



**SOUTH FLORIDA EAST COAST
CORRIDOR TRANSIT ANALYSIS STUDY**

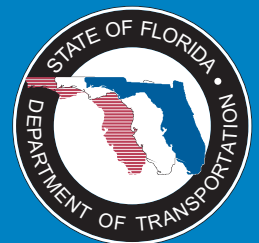
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***Phase 2 Mitigation Strategies and
Concepts Technical Memorandum***

Prepared by:



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To: Scott Seeburger
From: Rob McMullen
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Subject: South Florida East Coast Corridor Transit Analysis (SFECCTA) Study:
Mitigation Strategies and Concepts Technical Memorandum

INTRODUCTION

Purpose

The purpose of this technical memorandum is to offer possible mitigation strategies and concepts that could be applied during subsequent phases of this project. The mitigation strategies and concepts discussed in this technical memorandum would require continued consultation and coordination with regulatory agencies to lessen or avoid impacts to natural and social resources. In subsequent phases, likely environmental impacts would be quantified and plans formulated for avoidance or mitigation. Project-level environmental analyses, conducted in subsequent phases of this study would be required to conclude with certainty that the mitigation strategies discussed here would sufficiently reduce impacts on affected resources.

Project Description

The Florida Department of Transportation (FDOT) initiated the multi-phased South Florida East Coast Corridor Transit Analysis (SFECCTA) study in December 2005 recognizing that the Florida East Coast (FEC) Railway was and is a unique transportation asset that should be evaluated and developed in the context of regional transportation issues, priorities and needs. The SFECCTA study is designed to evaluate the reintroduction of passenger service along a portion of the FEC Railway corridor from Miami to Jupiter. In its second phase, the SFECCTA study continued the Alternative Analysis (AA) – Early Scoping process that was initiated in Phase 1. A discussion of the Phase 1 AA may be found in the Phase 1 Conceptual Alternatives Analysis/Environmental Screening Report (AA/ESR) on the project website (<http://www.sfecstudy.com/>).

Phase 2 of the SFECCTA was initiated in January 2009 and was designed to build upon the Phase 1 AA to refine and further develop through an iterative process the alternatives identified at the conclusion of the first phase. The primary focus of Phase 2 was to identify a locally preferred alternative (LPA) within the study area, in accordance with Federal Transit Administration (FTA) and FDOT project development processes, that could ultimately be submitted to FTA for federal assistance in the form of New Starts funding. A Phase 2 Draft Detailed Environmental Screening Report (ESR) has been prepared to describe the detailed environmental screening approach conducted as part of the Phase 2 AA and is supported by a series of technical memoranda and reports like the one presented here.

Project Area

The SFECCTA project area, illustrated on the Project Location Map (Figure 1), is bounded on the south by Flagler Street, just south of the Miami-Dade Government Center, in the City of Miami and on the north by the southern shoreline of the Loxahatchee River in the Town of Jupiter.

The western boundary of the project area runs parallel to and 0.5-mile west of the South Florida Rail Corridor (SFRC)/Tri-Rail corridor from the Miami Intermodal Center (MIC) north to Mangonia Park then continues in a northwesterly direction parallel to and 0.5-mile west of I-95 to the southern shoreline of Southwest Fork of the Loxahatchee River (C-18). The eastern boundary of the project area runs parallel to and 0.5-miles east of Highway US-1 from the Central Business District (CBD) of the City of Miami north to the southern shoreline of the Loxahatchee River in Jupiter.

Within the SFECCTA *project area* are several unique *study areas* that were developed specifically to define the affected environment and screen/evaluate the various project alternatives. Generally, the affected environment is a Geographic Information System (GIS) inventory of environmental, social, and cultural resources that could be affected by the proposed improvements. The affected environment and screening process are defined and documented in the Draft ESR.

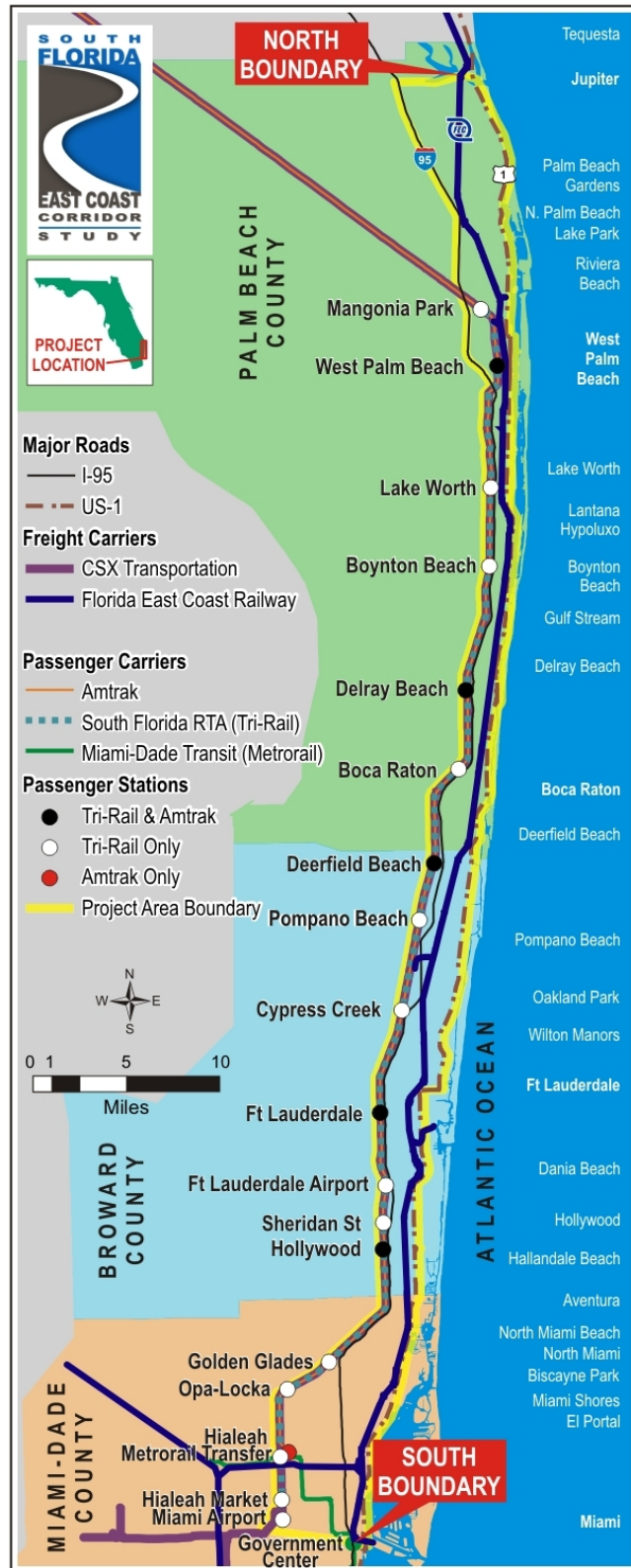
The primary study area, where most of the improvements are expected to occur, is the FEC Railway corridor that extends from the CBD of the City of Miami north to the Town of Jupiter in Palm Beach County (a linear distance of approximately 83 miles). A detailed description of each study area and environmental screening methodology is provided in Chapter 3 and Appendix A, respectively, of the Draft ESR.

LAND USE/SOCIO-ECONOMIC

Land Use Compatibility

Current regional and local policies (refer to Section 3.1.5 of the ESR) encourage the intensification of development through infill or redevelopment, and the expansion of the urban area in a contiguous pattern centered on a network of high-intensity urban centers well connected by multimodal intra-urban transportation facilities.

Figure 1: Project Location Map



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Some amount of residential, commercial, and industrial development is anticipated to be associated with the multi-modal improvements proposed along the project corridor: in particular, transit oriented development (TOD) in the immediate vicinity of proposed passenger transit stations. Local land use plans and ordinances would be further evaluated in subsequent phases to determine consistency with existing and planned land uses, neighborhood access needs, and connectivity between the proposed transit project and the areas it is intended to serve. Potential mitigation strategies to alleviate or minimize land use related impacts associated with the proposed transit improvements might include:

- Collaboration with city and county governments to develop plans for project facilities that would be consistent with land use planning processes and zoning ordinances;
- Establishment of requirements for station area plans and opportunities for TOD.

Communities and Neighborhoods

Community cohesion is an important issue for a project of this scale, one that traverses multiple neighborhoods and communities. Communities may be separated or isolated because of: constructing train tracks and fencing, closing transitway-highway crossings, and increasing train traffic. In subsequent phases, consultation with local governments and planning agencies will continue with consideration given to minimizing barrier effects, maintaining neighborhood integrity, and avoiding or minimizing impacts to community cohesion. Potential mitigation strategies to reduce the effects of any new barriers could include grade separating transitway-highway crossings, constructing new pedestrian crossings, improving the visual quality of project facilities, and developing traffic management plans to maintain access during and after construction. In addition, mitigation measures would also be developed to address temporary, construction-related impacts on nearby neighborhoods and communities.

Additional mitigation strategies that may be applied to alleviate or minimize community cohesion related impacts might include:

- Creating opportunities for community involvement early in project level studies;
- Convening design workshops within each affected neighborhood to develop an understanding of key vehicle, bicycle, and pedestrian linkages across the rail corridor so that those linkages can be preserved;
- Developing facility, landscape, and public art design standards for the project corridor that reflect the character of adjacent affected neighborhoods;
- Maximizing connectivity during construction;
- Applying aesthetic standards for project facilities in neighborhood areas using visual buffers such as trees and other landscaping, architectural design and public artwork.

Safety/Mobility

The potential for site-specific increases in traffic congestion around transit stations and at transitway-highway crossing closed because of this project would present another concern for affected communities. Potential mitigation strategies could include:

- Providing off-site parking with shuttles;
- Establishing parking permit plans for neighborhoods;
- Regulating parking and curbside use;

- Implementing a construction phasing and traffic management plan;
- Installing new traffic signals;
- Modifying intersections with signalization and/or low-cost capacity improvements;
- Coordinating and optimizing traffic signals;
- Designating one-way street patterns some station locations;
- Grade separating certain transitway-highway crossings;
- Designating truck route;
- Restricting certain turn movements;
- Increasing feeder bus service and/or adding routes to serve the proposed station areas.

Overall, the proposed transit improvements are anticipated to have a positive effect when viewed on a system-wide basis, particularly by reducing traffic on highways and around airports. However, an increase in traffic and congestion is expected around station areas. The location, extent, and particular characteristics of increased traffic and congestion at station areas would be identified in subsequent phases of the study. Planning multi-modal stations, coordinating with transit services, providing accessible locations and street improvements, and encouraging TOD in station areas, are potential mitigation strategies that could ease traffic congestion in station areas.

Property

Potential land use displacement and property acquisition would be avoided, to the extent feasible, by considering further transit or maintenance site location adjustments and design changes. In addition, subsequent phases of the study would consider relocation assistance in accordance with the *Federal Uniform Relocation and Real Property Acquisition Policies Act of 1970*. Design strategies would be developed during project-level analysis to avoid or minimize the temporary or permanent acquisition of private property.

Environmental Justice

Executive Order 12898 requires federal agencies to ensure effective public participation and access to information and to take actions such that no one group should bear a disproportionate share of the negative environmental consequences. Impacts to low-income and minority populations may occur, as they will for other communities/neighborhoods within the study area. However, it is not expected that the proposed transit improvements will disproportionately affect minority or low-income populations. Additional consideration of environmental justice (EJ) issues would occur during project-level review, which would include consideration of potential localized impacts and potential benefits to and enhancements for communities along the project corridor. Project-level evaluations in subsequent phases of the study would include consideration of detailed mitigation measures, including mitigation for temporary construction-related impacts as well as outreach to potentially affected communities as part of the public review process.

Mitigation measures applied to environmental impacts throughout the project corridor would also serve to mitigate potential impacts to EJ communities. However, specific attention would be given to permanent impact categories that are commonly of concern for this type of project. These include:

- Air quality;
- Noise and vibration;

- Public health;
- Visual/aesthetics;
- Parklands;
- Relocation.

Executive Order 12898 requires federal agencies to ensure effective public participation and access to information. Consequently, a key component of EO 12898 is outreach to potentially affected minority and low-income populations to discover important issues that may not otherwise be apparent. Outreach to affected communities would continue in subsequent phases of the study as part of the decision-making process.

Visual and Aesthetic Qualities

The significance of the visual/aesthetic changes is dependent on the sensitivity of the landscape and the magnitude of the changes. The introduction of a new transit system will undoubtedly change the visual landscape through the Tri-county area. However, overall visual impacts are not anticipated to be significant since the project corridor traverses a primarily urban region of south Florida with little to no highly sensitive scenic areas. Nevertheless, visual impacts will occur, in particular near historic sites or districts. The proposed transit improvements would create both short-term and long-term construction-related visual changes. Mitigation strategies, as well as appropriate design practices would be applied to reduce these impacts.

Generally, mitigation strategies would include the design of proposed facilities that are attractive in their own right and that would integrate well into landscape contexts. An effort would be made to avoid or minimize blocking view, creating contrasting views, and producing light and shadow effects. Further consultation with local and regional agencies and with the public would occur to refine these general mitigation strategies during subsequent phases.

The following mitigation measures could be considered during subsequent phases and design development to enhance project appearance and minimize project visual impacts:

- Bridges could be designed with graceful lines and with minimal apparent bulk and shading effects;
- Transit stations and parking structures could be designed with sensitivity to the surrounding context;
- Fencing, of an aesthetically appropriate nature, could be installed;
- Landscaping could be employed along the edge of the right-of-way, comprised of trees and shrubs, to screen or integrate the right-of-way into the residential context;
- Night lighting at stations could be minimized to the extent required for operations and safety;
- Potential shadow impacts on adjacent pedestrian areas, parks, and residential areas could be taken into account;
- Overhead and ground level utilities could be buried or concealed.

Context Sensitive Solutions (CSS) is a collaborative, interdisciplinary approach that involves all stakeholders in developing a transportation facility that fits its setting. An approach that leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions (CSS Strategic Planning

Process Summary Report, March 2007). Context Sensitive Solutions, initiated in Phase 2, would be refined in subsequent phases during the conceptual design of proposed alternatives in accordance with FDOT guidance. All avoidance, minimization and mitigation measures will strive to incorporate local agency and community input during subsequent phases.

HISTORIC AND CULTURAL RESOURCES

The proposed transit improvements could have an adverse effect on cultural and historic resources. Locating station sites in metropolitan centers increases the potential for adverse impacts to cultural and historic resources. However, placing the proposed transit improvements within existing Florida East Coast (FEC) Railway right-of-way reduces the potential for adverse effects to many resources.

Mitigation strategies, as well as appropriate design practices, would be applied to reduce potential impacts to cultural and historic resources. As the SFECCTA study proceeds into subsequent phases, FDOT would continue to consult with the State Historic Preservation Office (SHPO) to define and describe general procedures to be applied in the future for fieldwork, methods of analysis, and the development of specific mitigation measures to address effect and impacts on cultural resources. The FDOT would also continue to consult with local historic groups during subsequent phases of the study.

The following list presents some of the principles that generally guide protection of historic resources:

- Recording, rehabilitating, and relocating resources;
- Screening resources with vegetative or natural materials;
- Constructing artificial barriers such as fences, barriers, and walls;
- Enhancing historic streetscape;
- Offering public interpretation of the historic railway and historic communities along railway, through displays, videos, websites, and documentation such as National Register of Historic Places (NRHP) nominations;
- Installing plaques at key locations along the corridor that present local historic FEC Railway and community history with text, photos, etchings;

The FEC Railway itself has been identified as a linear historic resource whose significance remains to be determined. Coordination with SHPO and FDOT Central Environmental Management Office (CEMO) regarding procedures for preservation, recordation, responsible utilization of potential linear historic resources in the SFECCTA project area, including the FEC Railway and associated facilities or State Historic Highways will be continued in subsequent phases. Mitigation strategies may include the implementation of “creative mitigation” at strategic locations such as stations, greenways and trails, historic bridges, etc. Creative mitigation measures may include video documentation for educational purposes in local schools and history centers; interpretative documentation along the railway corridor incorporated into station locations; historic information and photos incorporated into displays within train cars; and disseminating historical information through current digital sources such as websites.

Archaeological Resources

The following are potential mitigation measures for eligible or listed archaeological sites:

- Incorporating the site into parks or open space;
- Capping or covering the site before construction;
- Recovering relevant data ;

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- Developing procedures for fieldwork, identification, evaluation, and determination of potential effects to cultural resources in consultation with SHPO and Native American tribes.

Additional environmental assessments, including the preparation of a Cultural Resource Assessment Survey (CRAS), will be conducted in subsequent phases in coordination SHPO as well as local historic preservation entities to define potential impacts and the appropriate mitigation measures.

Parklands and Recreation Areas

Proposed mitigation measures for historic resources and visual/aesthetic qualities may also be applied to Section 4(f) properties if necessary. In addition, specific mitigation strategies for Section 4(f) properties may include:

- Coordinating with FTA, state and local entities for Section 4(f) resource avoidance, minimization, preservation, and, should it be necessary, mitigation measures;
- Avoiding construction closures during large events;
- Maintaining access during construction;
- Applying best management practices to reduce construction related impacts such as dust, noise, debris removal, etc.

BIOLOGICAL AND NATURAL RESOURCES

Because specific biological resource impacts cannot be predicted with certainty during Phase 2 of the study, specific mitigation measures cannot be developed at this time. However, placing the proposed transit improvements largely within the existing FEC Railway right-of-way reduces the potential for adverse effects to biological and natural resources. Appropriate engineering and design practices would further reduce adverse impacts to these resources by avoiding encroachments on habitat and wetlands. Where impacts are unavoidable, strategies to mitigate impacts on biological resources would be developed in coordination with the appropriate regulatory agency or agencies. Candidate mitigation strategies are described below from which specific mitigation measures can be developed once the extent of direct and indirect biological resource impacts are determined. Mitigation strategies that could be applied at the project level for potential impacts to biological resources may include the following:

- Field verifying sensitive resources;
- Conducting project-specific analyses of environmental impacts;
- Developing and adopting mitigation monitoring program;
- Participating in or contributing to existing or proposed conservation banks or natural management areas, including possible acquisition, preservation, or restoration of habitats;
- Constructing wildlife underpasses, bridges, and/or large culverts, to facilitate known wildlife movement corridors.

Site-specific avoidance and minimization strategies would be identified during project-level environmental analysis in consultation with the appropriate resource agencies.

Jurisdictional Wetlands:

The amount of mitigation would depend upon the nature and condition of the jurisdictional areas located within the wetlands impact areas.

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When appropriate, on-site mitigation would be preferred. Off-site mitigation would be located within the same watershed or as close as possible to the area of impact. Mitigation options for unavoidable impacts to state and federal jurisdictional waters would include on- or off-site restoration, creation, enhancement, mitigation banking, and/or in-lieu fee payments, as described below:

- Restoration – Return degraded habitat to a pre-existing condition;
- Creation – Conversion of a persistent non-wetland habitat into wetland or other aquatic habitat;
- Enhancement – Increase one or more functions through activities, such as plantings or nonnative vegetation eradication;
- Mitigation banking - Purchase of units of wetland or waters habitat that have been restored or enhanced within a larger managed conservation area;
- In-Lieu Fee Program – A monetary payment is made to an agency approved entity (i.e. The Nature Conservancy) that provides habitat conservation or restoration.

Current federal and state policies emphasize a "no net loss" of wetlands habitat, which is achieved through the restoration of areas affected by temporary impacts or the creation of wetlands to offset permanent impacts. Approved mitigation and in-lieu fee programs would include measures that ensure the "no net loss" policy is met.

The above mitigation strategies are expected to substantially lessen or avoid impacts to biological resources and/or wetlands. With subsequent environmental project-level analysis in consultation with regulatory agencies, impacts to biological resources and wetlands would be reduced. Additional environmental assessments, to be conducted in subsequent phases of the study, will allow a better evaluation of mitigation and/or avoidance options for impact minimization to wetlands.

Water Quality/Stormwater Runoff

Placing the proposed transit system within the existing FEC Railway right-of-way reduces the potential for adverse effects on water quality/resources. Engineering and design practices would further reduce potential adverse impacts to water resources within the study area (e.g., avoiding encroachments on water resources, infrastructure setbacks from surface waters, using permeable surfaces and structures to reduce flow and drainage obstructions).

Stormwater runoff associated with the proposed transit improvements would be collected and treated via French or exfiltration trench drains. This design is advantageous since it meets all Florida Department of Transportation (FDOT) regulatory standards while minimizing space requirements, thus eliminating the need to acquire more right-of-way for drainage. Additional mitigation measures, designed to improve the quality of stormwater entering nearby waterways and/or capturing and reusing stormwater, may be incorporated into design practices. Examples of design elements that may be incorporated for transit stations and O&M facilities include:

- Green roofs, that is, roofs partially covered by plants and soil, that would capture rainwater and reduce the amount of runoff while also creating an insulating layer;
- Water efficient restroom irrigation fixtures;
- Rainwater collection from roof structures and the station platforms that could be used for onsite irrigation, greywater for toilet flushing, or for other non-potable applications;
- Stormwater management methods such as bioswales, rain gardens, detention/retention ponds, infiltration trenches, or even underground stormwater storage;

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- Decentralized stormwater runoff storage to mimic natural hydrological patterns;
- Native plant species that are acclimated to the South Florida region and require little or no irrigation.

Operational practices at these sites can be modified to mitigate adverse impacts on local water quality and water consumption. Some examples are:

- Utilizing environmentally friendly, organic fertilizers, pesticide, herbicides, and fungicides;
- Initiating both Integrated Management Practices and Best Management Practices at an operation level.

In addition, design guidelines developed for SFECCTA transit stations and Intra-nodal (corridor between stations) aesthetics may incorporate Leadership in Energy and Environmental Design (LEED) Green Building and Neighborhood Development Rating System™ practices. The above mitigation strategies and continued refinement of site-specific mitigation measures in subsequent phases and BMP, are expected to substantially lessen or avoid impacts to hydrology and water quality. Additional environmental assessments, to be conducted in subsequent phases of the study, would allow a better evaluation of mitigation and/or avoidance options for impacts to water quality and stormwater runoff.

Wildlife and Endangered Species:

The following are potential mitigation and/or avoidance measures for wildlife and endangered species:

- Incorporate location specific design features that avoid, reduce or minimize habitat loss and/or fragmentation;
- Conduct pre-construction focused surveys, construction monitoring, restoration of suitable breeding and foraging habitat, or purchase of credits from an existing mitigation bank;
- Phase construction if threatened and/or endangered species are found within or near construction areas. Avoid construction around the breeding season for affected species;
- Restore or enhance wildlife habitat by planting native landscapes in natural designs for wetland, upland and/or ecotonal communities;
- Contribute financially to existing or planned conservation banks (e.g., “Florida Panther Conservation Bank”) within the region.

PHYSICAL RESOURCES

Air Quality and Energy

The proposed transit system improvements are anticipated to benefit both energy resources and air quality on a local and regional basis by reducing the number amount of travel in single occupant vehicles (SOV) and high occupancy vehicles (HOV). Transit is inherently more energy efficient than travel by automobile and emits less air pollution per passenger-mile, on average.

In the case of electric-powered transit technologies, the energy required to move passengers is primarily produced away from the project study area and delivered via a power grid. This means, emissions produced for the operation of electric vehicles do not occur solely within the project area and are spread over a larger region, defined by the South Florida energy grid. It also means that the impact of consuming energy resources is also spread over this larger region, defined by the South Florida Power grid, and reduces the acute impact to energy resources directly within the project area.

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In the case of diesel-powered transit technologies, the energy required to move passengers is produced directly within the project area but equates to a removal of numerous point source emitters: car tailpipes. In addition, the proposed transit improvements can incorporate state-of-the-art, energy-efficient equipment to further minimize potential air pollution impacts. Similar mitigation strategies would be applied to facilities like stations and operations & maintenance facilities. Additional mitigation strategies to further reduce adverse effects on air quality may include:

- Shifting horizontal alignments or narrowing the footprint of the transit corridor away from sensitive receivers;
- Promoting sustainable design through green building practices aimed at reducing energy consumption and thus improving regional air quality. These may include:
 - Locating stations at sites to tie served by existing transportation modes such as bus, rail, bicycle or pedestrian paths, and other mass transit modes;
 - Orienting buildings to capture natural daylight for interior spaces while also reducing subsequent heating effects and taking advantage of prevailing breezes.
- Energy Conservation
 - Minimizing non-renewable energy consumption and encouraging the use of onsite renewable energy sources (i.e. photovoltaic and wind turbine systems);
 - Utilizing energy efficient lighting systems (i.e., LED or induction lighting) for large areas like the station platform, parking areas, and O&M facilities;
 - Utilizing insulation and energy efficient HVAC systems in all indoor areas and making use of natural ventilation;
 - Utilizing heat-reflective technologies for window and roof structures to reduce overall heat absorption.
- Station and Maintenance Facilities Location
 - Transit stations, particularly larger types, can be located in areas most likely to encourage TOD, where major activity centers are already present, where SFRC-FEC connections are proposed, and where intermodal connections exist or are planned;
 - O&M facilities can be located in existing industrial, commercial, or other areas less sensitive to air quality, particularly where zoning encourages such land use to promote economic activities and provide jobs.

Traffic near proposed transit stations and at transitway-highway crossings could produce localized air pollution increases. However, these effects may be mitigated through strategies discussed earlier under the Safety/Mobility section, as well as through the application of design practices formulated to reduce these impacts. Temporary, short-term increases in emissions associated with construction activities can be mitigated by complying with local and state guidelines and the application of best management practices.

Noise

Mitigation strategies for noise associated with the proposed transit improvements could be applied in two ways: path mitigation and source mitigation. For example, noise walls are a type of path mitigation that has proven to be an effective form of mitigation for receivers close to railway tracks.

Additional mitigation strategies may include:

- Acquire property along the right-of-way that may serve as a buffer (path mitigation);
- Increase ballast on at-grade guideways (source mitigation);
- Modify equipment (source mitigation);
- Use resilient or damped wheels (source mitigation);
- Install vehicle skirts (source mitigation);
- Apply undercar absorption treatment (source mitigation);
- Construct track with a turn radius of greater than 1000 feet (rail vehicles) (source mitigation);
- Insulate the engine compartment (buses) (source mitigation).

Transit horn noise has been a concern with respect to residences and historic resources along the FEC Railway since Phase 1 of the SFECCTA study. Transit horn noise could be mitigated through various means including the closure or grade-separation of certain transitway-highway grade crossings. In addition, affected municipalities may implement Quiet Zones that eliminate or regulate the use of transit horns within the boundaries of the municipality.

Vibration

Like noise mitigation strategies, mitigation strategies to reduce the effects of transit vehicle and associated roadway ground-borne vibration can be applied as path mitigation or source mitigation. Examples of these strategies include:

- Increase mass of support/foundations (source mitigation);
- Enhance design of ballast pads/mats (source mitigation);
- Ground trenches with vibration absorptive fill or air pockets/voids (path mitigation).

Contamination and Hazardous Materials

Mitigation for impacts related to hazardous materials and wastes is dependent on detailed site-specific investigations/Environmental Site Assessments (ESA), which were not performed in Phase 2 of the SFECCTA study. The presence of pollutants such as arsenic, pesticides and other contaminants typically associated with railway operations would be assessed in subsequent phases of the study and likely require soil and/or groundwater testing (*in situ* studies). Testing *in situ* would likely need to wait until the Preliminary Engineering and Permitting phases of individual project segments.

Mitigation strategies could include relocation of transit infrastructure such as stations and maintenance facilities to avoid an identified site and remediation of identified hazardous material/waste contamination. In some cases, selecting a known contaminated site, such as a “Brownfield” site for transit stations or maintenance facilities could promote positive redevelopment of blighted sites through remediation of the site. More detailed analysis and specific mitigation measures would be included in subsequent project-level environmental analysis. Additional, potential mitigation strategies would include:

- Investigating soils for contamination and prepare ESAs as necessary;

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- Surveying for lead-based paint and asbestos-containing materials prior to demolishing buildings for project construction;
- Acquiring necessary permits if ground dewatering is required;
- Preparing a Site Management Program/Contingency Plan (SMP/CP) prior to construction to address known and potential hazardous materials;
- Preparing a site-specific Health and Safety Plan (HASP) including measures to protect construction workers and the public.

At this phase of the study, it is not possible to identify specific hazardous material impacts or the nature and severity of contamination at specific sites. However, applying appropriate design practices to minimize impacts, and the use of best practices and mitigation strategies for remediation of hazardous sites, would be expected to substantially lessen or avoid impacts from hazardous materials and wastes. Additional environmental assessments, in subsequent phases, will facilitate the development of specific mitigation strategies to be developed.

Navigation

Several navigable waterways have been identified along the FEC Railway. Preliminary navigational data was collected for all waterway crossings, including the bridge operations at the New River for both the Andrews Avenue and FEC Railway bridges in Broward County. Further analysis, and the continued coordination with the United States Coast Guard (USCG) in subsequent phases on the study, would be used to identify impacts to navigation at waterway crossings along the FEC corridor. Mitigation strategies, as well as appropriate design practices, would be applied to reduce or avoid potential impacts to navigation.

References

United States Department of Transportation – Federal Highway Administration (FHWA) & American Association of State Highway and Transportation Officials (AASHTO). Results of Joint AASHTO/FHWA Context Sensitive Solutions Strategic Planning Process. Summary Report, March 2007.