evaluation
8BR03393	790 Scallop Drive	ca. 1970	Ineligible for NRHP
<i>Historic Bridges</i>			
FMSF No.	Name	Year Built	SHPO Evaluation
8BR03009	FDOT Bridge 700030	ca. 1965	Ineligible for NRHP
8BR03010	FDOT Bridge 700031	ca. 1965	Ineligible for NRHP
8BR03395	FDOT Bridge 700117	ca. 1971	Ineligible for NRHP
<i>Resource Groups</i>			
FMSF No.	Name	Period of Significance	SHPO Evaluation
8BR02936	Canaveral Lock	Modern, 1950–present	Eligible for NRHP
8BR03394	SR 528 Causeway	Modern, 1950–present	Ineligible for NRHP



Figure 4. Previously recorded cultural resources and surveys within 1 mile of the SR 401 Bridge Replacement APE.

790 Scallop Drive (8BR03393) is a ca. 1970 Industrial Vernacular style building located east of the APE. This resource group was determined ineligible for inclusion in the NRHP by the State Historic Preservation Officer (SHPO) (SEARCH 2017).

All three previously recorded historic bridges (8BR03009, 8BR03010, and 8BR03395) span the Canaveral Barge Canal and have been determined to be ineligible for listing in the NRHP by the SHPO. Bridges 8BR03009 and 8BR03010 were constructed ca. 1965 and were first documented as part of FMSF Survey No. 20057 in 2012. Bridge 8BR03395 was constructed ca. 1971 and was documented as part of FMSF Survey No. 23563 in 2017. This most recent survey described all three bridges as movable bascule bridges.

The Canaveral Lock (8BR02936) is a linear resource group that passes beneath the project bridges. This resource group was constructed in 1965 and was determined by the SHPO to be eligible for listing in the NRHP due to its association with the Florida space industry, NASA, and transportation (USACE 2012).

The SR 528 Causeway (8BR03394) is a linear resource group that extends from the western portion of the current project APE. This resource group was constructed in 1963 and was determined to be ineligible for listing in the NRHP due to its lack of association with historically significant period, event, theme, or person, as well as its lack of architectural and engineering distinction and potential to yield further information of historical importance (SEARCH 2017).

HISTORIC MAP AND AERIAL PHOTOGRAPH REVIEW

Historic maps and aerial photographs were examined to identify past land use in the vicinity of the SR 401 Bridge Replacement APE. The earliest detailed maps consulted were General Land Office (GLO) survey maps. The GLO maps were created by government land surveyors during the nineteenth century as part of the surveying, platting, and sale of public lands. In Florida, these maps characteristically show landscape features such as vegetation, bodies of water, roads, and Spanish land grants. The level of detail in GLO maps varies, with some also depicting structures, Native American villages, railroads, and agricultural fields. A GLO map of Florida Township 24 South, Range 37 East created in 1859 shows no development within the APE. The coastline to the east and west have been plotted but no improvements are shown (**Figure 5**) (GLO 1859). By 1890, several towns are apparent near the APE including Cocoa and City Point on the western bank, and Merritt Island on the eastern bank; however, no bridge spans the waterway (Norton 1890). The Jacksonville, Tampa, and Key West Railroad was north of the APE and stops at Titusville. By 1895, the Florida East Coast Railroad follows the entire coastline of Brevard County and passed through City Point and Cocoa, but no bridge spanned the waterway (Rand McNally & Co 1903).

Maps from the early twentieth century show several new cities on the western coast of the Indian River, including Sharpes, north of the APE (Mawson 1917). By 1935, the only improvement was SR 4 running northwest-southeast along the western bank of the Indian River, connecting Sharpes and Cocoa to other towns along the coast; however, no bridge over the waterway was illustrated (FSRD 1935). An aerial photograph from 1943 shows no bridge over the waterway (**Figure 6**) (US Department of Agriculture [USDA] 1943). Some change was apparent within the APE by 1951 when large areas of white sand crossed the APE (**Figure 7**) (USDA 1951). A general highway map of Brevard County in 1958 shows the turn basin constructed and SR 401 within the APE, but not extending southwest where the artificially constructed landform extends over the water (FSRD 1958). By 1964, a toll bridge crossed the waterway and extended into the APE from the west (FSRD 1964). A 1970 topographic map confirms these features. The Bennett Causeway was depicted west of the APE, and SR 401 and SR A1A were illustrated within the APE on their present-day paths (**Figure 8**) (US Geological Survey [USGS] 1970a, 1970b).

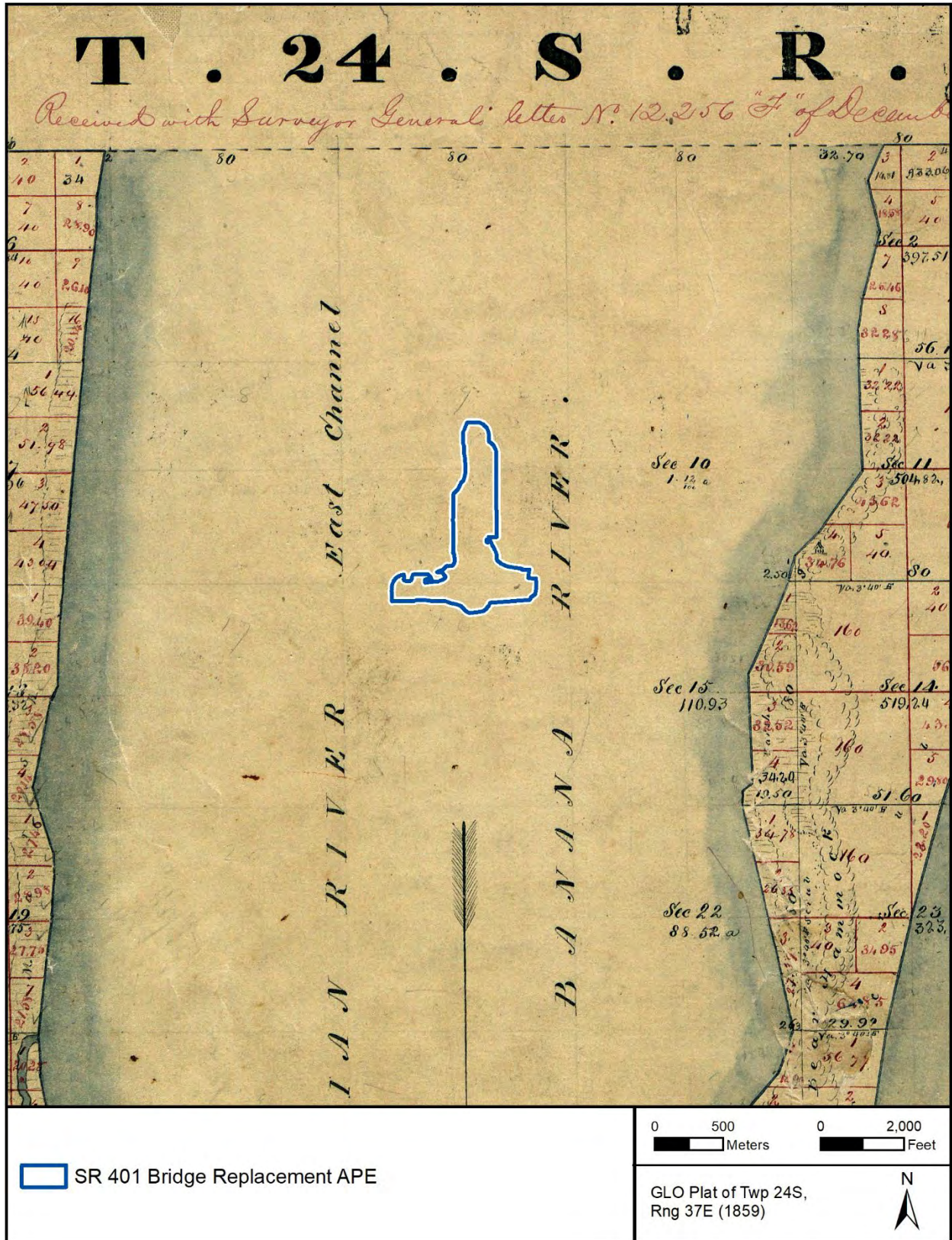


Figure 5. GLO survey map of Township 24 South, Range 37 East (GLO 1859).

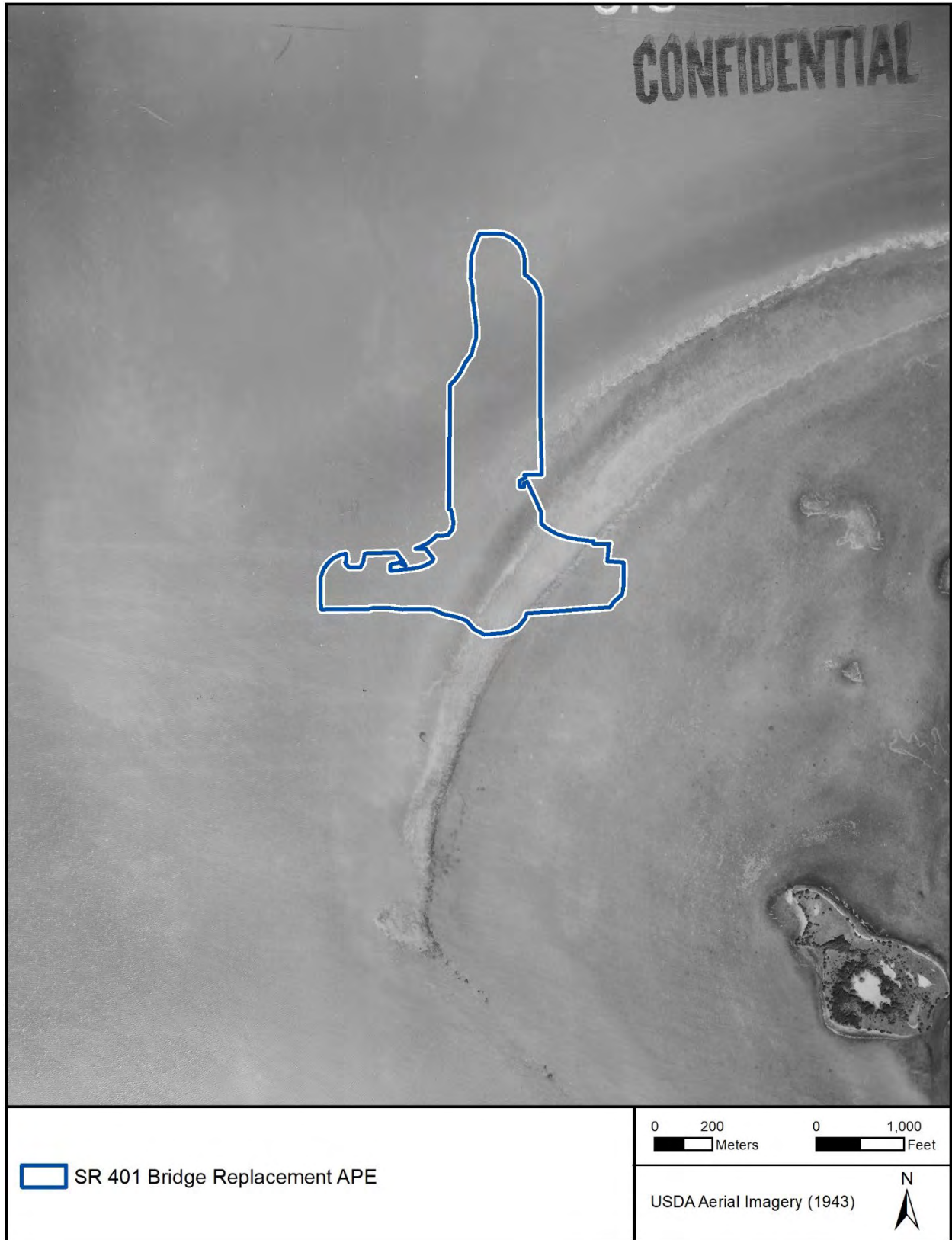


Figure 6. USDA aerial photograph of Brevard County, FL (USDA 1943).

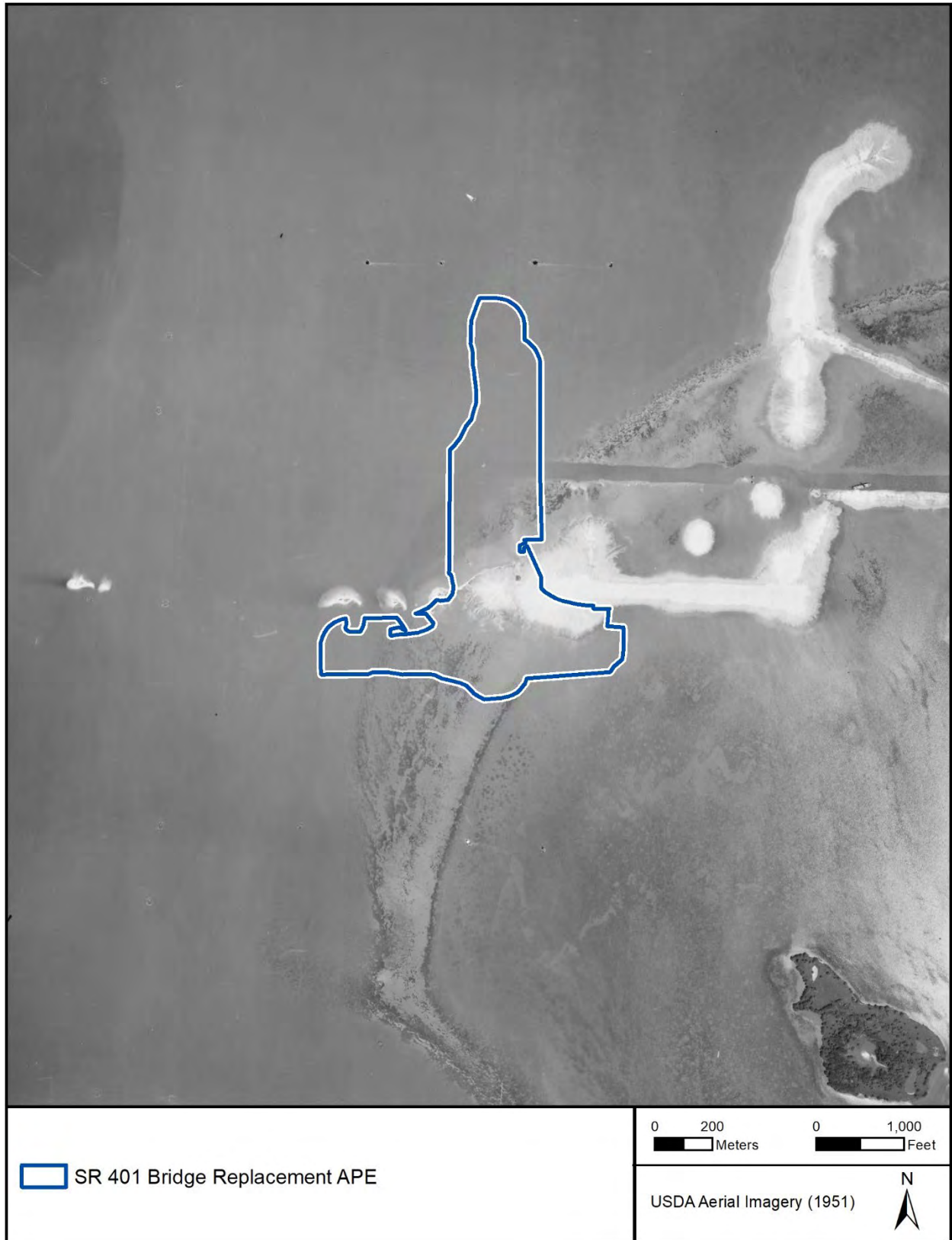


Figure 7. USDA aerial photograph of Brevard County, FL (USDA 1951).

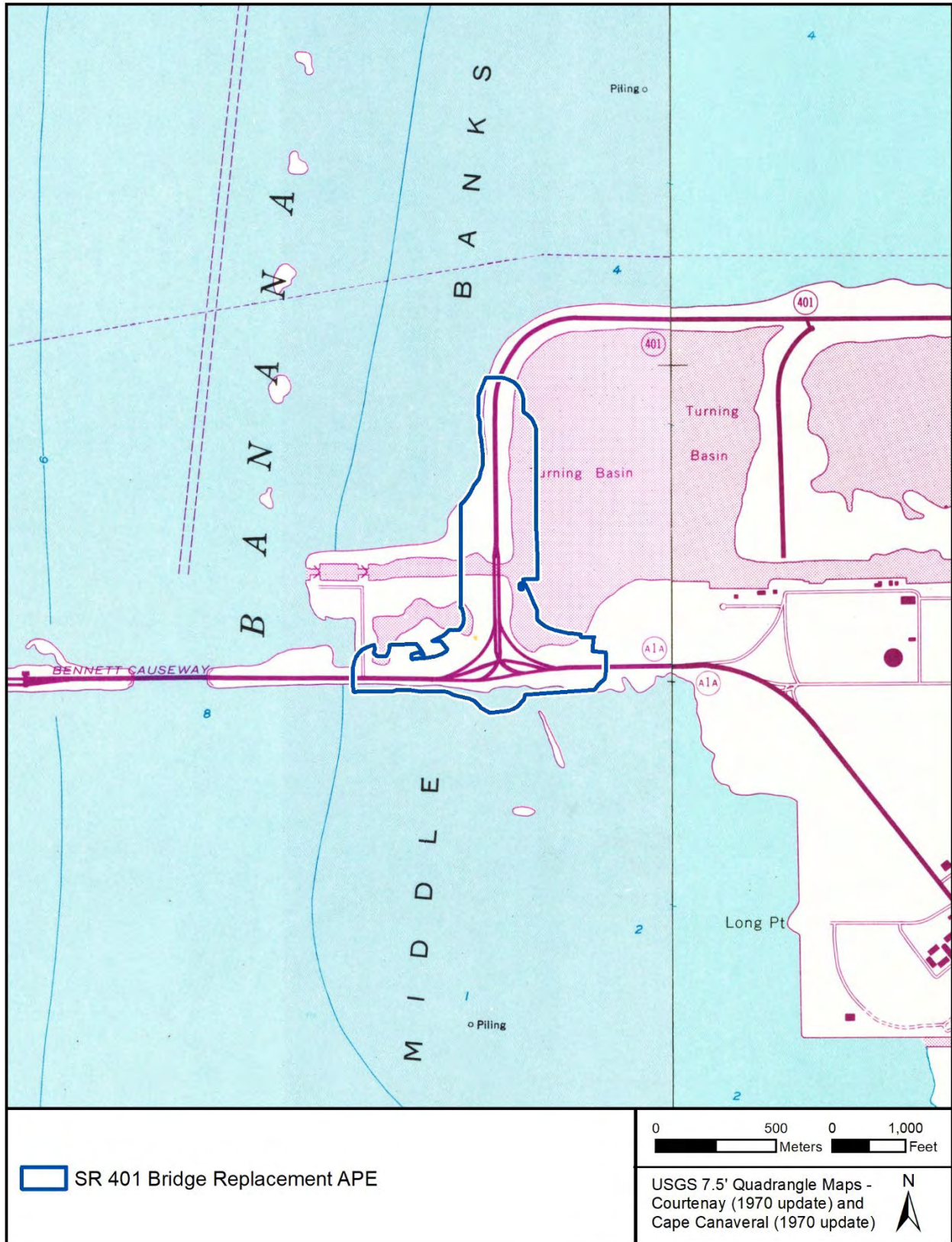


Figure 8. USGS topographic maps of Courtenay and Cape Canaveral, FL (USGS 1970a, 1970b).

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RESEARCH DESIGN

PROJECT GOALS

A research design is a plan to coordinate the cultural resource investigation from inception to completion of a project. This plan should minimally account for three things: (1) it should make explicit the goals and intentions of the research, (2) it should define the sequence of events to be undertaken in pursuit of the research goals, and (3) it should provide a basis for evaluating the findings and conclusions drawn from the investigation.

The goal of this cultural resource survey was to locate and document evidence of historic or prehistoric occupation or use within the APE (archaeological or historic sites, historic structures, or archaeological occurrences [isolated artifact finds]), and to evaluate these for their potential eligibility for listing in the NRHP. The research strategy was composed of background investigation, a historical document search, and field survey. The background investigation involved a perusal of relevant archaeological literature, producing a summary of previous archaeological work undertaken near the project area. The FMSF was checked for previously recorded sites within the project corridor, which provided an indication of prehistoric settlement and land-use patterns for the region. Current soil surveys, vegetation maps, and relevant literature were consulted to provide a description of the physiographic and geological region of which the project area is a part. These data were used in combination to develop expectations regarding the types of archaeological sites that may be present and their likely locations (site probability areas).

The historical document search involved a review of primary and secondary historic sources as well as a review of the FMSF for any previously recorded historic structures. The original township plat maps, early aerial photographs, and other relevant sources were checked for information pertaining to the existence of historic structures, sites of historic events, and historically occupied or noted Native American settlements within the project limits.

NRHP CRITERIA

Cultural resources identified within the project APE were evaluated according to the criteria for listing in the NRHP. As defined by the NPS, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. that are associated with events or activities that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or

- 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
- D. that have yielded, or may be likely to yield, information important in prehistory or history.

NRHP-eligible districts must possess a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. NRHP-eligible districts and buildings must also possess historic significance, historic integrity, and historical context.

CULTURAL RESOURCE POTENTIAL

Based on an examination of mapped soils, historic maps, and aerial photographs, and the results of previously conducted surveys, there is no potential for archaeological sites to be present within the project APE. Historic maps and aerial photographs indicate all soils within the project right-of-way were artificially introduced during construction of the Canaveral Lock, Canaveral Barge Canal, and Bennett Causeway in the 1960s and 1970s. This is supported by the results of FMSF Survey No. 11594, which described the area as heavily disturbed. Given historic development and previously recorded historic resources within the APE, the potential for historic resources was considered to be high.

SURVEY METHODS

Archaeological Field Methods

Given the absence of natural soils throughout the project right-of-way, no archaeological survey was conducted.

Architectural Field Methods

The architectural survey for the project utilized standard procedures for the location, investigation, and recording of historic properties. In addition to a search of the FMSF for previously recorded historic properties within the project area, USGS quadrangle maps were reviewed for structures that were constructed prior to 1978. The field survey inventoried existing buildings, structures, and other aspects of the built environment within the project APE. The location of each historic resource was plotted on USGS quadrangle maps and on project aerials. All identified historic resources were photographed with a digital camera, and all pertinent information regarding the architectural style, distinguishing characteristics, and present condition was recorded on FMSF resource forms. Upon completion of fieldwork, forms and photographs were returned to the SEARCH offices for analysis. Date of construction, design,

architectural features, condition, and integrity of the resource, as well as how the resources relate to the surrounding landscape, were carefully considered. The resources were categorized according to their significance for listing in the NRHP and then recommended eligible, potentially eligible, or not eligible.

There are two historic bridges located within the SR 401 Bridge Replacement APE that did not warrant survey and evaluation. FDOT Bridge Nos. 700074 (ca. 1971) and 700140 (ca. 1971) are concrete stringer/multi-beam or girder bridges. These two bridges are located along SR 528 where it crosses over SR 401 (SR A1A) (see **Figure 2**). These The 2012 *Program Comment Issued for Streamlining Section 106 Review for Actions Affecting Post-1945 Concrete and Steel Bridges* (Federal Register 2012:68793-68795) “relieves federal agencies from the Section 106 requirement to consider the effects of undertakings on the bridge types identified in Section V of this Program Comment” if a bridge does not meet three considerations listed in Section IV (Federal Register 2012:68793). Using these three considerations, SEARCH examined the two bridges to determine if they met the qualifications for application of the Program Comment.

First, based on a review of the FMSF, SEARCH determined that none of the bridges within the SR 401 Bridge Replacement APE was listed in or had been determined eligible for the NRHP. Second, SEARCH architectural historians examined the bridges to determine they were not one of the following bridge types: arch bridges, truss bridges, bridges with movable spans, suspension bridges, cable-stayed bridges, or covered bridges. Bridges Nos. 700074 and 700140 are concrete stringer/multi-beam or girder bridges.

Finally, the latest statewide bridge survey (ACI 2012) was reviewed concerning the bridges. Bridges Nos. 700074 and 700140 were not identified by the latest statewide bridge survey (ACI 2012) as having the characteristics that would exempt it from the Program Comment:

Exceptional significance for association with an event or individual or being a very early or particularly important example of its type in a State or the nation, having distinctive engineering or architectural features that depart from standard designs, such as an aesthetic railing or balustrade, includes spans of exceptional length or complexity, or displaying other elements that were engineered to respond to a unique environmental context (Federal Register 2012:68794).

Bridges Nos. 700074 and 700140 are concrete stringer/multi-beam or girder bridges. Based on the above considerations for the Program Comment, they are excluded from Section 106 consideration (Federal Register 2012:68793). As such, these bridges were not recorded or evaluated by the present study. The Section 106 responsibilities of FDOT and the Federal Highway Administration (FHWA) have been completed regarding these two bridges.

Laboratory Methods

No artifacts were recovered as a result of this survey, and therefore no laboratory analysis was required.

Curation

The original maps and field notes are presently housed at the Newberry office of SEARCH. The original maps and field notes will be turned over to FDOT, District 5, upon project completion; copies will be retained by SEARCH.

Informant Interviews

No local informants were contacted as part of this survey.

Certified Local Government Consultation

Brevard County is not a Certified Local Government (CLG) listed by the FDHR. In the absence of a CLG, SEARCH initiated consultation with SEARCH archaeologist Kristina Altes, PhD, RPA, and emailed Mr. Michael J. Boonstra, Genealogy Librarian/Archivist for the Catherine Schweinsberg Rood Central Library and the Brevard County Historical Commission, to discuss the project and inquire whether his office might have knowledge of any cultural resources associated with the project. In the email, Dr. Altes provided a project map to Mr. Boonstra for review. As of the submittal of this report, county staff has not responded with any concerns regarding the project.

Procedures to Deal with Unexpected Discoveries

Every reasonable effort has been made during this investigation to identify and evaluate possible locations of prehistoric and historic archaeological sites; however, the possibility exists that evidence of cultural resources may yet be encountered within the project limits. Should evidence of unrecorded cultural resources be discovered during construction activities, all work in that portion of the project area must stop. Evidence of cultural resources includes Native American or historic pottery, prehistoric stone tools, bone or shell tools, historic trash pits, and historic building foundations. Should questionable materials be uncovered during the excavation of the project area, representatives of FDOT, District 5, will assist in the identification and preliminary assessment of the materials. If such evidence is found, the FDHR will be notified within two working days.

In the unlikely event that human skeletal remains or associated burial artifacts are uncovered within the project area, all work in that area must stop. The FDOT, District 5, Cultural Resources Coordinator must be contacted. The discovery must be reported to local law enforcement, who will in turn contact the medical examiner. The medical examiner will determine whether or not the State Archaeologist should be contacted per the requirements of Chapter 872.05, Florida Statutes.

RESULTS

ARCHITECTURAL RESOURCES

The architectural survey resulted in the identification and evaluation of five previously recorded historic resources (**Figure 9**) within the SR 401 Bridge Replacement APE (8BR03009, 8BR03010, 8BR02936, 8BR03394, and 8BR03395). Resources 8BR03009 (FDOT Bridge No. 700030), 8BR03010 (FDOT Bridge No. 700031), and 8BR03395 (FDOT Bridge No. 700117) are historic bridges. The Canaveral Lock (8BR02936) is a historic canal and lock structure, and the SR 528 Causeway (8BR03394) is a historic causeway across the Banana River. All five resources are discussed below. SEARCH Architectural Historian Mikel Travisano conducted both the 2017 survey and the 2021 survey and confirmed that there have been no changes to the previously recorded historic resources in the APE. Therefore, the FMSF forms have not been updated. No existing or potential historic districts were identified. The bridge alternatives analysis is included in **Appendix A**. Project plans are included in **Appendix B**. A survey log sheet is included in **Appendix C**.



Figure 9. Historic resources recorded within the SR 401 Bridge Replacement APE.

NRHP EVALUATIONS

Linear Resources

8BR02936, Canaveral Lock

The Canaveral Lock (8BR02936) is a previously recorded resource group in Brevard County, Florida, that was determined NRHP eligible by the SHPO (USACE 2012). The vast majority of 8BR02936 is located to the west and outside the SR 401 Bridge Replacement APE. Resource 8BR02936 is in Section 15 of Township 24 South, Range 37 East, as shown on the *Courtenay, Fla.* 2021 USGS quadrangle map. The Canaveral Lock was constructed by the USACE in 1965 to provide safe passage for vessels from the Banana River to Port Canaveral and the Atlantic Ocean. The lock is part of the greater Canaveral Barge Canal that extends beyond the project limits to the west and east. The lock is the largest navigation lock in Florida, and its construction size surpassed its original design to accommodate passage of the Saturn Rocket's first stage (USACE 2016). The section of the Resource 8BR02936 within the SR 401 Bridge Replacement APE does not contain any buildings or parts of the lock structure and is approximately 1,061 feet (323 meters) long and approximately 434 feet (132 meters) at its widest point. Within the SR 401 Bridge Replacement APE, the Canaveral Lock (8BR02936) contains a section of the waterway with stone-covered earthen embankments and concrete retaining walls (**Figure 10**). Since much of the resource is located outside the SR 401 Bridge Replacement APE (SEARCH 2017), a full survey of the entire resource was not undertaken as part of the current study.



Figure 10. Resource 8BR02936, facing west.

Assessment

Previously recorded by USACE, the Canaveral Lock (8BR02936) was determined to be NRHP-eligible by the Florida SHPO in 2013 (USACE 2012). Based on the results of the current and previous surveys, the Canaveral Lock (8BR02936) is significant for listing in the NRHP under Criterion A for its association with the Florida space industry and NASA, as well as its transportation associations. Within the APE, the segment of the overall Canaveral Lock (8BR02936) also retains sufficient historic integrity to convey its significance. The Canaveral Lock retains a high level of integrity of association since it continues to operate in its historic role as a canal lock for guiding boats into and out of the Cape Canaveral area, and it maintains its original

location, design, materials, setting, feeling and association. Therefore, SEARCH recommends that Resource 8BR02936 remains eligible for NRHP listing.

Effects Discussion

The current project proposes a “No Build Alternative” or either a “Mid-Level Movable Bascule Bridge,” “Mid-Level Movable Lift Bridge,” or a “High-Level Fixed Bridge” (see **Appendix A**) of three existing bascule bridges. These three bridges are Resources 8BR03009 (FDOT Bridge No. 700030), 8BR03010 (FDOT Bridge No. 700031), and 8BR03395 (FDOT Bridge No. 700117), which span over the Canaveral Lock (8BR02936). The improvements proposed at this location are in keeping with the modernized SR 401 corridor. They will not visually affect Resource 8BR02936 such that its NRHP-eligible status would be compromised, as it is the resource’s associations with NASA and transportation that has contributed to the development of the area that determines its NRHP-eligible status. It is the opinion of SEARCH that proposed project has no potential to adversely affect 8BR02936.

8BR03394, State Road 528 (Emory L. Bennett) Causeway



Figure 11. Resource 8BR03394, facing southeast.

The State Road 528 Causeway (8BR03394), alternately known as the Emory L. Bennett Causeway, is a previously recorded linear resource in Brevard County that was determined ineligible for inclusion in the NRHP by the Florida SHPO (SEARCH 2019). The State Road 528 Causeway (8BR03394) was constructed in 1963 to connect the barrier island communities of Cape Canaveral to the mainland (**Figure 11**). The section of the causeway within the SR 401 Bridge Replacement APE is not set within a township as it is over a body of water. It is located nearest to Section 15 of Township

24 South, Range 37 East, as shown on the *Courtenay, Fla.* 2021 USGS quadrangle map. The causeway carries SR 528/US A1A over the Indian River and the Banana River onto the artificial peninsula on the west side of Cape Canaveral. The segment of the causeway within the SR 401 Bridge Replacement APE is the far eastern portion that extends partially into the Banana River and is approximately 1,944 feet (592 meters) in length. This segment includes a four-lane (two eastbound and two westbound) asphalt-paved portion of SR 528 with a grassy center median (SEARCH 2017).

The causeway was named in honor of Emory L. Bennett, a recipient of the Medal of Honor for his actions during the Korean War (Hill 1993). By the early 1960s, Cape Canaveral had gone from a swamp to a booming industrial city, based around the manufacture of missiles and the US Space

Program (Shofner 1996). Huge numbers of engineers, laborers, and skilled craftsmen flocked to the cape in search of work. By 1960, more than 8,000 Orange County residents were making the commute to Cape Canaveral. In 1963, a bill was signed into law creating the Orlando-Orange County Expressway Authority (OOCEA), which could use tolls to raise the funds needed to build a highway connecting Orlando to Cape Canaveral and the KSC. The intent of the OOCEA and the highways it constructed was to provide workers living in Orange County a faster route to reach their jobs in Cape Canaveral, as well as to promote tourism to the area (Shofner 2001). While the main goal was to build a road to the KSC, the law was written with the intent of a larger expressway network. After careful planning, a route was chosen that used a combination of the existing SR 528 and newly built roadways, with the entire corridor being designated as SR 528, informally known as the “Beachline.” In 1967, the causeway was incorporated into the highway, and in 1968, SR 528 was converted from a two-lane road into a four-lane highway to support the increased traffic flow. The causeway continues to be a major thoroughfare for travelers to Cape Canaveral (SEARCH 2017).

Assessment

The State Road 528 Causeway (8BR03394) is comprised of a causeway island and two sets of paired bridges (FDOT Nos. 700027, 700028, 700114, and 700115). However, the portion of 8BR03394 within the SR 401 Bridge Replacement APE does not contain any bridges and is a fill island constructed from rock and sand and built to support the construction of a roadbed and roadway. The State Road 528 Causeway (8BR03394) was determined ineligible for listing in the NRHP by the SHPO in 2017. It is the opinion of SEARCH that based on the historic research and the results of this survey, 8BR03394 has not gained historical significance since that time and remains ineligible for listing in the NRHP under Criteria A, B, C and D.

Bridges

8BR03009, SR 401 Bridge (FDOT No. 700030, SR-401 SB - Barge Canal)

Resource 8BR03009, the SR 401 Bridge (FDOT Bridge No. 700030), is a previously recorded bridge that was determined ineligible for inclusion in the NRHP by the Florida SHPO (SEARCH 2017). Resource 8BR03009 is one of two parallel SR 401 bridges that carry southbound traffic over the Canaveral Barge Canal; the other is Resource 8BR03010 (FDOT Bridge No. 700031). The bridge is in Township 24 South, Range 37 East, as shown on the *Courtenay, Fla.* 2021 USGS quadrangle map. The ca. 1965 bridge (**Figure 12**) is a 314-foot-long, 36-foot-wide, double-leaf trunnion bascule bridge (ACI 2012). The bridge is flanked by FDOT Bridge No. 700031 (Resource 8BR03010) on the west and FDOT Bridge No. 700117 (Resource 8BR03395) on the east (see **Figure 9**) (SEARCH 2017).

The bridge deck is composed of concrete on both sides of the movable span. The bridge has two steel grate deck movable leaves that meet at the center of the main span. The overall width of the bridge is 36 feet; this includes SR 401 and two raised pedestrian sidewalks (east and west) on either side of the roadway. The outboard side of both sidewalks has a low concrete wall topped



Figure 12. Resource 8BR03009 in 2021, facing northeast, left and in 2017, facing north, right.

with a steel and aluminum railing, and the movable span has a steel railing along the outboard side. The deck of the bridge approaches is supported by four parallel concrete stringers spanning

the distance between the concrete abutments and two pile bents with precast concrete caps. The section on either side of the main span is supported by five steel stringers, and the steel deck movable span is supported by two, built-up plate girders on the outboard side and five steel stringers. Transverse bracing of the main span is achieved through secondary members set perpendicular to the plate girders and cross bracing attached with gusset plates. The moveable leaves, including their counterweights, trunnions (axels), racks, and pinions, are supported by two rectangular bascule piers (SEARCH 2017).

Two protective timber fenders with wooden walkways and metal railings are located at the water line just below the main span and extend east and west beyond the bridge. A raised concrete perimeter roadway is located between the water and the abutment and travels under the south side of the bridge. The embankments on either side of the abutments are covered with articulating grout filled mattresses (FHWA 1997:47). The remaining sections of the sloped embankments are covered with grass. A shared tender station is located on the west side of the main span on an elevated concrete platform and just north of a walkway that connects Resources 8BR03009 and 8BR03010 (**Figure 13**). The modest structure is a rectangular, two-story concrete box with a flat roof featuring a wide eave overhang. The building features fixed-sash metal windows, independent, in corner pairs, and in groupings of four, providing a full view of the surrounding bridges and area from the second story of the structure. The glazed pair of steel doors is accessed via the pedestrian walkway and located on the south façade. The overall condition of the bridge is excellent with few visible spalls and cracks and no changes to the bridge structure between 2017 and 2021 (see **Figure 12**).



Figure 13. Resource 8BR03010, left. Tender station, center. Resource 8BR03009, right, facing north.

Assessment

Resource 8BR03009, SR 401 Bridge (FDOT No. 700030), was included in the 2012 edition of *Historic Highway Bridges of Florida* and was recommended ineligible for NRHP listing by the surveyor (ACI 2012). The 2021 3rd Quarter Florida Bridge Information list (FDOT 2021) notes that the SR 401 Bridge (FDOT No. 700030) was reconstructed in 2011; however, based upon a careful examination of the physical fabric, it appears that parts of the original bridge were retained, most noticeably the movable leaves, which are identical for Resources 8BR03009 and 8BR03010 (Figure 14).

Resource 8BR03009, SR 401 Bridge (FDOT No. 700030), was determined ineligible for listing in the NRHP by the SHPO in 2017. It is the opinion of SEARCH that based on the historic research and the results of this survey, 8BR03009 has not gained historical significance since that time and lacks the minimum criteria for listing in the NRHP under Criteria A, B, C and D either individually or as a contributing resource to a historic district.



Figure 14. Resources 8BR03009 and 8BR03010 in 2017, facing northwest (top) and in 2021, facing northwest, (bottom).

8BR03010, SR 401 Bridge (FDOT Bridge No. 700031, SR-401 SB - Barge Canal)

Resource 8BR03010, the SR 401 Bridge (FDOT Bridge No. 700031), is a previously recorded bridge that was determined ineligible for inclusion in the NRHP by the Florida SHPO (SEARCH 2017). Resource 8BR03010 is one of two SR 401 bridges that carry southbound traffic over the Canaveral Barge Canal; the other is the previously mentioned Resource 8BR03009 (FDOT Bridge No. 700030). The bridge is in Township 24 South, Range 37 East, as shown on the *Courtenay, Fla.* 2021 USGS quadrangle map. The ca. 1965 bridge is a 314-foot-long, 36-foot-wide, double-leaf trunnion bascule bridge (ACI 2012) (**Figure 15**). Resource 8BR03010 (FDOT Bridge No. 700031) is located just west of Bridge No. 700030 (see **Figure 9**) (SEARCH 2017).

The bridge deck is composed of concrete on both sides of the movable span. The bridge has two steel grate deck movable leaves that meet at the center of the main span. The overall width of the bridge is 36 feet; this total includes SR 401 and two raised pedestrian sidewalks (east and west) on either side of the roadway. The outboard side of both sidewalks has a low concrete wall topped with a steel and aluminum railing, and the movable span has a steel railing along the

outboard side. The deck of the bridge approaches is supported by four parallel concrete stringers spanning between the concrete abutments and two pile bents with precast concrete caps. The section on either side of the main span is supported by five steel stringers, and the steel deck movable span is supported by two built-up plate girders on the outboard side and five steel stringers. Transverse bracing of the main span is achieved through secondary members set perpendicular to the plate girders and cross bracing attached with gusset plates. The moveable leaves, including their counterweights, trunnions (axels), racks, and pinions, are supported by two rectangular bascule piers (SEARCH 2017).



Figure 15. Resource 8BR03010, facing northeast.

Two protective timber fenders (**Figure 16**) with wooden walkways and metal railings are located at the water line just below the main span and extend east and west beyond the bridge. A raised



Figure 16. Resource 8BR03010, facing northeast.

concrete perimeter roadway is located between the water and the abutment and travels under the south side of the bridge. The remaining sections of the sloped embankments are covered with grass and grout. A shared tender station is located on the east side of the main span on an elevated concrete platform and just north of a walkway that connects Resources 8BR03009 and 8BR03010 (see **Figure 13**). The overall condition of the bridge is excellent with some visible concrete spalling (SEARCH 2017).

Assessment

Resource 8BR03010, SR 401 Bridge (FDOT No. 700031), was included in the 2012 edition of *Historic Highway Bridges of Florida* and was recommended ineligible for NRHP listing by the surveyor (ACI 2012). The 2021 3rd Quarter Florida Bridge Information list notes that the SR 401 Bridge (FDOT No. 700031) has never been reconstructed and the structure is identical to Resource 8BR03009, which was reconstructed in 2011 (FDOT 2021). Resource 8BR03010, SR 401 Bridge (FDOT No. 700031) was determined ineligible for listing in the NRHP by the SHPO in 2017. It is the opinion of SEARCH that based on the historic research and the results of this survey, 8BR03010 has not gained historical significance since that time and lacks the minimum criteria for listing in the NRHP under Criteria A, B, C and D either individually or as a contributing resource to a historic district.

8BR03395, SR 401 Bridge (FDOT Bridge No. 700117, SR-401 NB - Barge Canal)

Resource 8BR03395, SR 401 Bridge (FDOT Bridge No. 700117), is a previously recorded bridge that was determined ineligible for inclusion in the NRHP by the Florida SHPO (SEARCH 2017). The SR 401 Bridge carries northbound traffic over the Canaveral Barge Canal. The bridge is in Township 24 South, Range 37 East, as shown on the *Courtenay, Fla.* 2021 USGS quadrangle map. The ca. 1971 bridge is a 314-foot-long, 47-foot-wide, double-leaf trunnion bascule bridge. FDOT Bridge No. 700117 (Resource 8BR03395) is located just east of Bridge No. 700030 (SEARCH 2017).

The bridge deck is composed of concrete on both sides of the movable span. The bridge has two steel grate deck movable leaves that meet at the center of the main span (**Figure 17**). The overall width of the bridge is 47 feet; this includes SR 401 and two raised pedestrian sidewalks (east and west) on either side of the roadway. The outboard side of both sidewalks has a low concrete wall topped with a steel and aluminum railing, and the movable span has a steel railing along the outboard side. The deck of the bridge approaches is supported by six parallel concrete stringers spanning between the concrete



Figure 17. Resource 8BR03395, facing northeast.

abutments and two pile bents with precast concrete caps. The section on either side of the main span is supported by six steel stringers, and the steel deck movable span is supported by two built-up plate girders on the outboard side and six steel stringers. Transverse bracing of the main span is achieved through secondary members set perpendicular to the plate girders and cross bracing attached with gusset plates. The moveable leaves, including their counterweights, trunnions (axels), racks, and pinions, are supported by two rectangular bascule piers (SEARCH 2017).

Two protective timber fenders with wooden walkways and metal railings are located at the water line just below the main span (**Figure 18**) and extend east and west beyond the bridge. A raised concrete perimeter roadway is located between the water and the abutment and travels under the south side of the bridge. The embankments on either side of the abutments are covered by grout with remaining sections of the sloped embankments are covered with grass (SEARCH 2017).



Figure 18. Resource 8BR03395, facing northwest.

Assessment

Bridge No. 700117 was not included in the 2004 or 2012 editions of *Historic Highway Bridges of Florida* (ACI 2012; Jackson 2004). The 2021 3rd Quarter Florida Bridge Information list (FDOT 2021) notes that the SR 401 Bridge (FDOT Bridge No. 700117) was reconstructed in 2010; however, based upon a careful examination of the physical fabric, it appears that parts of the original bridge were retained, most noticeably the movable leaves. Rather than being completely reconstructed in 2010, it is likely that, at that time, the bridge was extensively refurbished and many of the deteriorated elements were either repaired or replaced; however, key features, including the movable leaves, were retained (SEARCH 2017). Resource 8BR03395, SR 401 Bridge (FDOT No. 700117) was determined ineligible for listing in the NRHP by the SHPO in 2017. It is the opinion of SEARCH that based on the historic research and the results of this survey, 8BR03395 has not gained historical significance since that time and lacks the minimum criteria for listing in the NRHP under Criteria A, B, C and D either individually or as a contributing resource to a historic district.

CONCLUSION AND RECOMMENDATIONS

This report presents the findings of a Phase I CRAS conducted in support of bridge replacement along SR 401 (SR A1A) in Brevard County, Florida. The FDOT, District 5, is proposing four possible alternatives, including a “No Build Alternative” for the replacement of three existing bascule bridges. In addition to the “No Build Alternative,” which would leave the existing bridges in place, the project proposes either a “Mid-Level Movable Bascule Bridge,” “Mid-Level Movable Lift Bridge,” or a “High-Level Fixed Bridge” over the Canaveral Barge Canal.

The “Mid-Level Movable Bascule Bridge” would replace the current three bascule bridges with two bascule bridges that would carry traffic northbound and southbound along the existing bridge alignment. The “Mid-Level Movable Lift Bridge” would replace the current three bascule bridges with two vertical-lift bridges that would carry traffic northbound and southbound along the existing bridge alignment. The “High-Level Fixed Bridge” would replace the current three bascule bridges with two fixed span bridges that would carry traffic northbound and southbound along the existing bridge alignment. Additional improvements include roadway widening and/or realignment of existing ramps. The bridge and associated roadway improvements will take place within the existing right-of-way; no additional right-of-way is proposed.

Given the absence of natural soils within the project right-of-way, no archaeological survey was conducted.

The architectural survey resulted in the identification and evaluation of five previously recorded historic resources within the SR 401 Bridge Replacement APE (8BR03009, 8BR03010, 8BR02936, 8BR03394, and 8BR03395). Resources 8BR03009 (FDOT Bridge No. 700030), 8BR03010 (FDOT Bridge No. 700031), and 8BR03395 (FDOT Bridge No. 700117) were determined ineligible for inclusion in the NRHP by the Florida SHPO (SEARCH 2017). The SR 528 Causeway (8BR03394) was determined ineligible for inclusion in the NRHP by the Florida SHPO (SEARCH 2019). Finally, the Canaveral Lock (8BR02936) resource group has previously been determined eligible for listing in the NRHP by the Florida SHPO (USACE 2012, SEARCH 2017), and based upon the results of the current survey, 8BR02936 remains eligible for NRHP listing. No existing or potential historic districts were identified. No further architectural history survey is recommended.

Given the results of the CRAS, it is the opinion of SEARCH that the proposed SR 401 Bridge Replacement project will have no adverse effect to Resource 8BR02936, which is eligible for listing in the NRHP. No further work is therefore recommended according to current designs.

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APPENDIX A.

BRIDGE ALTERNATIVE ANALYSIS

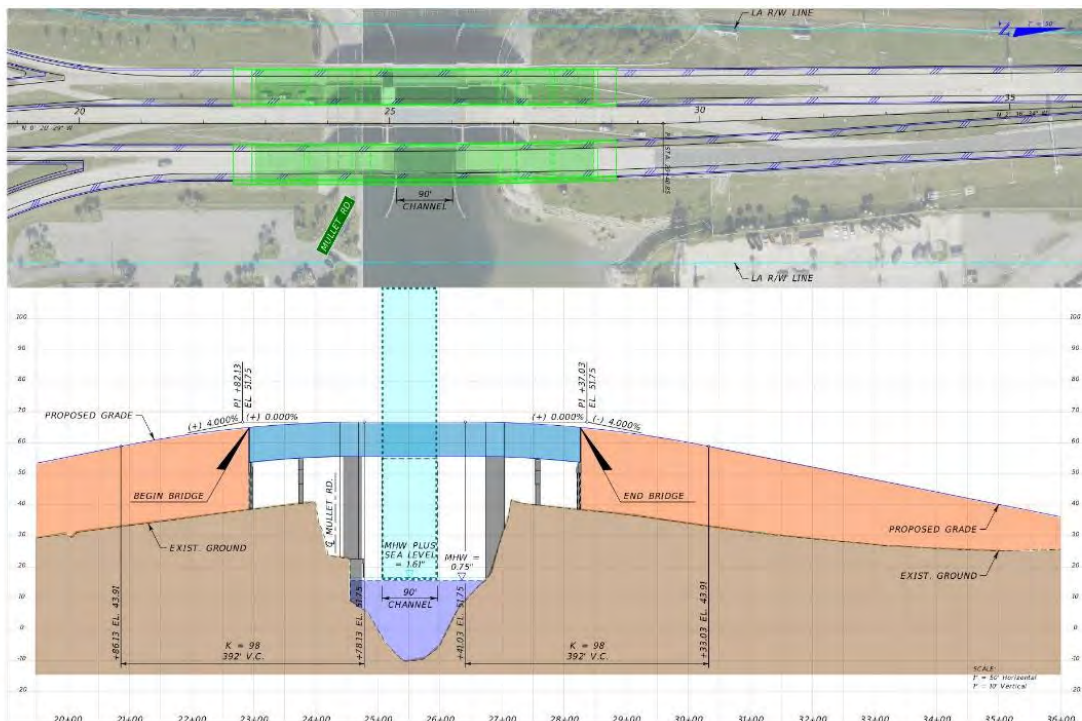
The following are descriptions of the alternatives being analysis for the SR 401 Bridge Replacement PD&E Study.

No Build Alternative

The No Build Alternative consists of leaving the existing bascule bridges in place. The existing bridges will continue to provide a 25-foot vertical clearance (MHW) in the closed position and a horizontal clearance of 90 feet at the main navigational channel. Bridge inspection reports prepared by the Florida Department of Transportation (FDOT) have classified the SR 401 bascule bridges at Port Canaveral as functionally obsolete due to not meeting current FDOT bridge design standards. The bridges were constructed in 1963 and are due for an update. A 2011 Spaceport Area infrastructure assessment study identified the SR 401 bridge as critically important and that the current bridge “weight limits and insufficient capacity can inhibit economic growth” of the region.

Mid-Level Movable Bascule Bridge Alternative

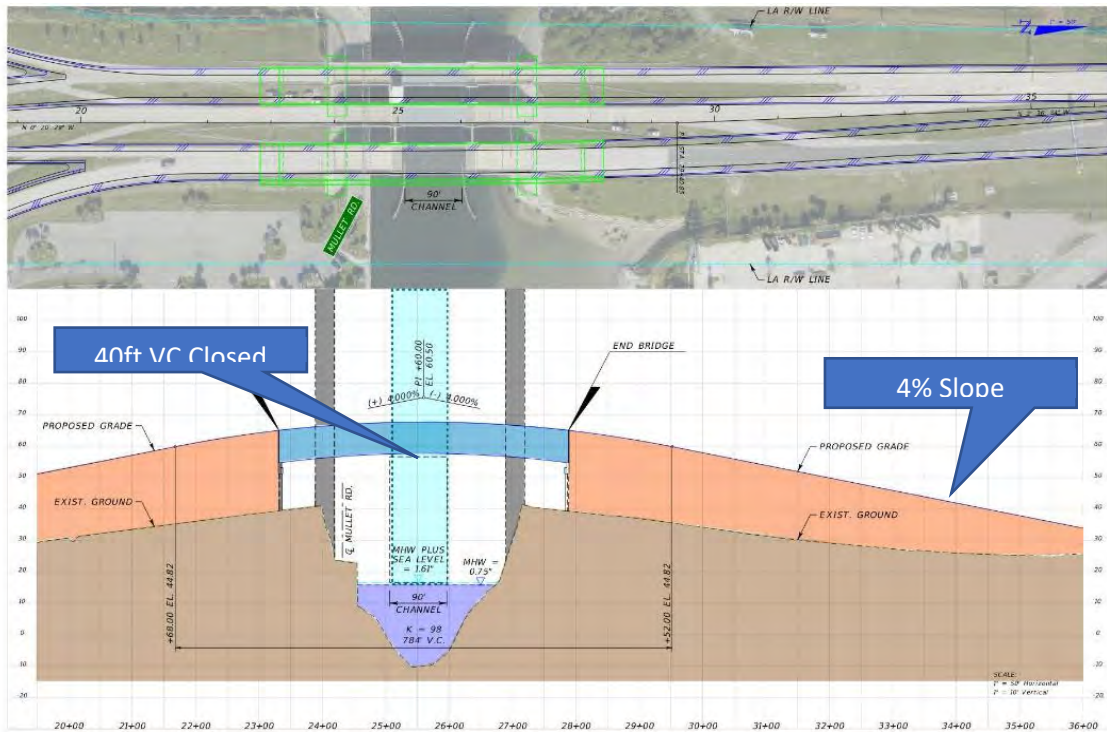
This Alternative considers replacing the existing three bascule bridges with two separate 3-lane bascule bridges, in the northbound/southbound directions, located along the existing bridge alignment. This alternative would provide a **mid-level** profile allowing for a 40-foot vertical clearance in the closed position and an unlimited open clearance in the open position. The existing horizontal clearance is a 90-foot main navigational channel. The total bridge length is 1,120 feet, and the maximum grade is 4%. The existing bascule bridges are classified as functionally obsolete, and this alternative would address that issue. The number of bridge openings will be reduced from 1,296 (current) to 312 per year (2025), and the traffic delays will be reduced from ~ 138 hours (current) to ~ 33 hours (2025).



Mid-Level Movable Lift Bridge Alternative

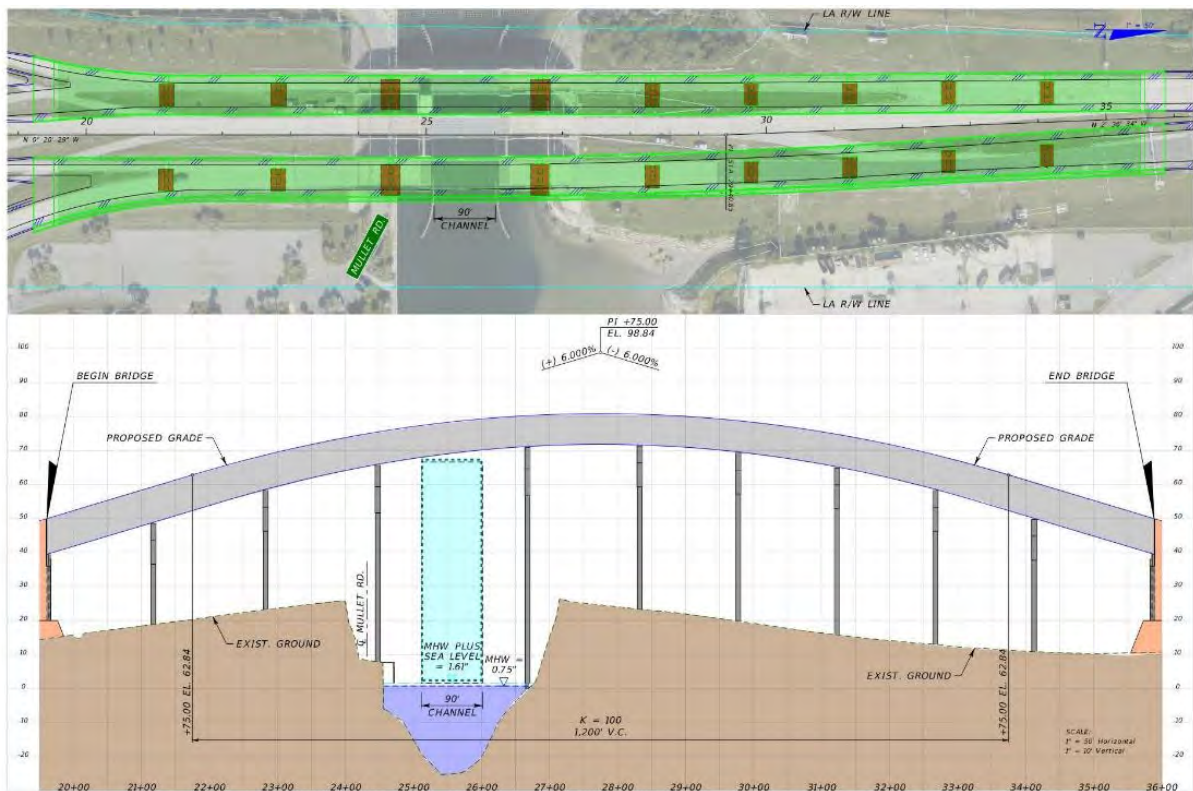
This Alternative considers replacing the existing three bascule bridges with two separate 3-lane lift bridges, in the northbound/southbound directions, located on the existing bridge alignment. A vertical lift bridge span, which can open/close faster than a bascule bridge, rises vertically while remaining parallel with the deck, whereas a bascule bridge operates with a counterweight that continuously balances a span, throughout its upward swing.

This alternative would provide a **mid-level** profile allowing for a 40-foot vertical clearance in the closed position and an 85+-foot clearance in the open position due to the existing FP&L lines to the west. The existing horizontal clearance is a 90-foot main navigational channel. The total bridge length is 970 feet, and the maximum grade is 4%. The existing bascule bridges are classified as functionally obsolete, and this alternative would address that issue. The number of bridge openings will be reduced from 1,296 (current) to 312 per year (2025), and the traffic delays will be reduced from ~ 138 hours (current) to ~ 33 hours (2025).



High-Level Fixed Bridge Alignment

This Alternative considers replacing the existing three bascule bridges with two separate 3-lane **high-level**, fixed span concrete bridges located on the existing bridge alignment, in the northbound/southbound directions. This improvement would provide a maximum 65-foot vertical clearance above mean high water and a 90-foot horizontal clearance at the main navigational channel. The total bridge length is 3,220 feet, and the maximum grade is 6%. The existing bascule bridges are classified as functionally obsolete, and this alternative would address that issue.



APPENDIX B.

PROJECT PLANS

APPENDIX C.

FDHR SURVEY LOG SHEET

Ent D (FMSF only) _____



Survey Log Sheet

Florida Master Site File
Version 5.0 3/19

Survey # (FMSF only) _____

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Manuscript Information

Survey Project (name and project phase)

CULTURAL RESOURCE ASSESSMENT SURVEY IN SUPPORT OF THE SR 401 BRIDGE REPLACEMENTS PD&E STUDY

Report Title (exactly as on title page)

CULTURAL RESOURCE ASSESSMENT SURVEY IN SUPPORT OF THE SR 401 BRIDGE REPLACEMENTS PD&E STUDY
BREVARD COUNTY, FLORIDA

Report Authors (as on title page)

- 1. Mikel Travisano
- 2. Angela Matusik
- 3. Kristina Altes
- 4. Ashley Parham

Publication Year 2022

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Supervisors of Fieldwork (even if same as author) Names Mikel Travisano

Affiliation of Fieldworkers: Organization Southeastern Archaeological Research City Newberry

Key Words/Phrases (Don't use county name, or common words like *archaeology, structure, survey, architecture, etc.*)

- 1. Bridge
- 2. Brevard
- 3. 401
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____

Survey Sponsors (corporation, government unit, organization, or person funding fieldwork)

Name Catherine Owen Organization Florida Dept of Transportation - District 5

Address/Phone/E-mail 719 South Woodland Boulevard, DeLand, Florida 32720

Recorder of Log Sheet Travisano, Mikel Date Log Sheet Completed 12-29-2021

Is this survey or project a continuation of a previous project? No Yes: Previous survey #s (FMSF only)

Project Area Mapping

Counties (select every county in which field survey was done; attach additional sheet if necessary)

- 1. Brevard
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____

USGS 1:24,000 Map Names/Year of Latest Revision (attach additional sheet if necessary)

- 1. Name COURTENAY Year 2021
- 2. Name _____ Year _____
- 3. Name _____ Year _____
- 4. Name _____ Year _____
- 5. Name _____ Year _____
- 6. Name _____ Year _____

Field Dates and Project Area Description

Fieldwork Dates: Start 12-20-2021 End 12-20-2021 Total Area Surveyed (fill in one) _____ hectares _____ acres

Number of Distinct Tracts or Areas Surveyed _____

If Corridor (fill in one for each) Width: _____ meters _____ feet Length: _____ kilometers _____ miles

Research and Field Methods

Types of Survey (select all that apply): archaeological architectural historical/archival underwater
 damage assessment monitoring report other(describe): _____

Scope/Intensity/Procedures

Architectural History Pedestrian Survey

Preliminary Methods (select as many as apply to the project as a whole)

Florida Archives (Gray Building) library research- local public local property or tax records other historic maps LIDAR
 Florida Photo Archives (Gray Building) library-special collection newspaper files soils maps or data other remote sensing
 Site File property search Public Lands Survey (maps at DEP) literature search windshield survey
 Site File survey search local informant(s) Sanborn Insurance maps aerial photography
 other (describe): _____

Archaeological Methods (select as many as apply to the project as a whole)

Check here if NO archaeological methods were used.
 surface collection, controlled shovel test-other screen size block excavation (at least 2x2 m) metal detector
 surface collection, uncontrolled water screen soil resistivity other remote sensing
 shovel test-1/4" screen posthole tests magnetometer pedestrian survey
 shovel test-1/8" screen auger tests side scan sonar unknown
 shovel test 1/16" screen coring ground penetrating radar (GPR)
 shovel test-unscreened test excavation (at least 1x2 m) LIDAR
 other (describe): _____

Historical/Architectural Methods (select as many as apply to the project as a whole)

Check here if NO historical/architectural methods were used.
 building permits demolition permits neighbor interview subdivision maps
 commercial permits windshield survey occupant interview tax records
 interior documentation local property records occupation permits unknown
 other (describe): Pedestrian survey

Survey Results

Resource Significance Evaluated? Yes No

Count of Previously Recorded Resources 5 Count of Newly Recorded Resources _____

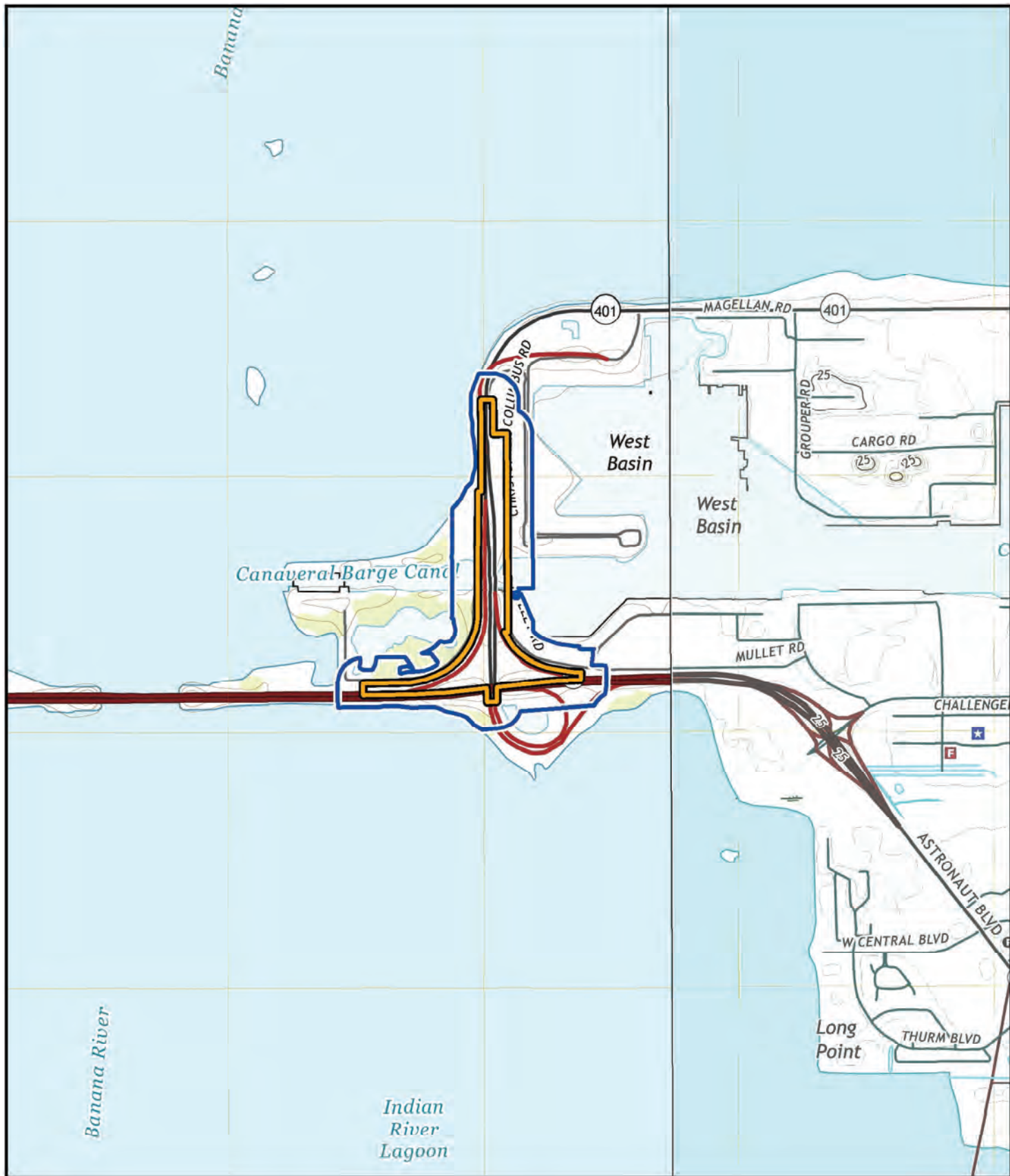
List Previously Recorded Site ID#s with Site File Forms Completed (attach additional pages if necessary)

List Newly Recorded Site ID#s (attach additional pages if necessary)

Site Forms Used: Site File Paper Forms Site File PDF Forms

REQUIRED: Attach Map of Survey or Project Area Boundary

SHPO USE ONLY SHPO USE ONLY SHPO USE ONLY
Origin of Report: 872 Public Lands UW 1A32 # _____ Academic Contract Avocational
 Grant Project # _____ Compliance Review: CRAT # _____
Type of Document: Archaeological Survey Historical/Architectural Survey Marine Survey Cell Tower CRAS Monitoring Report
 Overview Excavation Report Multi-Site Excavation Report Structure Detailed Report Library, Hist. or Archival Doc
 Desktop Analysis MPS MRA TG Other: _____
Document Destination: Plottable Projects Plotability: _____



- SR 401 Bridge Replacement APE
- SR 401 Bridge Replacement ROW



USGS 7.5' Quadrangle Maps -
 Courtenay (2018) and
 Cape Canaveral (2018)

