
PROJECT DEFINITION REPORT

RAILROAD TRACK TRESPASS PREVENTION STRATEGY

PROJECT NUMBER 17059

JANUARY 17, 2017

REVISION/VERSION # 001



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Acronyms and Abbreviations

Populate this section as needed

ESD Environmental Service Department
PDR Project Definition Report
FDOT Florida Department of Transportation

Approvals

City of Delray Beach and other partner organizations approving/providing resources, personnel, and guidance for the execution of this project.

John Morgan, Environmental Services Director

Date

Dale S. Sugerman, Ph.D., Assistant City Manager

Date

Other as needed/City Manager

Date

Other as needed

Date

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Purpose

This Project Definition Report provides a brief overview of the City of Delray Beach **Railroad Track Trespass Prevention Strategy (TPS)** to promote a shared understanding of the project before a more detailed plan, schedule, and budget are prepared.

Background

Nationwide, trespassing on a railroad's private property and along railroad rights-of-way is a leading cause of rail-related fatalities. Many trespassing deaths occur each year; the vast majority of which are preventable. On August 3, 2016, a 62-year old woman was killed when trying to cross the railroad's track in the City of Delray Beach (City). The woman left a downtown restaurant located at the northeast corner of E. Atlantic Avenue and NE 3rd Avenue on the east side of the railroad tracks, and headed toward another restaurant on the west side of the railroad tracks. Instead of using the dedicated pedestrian crossings, she and her husband decided to take a shortcut and cross the railroad tracks. Unfortunately, the woman tripped 50 yards north of the pedestrian crossing at E. Atlantic Avenue, her husband tried to pull her up from the tracks, but he could not help his wife and an oncoming train struck and killed her.

Definitionally, a trespasser is a person entering land or property without permission. When it comes to railroad tracks, trespassers are most often people who walk across or along the tracks as a shortcut to another destination. In the City's downtown and other areas trespassers are common. There is no doubt that railroad operating systems are hazardous/dangerous. Railroad operating companies have extensive safety training for their employees. However, the public/trespassers do not have the opportunity to receive safety training, and are not aware of the dynamics of train movements. Because of this, many trespassers risk their lives and are subject to critical situations such as life threatening injuries and loss of life. Not using properly designated crossing locations such as road/rail grade crossings and dedicated pedestrian crossings makes the public vulnerable to dangerous situations. In most of the states, trespassing is seen as a property crime and a general offense, with many states specifically prohibiting trespassing on railroad property. Florida is one of them.

The City is also facing new challenges associated with additional and more intense railroad traffic. The Brightline, a new passenger fast-rail system initiative by All Aboard Florida will launch service between Miami and West Palm Beach in mid-2017, with full service from Miami to Orlando coming in the future. This means that the City is going see around 32 Brightline trains running every day along the Florida East Coast (FEC) Railway tracks which cross the City. Indeed, this has generated more concerns about the safety of the public and any potential liabilities for the City.

Now that the additional railroad traffic is a reality for the City, and in an effort to prevent incidents like the one on August 3, 2016, the City's leadership initiated a request to get barriers placed along the railroad tracks which run through the City. On September 7, 2016 the City's leadership met with All Aboard Florida representatives, the Palm Beach County Metropolitan Planning Organization (MPO), and the City's Environmental Services Department (ESD) to discuss

potential partnerships and collaborative efforts to install trespass barriers along the railroad tracks. Since the installation of barriers could have an impact on the FEC right-of-way, the City decided to develop a close, collaborative effort with the railroad in order to help make the process of installing the railroad track barriers a smooth and easy process. General discussions took place on project funding, type of barriers, rights-of-way, current leases between the City and FEC, and participant responsibilities.

Subsequently, on September 29, 2016, ESD Engineering and Transportation met with the City's Landscape Architect and a representative of the City's Police Department to discuss barrier options and potential issues in the selection of barriers. Additional coordination with Parallel Infrastructure, the company in charge of managing the railroad track right-of way, took place. In a field visit performed on October 14, 2016, ESD met with a representative from Parallel Infrastructure at the intersection of E. Atlantic Avenue and NE 3rd Avenue. The representative provided additional information on the type of work being performed for the Brightline service. During the field visit, impacts on the City's parking and roadways were identified. Also during this same field visit, multiple examples of trespassing were observed during a single 15-minutes period. Various field visits have been performed to observe trespassing conditions along the railroad track, with the most frequent issues observed in the railroad segment between E. Atlantic Avenue and NE 2nd Avenue. However, the trespassing is not limited to this two block segment, as other areas of the City require attention as well. The goal of this project is for the City to address potential solutions to reduce trespassing incidents and therefore eliminate potential fatalities by establishing a Trespassing Prevention Strategy.

Project Goal

The purpose of this project is to restrict pedestrian trespass across the railroad tracks and to redirect pedestrian traffic to designated crossing locations such as road/rail grade crossings and dedicated pedestrian crossings.

Project Description and Objectives

The project requires the design and construction of a permanent and easy to maintain physical barrier which prohibits pedestrian trespassing across the railroad tracks and therefore reduces the potential for public injuries or fatalities. The selection of the type of physical barrier should be based on the surrounding area conditions; and potential impairment of pedestrians based on destinations in the area. Potential exists in the development of this project to also enhance the aesthetics of the downtown area and to create alternative transportation opportunities in the downtown core business district.

Project Location

The project is located within the railroad track corridor between Linton Boulevard and George Bush Boulevard, the most critical segment is between SE 2nd Street and NE 2nd Street which

[illegible]

PROJECT DEFINITION REPORT - RAILROAD TRACK TPS

Project Scope

The project scope includes the design, permitting and construction of a physical barrier to prevent pedestrian trespass across the railroad tracks in anticipation of future railroad traffic growth.

In order to assess potential solutions, the project team conducted the following tasks:

- The project team performed site visits and met with FEC representatives to assess potential impacts and to brainstorm solutions surrounding the proposed TPS. The project team studied the Federal Railroad Administration's (FRA) Volpe Report (July, 2014) which highlighted similar trespass mitigation strategies around the United States and Canada. The Volpe Report identified three criteria for strategizing: Engineering, Education, and Enforcement. FRA also created an approach referred to as the Community, Analysis, Response, and Evaluation (CARE) model, used on the South Florida Rail Corridor and FEC's rights-of-way to demonstrate the benefits of a community-based approach to physical barriers on railroad rights-of-way. The project team evaluated the report and various barrier models, in addition to the efficacy of strategies such as pyramidal-shaped anti-trespass grids around the tracks. However, it is believed that the situation for the downtown core of the City of Delray Beach requires a different approach to the type of physical barrier deployed.

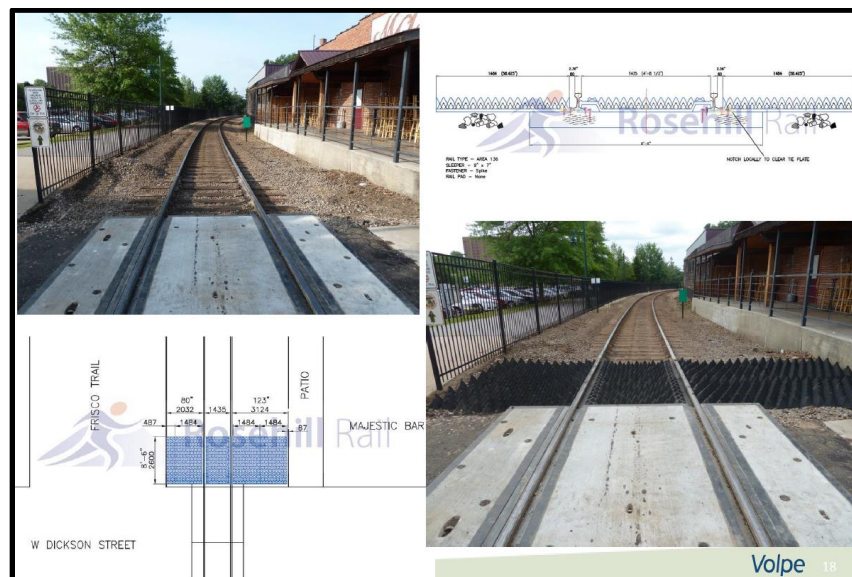


Figure 2 - Pyramidal-Shaped Anti-Trespass Grids

- The team then evaluated the potential for further street improvements and beautification, including fencing TPS treatments on both sides of the railroad's right-of-way, to address not only vehicle parking but to accommodate multimodality within a constrained right-of-way.
- Based on discussions with the FEC, it was clearly indicated that there must be a clearance zone of 25 feet from the center of both sides of the railroad tracks, prompting

a discussion about the need for a reconfiguration of the on-street parking that currently exists on NE 3rd Ave. since it is within the FEC clearance zone. If the City were to take a position that it would not modify any of the existing parking, the railroad could take the position that the City would need to relocate a total of 38 parking spaces currently in the FEC clearance zone. However, the project team determined that potentially 15 out of 38 parking spaces could be saved on Railroad Ave. by configuring them to parallel parking. The lost spaces could then be added on the east side of Railroad Ave., on the other side of the tracks between E. Atlantic Ave. and NE 1st St. This will require Railroad Ave. to be converted to a one-way southbound street to allow enough room to include angled parking. The team met with FEC staff to also renegotiate the lease agreement with FEC to build in the right-of-way.

This need for reconfiguration prompted a look at Best-Practice solutions to the two streets in question by looking to other cities' solutions, such as West Palm Beach's Rosemary Street in their downtown, that model an urban concept known by its Dutch origin as a "woonerf", or living street, where the space is shared equally by all users. This simplified streetscape philosophy would do away with separation of the user modes by creating a democratically-shared space, safe for all, that utilizes a brick paver treatment to keep vehicle speeds very low with a physical, tactile response when driving over it. This allows the City to activate an underutilized asset in the heart of its downtown core and to further beautify the area in conjunction with the trespass barriers.

Therefore, the trespass barrier options should include thoughtful, aesthetic features that would encourage the overall beautification of the underutilized corridor in the critical downtown area, between E. Atlantic Ave. and NE 1st Street, and create an asset that the City can utilize and market. Trespass barrier options include a combination of fence and other barrier styles that meet local building codes and are acceptable to be installed in the FEC right-of-way line/limits that meet local building codes and are acceptable to be installed in the FEC right-of-way line/limits.

The services of a consultant specializing in civil engineering, transportation and landscape architecture may be required to conduct a preliminary study and thorough analysis on the existing conditions. The primary goals of the study analysis will include:

1. Providing a series of recommended actions that will enable the City to capitalize on the current site features to properly install the trespass barriers;
2. Completing a verification right-of-way analysis with FEC;
3. Identifying potential constraints on the railroad track corridor that could prevent the installation of the trespass barriers.

Based upon these goals, plans will be prepared for civil, structural, landscape, architectural and design services, including a new site plan to be presented to the City Commission for approval. In addition, these plans will be used for any applicable review process with City departments and agencies that require approval/permits.

The TPS analysis completed by the Environmental Services Department, addresses both sides of the railroad track between E. Atlantic Ave. and NE 1st St. (because this is the most critical area in downtown) and offers the following options:

1. Option 1:

- a. An aluminum mechanical fence (handrail-type decorative fencing system).

2. Option 2:

A three-foot high decorative metal fence on top of a four-foot high concrete wall. Special attention should be given to this critical area to create a marketable asset for the City. This fencing style carries the City's branding and, coupled with the recommendation to tie in street beautification with this project, would activate the area to create a greater sense of place. Various street furniture, decorations, landscaping, and lighting options would also complement this barrier option.

3. Option 3:

- a. A landscape-only barrier to be maintained at a three-foot height. Note that the plants should be able to withstand the harsh conditions along the FEC railroad corridor and should be maintained with dripped irrigation.
- b. Reclaimed water irrigation system is needed for the landscape-only barrier.

4. Option 4:

- a. A four-foot high chain link fence with black or green vinyl coating and screening with landscaped hedging. The hedging is to be maintained at the full height of the fence.
- b. Reclaimed water irrigation system is needed for the hedging.

Required for all options:

- a. Sidewalks, roadway and parking reconfiguration, along with traffic calming at both sides of the railroad track between E. Atlantic Avenue and NE 1st Street (Downtown critical area). Note that the existing street parking leases between the City and FEC will expire due to the railroad expansion at the east side of the railroad track between these roads, requiring this component to be included as part of this scope of work. A total of 38 parking spaces will initially be lost, however 15 can be reconfigured into parallel parking such that they can be saved.
- b. From NE 1st Street to George Bush Boulevard and from E. Atlantic Avenue to Linton Boulevard four-foot high black or green vinyl coated chain link fencing should be installed on one side of the railroad track unless existing or future developments increase the possibility of trespassing, which in that case, fencing on both sides should be considered.
- c. Relocation/removal of trees and other large objects that can cause interference with the fencing installation. This requires coordination between the City and FEC.
- d. Utilities relocation/management in various areas of the project; this includes but is not limited to water, sewer, and storm drainage.
- e. Boundary, tree location and topographic survey.
- f. Post-construction survey.

The required disciplines for this project include, but are not limited to: civil, architectural, landscape architectural, geotechnical, structural, electrical, and survey.

Note: The preferred plants are:

- a. Cocoplum (*Chrysobalanus icaco*)
- b. Clusia Small-Leaf (*Clusia guttifera*)
- c. Dwarf Firebush (*Hamelia patens* 'Compacta')
- d. Bougainvillea (*Bougainvillea spectabilis*)

These plants will be able to take the harsh conditions along the FEC railway corridor and will require low irrigation.

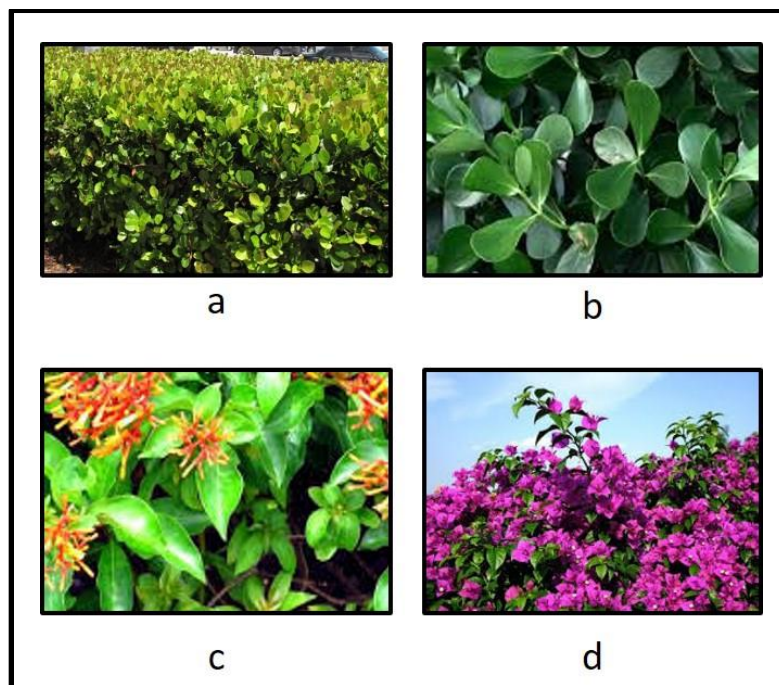


Figure 3 - Preferred Plants:

a. Cocoplum, b. Clusia Small-Leaf, c. Dwarf Firebush, d. Bougainvillea

One critical aspect of the barrier project is the coordination with FEC for the design and construction of the pedestrian trespass barriers along the railroad right-of-way; this also includes the need for the City of obtain the various required permits. Cost estimate and overall design is subject to change after the detailed design is complete.

Risks

In order to execute this project, it is necessary to obtain approval from the FEC to work in their right-of-way. In addition, the timeframe for the project completion is limited; it is anticipated that Brightline operations will start in mid-2017. It is preferred that any trespass barrier construction/installation is completed before Brightline begins full operation. Since it is also important to consider the impact on the public and business operations around the downtown area (critical area of the project) during construction, coordination between road closures and utility management is vital. The fencing system's long-term maintenance should be properly budgeted and planned once the project is online as well.

Permitting

Prior to construction, the following permits are required but not limited to:

- FEC Right-of-Way Permit
- Building permit with the City
- Florida Department of Health Department permit for reclaimed water
- Florida Department of Environmental Protection (FDEP) for run-off water to the storm water system

It is anticipated that upfront negotiations with FEC will be required to obtain right-of-way permits and execute potential lease agreements between the City and the FEC.

It is the responsibility of the designer and contractor to obtain and verify all required permits for the execution of this project.

Right of Way

FEC right-of-way permits are required for this project. Potential utilities conflicts are anticipated for this project; therefore relocations may be required.

Real Estate

Since FEC owns the lands where the pedestrian trespass barriers will be installed, the City needs to obtain FEC approval for fencing installation. If the trespass barriers include irrigation, a utilities easement/lease from FEC may also be required.

Public Use/ Outreach

The purpose of this project is to protect the public by restricting railroad track trespassing. Outreach programs need to be created to inform the community and business owners about the project's purpose, impact and timeframe. Public access and traffic need to be coordinated during construction in the downtown area and as well as those areas outside of the downtown

where simpler pedestrian trespass barriers will be installed. Additional coordination among the City, Brightline, Florida Power and Light (FPL) and FEC is required. It is anticipated that the project will require negotiations, meetings, presentations, fact sheets, mailers, or door-to-door communication at different project stages and for a variety of stakeholders. ESD, Public Affairs Office and the consultant in charge of the design would support and coordinate the outreach efforts.

Stakeholder Considerations

The stakeholders for this project include:

- City residents and business owners
- FEC
- Brightline
- ESD
- The City Public Affairs Office
- The City Department of Community Improvement
- The City Office of Economic Development
- Downtown Delray Beach
- The City Planning, Zoning and Building Department
- The City Parks and Recreation Department
- The Police Department
- The Fire Department

The stakeholders will be involved during the project conceptualization process in order to obtain their opinion on the project purpose and benefits. There are no legal or regulatory mandates driving the project. The project has been proposed to protect the wellbeing of the citizens, visitors, and business owners of the City.

Outcomes and Success Criteria

This project will be considered a success if the installed TPS prevents/reduces the trespassing along the railroad tracks. In addition, the project will be considered a success if the TPS improves or does not negatively impact the aesthetics of the areas located along the railroad track in the downtown area.

Operations and Maintenance

No operational constraints have been identified for the construction of this project. Once the project is online, the ESD Public Works Division will need to allocate resources, manpower and equipment for maintenance. This new asset will require regular landscape and irrigation maintenance if the selected option includes hedging/landscape/plants. Programmatic inspections for non-landscape related elements should be performed on a regular basis; any deficiencies should be recorded and repaired.

Technology

The project does not have a technology component.

Security and Safety

The project itself has been generated by a safety need, which is to prohibit trespassing along the railroad tracks. City leadership has identified the trespass prevention program as critical for the safety of the residents, visitors and business owners of the City. The City Police Department has agreed on the need for this project. No other additional security measures have been identified for this project.

The construction contractor would be responsible for the site security and safety during construction. The contractor should coordinate with ESD, Police Department, FEC, and Brightline during construction to provide any necessary security systems that will prohibit public access to the project area. A comprehensive Maintenance of Traffic (MOT) plan will be implemented by the contractor in required areas.

Environmental

The project does not include or impact any existing environmentally sensitive areas.

Monitoring

Silt screens and similar systems for storm water runoff control would be needed.

Commissioning

No commissioning is required to bring project online.

Lessons Learned

Not applicable.

Conceptual Alternative Options

Not applicable.

Cost Estimates

The following is a high level cost estimate for each option focused on the pedestrian trespass barriers for the downtown area, including total linear feet of fence (approximately 1,270 feet to be installed on both sides); and the total linear feet of reclaimed water main for irrigation

purposes (approximately 1,200 feet). Note that reclaimed water main for irrigation only applies for Options 2 and 4.

1. **Option 1**, aluminum mechanical fence (handrail-type decorative fencing system):
 - Unit cost \$22 per linear feet for a total cost of \$ 27,940Cost estimate Option 3: \$28,000 +/-
2. **Option 2**, decorative metal three-foot high fence on top of a four-foot high concrete wall:
 - Unit cost \$38 per linear feet, for a total cost of \$48,260Cost estimate Option 1: \$49,000 +/-
3. **Option 3**, A landscape-only barrier to be maintained at a three-foot height.
 - Unit cost \$15 per linear feet for a total cost of \$ 19,050
 - Six inches reclaimed water main for irrigation unit cost \$156 per linear feet, for a total cost of \$187,200Cost estimate Option 4: \$206,300 +/-
4. **Option 4**, four-foot high chain link fence with black or green vinyl coating screened by hedging:
 - Chain link fence unit cost \$29 per linear feet for a total cost of \$36,830
 - Six inches reclaimed water main for irrigation unit cost \$156 per linear feet, for a total cost of \$187,200Cost estimate Option 2: \$224,100 +/-

Note: Sidewalks, roadway and parking reconfiguration, and traffic calming at both sides of the railroad track between E. Atlantic Avenue and NE 1st Street (Downtown critical area), are not being evaluated in this cost estimate. In addition, construction items such as boundary and topographic survey, site preparation, demolition (including hauling and disposal), direct cost (mobilization, field and office overhead), sales tax, profit, construction cost (bonds and contingency) are not part of this cost estimate. Once a consultant has been selected an “Engineer’s Opinion of Cost” will be provided.

Project Milestones

- Design should start in second quarter of FY16/17 and construction should start third quarter of FY16/17.
- There are no legal or regulatory mandates driving the project to a certain date. However, it is preferred to have construction complete before Brightline operations begin.

Resource Requirements

List Functions	Responsible
Engineering	
Civil	Consultant
Structural	Consultant

List Functions	Responsible
Mechanical	Consultant
Electrical	Consultant
Geotechnical	Consultant
Planners	City
Architectural	Consultant
Permitting	Consultant/Contractor
Project/Construction Manager	City
Inspections	City
Survey	Consultant
Other	TBD
Total Resource Requirements	

Project Deliverable and Schedule

Fiscal Year	Deliverable	Schedule
FY16/17	Survey	TBD
FY16/17	Preliminary Engineering/Geotechnical	TBD
FY16/17	Design	TBD
FY16/17	R/W Coordination	TBD
FY16/17	Land Coordination	TBD
FY16/17	Public Outreach	TBD
FY16/17	Permitting	TBD
FY16/17	Bid Process	City Commission TBD
FY16/17	Notice to Proceed	TBD
FY16/17	Construction	Start TBD
FY16/17	Construction	Complete TBD

*Provide Project design and construction fiscal years. Consider construction timeframes based on operational needs, resource availability, season, etc.

Project Funding Sources

The City is planning to fund this project via an MPO grant.

References

Not applicable

Photographs



Photo 1 - E. Atlantic Avenue and Ne 3rd Avenue Crossing Looking North



Photo 2 - E. Atlantic Avenue and Railroad Track Crossing Looking North



Photo 3 - E. Atlantic Avenue and Railroad Track Crossing Looking South



**Photo 4 - E. Atlantic Avenue and Railroad Track Crossing Looking North
People Trespassing - Perpendicular Parking Impacted by New Railroad Tracks**



Photo 5 - NE 3rd Avenue/Railroad Avenue and NE 1st Street

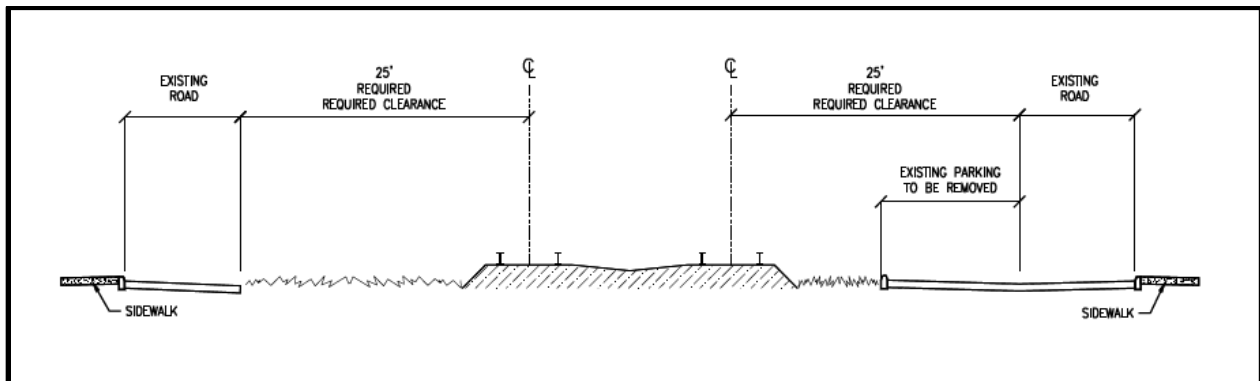


**Photo 6 - E. Example of Railroad Track Trespass Prevention Strategy
Neighbor City of Boca Raton**

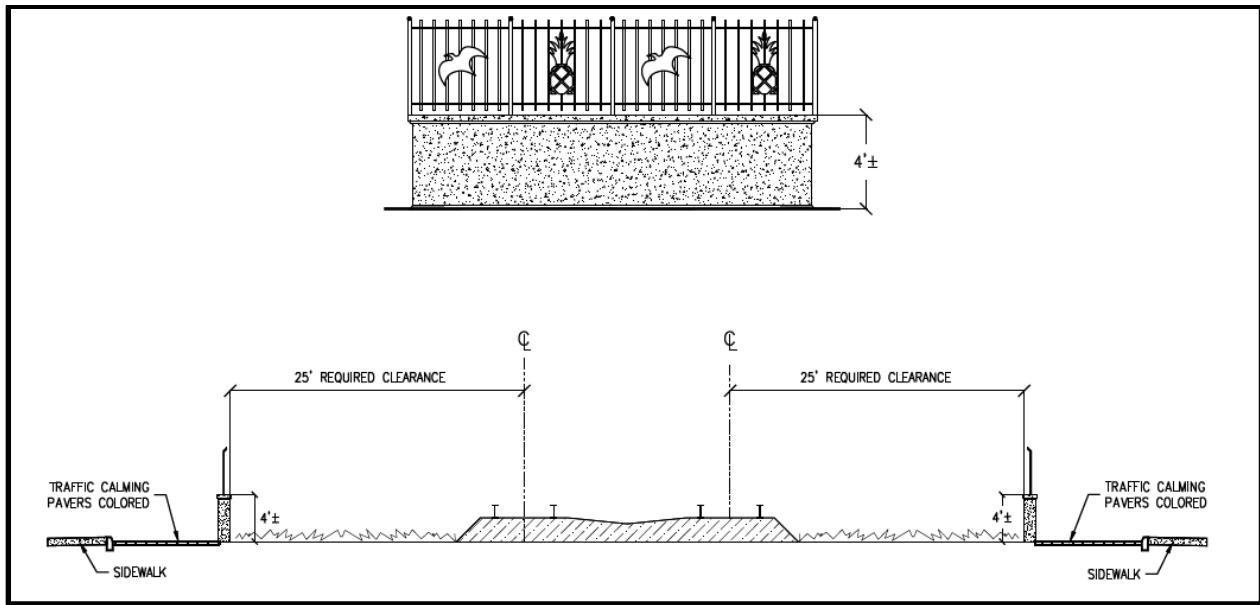


**Photo 7 - E. Example of Railroad Track Trespass Prevention Strategy
Landscape & Chain Link Fence Neighbor City of Boca Raton**

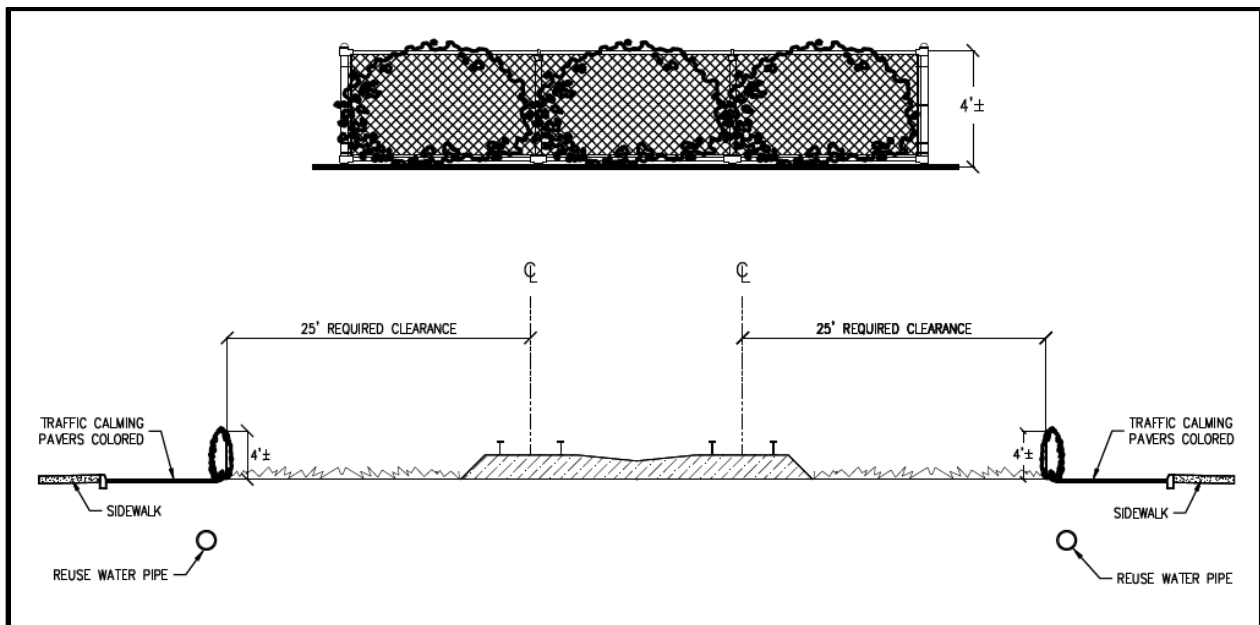
Project Schematic Diagram



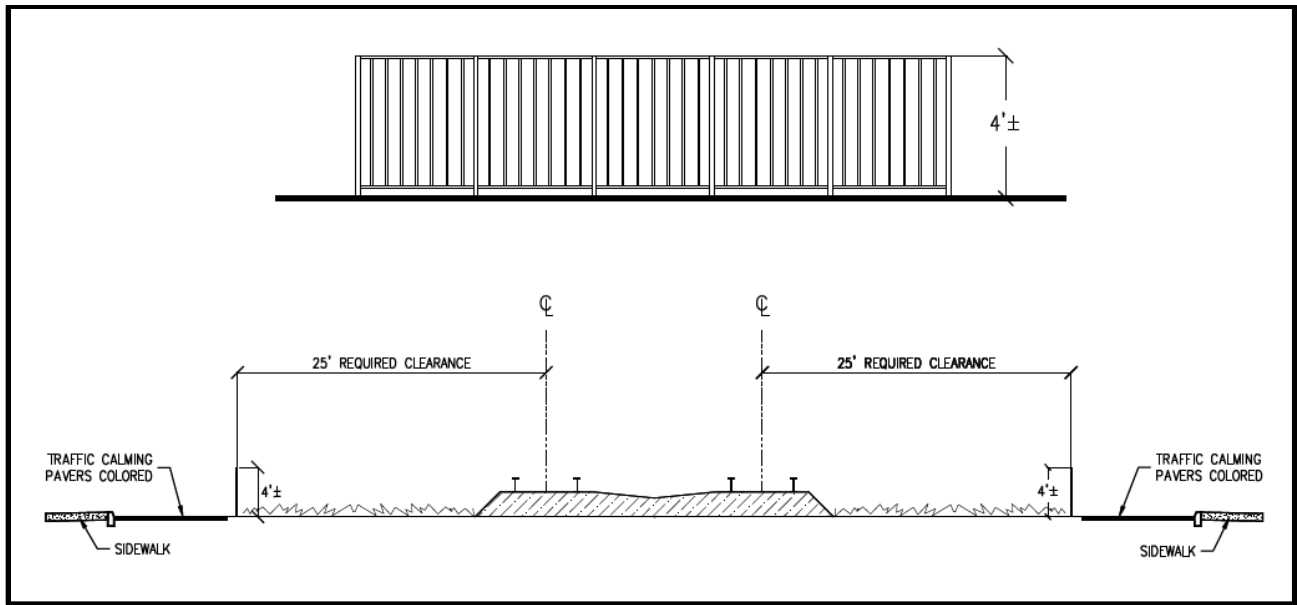
**Figure 4 - Approximate Cross Section at E. Atlantic Avenue and NE 3rd Street
(Not to Scale)**



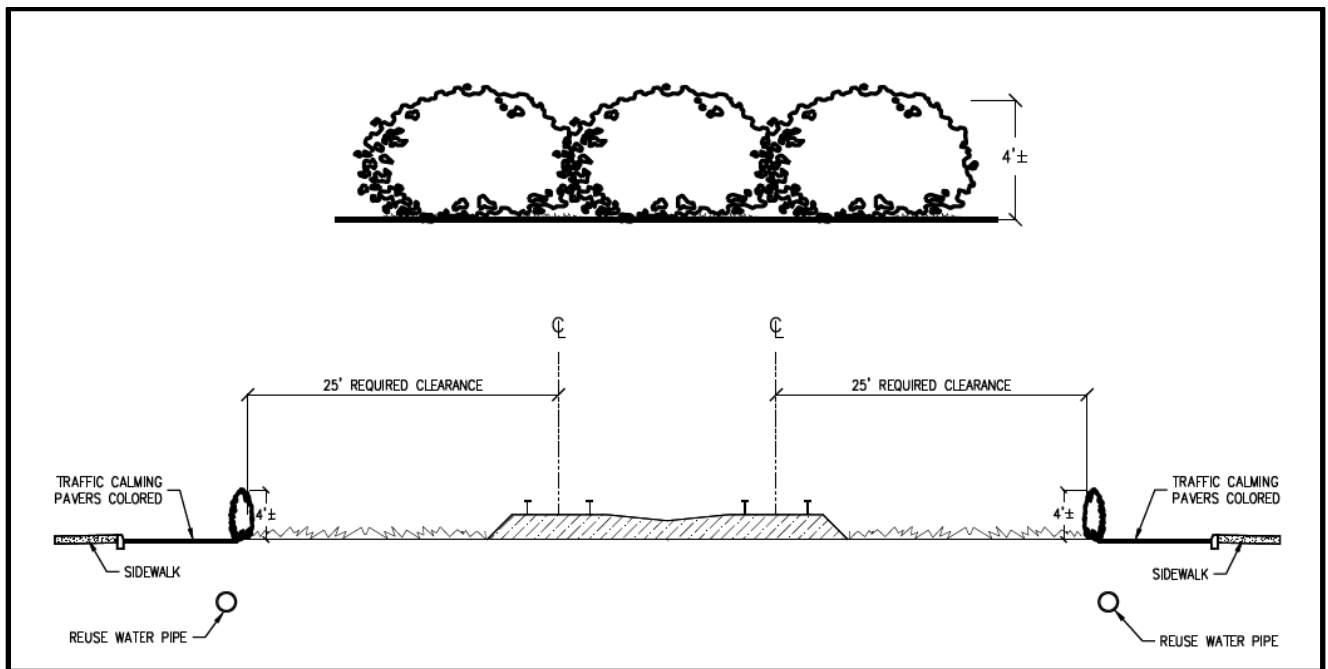
**Figure 5 - Option 1 Decorative Metal Fence - Concrete Wall
Between E. Atlantic Avenue and NE 1st Street.**



**Figure 6 - Option 2 - 4-Foot High Chain Link and Hedging.
Between E. Atlantic Avenue and NE 1st Street.**



**Figure 7 - Option 3 - Aluminum Mechanical Fencing
Between E. Atlantic Avenue and NE 1st Street.**



**Figure 8 - Option 4 - 4-Foot High Landscape Barrier
Between E. Atlantic Avenue and NE 1st Street.**



Figure 9 - New Railroad Enhancement Impacting Existing Parking Spaces