

Trail Feasibility

September 7, 2005

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The 2000 census figures show that, of those that commute to work a total of 4.4% walk, take public transportation or use other means.

1. Introduction

The City of Orange City, Florida has submitted the Orange City Bicycle-Pedestrian Proposal to the Volusia County Metropolitan Planning Organization (MPO) for inclusion on the MPO's Eligibility List. This proposal includes the addition of several multi-use trails, paved shoulders and sidewalks. This feasibility study focuses on a paved 10 foot multi-use trail on Graves Avenue between North Volusia Avenue and Park Street and 5 foot paved shoulder, bicycle lanes on Park Avenue between Graves Avenue and French Avenue that are part of the overall proposal. The location of this multi-use trail is illustrated in Figure 1.

In 2000, the Volusia County MPO completed an update to its Long Range Transportation Plan (LRTP) for the County. One of the priorities that emerged from the transportation plan was the "importance of providing pedestrian

and bicycle facilities as a means of expanding the travel opportunities for county residents."¹ The LRTP also recognizes the importance of bicycle and pedestrian facilities as a tool for economic development and as an expansion of recreational activities for residents and visitors. The bicycle and pedestrian plan represents approximately 76 miles of multi-use trails throughout Volusia County.

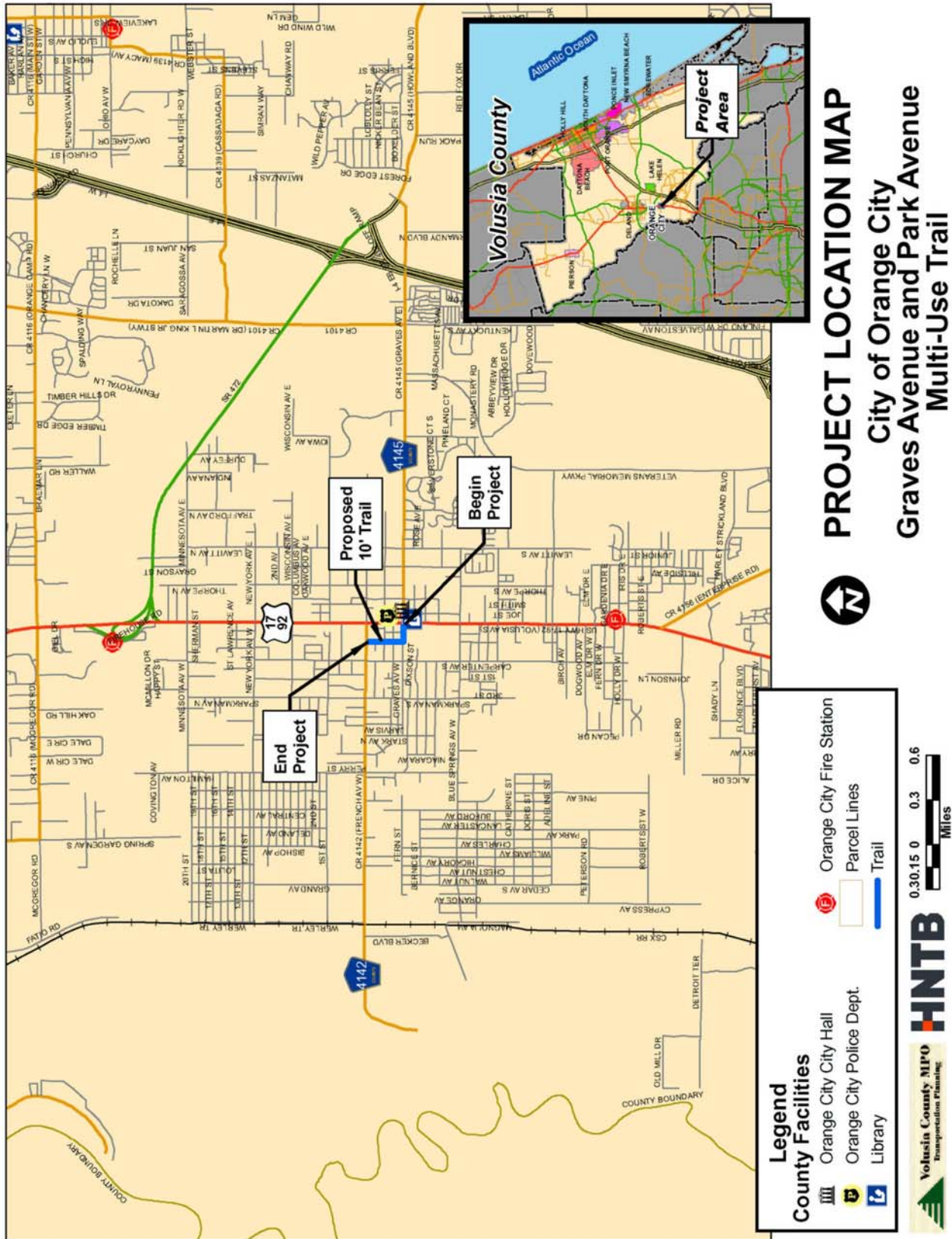
The LRTP describes the performance criteria used to analyze and evaluate the need for improved or new bicycle and pedestrian facilities. The criteria considers: bicycle and pedestrian injuries per million vehicle miles, connectivity of segments, proximity to attractions (such as: schools, parks, civic centers, etc.), and proximity to transit. The multi-use trail proposed for this study will provide a connection to Dickinson

Park and other planned bicycle and pedestrian facilities to end ultimately at the Spring to Spring Trail. Dickinson Park is located at the corner of US 17/92 and Graves Avenue (just east of the proposed multi-use trail). The park has been leased to the City by the Village Improvement Association and is adjacent to the Dickinson Memorial Library.

This trail will provide more opportunities for recreational use as well as an alternate form of transportation throughout Orange City. The 2000 census figures show that, of those that commute to work a total of 4.4% walk, take public transportation or use other means. Providing extra transportation avenues as well as modes will prove beneficial especially to this group of people, as well as others.

¹Volusia County Metropolitan Planning Organization, 2020 Long Range Transportation Plan, Chapter 5.

Figure 1: Project Location Map



2. Project Purpose & Scope

The following Scope of Work completed for the project was agreed upon in contract by Volusia County MPO and HNTB Corporation.

Study Purpose

This study evaluated the corridor along Graves and Park Avenues as established in the "Town of Orange City, Historic District to St. John's River, Bicycle Pedestrian Task Force Eligibility Submittal" prepared by the Orange City Public Works Development Services Department. The goal of this study is to determine the feasibility of the trail considering items such as project need, support of jurisdictional planning studies, and construction cost estimates.

Physical Inventory & Assessment of Right-of-Way

The Orange City proposed bicycle and pedestrian network and GIS maps were reviewed to assess the physical inventory as it relates to the proposed improvements. GIS databases were utilized to create mapping for the project and were supplemented with local municipal and county data. Orange City has 100 feet of right-of-way along Graves Avenue and 60

feet along Park Avenue.

After completing the background study, a detailed field review and analysis was conducted of the proposed corridor. This analysis provided detailed information that was used to make specific recommendations for construction, safety, signing, and access. Also identified were potential locations for connections to public facilities, parking areas, and connections to other facilities that are part of the bicycle and pedestrian network.

Property tax maps and municipal land development plans were reviewed to study the alignment and identify neighboring property owners.

Trail Concept Plan

The field analysis mapping was used as a base for the planning of proposed construction elements. Mapping of the proposed corridors identified environmental and natural features, surrounding land uses, surrounding roads, community developments and assets, and construction element locations. The final graphics included notes, diagrams, and callouts identifying the

trail, access points, trail features, mitigation efforts, and enhancements to natural, cultural, and historic features.

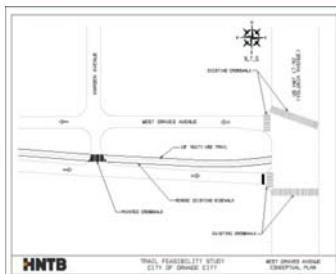
Concept plans of the trail project area were prepared and included all of the features listed as well as proposed construction phasing sections and any other proposed enhancements.

Financial Feasibility

Detailed estimates for construction were prepared based on American Disabilities Act (ADA) compliance, Florida Department of Transportation standards for design, the City of Orange City Design Standards and past construction bids for the construction of related projects.

The cost estimates include the following elements, as necessary: right-of-way acquisition, brush/tree clearing, drainage improvements, grading (earthwork), trail access points, trail surfaces, trailhead areas, ADA accessibility, improvements at road crossings, safety warning signals, signage – safety and directional, and appropriate landscaping buffers, etc.

The goal of this study is to determine the feasibility of the trail considering items such as project need, support of jurisdictional planning studies, and construction cost estimates.



Sample of conceptual plan at Graves Avenue and Volusia Avenue.

3. Physical Inventory & Assessment of Right-of-Way

A physical inventory and assessment (via field reviews) for the corridor was conducted in order to document present conditions, assets, and obstacles throughout the area. Topographic and soils maps were used to supplement the field reviews.

Two field reviews were conducted to determine the conditions along the corridor. The first field review was conducted on July 5, 2005. The following persons attended the field review and represented the respective entities:

- City of Orange City – Elaine Wilson, Paul Johnson, James Moltz, Christina Wright
- HNTB Corporation – Luis Diaz, Kate Brady

A follow-up field review was conducted on August 18, 2005. Participants included: Elaine Wilson and Kate Brady.

Based on the field reviews and the discussions among the participants, it was determined that the best alternative for the multi-use trail was to create a 10' concrete sidewalk along both Graves and Park Avenues to serve the community as a multi-use trail.

A photographic inventory of the corridor is presented below to provide an understanding of the physical features of the corridor.

Physical Description

The corridor for the Orange City multi-use trail begins at the intersection of US 17/92 and West Graves Avenue. The proposed trail concept designates this median area, as shown in Figure 2, for a trail-head.

Along this section of the corridor, Orange City owns 100 feet of right-of-way (ROW). Based on the field and documentation review, no property acquisition will be required.

Along West Graves Avenue there is a sidewalk through the median near the south bound side of the roadway as can be seen in Figure 3.

A crosswalk currently exists to allow people to cross eastbound and westbound Graves Avenue at the end of the median. Painted crosswalk boundaries exist on the pavement however, they are barely visible. A sign exists at the crosswalk in the median on both the east and westbound sides indicating the

pedestrian crossing. The crossing and signposts are shown in Figure 4.

Prior to the crosswalk there is a median opening to provide access to a business for its customers.

The crosswalk on westbound Graves Avenue does not connect to any pedestrian facilities on Park Avenue. The posted speed limit on Park Avenue is 25 miles per hour. The city owns 60 feet of right-of-way along Park Avenue. Figure 5 provides a visual of the east side of Park Avenue near Graves Avenue.

No sidewalks exist on either side of Park Avenue between Graves and Central Avenues. On the east side of Park Avenue, there is a tree line, with mature trees that borders the City of Orange City right-of-way and along the west side there is various landscaping by the property owners. The tree line can be seen in Figure 6.



Figure 2: US 17/92 and Graves Avenue median looking west



Figure 3: Graves Avenue sidewalk

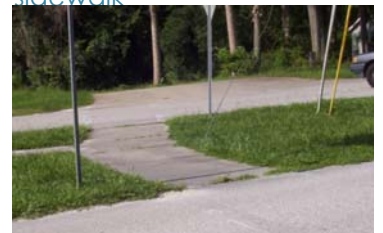


Figure 4: Graves Avenue crosswalk



Figure 5: East side of Park Ave. at Graves Ave.



Figure 6: Park between Graves & Central Avenues

Vehicles traveling down Park Avenue must stop at Central Avenue. The vehicles on Central Avenue have no stop sign. After crossing Central Avenue, where there are no crosswalks on either side, a sidewalk begins on the east side of the street. The sidewalk abuts a house and historic fence posts which lie on the right-of-way line as seen in Figure 7 and Figure 8. Early property requirements in Orange City did not require property set backs.

At the intersection of Park Avenue and University Avenue, a

stop sign exists for those on Park Avenue. Again there are no painted crosswalks on the pavement. The intersection can be seen in Figure 9. Sidewalks exist along University Avenue and along Park Avenue in the southeast, northeast, and northwest quadrants.

The sidewalks along the west side of Park Avenue continue to French Avenue but no crosswalk exists on Howard Avenue. On the east side of Park Avenue the sidewalk ends just after Howard Avenue. This section of

Park Avenue can be seen in the picture in Figure 10 which is taken across from Howard Avenue.

The intersection of Park Avenue and French Avenue is a T-intersection. Sidewalks exist along both sides of French Avenue along with paved shoulders for bike lanes. Figure 11 below depicts the western side of this intersection.

Figures 12 and 13 provided a graphical representation of the soils and topographic elements along the trail corridor.

4. Trail Concept Plan

Establishing a trail system within Volusia County will offer residents and visitors a network of recreational facilities and alternative forms of transportations.

The multi-use trail along Graves and Park Avenues offers a feasible option for use by the residents of Orange City. The surrounding land uses are not in conflict with the proposed trail and the area does not present design challenges that must be overcome prior to construction. The City owns substantial right-of-way along these roads to allow for the trails as planned.

A trailhead can be developed within the median at the intersection of U.S. 17/92 and Graves Avenue to include a trailhead kiosk, trail directory, bike racks and a water station, if desired and a connection to Dickinson Park.

After further discussions with the City of Orange City, the conceptual plan introduced in the Eligibility Submittal was revised as presented in the conceptual plan accompanying this report based on the existing roadway and right-of-way. The plan provided considers a 10' multi-use trail not only on Graves Avenue

but also on Park Avenue rather than bicycle lanes and a sidewalk as previously considered. The existing Park Avenue typical section includes a 15-foot roadbed with sporadic 4-foot sidewalks on either side.

Figures 14 through 18 provide existing details along with considerations for proposed construction of the multi-use trail on Graves Avenue and Park Avenue.



Figure 7: Property line abutting right-of-way



Figure 8: Historic fence posts on Park Avenue



Figure 9: Park and University Avenues intersection



Figure 10: Park Ave. across from Howard Ave.



Figure 11: Park & French Avenue looking west

Figure 12: Topographic Map of Corridor

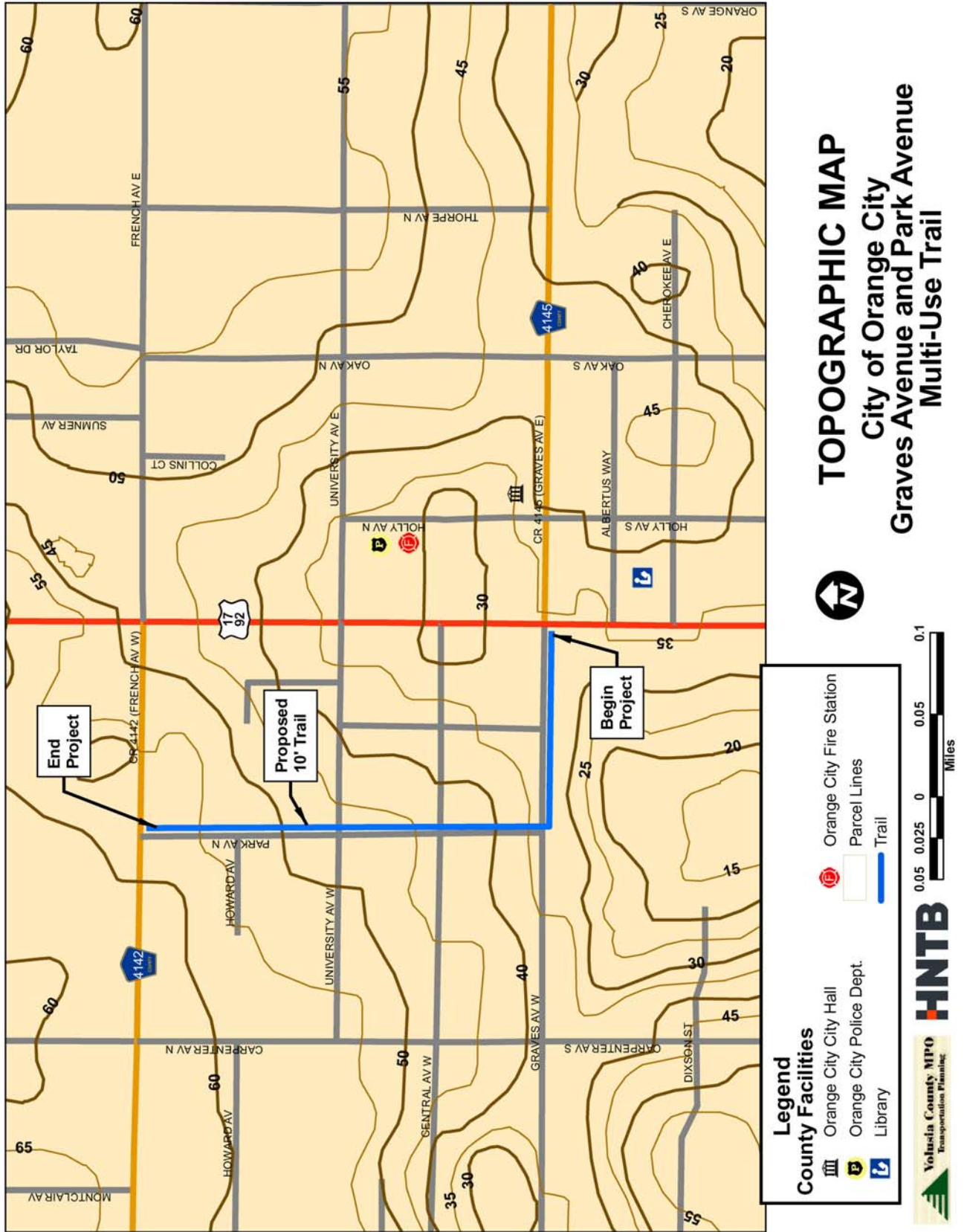
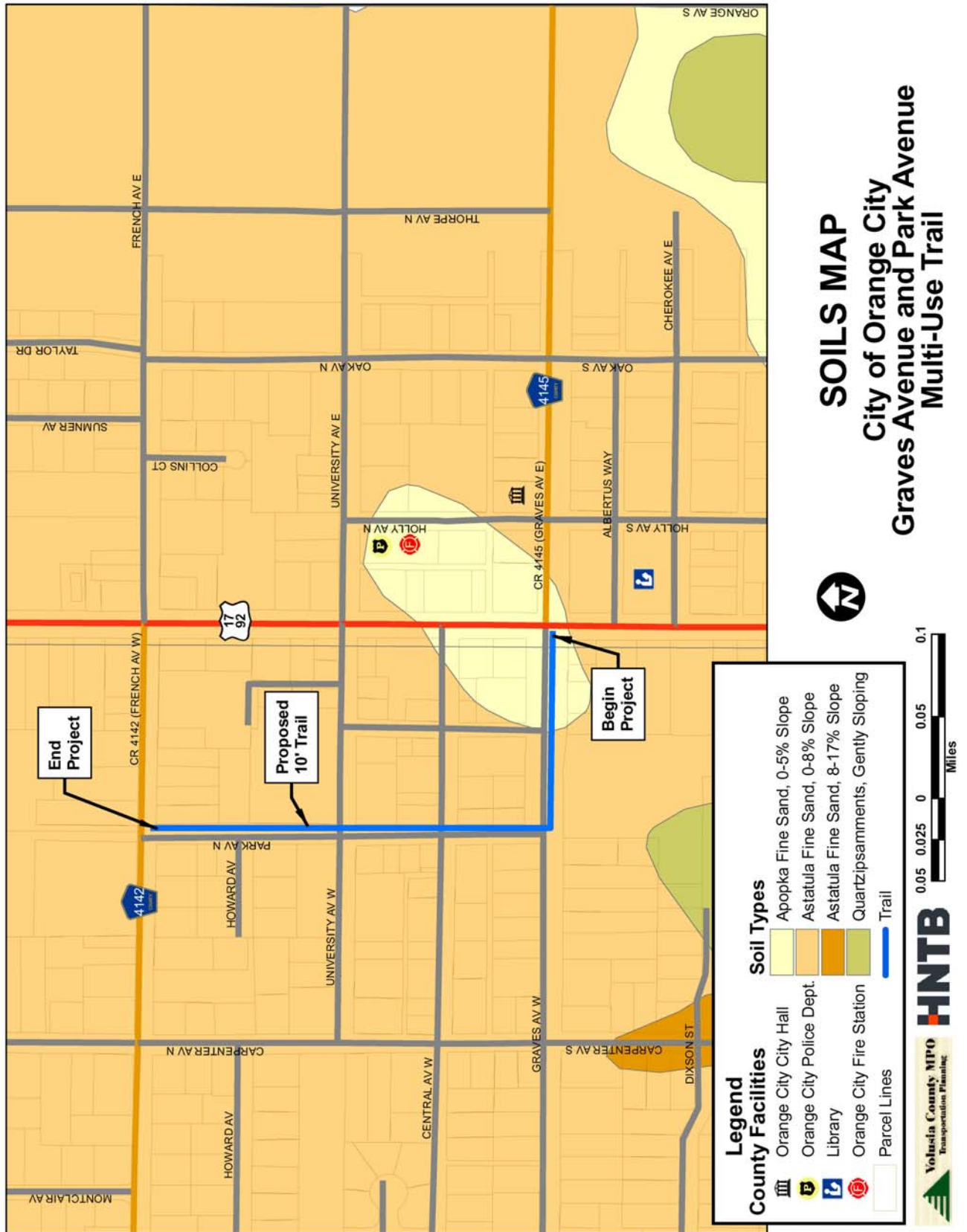
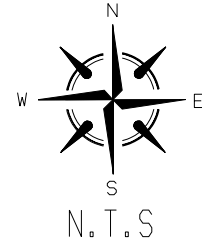


Figure 13: Soils Map of Corridor



MATCH PAGE 9

HARDEN AVENUE



EXISTING CROSSWALK

REMOVE PED
CROSSING SIGN

US HWY 17-92
(VOLUSTIA AVENUE)

WEST GRAVES AVENUE



10' MULTI-USE TRAIL

6' WIDE



REMOVE EXISTING
4' SIDEWALK

CONSTRUCT STAMPED
CROSSWALK

EXISTING
STOP BAR

EXISTING CROSSWALK



TRAIL FEASIBILITY STUDY
CITY OF ORANGE CITY
GRAVES AND PARK AVENUES

CONCEPTUAL PLAN
TRAILHEAD
FIGURE 14 PAGE 8

MATCH PAGE 10

MATCH PAGE 8

PARK AVENUE

CONSTRUCT 10' MULTI-USE TRAIL

CONSTRUCT RAISED STAMPED CONCRETE CROSSWALK

RELOCATE PED CROSSING SIGN TO HERE

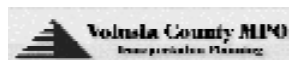
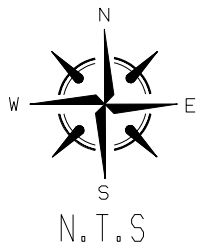
ADD PAINTED STOP BAR

WEST GRAVES AVENUE

CONSTRUCT 10' MULTI-USE TRAIL

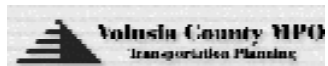
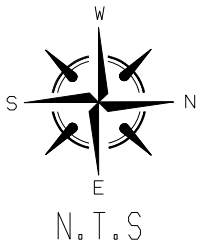
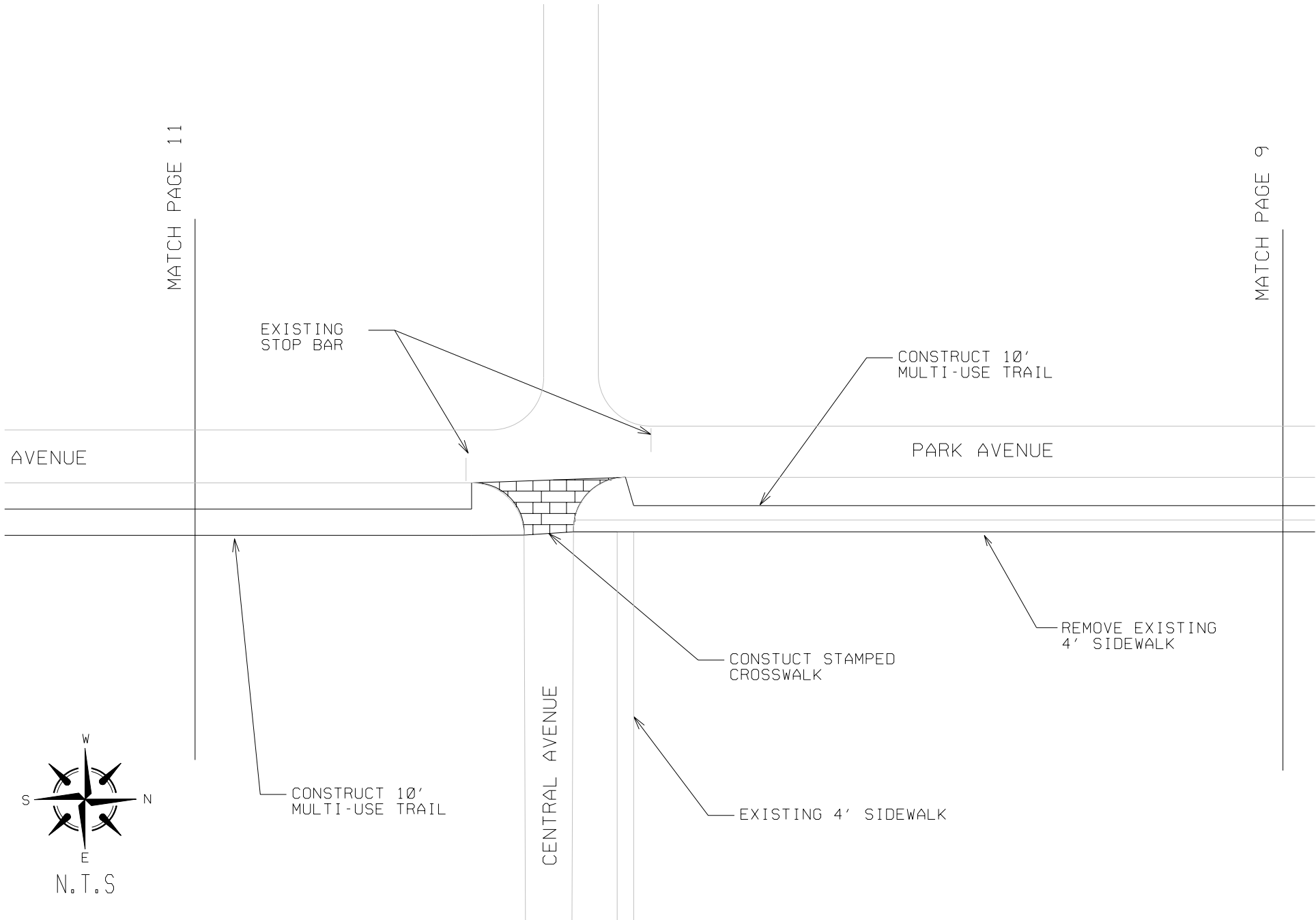
EXISTING CROSSWALK

REMOVE EXISTING SIDEWALK



MATCH PAGE 11

MATCH PAGE 9



TRAIL FEASIBILITY STUDY
 CITY OF ORANGE CITY
 GRAVES AND PARK AVENUES

CONCEPTUAL PLAN
 PARK AND CENTRAL AVE.
 FIGURE 16 PAGE 10

MATCH PAGE 10

UNIVERSITY AVENUE

EXISTING 4' SIDEWALK

MATCH PAGE 12

HOWARD AVENUE

EXISTING 4' SIDEWALK

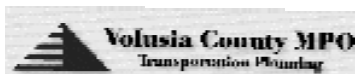
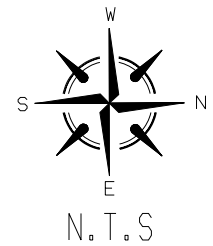
CONSTRCT STAMPED CROSSWALK

CONSTRUCT 10' MULTI-USE TRAIL

EXISTING DRIVEWAY FENCE POSTS

REMOVE EXISTING 4' SIDEWALK

EXISTING 4' SIDEWALK



MATCH PAGE 11

EXISTING 4' SIDEWALK

HOWARD AVENUE

EXISTING 4' SIDEWALK

EXISTING 4' SIDEWALK

CONSTRUCT STAMPED CROSSWALK

PARK AVENUE

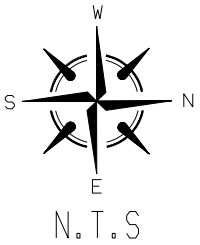
REMOVE EXISTING 4' SIDEWALK

EXISTING STOP BAR

CONSTRUCT 10' MULTI-USE TRAIL

FRENCH AVENUE

EXISTING 4' SIDEWALK



5. Financial Feasibility

Table 1 provides a cost estimate for the design and construction of the multi-use trail. The item number and unit of measure are based on the Florida Department of Transportation Basis of Estimate manual. The unit prices are based on the average costs for each pay item as provided by the Florida Department of Transportation.

The cost estimate is based on Orange City Design Standards for sidewalks. Bike Paths and Trails standards have not yet been established for Orange City. The minimum construction standards call for 4" thick Portland concrete.

As shown in Table 1, the total cost for design and construction of the multi-use trail as detailed in the conceptual plan and discussed in this report is \$215,093.41.

This project will be planned, designed and constructed with a variety of funds. The project is eligible for federal funds that will flow through the Florida Department of Transportation and will be matched by the City of Orange City.

Table 1: Cost Estimate

Construction Cost					
ITEM NUMBER	DESCRIPTION	EST QTY	UNIT OF MEASURE	UNIT PRICE	EXTENDED PRICE
110-1-1	CLEARING & GRUBBING (.6 acres)	1	LS	\$4,278.70	\$4,278.71
110-4	REMOVAL OF EXISTING CONCRETE, PAVEMENT	990	SY	\$15.00	\$14,850.00
120-1	REGULAR EXCAVATION	170	CY	\$1.76	\$299.20
522-2	CONCRETE SIDEWALK, 6" THICK	1,900	SY	\$34.06	\$64,714.00
523-1-1	PAINTED/TEXTURED PAVEMENT	173.9	SY	\$134.50	\$23,389.55
526-1-2	PAVERS, ARCHITECTURAL	40.9	SY	\$197.50	\$8,077.75
570-5	FERTILIZER	.034	TN	\$115.00	\$3.91
570-9	WATER FOR SOD	7	MG	\$19.23	\$134.61
575-1-1	SODDING (BAHIA)	845	SY	\$1.15	\$971.75
700-40-1	SINGLE SIGN POST (LESS THAN 12 SF)	6	AS	\$222.25	\$1,333.50
700-46-11	SIGN EXISTING, REMOVE	1	AS	\$21.00	\$21.00
700-46-21	SIGN EXISTING, RELOCATE	1	AS	\$109.29	\$109.29
SUBTOTAL BEFORE MOT AND MOBILIZATION					\$118,183.27
101-1	MOBILIZATION		LS	10%	\$11,818.33
102-1	MAINTENANCE OF TRAFFIC		LS	20%	\$23,636.65
SUBTOTAL BEFORE DESIGN/CONTINGENCY/SCOPE CREEP					\$153,638.15
N/A	ENGINEERING & DESIGN		LS	15%	\$23,045.72
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	5%	\$7,681.91
999-99	SCOPE CREEP		LS	20%	\$30,727.63
TOTAL COST					\$215,093.41