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AVCON'S APPROACH AND PROCESS

NATURE OF SERVICES TO BE PROVIDED BY AVCON FOR THE DESIGN OF THE WEKIVA TRAIL, SEGMENT 1

The Wekiva Trail Segment 1 has been identified as a high priority project in Lake County. The 14-foot trail will utilize existing CSX rail corridor and will extend from west of Tremaine Street to SR 46 (Sorrento Road) for a distance of approximately 5.5 miles. This trail segment will provide another link for greater pedestrian and bicycle connectivity through the existing adjacent trail networks such as the Tav-Dora Trail and West Orange Trail, among others. This project will extend Lake County's reputation as a pedestrian and bicycle friendly community. The **AVCON** team will prepare plans and specifications for the construction of the trail; design the connections to existing roadways, pedestrian features, and parks; and incorporate the trail into the natural environment with minimal impact. Based on our site observations and discussions with County staff, we understand the major design issues for this project will be maintaining existing drainage patterns; treatment of road crossings (particularly at landfill site); public involvement; eliminating the need for additional right-of-way; safety and security of the trail facility; and preservation and integration of historic rail bridges at Tremaine Street and US 441 (SR 500).

The project is LAP funded through the FDOT. **AVCON** has extensive experience working on LAP projects. We know the process and will ensure the needs and desires of Lake County are executed throughout design. We also understand that significant design, coordination, and agreements regarding the Wekiva Trail were performed during the PD&E phase that will guide the final design efforts for the project. One key document that will be followed is the Minor Categorical Exclusion (MiCE) signed by FDOT and FHWA in December of 2016. Among other commitments in the document is the requirement to utilize existing historical rail bridges if possible, or to salvage materials for display. Addressing historical bridges at Tremaine Street and US 441 will be one of the major keys to design. Below AVCON provides our solutions to major issues that will be encountered during design.

Structures: **AVCON** understands this project includes the repurposing of two existing railroad bridges with the intent to maintain their historic significance and remembering that the railroad was an integral part of Lake County transportation from the late 1800s to the 1960s moving citrus, food, and goods.

One of these rail bridges is a timber bridge that spans Tremaine Street in Mt. Dora and is considered eligible for inclusion in the National Registry. The other is a steel framed riveted girder bridge that spans the four lanes of US 441 in Mount Dora and is also eligible for inclusion in the national Register. In order to preserve the Tremaine Street Bridge, very early in the project schedule, **AVCON** will determine if Design Exceptions are warranted for the lane widths under the bridge, the vertical clearance under the bridge, and pier protection for the timber



Existing Tremaine Street Bridge

piles. We will evaluate the need for pier protection along Tremaine Street since the timber piles are currently not protected from vehicular collision. We will inspect both bridge structures to identify any deficiencies and provide a comprehensive structural analysis and load rating to determine the existing structural capacities. These bridges were originally designed to carry a railroad live load and should have adequate capacity to carry

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Existing US 441 Bridge

the required AASHTO pedestrian loads and H-10 Live Load. A bridge assessment design report will be prepared that summarizes the findings of the inspections, load ratings and recommendations for repairs. It will also provide estimated costs for the proposed repairs and modifications.

Per the PD&E commitments, **AVCON** will work with Lake County to establish a Design and Aesthetics Committee to consult with all the local stakeholders in order to incorporate aesthetic details to preserve the

historic nature of the two bridges. We recommend holding at least two meetings. The first meeting would be to allow the historical society members, Lake County concerned citizens, and the project designers to collaborate on the vision and appearance for the structures. The second meeting would be scheduled after the design team has fully inspected the structures and documented the necessary repairs/rehabilitation required along with a feasibility report and can present preliminary concepts to the group in order to get consent on the final appearance.

For the Tremain Street Bridge, a Cost/Benefit analysis will also be presented to include the following:

1. Adhering to the PD&E study of replacing the rails with a timber decking and posts while maintaining an 8'-0" open trail width
2. Replacing the rails with a low-profile concrete deck surface to provide better traction during the rainy season and including timber in the design for aesthetics
3. Replacing the rails with a wider bridge deck (if structural analysis allows) to 10 ft or even 12 ft to accommodate a greater number of pedestrians and trail traffic according to it being closer to downtown Mount Dora and the interest it may draw

Borelli + Partners was involved in the PD&E phase of the project and helped to develop the preliminary plans and architectural renderings that will help the public to determine the final design appearance. Borelli + Partners is a team member with **AVCON** for this pursuit.

We also understand that the PD&E study recommended raising the steel framed rail bridge over US 441 between 2 ft to 3 ft in order to improve the minimum vertical clearance under the bridge from 14'-5" to 17'-6" over the roadway. This can be accomplished by jacking and supporting the superstructure slightly above its new elevation to remove the load from the piers. Then constructing pedestals under the existing bearings at each pier column. Prefabricated steel box pedestals will be considered to facilitate construction and reduce the time required for lane closures along US 441. Aesthetics can be added to the pedestals to help them blend with the existing concrete pier columns.

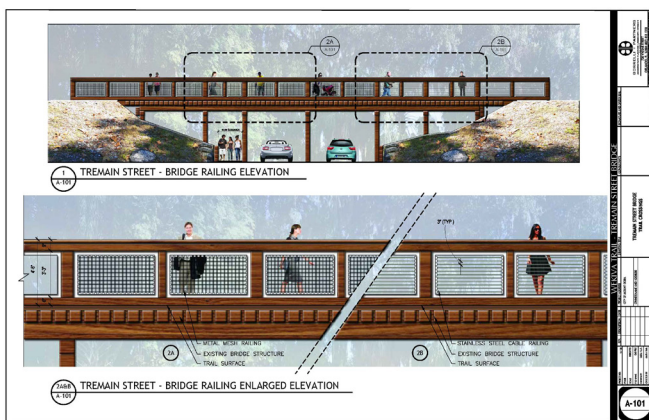
A Cost/Benefit analysis will also be performed for the steel rail bridge. The existing bridge includes corroded and damaged members that will need to be repaired. These include impact damage to the steel girder flanges from traffic below and maintenance to the bridge deck drainage and expansion joints. A sampling of the paint will also need to be performed to test for the presence of lead. If lead-based paint is found, then the cost to

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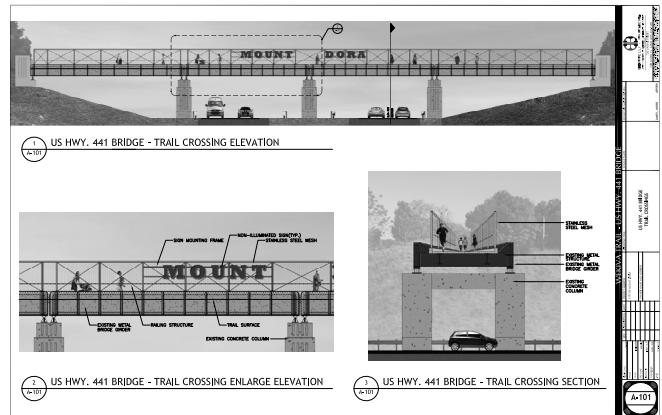
repaint will be compared with just encapsulating the existing paint. A repainting of the entire steel surfaces will require lane closures on US 441.

In addition to significant changes required for the historic bridges noted above, the underpass at Highland Street will require cosmetic upgrades. There is graffiti under the bridge and anti-graffiti coating per FDOT Specification 563 should be applied. If budget allows, **AVCON** would recommend a sacrificial coating so that it will remain even after cleaning. Additionally, existing terrain falls off steeply away from existing railroad bed east of Swan Road. Depending on survey details small retaining walls may be required to keep slopes within existing right-of-way.

Landscape Architecture: Utilizing and enhancing the existing traits of the rail corridor, as noted above, will help this segment of trail connect with the community creating a sense of place. Our Architecture and Landscape team was involved with the PD&E phase and is excited to continue that experience through final design, enhancing the aesthetics of the existing bridges.



Tremain Street Bridge Draft Rendering



US 441 Bridge Rendering

Cultural Resources Approach (CRAS): These historic bridges will also be the focus of cultural resources design. All work shall be conducted by a professional who meets the Secretary of the Interior's Professional Qualification Standards (48 FR 44716) for archaeology, history, or architecture. Concurrence with the findings of the report shall be obtained from Florida State Historic Preservation Officer (SHPO). ACI will conduct the field work to support the CRAS. It is anticipated that the above bridges may qualify for the National Historic Registry.

The CRAS shall be prepared with appropriate documentation. Any design changes since the Section 106 Case Study Report will be documented and updated forms will be prepared if any resources have been substantially altered since they were recorded. All work shall be done in compliance with the National Historic Preservation Act of 1966 (Public Law 89-665, as amended) and the implementing regulations (36 CFR 800) as well as with the provisions contained in Chapter 267.061, Florida Statutes.

Trail Geometry/Typical Section: Most of the trail will be at longitudinal grades less than 4% and therefore utilize 18 MPH design speeds, per FDOT Design Manual (FDM) Section 224. Due to rolling nature of topography east of US 441 grades greater than 4% may be encountered. If this is confirmed, higher design speed of 30 MPH should be used in those sections only. The minimum radii for 18 MPH and 30 MPH are 86 ft and 316 ft, respectively. If a tighter radius is needed to keep the trail within right-of-way, warning signs will be considered to eliminate right-of-way acquisition, however, this condition is not anticipated. Per FDM Section 224.12, the trail will be placed a minimum of five feet from the paved shoulder on flush roadways.

A 14 ft asphalt trail is anticipated for the entire limits of this project. The trail will utilize a uniform 2% cross slope, provide two-foot level sodded area on either side and tie down to existing grade at maximum of

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1:2 slope. If right-of-way and budget allows a 1:3 or flatter side slope may be utilized to aid maintenance activities. As a pavement design example, the FDOT FDM 224.17 section for a standard "shared use path" consists of 1.5-inches of Type SP Structural Course (Traffic A) asphalt on Optional Base Group 1 (equivalent to four inches Limerock) and 12 inches of Type B Stabilization (LBR 40); however, this design will be evaluated based on geotechnical conditions and loading. If the trail will be subject to temporary or occasional vehicular loading for equipment maintenance, inspection, mowing, etc., **AVCON** will work with the County to develop a pavement section capable of handling the temporary loads without damage to the trail. Additional pavement designs per County, AASHTO and/or FDOT standards may be required for improvements to intersections and side streets. At a minimum a significantly strengthened pavement section will be provided for trail crossing at the Mid Florida Materials Recycle and Disposal facility.



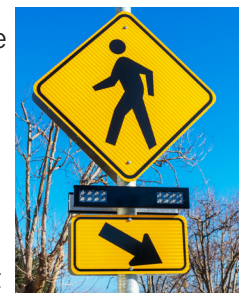
Sidewalk Connection at S. Clayton Street

All trail elements will adhere to the Americans with Disability Act (ADA) requirements. This will include the max 2% cross slope, maximum running grades of 5% and ramp grades of 8.3%. One area of focus will be the connection to existing sidewalk on the west side of South Clayton Street at the trail crossing. The existing sidewalk is considerably higher than the existing rail elevation, and sections of sidewalk may have to be reconstructed to meet ADA requirements.

Trail/Road Crossings: There are ten road crossings, not including rail bridges and underpasses. Each trail crossing will be designed with extreme care with safety for the trail users and motorists being the primary concern. Each crossing will meet or exceed ADA standards to maximize the comfort and enjoyment of the recreation activities. All crossings will require shared-use path scaled signs to prevent cyclists from proceeding into cross traffic. Mid-block crossings require special attention during design. For minor, two-lane crossings, proper roadway lighting and crosswalk markings should adequately identify the trail crossing. In other crossings with heavy traffic volumes, such as at the trail crossing at Mid Florida Materials Recycle and Disposal facility (landfill), a more identifiable and enforceable crossing with advance signing may be necessary. At this location, the vehicles that will traverse the trail are large industrial trucks that will require additional safety measures. The trail crossing at Round Lake Road will also require special attention due to high traffic volumes and vehicle speeds. Potential solutions include **Rapid Rectangular Flashing Beacons** (RRFB), or overhead pedestrian signals. **AVCON** has found RRFB to be an cost-effective tool to bring added safety to pedestrian crossings. Rapid flashing lights would not



Truck Traffic at Landfill



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come on unless activated by trail user. **AVCON** also has experience designing pedestrian signals and getting signal warrants approved by and FDOT Traffic departments, should a signal be needed. Decisions will be unique to each intersection and will be evaluated as part of the preliminary engineering phase of the project and presented to Lake County to obtain staff guidance. Additional details will be required for trail crossing of SR 46, however, that crossing appears to be outside the limits of this project. If design of the next segment is concurrent, **AVCON** will coordinate with that design team, or coordination with FDOT for anticipated improvements will be performed.

Signing and Pavement Markings: New shared-use trail pavement markings and scaled signs (MUTCD Table 9B-1) will be installed on the trail as required or recommended per applicable County, FDOT and MUTCD criteria. Additional standard signs and pavement markings will be installed where the trail crosses existing roadways. Part 9 of the current edition of the MUTCD provides guidance and illustrations that will apply directly to this project. In addition, all railroad ahead signage and pavement markings will be removed and replaced with trail/pedestrian ahead signage. Consideration will be given to surface asphalt layer milling and resurfacing to eliminate the pavement markings to provide a better aesthetic appearance, if budget allows. Additional warning signs should be considered for southern approach to the trail on Grandview Street due to elevation change of roadway, curve in roadway alignment, and over hanging foliage.



Site Line Issues at Grandview Street

Drainage Design and Permitting: The existing drainage patterns are likely to be maintained. We anticipate that the project will not require an environmental resource permit from St. Johns River Water Management District (SJRWMD) based on Section 40C-42.0225 (6), which indicates that "recreational paths which do not allow motorized vehicles powered by internal combustion engines are exempt from notice and permit requirements." A letter of permit determination will be sent to the agency early in the design process to determine the necessary documentation that will be needed. **AVCON** has successfully pursued and obtained permit exemptions with SJRWMD for previously designed trail projects. Should a permit be required, **AVCON** has experience obtaining permits through SJRWMD and will work with Lake County to obtain the permit while minimizing impacts to the project. Should Lake County desire any treatment above and beyond SJRWMD requirements, drainage treatment can be provided by a series of swales, then routed to existing outfall locations or allowed to percolate on site. Portions of the site may fall within flood zone AE and any fill would be offset by cut to adjacent areas within the corridor.

Trail crossing at Rossiter Street appears to be at a sag, or low point, of the roadway alignment. During design, additional investigation will be done to ensure drainage has positive outfall away from trail. Additionally, curb inlet drainage structures will require adjustment on the east side of Liberty Street at the trail crossing. During our site visit, **AVCON** noted that the existing rail bed is covered with silt just east of the Highland Street underpass. We will consider raising the grade of trail in this area and/or providing culverts to keep the water moving and reduce the possibility of ponding over the trail and silt accumulation.

Environmental Permitting: The Proposed Wekiva Trail Segment 1 corridor is comprised of a mixture of landcover classifications but is developed (residential, commercial, industrial, and recreational) and intertwined with natural lands (agricultural, rangelands, upland forests, and wetlands). The project corridor is

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entirely within the United States Fish and Wildlife Service's (USFWS) Consultation Area (CA) for the Florida scrub-jay (*Alphelocoma coerulescens*), sand skink (*Plestiodon reynoldsi*), Everglade snail kite (*Rostrhamus sociabilis*), and Lake Wales Ridge plants. Potential habitat for the Florida scrub-jay occurs within the project corridor; however no scrub-jays have been documented to occur within the project limits. Much of the corridor meets suitable soils and elevation for the sand skink; however, due to the nature of the project (staying within the limits of the existing CSX footprint), it is unlikely coverboard surveys will be required. Although, the project corridor is within the CA for the Everglade snail kite, no habitat for the snail kite occurs within the project corridor and, additionally, Lake Wales Ridge plants are unlikely to occur within the project corridor, due to the existing disturbance from the existing rail.

The nearest bald eagle (*Haliaeetus leucocephalus*) nest (Nest ID: LA176a) is located more than a half mile north of the center of the project area. This is outside of the 660-foot construction buffer designated by the USFWS. The entire corridor is within the core foraging area (CFA) for one wood stork (*Mycteria americana*) colony (Colony ID: Lake Yale) and suitable foraging habitat (SFH) for the wood stork does occur within the project corridor. However, staying within the existing CSX footprint will eliminate impacts to SFH for the wood stork. Additional wildlife considerations include the gopher tortoise (*Gopherus polyphemus*), burrowing owl (*Athene cunicularia*), eastern indigo snake (*Drymarchon couperi*), Florida pine snake (*Pituophis melanoleucus*), southern fox squirrel (*Sciurus niger*), sandhill crane (*Grus canadensis*), and other listed wading birds.

Several herbaceous wetlands are located within the project corridor. The **AVCON** Design Team will delineate wetlands and quantify **impacts to these systems**. Findings will be documented in the Environmental Considerations Report. While the project is **expected to be exempt** from state permitting under 62-330.051 F.A.C and from federal permitting due to **lack of wetland impacts**, the Design Team will confirm that no natural or otherwise regulated resources will be impacted. We will prepare an Environmental Considerations Report to submitted with the design plans which can also be utilized to support any state and federal permitting as needed.

Utility Coordination: Our team has significant experience in utility design and a strong background in the utility coordination process. Our approach during the design phase is to avoid conflicts with existing utilities by meandering the trail alignment where possible. When utility adjustments or relocations are necessary, we work closely with the utility operators to position their facilities to eliminate conflicts with the new improvements and to provide accessibility for future maintenance. We have identified nine utility providers through



Sanitary Pipelines East Side of US 441 Bridge

Sunshine State One Call of Florida that could potentially be impacted by this project. Two sanitary sewer pipelines were observed at the top of sloped concrete embankment on the east side of existing rail bridge over US 441. Design provisions will be included to protect these lines while the bridge is being raised. There are also multiple utilities marked under the sloped concrete embankment which will be accommodated.

Public Involvement: Outreach to the community will be a significant factor in providing a successful design. Virtual and in-person meetings will be included to reach the most interested parties. **AVCON** will build upon the efforts already performed during the PD&E phases, most notably, preserving the historic elements of the

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rail corridor as previously discussed. In addition, the trail passes through neighborhood streets on the west end and on the east end the trail passes in front of many private residences east of SR 453. Also, the existing rail corridor is overgrown with weeds and brush between Church Street and SR 46. There is private residence adjacent to rail corridor that might be infringing existing rail right-of-way with parked vehicles. Additional coordination with that resident will be required. Coordination will be required to inform all adjacent residents and businesses of the upcoming construction project. Requirements for contractor to provide additional coordination during construction will be included in the construction plans.

Geotech and Contamination: Soil conditions along the majority of the trail alignment include upland, gently to moderately sloping, sands with seasonal high groundwater levels ranging from 3.5 ft to greater than six feet below the natural ground surface. However, the trail alignment crosses several isolated areas of depressional, poorly drained sands with seasonal high groundwater levels ranging from two feet above to 1.5 feet below the natural ground surface. These depressional areas are typically composed of several circular features, indicative of relic sinkholes. Relic sinkhole features are generally water-filled and many of the lakes in this area of Lake County are composed of one or more relic sinkholes. In some cases relic sinkholes may contain deep organic soil (muck) deposits.

The primary geotechnical considerations for this project include establishing accurate groundwater levels along the trail alignment as well as delineating any surface or buried muck deposits. Geotechnical services will also include corrosion series testing for optional pipe material analysis for new cross-drain pipes. GEC's field crews have extensive experience working on rail corridors and will obtain all necessary roadway work protection training in accordance with CSX access requirements.

GEC performed an August 2012 Contamination Screening Evaluation Report (CSER) for the portion of Wekiva Trail west of US 441. The CSER identified 15 potential contamination sites and assigned risk ratings of Low to 12 sites, Medium to one site, and High to two sites. In addition, GEC performed a current preliminary review of the Florida Department of Environmental Protection (FDEP) Map Direct website for potential contamination sites located within the PD&E Manual, Part 2 Chapter 20 search distances for project alignment. We identified the following listings: 16 petroleum tank facilities, three petroleum-contaminated sites, six hazardous material generators, one Brownfield-designated zone, three solid waste sites, and the railroad corridor.

Potential contamination sites near the alignment and possible contamination related to former railroad operations along the majority of the trail are important project concerns. Railroad ties were typically coated with inorganic and/or petroleum-based preservatives and would likely require special disposal provisions. Herbicides were used surrounding the ties for weed control and contained hazardous chemicals, possibly including arsenic. Such materials may have resulted in soil and/or groundwater impacts along the railway corridor. Soils that contain chemical concentrations above cleanup criteria or above toxic characteristic concentrations must be handled and disposed of properly. Chemicals of concern include volatile and semi-volatile organics, arsenic, chromium, cresol compounds, pentachlorophenol, and pesticides. During the Contamination Screening Evaluation, soil samples will be collected along the rail bed to evaluate the presence of contaminants. This data will be used to develop recommendations for trail design and construction that will protect construction workers and trail users from exposure to rail bed contaminants. Existing bridges will also be evaluated for asbestos and metals-based coatings as part of the contamination screening process.

Surveying and Mapping: The Survey Project Manager will gather the necessary crews and have an internal kickoff meeting, to go over scope of work and plan of attack. The field crews will begin by performing general reconnaissance along the trail, to recover monumentation and to assess the conditions to determine the best

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method for data collection. Next control will be established. Horizontal Project Control (HPC) will be relative to Florida State Plane Coordinate System, Florida East Zone, North American Datum of 1983 (NAD83). Vertical Project Control (VPC) will be relative to North American Vertical Datum of 1988 (NAVD88). Survey and Utility crews will begin performing their assigned tasks, under the supervision of a Licensed Surveyor. During and after field work is complete, all data coming to the office will undergo the first QC checkpoint for accuracy and correctness. A Topographic Survey will be created from the data and entered into a strict QA/QC process.

Right-of-way mapping will also be critical for this project and will follow CSX and FDOT guidelines. Right-of-way maps will also undergo a thorough QA/QC process. After these maps have cleared all checks, they will be sent to the client for review.

Additional Concerns: Our team identified that a large tree has fallen across the train tracks east of Highland Street. It is clearly noted to remove and dispose to avoid a change order during the construction phase. **AVCON** will perform field research during design to determine if any other trees are in danger of falling across the trail corridor, and note for them to be removed. Also, significant trash was observed to be dumped throughout the corridor. Construction plans will include a requirement in the plans for the contractor to remove all litter and debris from project corridor.



Tree Blocking Existing Rail Corridor

There are no existing pedestrian facilities at terminus of the trail at SR 46 until future sections of trail are built. Depending on the timing of design and construction of planned adjacent trail segments, signage will be required to inform users that the trail ends.

There is no doubt that the **AVCON** team is the best suited to meet the requirements of this important trail segment for Lake County. The team includes experienced professionals covering every aspect of the potential task requirements using key personnel with recent and relevant hands-on experience serving on identical projects throughout the County and Central Florida with unconditional senior executive level availability and commitment. Beginning with **AVCON**, the entire team of professionals, including Project Managers, engineers, surveyors, testing technicians, and total staff provides:

- Unparalleled experience on recent and relevant trail and LAP projects;
- Demonstrated track record in efficiently providing all programming, design, bidding and construction phase services on similar projects for Cities, Counties, and other Municipalities;
- Total commitment to the highest quality of each element of the overall project approach;
- Complete and unconditional corporate and personal pledge to continue advancement of Lake County's trail infrastructure; and
- Unmatched understanding of the specific planning, scope and criteria, final design, and construction requirements necessary to complete this project assignment, including preservation of historic bridges, safety, and visibility.

AVCON truly wants this assignment as well as the opportunity to serve Lake County. We understand the challenges and are ready execute Lake County's vision for the Segment 1 of the Wekiva Trail.