



S-Line Grade Crossing

General Assessment of Potential Transportation and Safety Impacts of CSXT Freight Relocation

for the
**DeLand Amtrak Station in Volusia County to
Poinciana Industrial Park Station in Osceola County
Environmental Assessment & Conceptual Engineering Phase**



Prepared for:

Florida Department of Transportation - District 5



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S-LINE GRADE CROSSINGS

The following information summarizes a general assessment of the transportation and safety impacts at grade crossings associated with relocating certain CSXT freight trains to the S-Line. CSXT owns and operates the railroad lines referred as the “A-Line” and the “S-Line”. In an effort to meet the growing demands for railroad freight traffic, CSXT has made the decision to transfer some freight traffic from the A-Line to the S-Line then access the A-Line near the Lakeland area to the CSXT’s planned Integrated Logistics Center in Winter Haven, Florida. Summary information is presented for all grade crossings in tables and maps. The general assessment was directed primarily at grade crossings with the highest volume of vehicular traffic that could be potentially delayed by increased frequency of train operations. The assessment compares general roadway and railroad operating conditions at selected grade crossings “without freight relocation” to anticipated conditions “with freight relocation”. Based on the results of the assessment at selected grade crossings potential impacts at lower volume grade crossings are discussed. As part of this analysis, the grade crossings for the portion of the A-Line from Lakeland to Auburndale have been assessed and are included within this document. However, for simplicity, all grade crossings analyzed are referred to as S-Line grade crossings.

1.0 EXISTING CONDITIONS

This section provides an overview of existing roadway and railroad operating conditions (With freight relocation scenario) along the CSXT S-Line relevant to the grade crossing assessment. Existing conditions data was collected from FDOT, CSXT, and a variety of local sources, and summarized in tables and maps. This section also includes a summary and description of accident data for grade crossings on the S-Line.

1.1 TABLE AND MAPS

Existing at-grade crossings were identified through tables and maps using a combination of FDOT crossing inventory databases and maps previously prepared by FDOT, as well as Geographic Information System (GIS) mapping prepared by Earth Tech. Grade crossings were identified by U.S. DOT ID number, railroad mile post, and street names. Figure 1.1.1 shows the general location of the S-Line relative to the A-Line and other CSXT mainlines in northern and central Florida. The S-Line travels through nine counties: Duval, Clay, Bradford, Alachua, Marion, Sumter, Hernando, Pasco, and Polk Counties from the City of Baldwin in the north and extending south to Lakeland. This also includes Lawtey, Stark, Waldo, Hawthorne, Citra, Ocala, Belleview, Summerfield, Wildwood, Coleman, Sumterville, Bushnell, Lacoochee, Dade City, Zephyrhills, and Lakeland.

Figures 1.1.2 through 1.1.6 contain maps depicting the S-Line at the county level, with municipal boundaries also shown. As seen in the figures, the land use in the S-Line corridor is generally low density and the line passes through a relatively small number of urbanized areas. Of the total 224 rail-crossings along S-Line, 10 are arterials, 19 are urban collectors, 35 are rural/local, 51 are private crossings, and the remaining are either residential or low volume roads. Each crossing depicted in the figures is color coded by roadway category and is numbered sequentially from north to south, with the sequential numbering linked to the summary information contained in Table 1.1. Additionally, the figures also show the general location of fire departments and hospitals located in

proximity to the S-Line based on review of data files accessible to the public in GIS format.

Figure 1.1.1 CSXT A-Line and S-Line



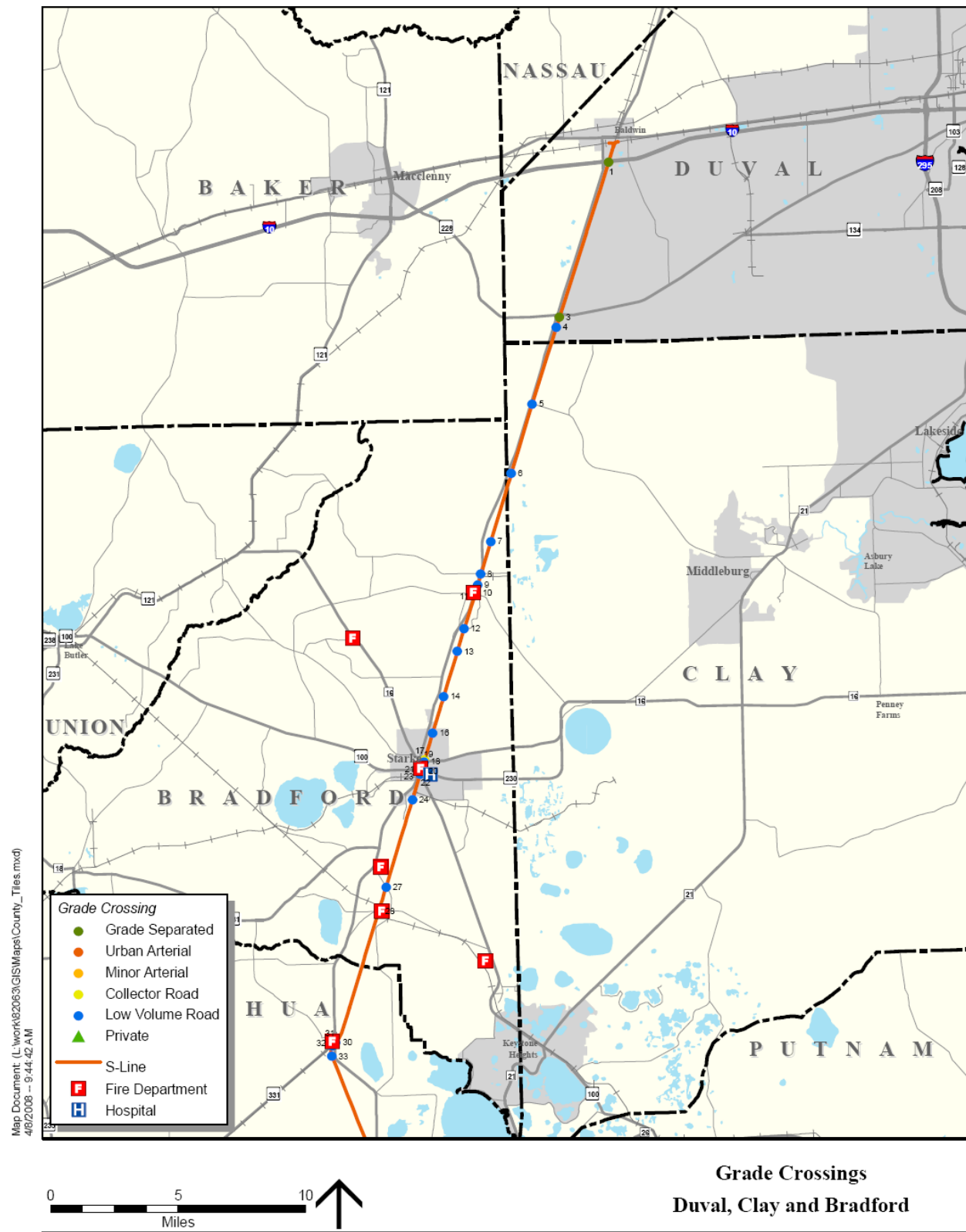
Figure 1.1.2 S-Line Grade Crossings – Duval, Clay and Bradford Counties

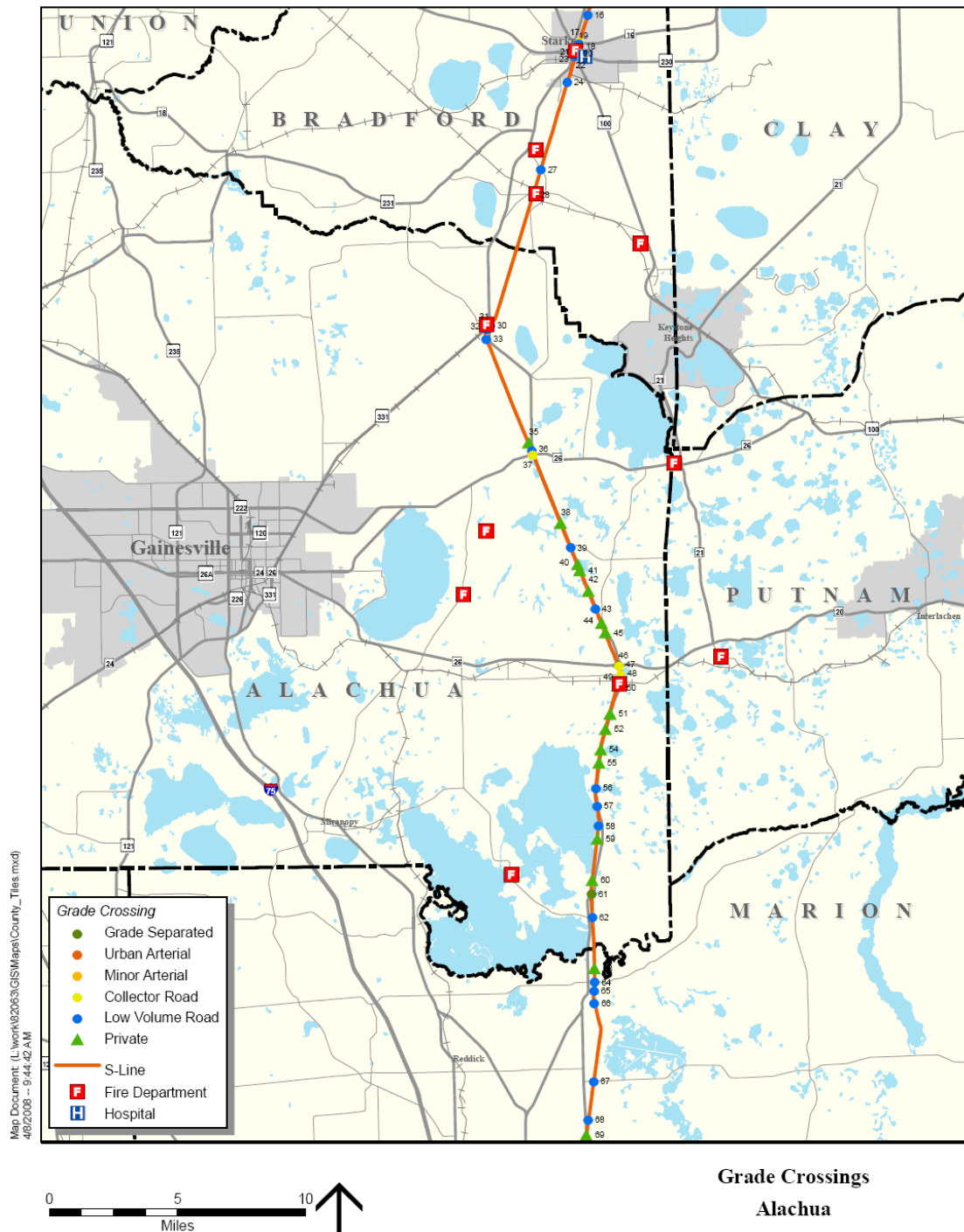
Figure 1.1.3 S-Line Grade Crossings - Alachua County

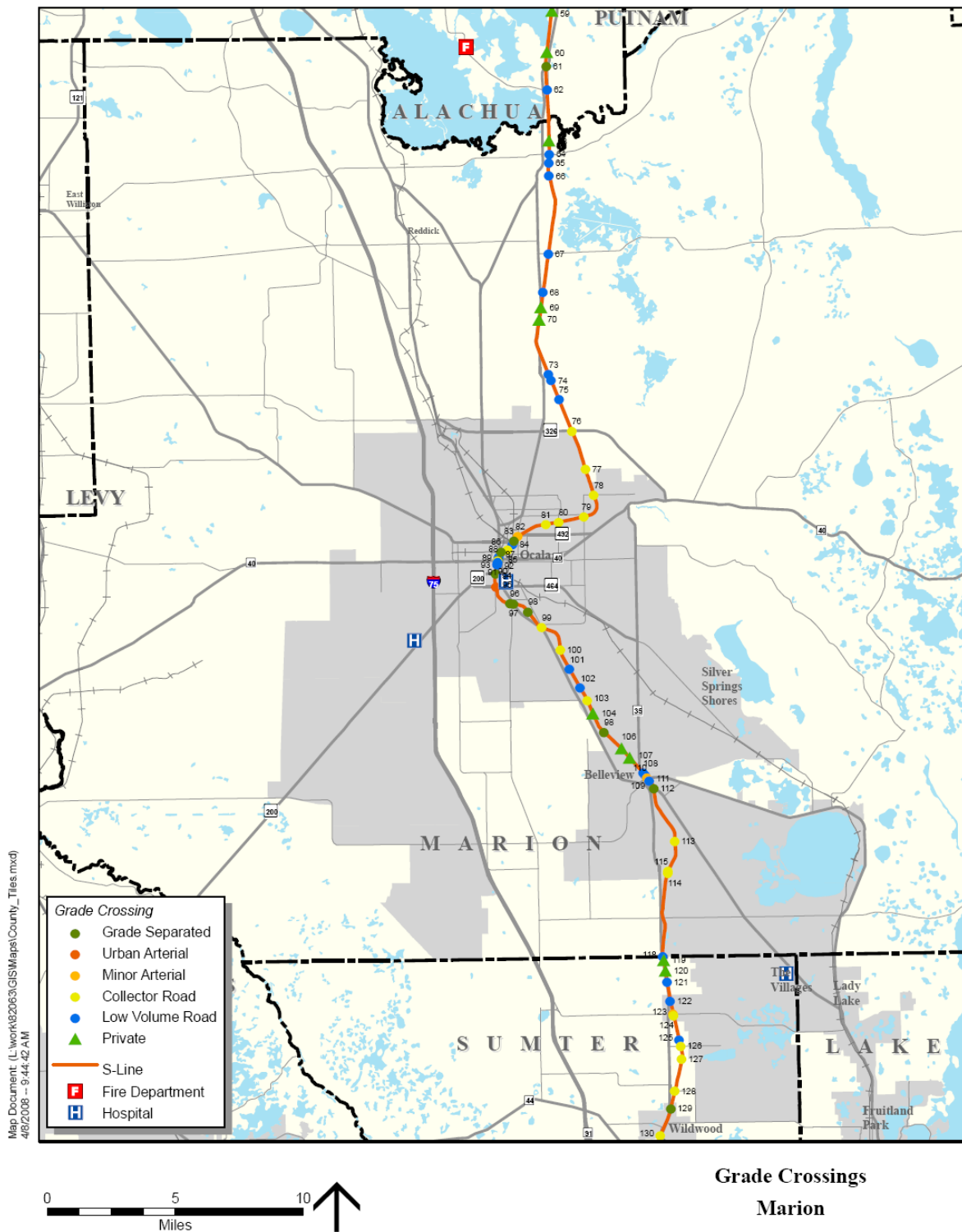
Figure 1.1.4 S-Line Grade Crossings – Marion County

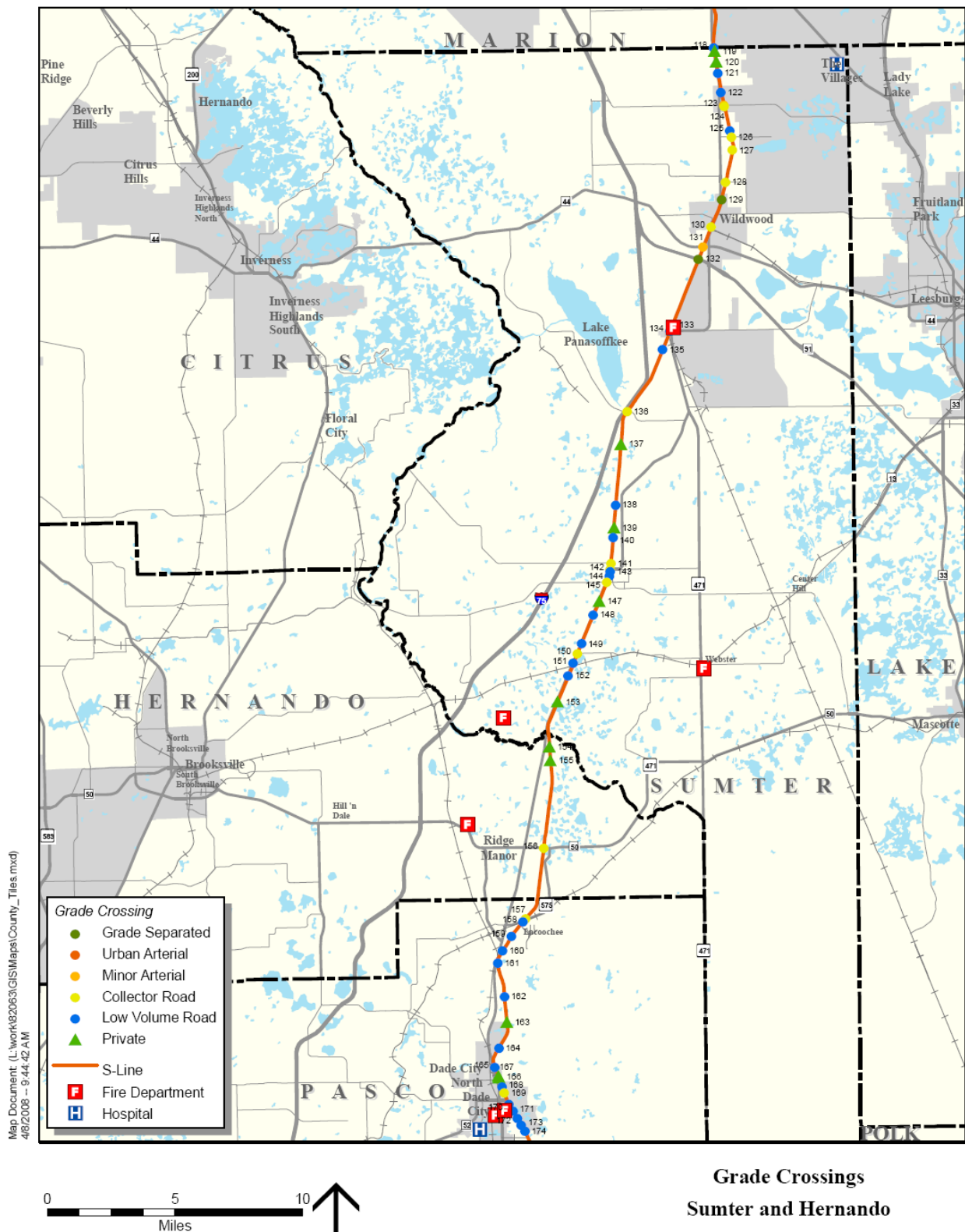
Figure 1.1.5 S-Line Grade Crossings – Sumter and Hernando Counties

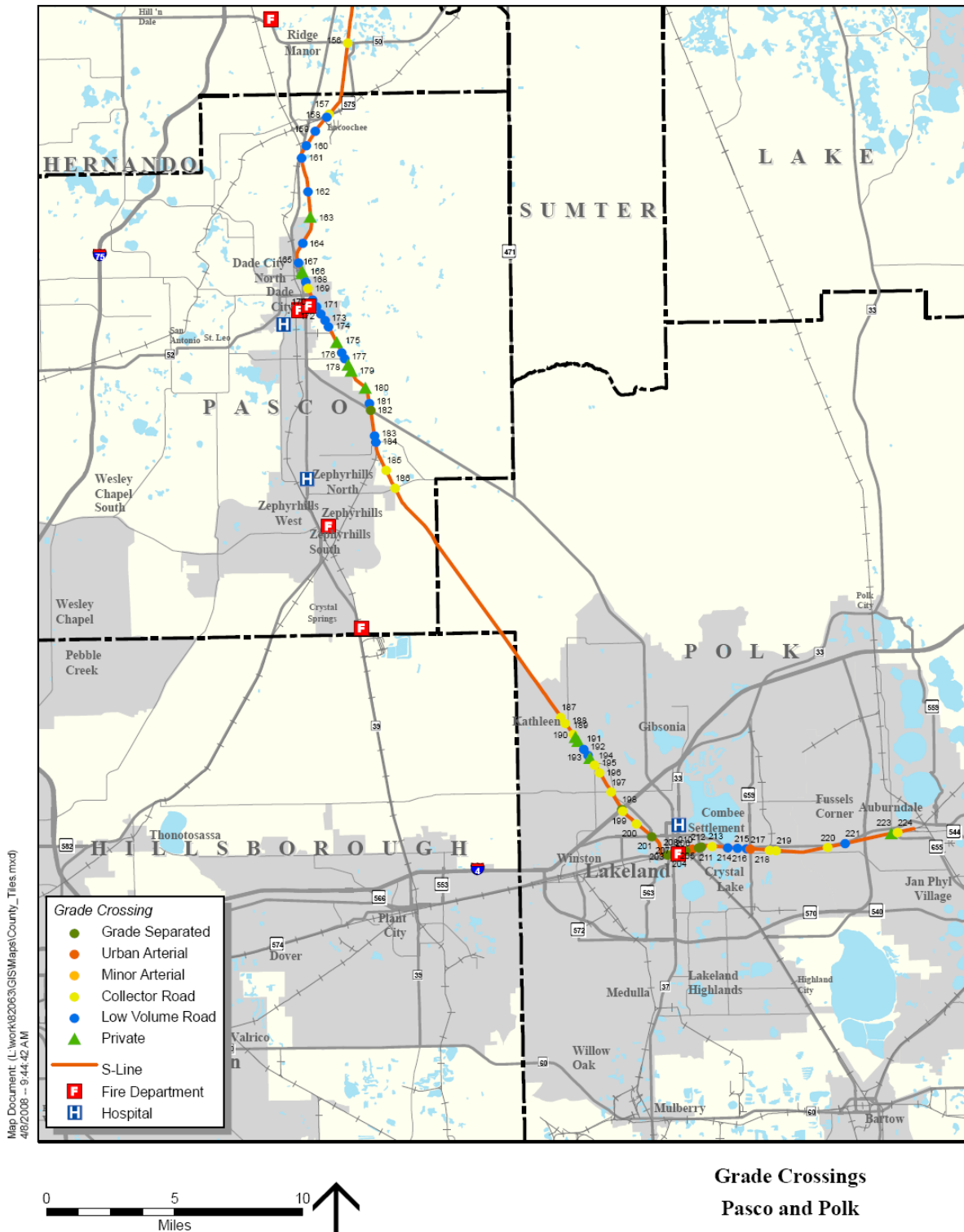
Figure 1.1.6 S-Line Grade Crossings - Pasco and Polk Counties

Table 1.1 S-Line Grade Crossings

Crossing No.	Rail Line	USDOT No.	RR Mile Post No.	Street Name	County	Municipality	Evacuation Route ¹	SIS Route ²
1	S	620655B	653.33	I 10	Duval	Baldwin		
2	S	620657P	656.24	Gilman Gate	Duval	Baldwin		
3	S	627487W	659.71	S.R. 228	Duval	Baldwin		
4	S	627488D	660.14	Old Middleburg Rd	Duval	Baldwin		
5	S	627490E	663.34	CR 218	Clay	Middleburg	X	
6	S	627491L	666.51	Richard Mosley Rd	Clay	Middleburg		
7	S	627492T	669.46	247th St	Bradford	Lawtey		
8	S	627493A	670.78	CR 125	Bradford	Lawtey		
9	S	627496V	671.24	Carter Rd	Bradford	Lawtey		
10	S	627497C	671.48	Middleburg Rd	Bradford	Lawtey	X	
11	S	627498J	671.62	Lake St	Bradford	Lawtey		
12	S	627499R	673.03	CR 200B	Bradford	Lawtey		
13	S	627500H	673.96	204th St	Bradford	Lawtey		
14	S	627501P	675.81	185th St	Bradford	Starke		
15	S	627833J	676.45	N.E. 187 Street	Bradford	Starke		
16	S	627503D	677.30	Market St	Bradford	Starke		
17	S	627505S	678.42	E. Brownlee St	Bradford	Starke	X	
18	S	627506Y	678.50	E. Washington St	Bradford	Starke		
19	S	627507F	678.58	Adkins St	Bradford	Starke		
20	S	627508M	678.91	Jackson St	Bradford	Starke		
21	S	627510N	678.89	Call St	Bradford	Starke		
22	S	627511V	678.97	SR 100/Madison St	Bradford	Starke	X	
23	S	627512C	679.02	E. South St	Bradford	Starke		
24	S	627514R	680.05	SE 144th (Mullins)	Bradford	Starke		
25	S	627523P	680.79	Private	Bradford	Starke		
26	S	627524W	682.93	Private (Gated)	Bradford	Starke		
27	S	627525D	683.62	CR 221	Bradford	Starke		
28	S	624982A	684.63	CR 18/Navarre St	Bradford	Hampton	X	
29	S	624984N	687.76	Private	Alachua	Waldo		
30	S	624985V	690.02	NE 147th Avenue	Alachua	Waldo		
31	S	624986C	690.08	U.S. 301/S.R. 200	Alachua	Waldo		
32	S	624987J	690.22	Cole Street	Alachua	Waldo		
33	S	624988R	690.66	N.E. 138th Place	Alachua	Waldo		
34	S	624991Y	693.93	Private	Alachua	Waldo		
35	S	624992F	695.06	NE 76th Place	Alachua	Hawthorne		
36	S	624993M	695.39	NE 70th Place	Alachua	Hawthorne		
37	S	624994U	695.53	NE SR 26	Alachua	Hawthorne	X	
38	S	624996H	698.44	Private	Alachua	Hawthorne		
39	S	624998W	699.45	E CR 1474	Alachua	Hawthorne		
40	S	625001K	700.17	Private	Alachua	Hawthorne		
41	S	625002S	700.42	Private	Alachua	Hawthorne		

Table 1.1 S-Line Grade Crossings (cont'd)

Crossing No.	Rail Line	USDOT No.	RR Mile	Street Name	County	Municipality	Evacuation Route ¹	SIS Route ²
42	S	625003Y	701.29	Private	Alachua	Hawthorne		
43	S	625004F	702.03	SE 24th Ave.	Alachua	Hawthorne		
44	S	625006U	702.66	Private	Alachua	Hawthorne		
45	S	625007B	703.05	Private	Alachua	Hawthorne		
46	S	625009P	704.43	S.R. 20, Hawthorne Rd	Alachua	Hawthorne		
47	S	625010J	704.46	SR 20 Access Ramp	Alachua	Hawthorne	X	
48	S	625011R	704.84	S.E. 69th Ave/W Lake Ave	Alachua	Hawthorne		
49	S	625013E	705.02	S.E. 221st St/Johnson St	Alachua	Hawthorne		
50	S	625014L	705.25	Private	Alachua	Hawthorne		
51	S	625015T	706.39	Private	Alachua	Hawthorne		
52	S	625016A	707.01	Private	Alachua	Hawthorne		
53	S	625017G	707.52	Private	Alachua	Hawthorne		
54	S	625018N	707.84	Private	Alachua	Hawthorne		
55	S	625019V	708.35	Private	Alachua	Hawthorne		
56	S	625020P	709.36	SE 138th Place	Alachua	Hawthorne		
57	S	625021W	710.07	SE 149th Place	Alachua	Hawthorne		
58	S	625022D	710.85	SE 162nd Ave	Alachua	Hawthorne		
59	S	625024S	711.37	Private (SE 177th Place)	Alachua	Hawthorne		
60	S	625025Y	712.94	Private	Alachua	Hawthorne		
61	S	625026F	713.54	US 301	Alachua	Hawthorne		
62	S	625027M	714.45	SE 219th Avenue	Alachua	Hawthorne		
63	S	625029B	716.45	Private	Marion	Citra		
64	S	625030V	716.98	CR 318	Marion	Citra		
65	S	625031C	717.31	NE 180th St	Marion	Citra		
66	S	625033R	717.82	NE 175th Rd	Marion	Citra		
67	S	625034X	720.92	CR 316	Marion	Citra		
68	S	625036L	722.43	CR 329	Marion	Citra		
69	S	625037T	723.00	Private	Marion	n/a		
70	S	625038A	723.52	Private	Marion	n/a		
71	S	625039G	723.90	Private	Marion	n/a		
72	S	625040B	724.21	Private	Marion	n/a		
73	S	625042P	725.76	N.E. 97th St./Burbank Rd	Marion	Anthony		
74	S	625043W	726.01	N.E. 95th S& Anthony Rd	Marion	Anthony		
75	S	625044D	726.82	NE 86th LN	Marion	Anthony		
76	S	625046S	728.17	SR 326/NE 70th St	Marion	Ocala	X	
77	S	627890X	729.74	NE 49th Street	Marion	Ocala		
78	S	625048F	730.80	NE 35th Street	Marion	Ocala		
79	S	625049M	731.98	NE 36th Ave	Marion	Ocala		
80	S	625050G	732.99	NE 25th Ave	Marion	Ocala		
81	S	625051N	733.54	NE 19th Ave	Marion	Ocala		
82	S	625052V	734.72	NE 8th Ave	Marion	Ocala		

Table 1.1 S-Line Grade Crossings (cont'd)

Crossing No.	Rail Line	USDOT No.	RR Mile Post No.	Street Name	County	Municipality	Evacuation Route ¹	SIS Route ²
83	S	625055R	734.90	N.E. 14th Street	Marion	Ocala		
84	S	625056X	735.08	NE 9th St	Marion	Ocala		
85	S	625058L	735.41	Magnolia Ave	Marion	Ocala		
86	S	627178J	735.69	N.W. Pine Avenue	Marion	Ocala		
87	S	625066D	735.90	NW 2nd St	Marion	Ocala		
88	S	625067K	735.95	NW 1st St	Marion	Ocala		
89	S	908578E	736.03	W Silver SPGS BLV	Marion	Ocala		
90	S	625069Y	736.06	SW Broadway St	Marion	Ocala		
91	S	625070T	736.12	W Fort King St	Marion	Ocala		
92	S	625071A	736.17	SW 2nd St	Marion	Ocala		
93	S	625072G	736.22	SW 3rd St	Marion	Ocala		
94	S	625073N	736.58	SW 10th St	Marion	Ocala		
95	S	625078X	737.08	SR 464/SW 17th St	Marion	Ocala	X	
96	S	625081F	738.04	S.W. 1st Ave (RR Over)	Marion	Ocala		
97	S	625082M	738.18	S.E. Pine Ave (RR Over)	Marion	Ocala		
98	S			S.E. 31st St (RR Under)	Marion	Ocala		
99	S	625083U	739.68	Lake Weir Ave	Marion	Ocala		
100	S	625084B	740.96	SE 52nd St	Marion	Ocala		
101	S	625085H	741.81	SE 62nd St	Marion	Ocala		
102	S	625086P	742.66	SE 73rd St	Marion	Ocala		
103	S	625087W	743.24	S.E. 80th Street	Marion	Ocala		
104	S	625088D	743.74	SE 84th Ln Rd	Marion	Ocala		
105	S			S.E. 92nd Place Rd	Marion	Ocala		
106	S	625089K	745.56	S.E. 50th Court Road	Marion	Belleview		
107	S	625090E	746.00	S.E. 101st Place	Marion	Belleview		
108	S	625091L	746.84	SE Foss Rd	Marion	Belleview		
109	S	625093A	746.97	SE Robinson Rd	Marion	Belleview		
110	S	625094G	747.08	Hames Ave/S.E. 110th St.	Marion	Belleview		
111	S	625095N	747.23	SE Babb Rd	Marion	Belleview		
112	S	625096V	747.60	US Hwy 27	Marion	Belleview		
113	S	625097C	749.87	SE 135th St	Marion	Summerfield		
114	S	625098J	751.12	S.E.147th St & Arthur White Rd	Marion	Summerfield		
115	S	625100H	752.99	CR 42	Marion	Summerfield		
116	S	625101P	753.77	Private	Marion	Summerfield		
117	S	625102W	754.07	Private	Marion	Summerfield		
118	S	625103D	754.52	County Line Rd & C.R.102	Sumter	Oxford		
119	S	625104K	754.81	Private	Sumter	Oxford		
120	S	625105S	755.09	Private	Sumter	Oxford		
121	S	625106Y	755.53	CR 104	Sumter	Oxford		
122	S	625107F	756.28	CR 105	Sumter	Oxford		
123	S	625108M	756.81	CR 466	Sumter	Oxford		

Table 1.1 S-Line Grade Crossings (cont'd)

Crossing No.	Rail Line	USDOT No.	RR Mile Post No.	Street Name	County	Municipality	Evacuation Route ¹	SIS Route ²
124	S	625109U	756.86	CR 106	Sumter	Oxford		
125	S	625112C	757.83	CR 110	Sumter	Wildwood		
126	S	625113J	758.08	CR 472	Sumter	Wildwood		
127	S	625114R	758.60	CR 114	Sumter	Wildwood		
128	S	625115X	759.90	CR 462	Sumter	Wildwood		
129	S	625117L	760.61	US 301/ Main St	Sumter	Wildwood		
130	S	625318C	761.66	Lynum Street	Sumter	Wildwood		
131	S	625319J	762.52	SR 44	Sumter	Wildwood	X	
132	S	625320D	763.09	Turnpike	Sumter	Wildwood		X
133	S	625321K	765.82	Taylor Ave	Sumter	Coleman		
134	S	625280H	766.09	Warm Spring Ave	Sumter	Coleman		
135	S	625282W	766.92	Coleman Cem Dr.	Sumter	Coleman		
136	S	625284K	769.72	CR 470	Sumter	Sumterville		
137	S	625286Y	771.04	Private	Sumter	Sumterville		
138	S	625288M	773.43	CR 532	Sumter	Bushnell		
139	S	625289U	774.31	Private E OF Hwy 301	Sumter	Bushnell		
140	S	625290N	774.70	CR 542W/Walker Ave	Sumter	Bushnell		
141	S	625291V	775.71	E Belt Avenue	Sumter	Bushnell		
142	S	625293J	775.96	E Noble Ave	Sumter	Bushnell	X	
143	S	625294R	776.03	Bushnel Plaza	Sumter	Bushnell		
144	S	625295X	776.21	E Central Ave	Sumter	Bushnell		
145	S	625296E	776.49	Seminole Ave	Sumter	Bushnell	X	
146	S	627931A	776.87	Wallace Hatchery	Sumter	Bushnell		
147	S	625297L	777.28	Private Triple Ranch	Sumter	Bushnell		
148	S	625298T	777.85	CR 652	Sumter	Bushnell		
149	S	625300S	779.07	CR 720	Sumter	Bushnell		
150	S	625301Y	779.49	CR 478	Sumter	Bushnell		
151	S	625302F	779.91	CR 738A	Sumter	Bushnell		
152	S	625303M	780.43	CR 771	Sumter	Bushnell		
153	S	643884K	781.54	Private E SR 301	Sumter	Bushnell		
154	S	625304U	783.38	Gresham Rd	Hernand	Ridge Manor		
155	S	625305B	783.90	Private	Hernand	Ridge Manor		
156	S	625307P	787.35	Cortez Blvd & SR 50	Hernand	Ridge Manor	X	
157	S	625308W	790.30	SR 575	Pasco	Lacoochee		
158	S	625309D	790.50	Bower Rd	Pasco	Lacoochee		
159	S	625310X	791.16	Cummer Rd	Pasco	Dade City		
160	S	625312L	791.82	Mickler Rd	Pasco	Dade City		
161	AR	622704C	824.68	OwensboroRd/Old US 301	Pasco	Dade City		
162	AR	622705J	825.92	Gould Rd	Pasco	Dade City		
163	AR	622706R	826.92	Pvt Ashbrook Rd	Pasco	Dade City		
164	AR	622707X	828.02	Jordan Rd	Pasco	Dade City		
165	AR	622708E	828.84	Pioneer Museum Rd	Pasco	Dade City		

Table 1.1 S-Line Grade Crossings (cont'd)

Crossing No.	Rail Line	USDOT No.	RR Mile Post No.	Street Name	County	Municipality	Evacuation Route ¹	SIS Route ²
166	AR	908575J	829.20	Pasco Beverage	Pasco	Dade City		
167	AR	622719S	829.20	Pvt Pasco Beverage	Pasco	Dade City		
168	AR	622720L	829.65	River Road Dr	Pasco	Dade City		
169	AR	622721T	829.92	Martin Luther King Blvd	Pasco	Dade City		
170	AR	622722A	830.40	Tuskegee Ave	Pasco	Dade City		
171	AR	622723G	830.71	Wilson St	Pasco	Dade City		
172	AR	622724N	831.03	Dixie Dr	Pasco	Dade City		
173	AR	622725V	831.33	Old Sparkman Rd	Pasco	Dade City		
174	AR	622726C	831.62	Johnson St	Pasco	Dade City		
175	AR	622732F	832.32	Pvt Larkin Ranch	Pasco	Dade City		
176	AR	622733M	832.75	Johnson Rd	Pasco	Dade City		
177	AR	622734U	833.01	Enterprise Rd	Pasco	Dade City		
178	AR	622735B	833.30	Pvt Lykes Agri In	Pasco	Dade City		
179	AR	622736H	833.56	Santa Gertudis Dr	Pasco	Dade City		
180	AR	622737P	834.44	Pvt - Waller Ranch	Pasco	Dade City		
181	AR	622738W	835.08	Messick Rd	Pasco	Dade City		
182	AR	622739D	835.36	SR 35/ SR 700/US 98	Pasco	Dade City		
183	AR	622741E	836.35	Stewart Rd	Pasco	Zephyrhills		
184	AR	622843X	836.60	CR 35A/Melrose Ave	Pasco	Zephyrhills		
185	AR	622849N	837.80	CR 54A/Elwood Merrick Rd	Pasco	Zephyrhills		
186	AR	622851P	838.57	CR 54	Pasco	Zephyrhills	X	
187	AR	622855S	849.64	1st St NW	Polk	Lakeland		
188	AR	622856Y	849.92	Oak Ave NW	Polk	Lakeland		
189	AR	622857F	850.46	Deeson Rd	Polk	Lakeland		
190	AR	622858M	850.46	Private Dr	Polk	Lakeland		
191	AR	622859U	850.78	Pvt Tony Elrod Ave	Polk	Lakeland		
192	AR	622860N	851.17	Youngs Ridge Rd	Polk	Lakeland		
193	AR	622861V	851.48	Strickland Rd	Polk	Lakeland		
194	AR	622862C	851.59	Private Rd	Polk	Lakeland		
195	AR	622863J	851.92	Galloway Rd	Polk	Lakeland		
196	AR	622864R	852.28	Sleepy Hill Rd	Polk	Lakeland		
197	AR	622866E	853.16	Knights Sta Rd/ Griffin Rd	Polk	Lakeland		
198	AR	622867L	853.95	SR 400	Polk	Lakeland		X
199	AR	624287C	854.02	Bella Vista St	Polk	Lakeland		
200	AR	624286V	854.76	10th St	Polk	Lakeland		
201	AR	624288J	855.55	Memorial Blvd	Polk	Lakeland		

Table 1.1 S-Line Grade Crossings (cont'd)

Crossing No.	Rail Line	USDOT No.	RR Mile Post No.	Street Name	County	Municipality	Evacuation Route ¹	SIS Route ²
202	A	624290K	851.10	S.R. 563, Sikes Blvd	Polk	Lakeland		
203	A	624289R	851.01	New York Ave S	Polk	Lakeland		
204	A	624164R	850.95	Missouri Ave N	Polk	Lakeland		
205	A	624163J	850.89	North Florida Ave	Polk	Lakeland		
206	A	624162C	850.83	Tennessee Avenue	Polk	Lakeland		
207	A	624161V	850.77	Kentucky Avenue	Polk	Lakeland		
208	A	624160N	850.70	Massachusetts Avenue	Polk	Lakeland		
209				Bartow Road (RR Under)	Polk	Lakeland		
210	A	624158M	850.15	Ingraham Avenue	Polk	Lakeland		
211	A	624157F	849.90	Lake Parker Ave	Polk	Lakeland		
212	A	624156Y	849.79	Gary Road	Polk	Lakeland		
213	A	624155S	849.39	Interlachen Pkwy	Polk	Lakeland		
214	A	624154K	848.75	Canal Ave	Polk	Lakeland		
215	A	624153D	848.38	Fairway Ave	Polk	Lakeland		
216	A	624152W	848.02	N Eastside Dr	Polk	Lakeland		
217	A	624151P	847.88	Combee Road	Polk	Lakeland		
218	A	624150H	847.13	Fish Hatchery Road	Polk	Lakeland		
219	A	624149N	846.88	Reynolds Road	Polk	Lakeland		
220	A	623085B	844.84	Old Dixie Highway	Polk	Auburndale		
221	A	623084U	844.15	Payne St	Polk	Auburndale		
222	A			Polk Parkway S.R. 570 (RR Under)	Polk	Auburndale		X
223	A	623083M	842.31	Pvt Neptune Rd	Polk	Auburndale		
224	A	623082F	842.05	Recker Highway	Polk	Auburndale		

Source: Florida Department of Transportation

Notes:

(1) Evacuation routes: <http://www.floridadisaster.org/PublicMapping/index.htm>(2) SIS routes: <http://www.dot.state.fl.us/planning/SIS/atlas/distmaps/default.htm>. (SIS: Strategic Intermodal System)

1.2 GRADE CROSSINGS IDENTIFIED FOR SCREENING AND REVIEW

Operational conditions on a particular roadway are classified by the Level of Service that the roadway experiences. Level of Service (LOS) is a qualitative measure that considers speed and travel time, freedom to maneuver, traffic flow interruptions, driver comfort, convenience, and safety. The 2000 Highway Capacity Manual (HCM), and industry standard source, defines levels of service as follows:

LOS A represents free flow with low volumes and unimpeded movements.

LOS B represents a stable traffic flow with some restriction in a driver's ability to maneuver within the traffic stream.

LOS C generally is used for design purposes. Traffic flow is stable, but movements and ability to select speeds are restricted due to higher volumes. Traffic flow conditions are generally acceptable.

LOS D is generally considered the lower range of acceptable conditions. Traffic flow is stable, but driver comfort is compromised, and small increases in volume can create significant operational issues.

LOS E represents the capacity of the roadway or intersection and involves delay due to congestion. Operator comfort, convenience, and freedom to maneuver are significantly compromised.

LOS F is generally described as forced flow, with the traffic volume exceeding the capacity of the roadway or intersection. Operations are extremely unstable, and are characterized by stop and go, congested flow. This is considered an unacceptable operating condition.

The project team reviewed the at-grade crossing locations along the S-Line and the portion of the A-Line (Lakeland to Auburndale) that may potentially be impacted by the freight relocation. The grade crossing locations where the S-Line crosses either an arterial or collector roadway were selected for screening and assessment, because roadways in these categories generally carry higher volumes of traffic compared to smaller, local roadways, and as such are more likely to have existing levels of service in the range of LOS C or below. The smaller, local roadways are generally located in rural, low density land use areas and carry low volumes, and are expected to be operating at fairly high levels of service, LOS C or better. Therefore, the analysis is focused on the arterial and urban collector roadways in the corridor. Existing traffic data for these arterial and collector roadways were reviewed to identify grade crossings where the roadway level of service during peak driving periods is below LOS C. Existing records on traffic conditions including traffic data and LOS standards were collected from FDOT, relevant counties and municipalities, and Metropolitan Planning Organizations (MPOs). Data on existing traffic conditions (both LOS and volume) were collected, reviewed, and used to screen the grade crossings to identify those where the potential for impacts would be greatest.

The initial data collection process identified 29 grade crossing locations along the S-Line as candidates for further screening and review. (Refer to Table 1.2: Study Grade Crossings: Screening Results). Existing roadway traffic volumes were then collected and

projected to Year 2010 using locally sourced growth rates ranging from 1.8 to 3.4 percent per year. Of the total 29 grade crossing locations, two locations: N.W. Pine Avenue and SR 464/SW 17th Street in Ocala were screened out because they are, or will be, under construction. Another seven locations were screened out due to 2010 roadway traffic volumes that are below the FDOT 4,800 Annual Average Daily Traffic (AADT) threshold for LOS C on collector roads, which was agreed upon with FTA. As a result of this screening process a total of 20 grade crossing locations were identified for further evaluation.

TABLE 1.2 STUDY GRADE CROSSINGS: SCREENING RESULTS

Crossing No.	Location	Roadway Classification	No. of Lanes	No. of RR Tracks	County	AADT ¹	AADT Year	2010 Volume ²	2010 LOS ³		Screening Result ⁴	Comment
									AM Peak	PM Peak		
11	Lake Street/CR 225	Low Volume Rd	2	2	Bradford	2,100	2006	2,364	A	A	Dropped	Low Volume
17	East Brownlee Street/SR 16	Collector	2	2	Bradford	8,500	2006	9,567	A	A	Retained	
21	Call Street/SR 230	Collector	2	2	Bradford	7,000	2006	7,879	A	A	Retained	
22	SR 100/Madison St.	Collector	2	2	Bradford	7,800	2006	8,779	A	A	Retained	
82	NE 8th Avenue/CR 2877	Minor Arterial	4	2	Marion	6,100	2006	6,866	A	A	Retained	
86	N.W. Pine Avenue	Arterial (G.S)	4	2	Marion	31,000	2006	34,891	A	A	Dropped	Grade Separated
90	SW Broadway Street	Collector	2	2	Marion	900	2006	1,013	A	A	Dropped	Low Volume
95	SR 464/SW 17th St	Urban Arterial	4	1	Marion	41,500	2006	45,583	A	A	Dropped	Grade Sep. Under const
110	Hames Avenue/S.E. 110th St.	Minor Arterial	2E/1W	1	Marion	14,400	2006	16,207	A	A	Retained	
123	CR 466	Minor Arterial	4	1	Sumter	14,655	2005	15,552	A	A	Retained	
124	CR 106	Collector	2	1	Sumter	164	2003	202	A	A	Dropped	Low Volume
131	SR 44	Minor Arterial	4	2	Sumter	17,492	2005	21,428	A	A	Retained	
141	East Belt Avenue	Collector	2	2	Sumter	5,832	2003	7,173	A	A	Retained	
142	East Noble Avenue	Collector	2	2	Sumter	9,900	2006	11,143	A	A	Retained	
169	MLK Boulevard	Collector	2	2	Pasco	2,262	2003	2,782	A	A	Dropped	Low Volume
195	Galloway Road	Collector	2	1	Polk	6,600	2006	7,088	A	A	Retained	
200	10th Street	Collector	2	1	Polk	6,600	2001	8,612	A	A	Retained	
203	New York Ave South	Collector	2	1	Polk	2,968	2001	3,873	A	A	Dropped	Low Volume
204	Missouri Ave North	Collector	2	1	Polk	1,200	2006	1,289	A	A	Dropped	Low Volume
205	N. Florida Ave/US B 98/SR35	Urban Arterial	4	1	Polk	14,000	2006	16,003	A	A	Retained	
206	Tennessee Avenue	Collector	2	1	Polk	1,900	2001	2,479	A	A	Dropped	Low Volume
207	Kentucky Avenue	Collector	2	1	Polk	7,210	2001	9,407	A	A	Retained	
208	Massachusetts Avenue	Urban Arterial	4	1	Polk	9,300	2006	9,988	A	A	Retained	
210	Ingraham Avenue	Urban Arterial	4	1	Polk	9,700	2006	10,417	A	A	Retained	
217	Combee Road	Urban Arterial	4	1	Polk	20,400	2006	23,319	A	A	Retained	
218	Fish Hatchery Road	Collector	2	1	Polk	6,700	2006	7,196	A	A	Retained	
219	Reynolds Road	Collector	2	1	Polk	10,500	2006	11,277	A	A	Retained	
220	Old Dixie Highway	Collector	2	2	Polk	4,637	2003	5,703	A	A	Retained	
224	Recker Highway	Collector	2	1	Polk	15,700	2006	17,947	A	A	Retained	

Source: Florida Department of Transportation

Notes:

(1) AADT: Annual Average Daily Traffic

(2) Growth rates used to project roadway traffic volumes to year 2010 are based on rates published by local governments and MPOs and ranged from 1.8% to 3.4% per year.

(3) Grade crossing delay-based LOS based on average seconds of delay per vehicle experienced due to gate down time during the busiest AM or PM peak hour of roadway traffic.

(4) Dropped if 2010 AADT is less than 4,800 (defined by FDOT as LOS C for non-state/collector roadways), or if existing or proposed grade separated.

1.3 RAILROAD OPERATIONS – WITHOUT RELOCATION

CSXT provided rail operations data for the S-Line corridor for the existing, i.e. “without freight relocation” scenario. Information provided included average train counts by two-hour weekday peak periods (7–9 A.M. and 4–6 P.M.), average train lengths and existing speeds by CSXT subdivision.

Table 1.3 shows the 20 rail crossing locations along S-Line corridor in Bradford, Marion, Sumter, Pasco and Polk counties that have been screened as candidates for the grade crossing assessment. The average speed at the S-Line grade crossings varies from 45 mph in Lawtey, Stark, Ocala, Belleview, Wildwood, Bushnell, Dade City and Lakeland to 60 mph in the City of Auburndale. The average train length of the existing operations was established as 5,000 feet, and the equivalent of 75 rail cars. The table also shows the number of trains at the 20 grade crossing locations by two-hour weekday peak period. The number of trains was rounded upward to the nearest whole number, and it varies from three trains in Polk County to four trains in Bradford, Marion and Sumter Counties. The number of trains in the AM peak period for all the locations is one (1) whereas the number of trains for the PM peak period varies from two (2) to three (3) trains, depending on location.

TABLE 1.3 RAILROAD OPERATIONS AT STUDY GRADE CROSSINGS – WITHOUT RELOCATION

Crossing No.	Rail Line	Location Name	Grade Crossings	County	Municipality	Avg. Speed (mph)	Avg. Train Length (ft)	No. of Trains ¹		
								AM Peak (7-9)	PM Peak (4-6)	Total
17	S	E. Brownlee St.	Collector	Bradford	Stark	45	5,000	2	2	4
21	S	Call St	Collector	Bradford	Stark	45	5,000	2	2	4
22	S	SR 100/Madison St.	Collector	Bradford	Stark	45	5,000	2	2	4
82	S	NE 8th Avenue	Arterial	Marion	Ocala	45	5,000	1	3	4
110	S	Hames Ave./S.E.	Arterial	Marion	Belleview	45	5,000	1	3	4
123	S	CR 466	Arterial	Sumter	Oxford	45	5,000	1	3	4
131	S	SR 44	Arterial	Sumter	Wildwood	45	5,000	1	3	4
141	S	E Belt Ave	Collector	Sumter	Bushnell	45	5,000	1	3	4
142	S	E Noble Ave	Collector	Sumter	Bushnell	45	5,000	1	3	4
195	AR	Galloway Rd	Collector	Polk	Lakeland	45	5,000	1	2	3
200	AR	10th Street	Collector	Polk	Lakeland	45	5,000	1	2	3
205	A	N Florida Ave	Arterial	Polk	Lakeland	45	5,000	1	2	3
207	A	Kentucky Ave	Collector	Polk	Lakeland	45	5,000	1	2	3
208	A	Massachusetts Ave	Arterial	Polk	Lakeland	45	5,000	1	2	3
210	A	Ingraham Ave	Arterial	Polk	Lakeland	45	5,000	1	2	3
217	A	Combee Rd	Arterial	Polk	Lakeland	45	5,000	1	2	3
218	A	Fish Hatchery Rd	Collector	Polk	Lakeland	45	5,000	1	2	3
219	A	Reynolds Rd	Collector	Polk	Lakeland	45	5,000	1	2	3
220	A	Old Dixie Hwy	Collector	Polk	Auburndale	60	5,000	1	2	3
224	A	Recker Hwy	Collector	Polk	Auburndale	60	5,000	1	2	3

Source: Rail Operations Data. CSXT

Note:

(1) The analysis year assumed for the train operations without relocation is 2010. No. of Trains source: CSXT, April 2008.

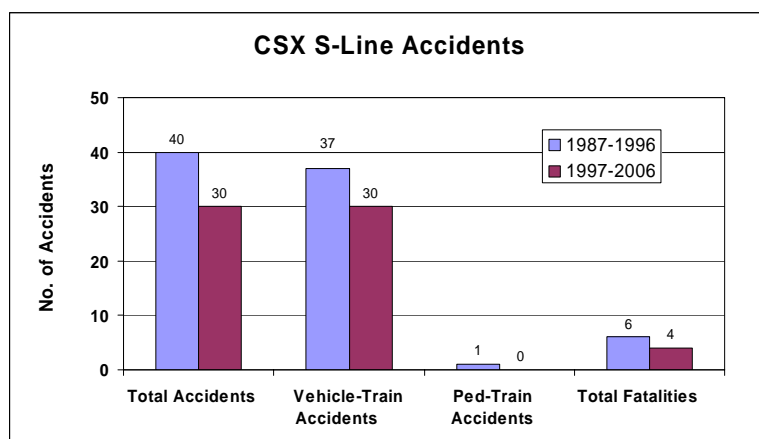
1.4 SAFETY

Improvements to rail-highway grade crossing signal safety devices, crossing closures and a combination of public education and rail safety awareness have all been designed to reduce the opportunity for collisions, fatalities and injuries at rail crossings and on railroad property. Over the years, a significant decrease in vehicle/train accidents has been witnessed even as the State of Florida has rapidly grown to the 4th largest state in population and correspondingly shown tremendous density increases in vehicular traffic.

The nine counties that the S-Line corridor passes through are mainly rural but in the last 20 years have had a steady population growth. These corridor counties had a modest population of 1,802,278 in 1987, but have grown by 25.4% in ten years to 2,260,136 by 1996. The following ten years illustrated a similar 22.7 % surge from a population of 2,306,554 to 2,829,501 between 1997 and 2006. This steady increase of growth places an increasing volume of the motoring public across rail-highway grade crossings. The potential for vehicle/train conflict has risen significantly over the last 20 years with a 56.9% population increase and unknown quantities of out of state travelers and tourists. During this time the total accidents at rail-highway grade crossings has actually decreased by 8%.

Rail operation accident data was provided by FDOT for the 20-year period between 1987 and 2006. This accident data is summarized in Figure 1.4.1. The data show that the total number of accidents and fatalities decreased over the latest 10-year period compared to the prior 10-year period. The number of vehicle-train accidents decreased from 37 (1987-1996) to 30 (1997-2006). The number of pedestrian-train accidents decreased, from 1 during (1987-1996) to none (1997-2006). The cause of the decrease in number of accidents and fatalities may be due to a combination of ongoing FDOT safety programs, Operation Lifesaver, and CSXT capital investments in upgrading infrastructure on the line. FDOT continues to conduct diagnostic reviews of all grade crossings and provides recommendations on the crossings that require upgrades or protection devices.

Figure 1.4.1 CSX S-Line Accidents from 1987 to 2006



Source: Florida Department of Transportation

2.0 S-LINE WITH FREIGHT RELOCATION

This section provides an overview of future roadway and railroad operating conditions along the CSXT S-Line relevant to the grade crossing assessment. Year 2010 was chosen as the analysis year for both “Without Freight Relocation” and “With Freight Relocation” scenarios. Future conditions data was collected from FDOT, CSXT, and a variety of local sources, and summarized in tables and maps. This section also includes a general discussion of potential for changes in accident occurrence at grade crossings on the S-Line.

2.1 RAILROAD OPERATIONS - WITH RELOCATION

CSXT provided future railroad operations data for the S-Line corridor for the “with freight relocation” scenario. Information provided included average train counts by two-hour weekday peak periods (7–9 AM and 4–6 PM), average train lengths and existing timetable speeds by CSXT subdivision for the 2010 analysis year.

Table 2.1.1 shows the future railroad operations for the 20 rail crossings along S-Line corridor in Bradford, Marion, Sumter, Pasco and Polk counties that were identified as candidates for the grade crossing assessment. The average speeds and the train lengths provided by CSXT for “Without freight relocation” scenario were also used for the “With freight relocation” scenario. As shown, the average speed is 45 mph in most municipalities and 60 mph in Auburndale. The average train length of the future operations was established as 5,000 feet, or the equivalent of 75 rail cars. The number of trains for the two-hour weekday peak period was rounded to the nearest whole number. As shown in the table, the total number of trains varies from three trains in Polk County to four trains in Sumter County, five trains in Marion County and six trains in Bradford for the year 2010.

TABLE 2.1.1 RAILROAD OPERATIONS AT STUDY GRADE CROSSINGS – WITH RELOCATION

Crossing No.	Rail Line	Location Name	Grade Crossings	County	Municipality	Avg. Speed (mph)	Avg. Train Length (ft)	No. of Trains ¹		
								AM Peak (7-9 am)	PM Peak (4-6pm)	Total
17	S	E. Brownlee St.	Collector	Bradford	Stark	45	5,000	2	4	6
21	S	Call St	Collector	Bradford	Stark	45	5,000	2	4	6
22	S	SR 100/Madison St.	Collector	Bradford	Stark	45	5,000	2	4	6
82	S	NE 8th Avenue	Arterial	Marion	Ocala	45	5,000	1	4	5
110	S	Hames Ave./S.E. 110th St.	Arterial	Marion	Bellevue	45	5,000	1	4	5
123	S	CR 466	Arterial	Sumter	Oxford	45	5,000	1	3	4
131	S	SR 44	Arterial	Sumter	Wildwood	45	5,000	1	3	4
141	S	E Belt Ave	Collector	Sumter	Bushnell	45	5,000	1	3	4
142	S	E Noble Ave	Collector	Sumter	Bushnell	45	5,000	1	3	4
195	AR	Galloway Rd	Collector	Polk	Lakeland	45	5,000	1	2	3
200	AR	10th Street	Collector	Polk	Lakeland	45	5,000	1	2	3
205	A	N Florida Ave	Arterial	Polk	Lakeland	45	5,000	1	2	3
207	A	Kentucky Ave	Collector	Polk	Lakeland	45	5,000	1	2	3
208	A	Massachusetts Ave	Arterial	Polk	Lakeland	45	5,000	1	2	3
210	A	Ingraham Ave	Arterial	Polk	Lakeland	45	5,000	1	2	3
217	A	Combee Rd	Arterial	Polk	Lakeland	45	5,000	1	2	3
218	A	Fish Hatchery Rd	Collector	Polk	Lakeland	45	5,000	1	2	3
219	A	Reynolds Rd	Collector	Polk	Lakeland	45	5,000	1	2	3
220	A	Old Dixie Hwy	Collector	Polk	Auburndale	60	5,000	1	2	3
224	A	Recker Hwy	Collector	Polk	Auburndale	60	5,000	1	2	3

Source: Rail Operations Data. CSXT

Note:

(1) The analysis year assumed for the train operations with freight relocation is 2010. No. of Trains source: CSXT, April 2008.

2.1.1 Lakeland Area

A map of the Lakeland area showing train movement after the relocation of A-line traffic to the S-Line is shown in Figure 2.1.1 The figure shows A-Line, S-Line, CSX corridor and regional connections.

Currently coal traffic represented by the green line travels to and from the Orlando Utilities Commission (OUC) Stanton Coal Plant east of the Orlando International Airport via the A-Line from the north and the OUC spur line south of Taft Yard in Orlando. This traffic occurs approximately 6 days a week (one loaded train to the Stanton Plant and one empty train from the plant each day, 6 out of 7 days a week). With the CSXT proposed train shift, this bi-directional train movement will now occur via the S-Line through Lakeland to the OUC Spur in Orlando via the south end of the A-Line (two additional coal train movements).

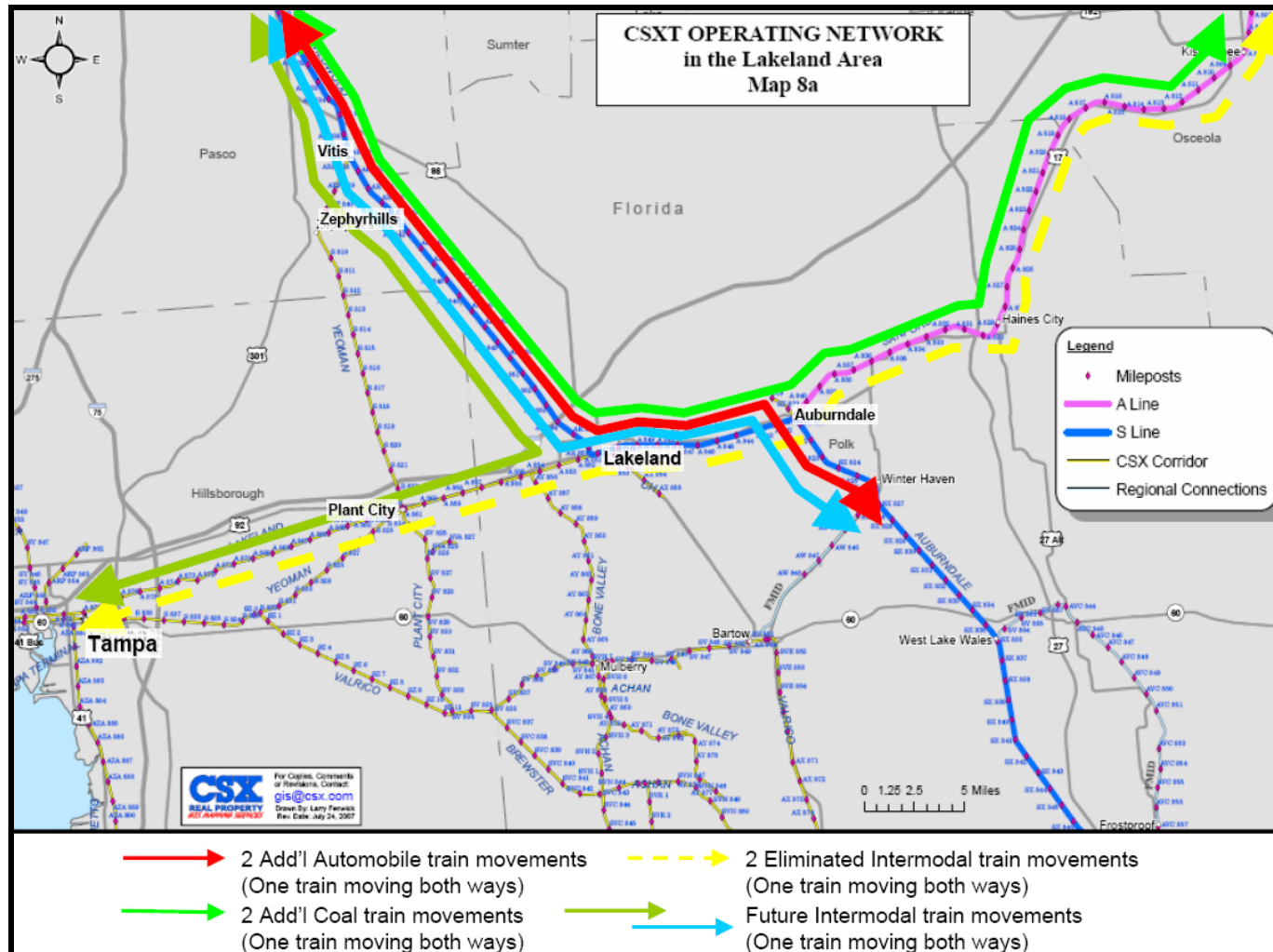
Two daily intermodal trains, one in each direction and represented in blue currently travel via the A-Line destined for Taft Intermodal Yard. Based upon CSXT's Business Plan, Taft Intermodal Yard business is being incorporated in the Winter Haven ILC Terminal. As a result these two daily intermodal trains represented by the blue line will shift from the A-Line to the S-Line and travel to and from Winter Haven through the City of Lakeland (two additional intermodal train movements).

Two daily intermodal trains are represented by the yellow line. These two trains, one in each direction, currently stop in Taft Intermodal Yard and then travel to and from Tampa via the City of Lakeland. This traffic will now travel via the S-Line through Vitis and Lakeland Junction (lighter green line) bypassing the City of Lakeland (two eliminated intermodal train movements).

The Auto Rack trains (tri-level automobile railway cars) are represented by the red line. These two daily trains, one in each direction, are currently routed via the A-Line to and from Taft Intermodal Yard. These Auto Rack trains will now be routed via the S Line through Lakeland to and from Winter Haven (two additional auto train movements).

In summary, after the A-line railroad traffic shift there will be 4 additional train movements operating through Lakeland daily (2 two additional trains moving both ways daily).

Figure 2.1.1 Train Movement in Lakeland Area with Freight Relocation



Source: CSXT

2.2 GRADE CROSSINGS SAFETY IMPROVEMENT PROGRAM

Florida Department of Transportation employs the Highway Railroad Grade Crossing Safety Improvement Program to continuously identify hazardous highway railroad grade crossing locations and develop safety improvement projects to reduce the number of crashes at grade crossings. Through a diagnostic review, the Program identifies grade crossings that are potentially hazardous based on predicted crash data that have the highest number of crashes, carry hazardous materials, carry passengers, and have existing or future plans to increase rail traffic. The Safety Improvement Program is also used for evaluating project effectiveness.

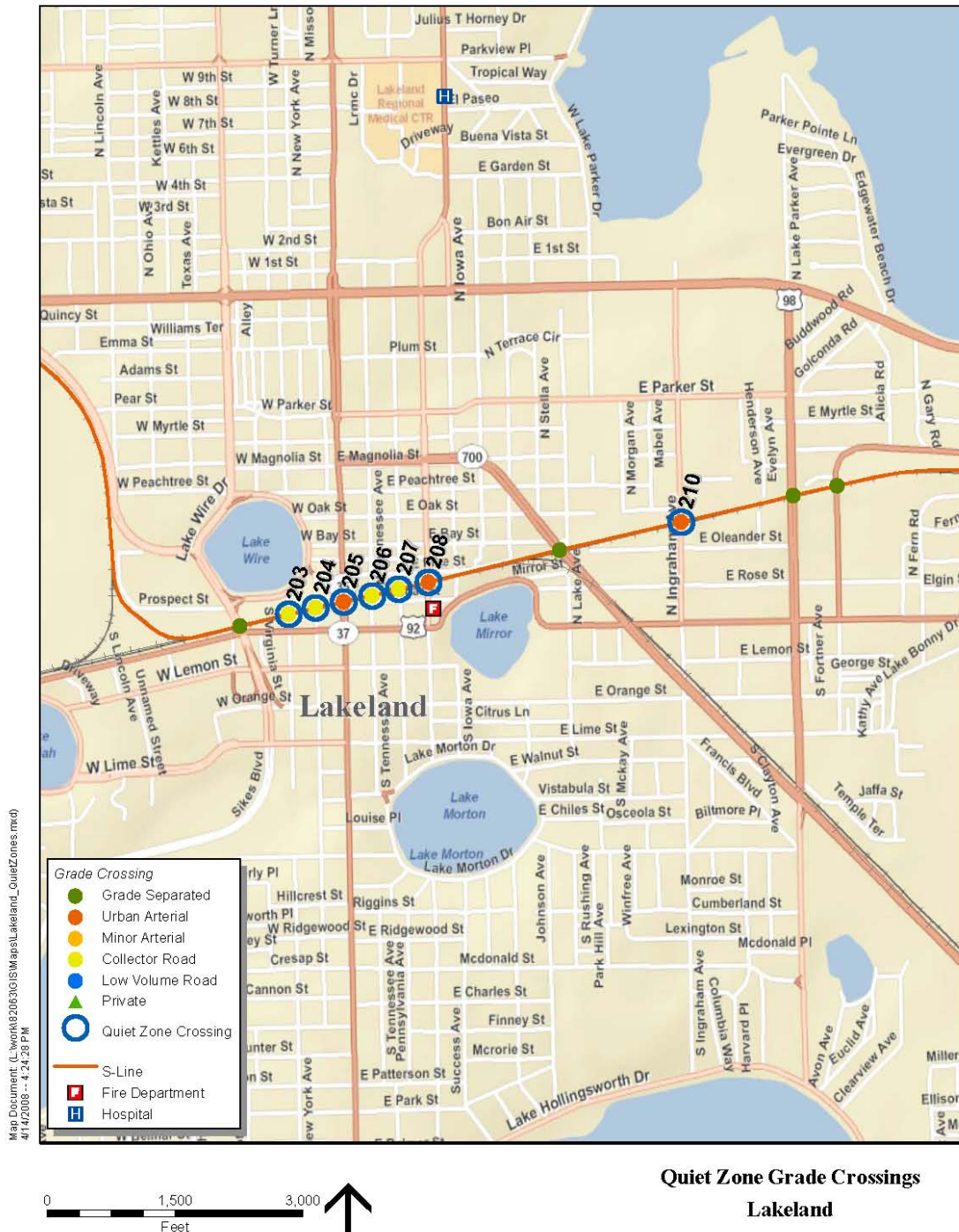
Improvements on hazardous grade crossings, identified through the program, are made through several efforts including elimination of redundant grade crossings, installation of grade crossing warning devices, upgrading of grade crossing warning devices, and new crossing surfaces.

All public crossings are included in the FDOT program. Only a limited number of crossings are programmed for improvements each year. A diagnostic review was performed in Alachua and Bradford Counties, Ocala and Belleview areas, and the Lakeland and Winter Haven areas.¹ Recommendations on improving grade crossings were made in the diagnostic reviews that include closing crossings, marking pavements and providing signs, resolving drainage and utility conflicts, installing active traffic control devices, upgrading existing active devices, providing grade separation at crossings, and removing sight obstructions.

There is currently one grade crossing under construction at the SR 464/S.W. 17th Street in Ocala. CSXT has committed to proposed quiet zones for Lakeland provided in Figure 2.2.1 include New York Avenue (MP 851.01), Missouri Avenue (MP 850.95), SR700 North Florida Avenue (MP850.89, Tennessee Avenue (MP 850.83), Kentucky Avenue (MP 850.77), Massachusetts Avenue (MP850.70) and Ingraham Ave (MP 850.15). In addition, the New York Avenue crossing has been identified for closure.²

¹Diagnostic Field Review Sheet. Rail-Highway Grade Crossing Data Sheet. Date Reviewed: 09/26/2006 and 06/18/2007. Florida Department of Transportation

² Florida Department of Transportation, Correspondence from G. M. Fitzpatrick, Administrator of Rail Operations, April 14, 2008.

Figure 2.2.1 Proposed Lakeland Quiet Zones

2.3 GRADE CROSSING CAPACITY ANALYSIS

Roadway capacity analysis was conducted for the 20 study grade crossing locations for both the “Without freight relocation” and “With freight relocation” scenarios during both weekday morning and afternoon peak hour periods. The traffic capacity analysis was conducted using the procedures outlined in the 2000 Highway Capacity Manual (HCM) for signalized intersections. Synchro Version 7.0 software was used to perform capacity analysis. The capacity analysis uses traffic volumes, lane geometry, and gate down time at the crossing to determine a Level of Service (LOS) rating from A to F. Level of service for signalized intersections is based on the average delay in seconds per vehicle, and ranges from less than 10 seconds for LOS A to greater than 80 seconds for LOS F. Table 2.3.1 shows the LOS criteria for signalized intersections.

TABLE 2.3.1 SIGNALIZED INTERSECTION PEAK HOUR LEVEL OF SERVICE CRITERIA

Level of Service	Average Delay Per Vehicle (seconds)
A	≤ 10
B	> 10 - 20
C	>20 - 35
D	>35 - 55
E	>55 - 80
F	>80

Source: Transportation Research Board, Highway Capacity Manual, HCM 2000, 2000.

Traffic capacity analysis for signalized intersections is typically performed using a 15-minute analysis period. Due to the relatively infrequent closure of the grade crossing compared to a typical signalized roadway intersection a one-hour analysis period was used to represent the highest peak hour during the two-hour morning and afternoon peak periods. It is noted that the average delay is for all vehicles crossing the tracks during the peak hour, not just the vehicles that are stopped during the gate down time.

The LOS impact analysis for the “Without freight relocation” scenario reflects 2010 roadway traffic volumes and existing freight service at the 20 study grade crossing locations along the S-Line. It includes gate down time at each location based on a freight train length of 5,000 feet and a train speed of 45 mph in Bradford, Marion, Sumter, Pasco, and Polk counties and 60 mph in Auburndale.

The LOS impact analysis for the “With freight relocation” scenario estimates the LOS at the selected grade-crossing assuming the shift of rail freight traffic to the S-Line. The analysis assumes the same freight train length and train speed as the “Without freight relocation” scenario, therefore gate down time for one event (one train passing) remains the same. However, the frequency of trains traveling through the grade crossing locations would increase based on projected train

operations data provided by CSXT for the “With freight relocation” scenario. It is projected that the frequency of trains will increase by 1 train in each (morning and afternoon) peak hour for Bradford and Marion counties, and by 1 train in the afternoon peak hour only in Sumter County. No increase in the number of trains is expected for any of the Polk county locations under the “With freight relocation” scenario during the morning or afternoon peak periods.

All grade crossings operate at LOS A during the peak hour and peak periods under the “Without freight relocation” scenario and will remain at LOS A under the “With freight relocation” scenario. Table 2.3.2 summarizes the results of the traffic LOS impact analysis for both scenarios. The average delay per vehicle remains less than 10 seconds at all 20 study grade crossings during both peak hours (AM and PM) under the “With freight relocation” scenario. In addition to the delay calculations, a volume to capacity (v/c) ratio was determined for each study grade crossing location. The v/c ratio does not exceed 0.5 for any of the study crossings as a result of the freight relocation.

The traffic analysis results also include an estimation of the 95th percentile queue lengths for vehicles stopped at the grade crossings. It should be noted that these queues occur under existing conditions. Comparing the two scenarios shows that the 95th percentile queue length does not increase due to the freight relocation; however the frequency of the queues occurring will increase by one event at most during each peak hour.

**TABLE 2.3.2 GRADE CROSSING CAPACITY ANALYSIS SUMMARY – WEEKDAY
PEAK PERIODS 1**

Crossing No.	Location	County	Without Freight Relocation AM/PM Peak Periods			With Freight Relocation ⁴ AM/PM Peak Periods			
			Total No. of Trains	Gate Down Time (s) ²	LOS ³ AM/PM		Total No. of Trains	Gate Down Time (s)	LOS AM/PM
17	East Brownlee Street/SR 16	Bradford	4	432	A/A		6	648	A/A
21	Call Street/SR 230	Bradford	4	432	A/A		6	648	A/A
22	SR 100/Madison St.	Bradford	4	432	A/A		6	648	A/A
82	NE 8th Avenue/CR 2877	Marion	4	432	A/A		5	540	A/A
110	Hames Ave./ S.E.110th St.	Marion	4	432	A/A		5	540	A/A
123	CR 466	Sumter	4	432	A/A		4	432	A/A
131	SR 44	Sumter	4	432	A/A		4	432	A/A
141	East Belt Avenue	Sumter	4	432	A/A		4	432	A/A
142	East Noble Avenue	Sumter	4	432	A/A		4	432	A/A
195	Galloway Road	Polk	3	324	A/A		3	324	A/A
200	10th Street	Polk	3	324	A/A		3	324	A/A
205	North Fl. Ave/US B 98/SR35	Polk	3	324	A/A		3	324	A/A
207	Kentucky Avenue	Polk	3	324	A/A		3	324	A/A
208	Massachusetts Avenue	Polk	3	324	A/A		3	324	A/A
210	Ingraham Avenue	Polk	3	324	A/A		3	324	A/A
217	Combee Road	Polk	3	324	A/A		3	324	A/A
218	Fish Hatchery Road	Polk	3	324	A/A		3	324	A/A
219	Reynolds Road	Polk	3	324	A/A		3	324	A/A
220	Old Dixie Highway	Polk	3	267	A/A		3	267	A/A
224	Recker Highway	Polk	3	267	A/A		3	267	A/A

Notes:

(1) AM Peak Period is 7 – 9 AM.

PM Peak Period is 4 – 6 PM.

(2) Gate Down Time is measured in seconds.

(3) LOS: Level of Service. LOS is calculated for the peak hour and is based on average vehicle delay over the peak hour.

(4) Volume to capacity ratio (V/C) remains below 50% on all roadways at these crossings after relocation.

2.4 SAFETY

This section discusses the potential for change in train accidents and road – rail incidents at grade crossings on the S-Line as a result of the shift of the rail freight traffic to the S-Line.

Through Highway Railroad Grade Crossing Safety Improvement Program, FDOT continuously evaluates and identifies grade crossing locations that are potentially hazardous, and develops safety improvement projects to upgrade crossings and reduce the number of crashes at grade crossings. Approximately 95 percent of public crossings along S-Line have active warning devices, and with most of the relocated trains occurring off peak when traffic volumes are lower, the relocation of some freight trains to the S-Line is not expected to have a significant impact on safety.

2.5 EMERGENCY VEHICLES

This section identifies locations on the S-Line where existing train operations are of particular concern relative to their potential impact on emergency vehicle response time.

Figures 1.1.2 through 1.1.6 in Section 1 shows fire departments and hospitals that are located within five miles of the S-Line corridor. About eight hospitals that provide emergency care and 26 fire departments (including volunteer fire departments) were identified within five miles of S-Line for emergency response. Table 2.4.1 compares gate down time for 24-hour period for the hospitals and fire departments. Total gate down time per train is assumed to be same with relocation and without relocation scenarios. The comparison of gate down time in a 24-hour period varies from two to three percent for “With relocation” scenario and from three to four percent for “Without relocation”. The percentage of gate down time remains the same in both scenarios for all the hospitals and fire departments except for the ones located in Bradford, Sumter and Polk Counties, where the gate down time for 24-hour period increases by one percent. Therefore, relocation of freight trains along the S-Line will not have significant impact on emergency response vehicles.

**TABLE 2.4.1 HOSPITALS AND FIRE DEPARTMENTS WITHIN 5 MILES OF S- LINE
AND GATE DOWN TIME 24-HOUR COMPARISON**

Locations	County	Municipalities	Gate Down Time (min) ¹	Without Relocation (24 hr)			With Relocation (24 hr)		
				No. of Trains	Gate Down Time (min)		No. of Trains	Gate Down Time (min)	
Hospitals									
Shands at Starke	Bradford	Starke	1.8	26	47		31	56	
West Marion Community	Marion	Ocala	1.8	21	38		27	49	
Monroe Regional Medical	Marion	Ocala	1.8	21	38		27	49	
Ocala Regional Medical Center	Marion	Ocala	1.8	21	38		27	49	
Villages Regional Hospital, The	Sumter	The Villages	1.8	24	43		29	52	
Pasco Regional Medical Center	Pasco	Dade City	1.8	20	36		25	45	
Florida Hospital	Pasco	Zephyrhills	1.8	20	36		25	45	
Lakeland Regional Medical	Polk	Lakeland	1.8	17	31		23	42	
Fire Departments									
Lawley V.F.D	Bradford	Lawley	1.8	26	47		31	56	
Theresa V.F.D.	Bradford	Starke	1.8	26	47		31	56	
Starke Fire Department	Bradford	Starke	1.8	26	47		31	56	
Heilbron Springs V.F.D.	Bradford	Starke	1.8	26	47		31	56	
Hampton V.F.D	Bradford	Hampton	1.8	26	47		31	56	
Waldo Fire Department	Alachua	Waldo	1.8	21	38		27	49	
Melrose Fire Department	Alachua	Melrose	1.8	21	38		27	49	
Dept. of Forestry Dist. Office	Alachua	Gainesville	1.8	21	38		27	49	
Windsor Fire Department	Alachua	Windsor	1.8	21	38		27	49	
Hawthorne Fire Department	Alachua	Hawthorne	1.8	21	38		27	49	
West Putnam Fire Department	Putnam	Hawthorne	1.8	21	38		27	49	
Cross Creek V.F.D	Alachua	Cross Creek	1.8	21	38		27	49	
Micanopy Fire Department	Alachua	Micanopy	1.8	21	38		27	49	
Coleman Fire Department	Sumter	Coleman	1.8	24	43		29	52	
Croom-A-Coochee V.F.D	Sumter	Webster	1.8	24	43		29	52	
City Of Webster Police/Fire	Sumter	Webster	1.8	24	43		29	52	
East Hernando Fire Station 2	Hernando	Ridge Manor	1.8	20	36		25	45	
Pasco Fire Station 24	Pasco	Dade City	1.8	20	36		25	45	
Pasco Fire Station 24 - Bays	Pasco	Dade City	1.8	20	36		25	45	
Dade City Fire Station – Circ	Pasco	Dade City	1.8	20	36		25	45	
Pasco Fire Station 25	Pasco	Zephyrhills	1.8	20	36		25	45	
Pasco Fire Station 18	Pasco	Crystal Springs	1.8	20	36		25	45	
Lakeland Fire Department	Polk	Lakeland	1.8	17	31		23	42	

Sources: Hospital and Fire Department locations: Florida Geographic Data Library.

Train operations: CSXT

Notes:

(1) Per train based on average train speed and length shown in Tables 1.3 and 2.1.1.

Gate down time per train is assumed to be same with relocation and without relocation.

Traveling from the north, West Marion Community Hospital, Pasco Regional Medical Center, and Florida Hospital are located on the west side of the rail-road track whereas, Shands at Starke Hospital; Munroe Regional Medical Center and Ocala Regional Medical Center; Villages Regional Hospital, and Lakeland Regional Medical Center are located on the east side of the rail-road track.

Table 1.1 in Section 1 lists the locations that cross the identified evacuation and Strategic Intermodal System (SIS) routes. The S-Line grade crossing locations (Refer to Table 1.1) that cross the evacuation routes are summarized below:

<u>Crossing No.</u>	<u>Locations</u>
5	CR 218 (Middleburg)
10	Middleburg Road (Lawtey)
17	E. Brownlee Street (Starke)
22	SR 100/ Madison Street (Starke)
28	CR 18/Navarre Street (Hampton)
37	NE SR 26 (Hawthorne)
47	SR 20 Access Ramp (Hawthorne)
76	SR 326/NE 70th Street (Ocala)
95	SR 464/SW 17th Street (Ocala)
131	SR 44 (Wildwood),
142	E Noble Avenue (Bushnell)
145	Seminole Avenue (Bushnell)
156	Cortez Boulevard & SR 50 (Ridge Manor)
186	CR 54 (Zephyrhills)

Also, as shown in Table 1.1, three locations cross SIS routes in Wildwood, Lakeland and Auburndale. These include the Florida Turnpike in Wildwood, S.R. 400 in Lakeland and Polk Parkway in Auburndale. It is anticipated that these crossings will not have any impact on the SIS routes because all of the three crossings are grade separated state routes and highways. In summary, there will be no impact on these routes since there are no significant changes in delays related to gate down time.

2.6 MARSHALLING AREAS

This section reviews the changes in railroad and roadway operations and infrastructure documented in Subtask 2.1 to assess where and how those changes could impact grade crossing delay due to activities at freight marshalling areas. It is assumed that the additional freight in the “With Relocation” scenario will be through trains not bound for locations along most of the S-Line; otherwise that freight traffic would already be using the S-line. Therefore, an increase in local freight marshalling and its potential for additional grade crossing delay along the S-line is not expected to occur. Increased train and truck activities associated with the Intermodal Logistics Center (ILC) are the subject of a separate impact analysis under the Development of Regional Impact (DRI) process

3.0 CONCLUSIONS

The grade crossing capacity analysis and safety study for the study grade crossings show that the relocation of the CSXT trains will not significantly impact grade crossing delay and safety.

The grade crossing capacity analysis shows that all the study grade crossings will continue to operate at level of service (LOS) A under the “With freight relocation” scenario. The average delay per vehicle remains less than 10 seconds at all 20 study grade crossings during both peak hours (AM and PM) and the v/c ratio does not exceed 0.5 for any of the study crossings as a result of the freight relocation. The traffic analysis also shows that the 95th percentile queue length does not increase due to the freight relocation. Additionally, the rail operations data provided by CSXT for the “with relocation” scenario shows an increase in trains during peak hours only in the northern end of the corridor.

The relocation of freight trains will have minimal impact on safety and emergency response vehicles because FDOT continuously evaluates and provides recommendations on safety improvement for grade crossing locations that are potentially hazardous or require upgrades for protection devices. In addition, the percentage of time that the gate will be down in a 24-hour period is minimal in both scenarios. The gate down time increases by one percent in Bradford, Sumter and Polk Counties under the “With freight relocation” scenario, whereas it remains the same for all the other counties under both scenarios. Gate down time per train does not increase.