



The New Planner — Fall 2012

Planning for Bicycles in Fort Lauderdale's City Center

By Alexandra Andrei

Many planners would think the prospect of a new downtown train station would highlight the need for additional transportation connections, such as bicycle routes. Such a prospect could become a reality in Fort Lauderdale, where a new train station is being considered for the city center as part of a passenger rail project that would connect various cities in South Florida.

City centers offer great advantages when it comes to public transportation options: they have population and real estate density, social amenities, and high foot traffic. According to recent research by Kevin Krizek and Eric Stonebraker, many countries have experienced a rise in cycling, and reports from 2008 found that bicycle transportation in the U.S. had risen to its highest level in 52 years.

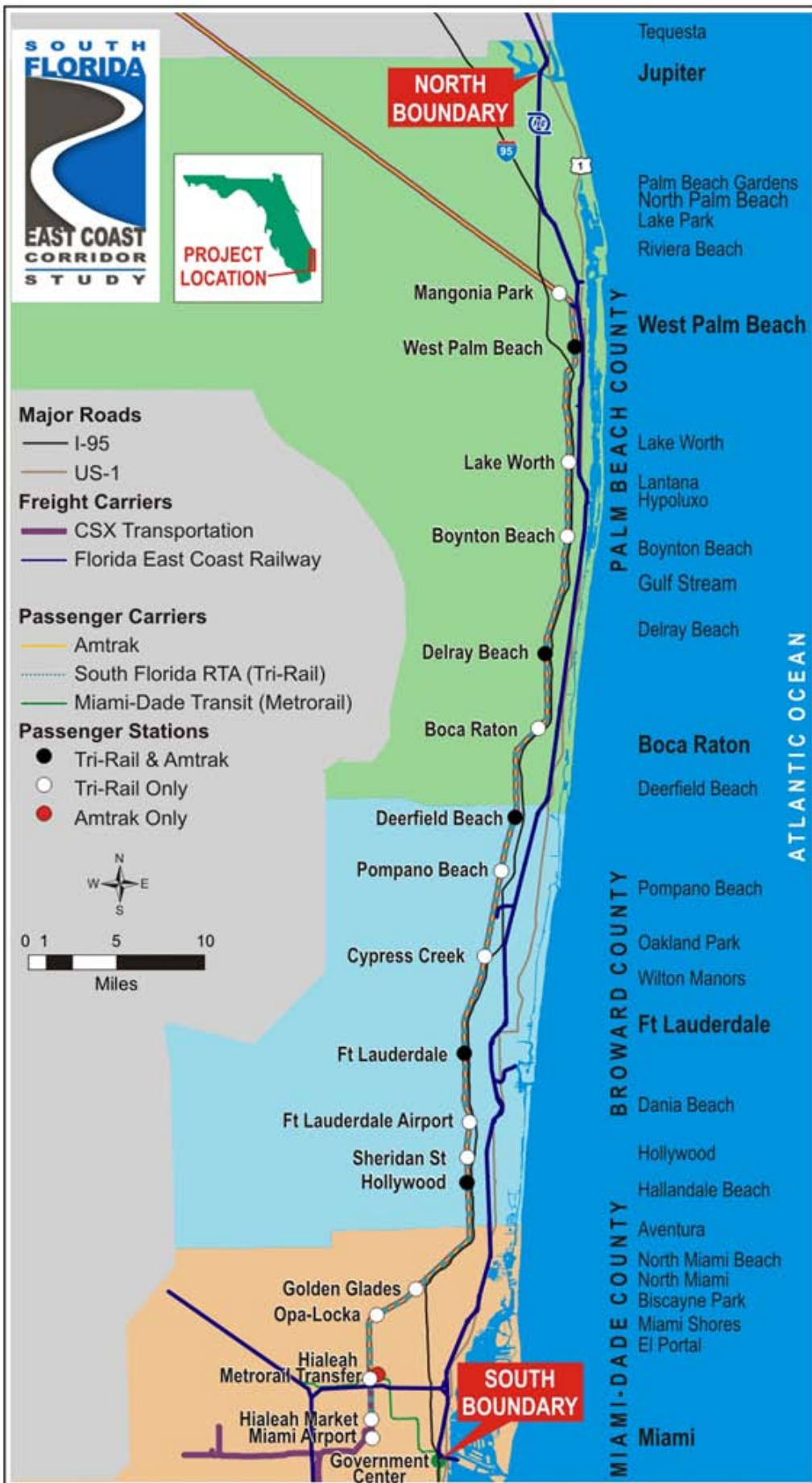
The possibility of a new train station and the current growing trend in bicycle commuting in cities throughout the United States suggest a great opportunity to develop cycling routes in central Fort Lauderdale. New routes could connect with existing bicycle routes and provide a solid foundation for diversifying future transportation choices.

The Rail Planning Project

Fort Lauderdale is located in Broward County, part of the West Palm Beach, Broward, and Miami-Dade tri-county area in South Florida. Currently, freeways dominate the area.

In 2004, Florida East Coast Industries (FEC), which owns a railway corridor in the area, commissioned the South Florida Regional Transportation Authority (SFRTA) to analyze the potential for passenger transit along the FEC corridor, which is currently used for freight transport. The resulting **South Florida East Coast Corridor Study (SFECCS)** proposes to reintroduce passenger services along an 85-mile stretch of the corridor and to increase connectivity across all means of motorized transportation.

Between 2005 and 2007, the SFECCS looked at alternative development in the area, assessing freight movement and drafting and defining alternatives. The period from 2008 to 2010 saw a detailed screening of those alternatives in relation to the regional master plan and locally preferred alternatives. Since that time, the study has focused on phased implementation, including coordinating and negotiating with the FEC, finalizing locally preferred alternatives, and drafting an environmental impact statement.



The 85-mile FEC corridor between downtown Miami and Jupiter, Florida. Image courtesy Florida Department of Transportation.

The FEC rail corridor extends through Fort Lauderdale, and the proposed passenger line would include a stop in the city center. The SFECCS project did not consider the possibility of integrating the rail line with existing bicycle routes and amenities, however. It wasn't until 2011 that such amenities were introduced in the Fort Lauderdale area, through programs such as the **Broward B-cycle program**. This effort established eight bicycle rental stations within Fort Lauderdale and a total of 26 rental stations throughout Broward County.

Currently the City of Fort Lauderdale is evaluating a bicycle master plan. This convergence of planning for rail and bicycle transit creates an opportunity to provide amenities for cyclists, who might not otherwise use the rail system because of the distance between the station and other services and businesses, such as bicycle rental facilities. Fort Lauderdale currently has only a **handful of bicycle lanes**, none of which connect with each other or with the future FEC station.

Improving these connections would help to carry out the vision of **Fort Lauderdale's downtown master plan**, which seeks to improve transportation connections and create a more livable downtown. With this vision in mind, the downtown bicycle network is an important component that needs to be carefully designed and implemented.

How Far Would Cyclists Travel?

How far would you be able to cycle in an environment where the average temperature is 90 degrees Fahrenheit and the humidity is 88 percent? If an individual cycles for 10 minutes at an average speed of 12 miles per hour, he or she will have traveled about two miles. Under Fort Lauderdale's weather conditions, this would be many individuals' threshold. The area within a two-mile radius of the FEC station would therefore be the station's "catchment area" — the geographical area from which the station would attract riders.

Many factors influence people's decisions about using private transportation or some combination of personal and public transportation. These factors can include the available infrastructure, climate and natural environment, socio-economic factors, cost, safety, time, and incentives. Notable research by Krizek and Stonebraker found that, in European cities on improved multimodal transportation, people prefer to cycle between 1.2 and 3.1 miles (2 and 5 kilometers) to reach faster modes of transportation and 1.2 to 1.9 miles (2 to 3 kilometers) to reach slower modes of transportation. A National Center for Transit Research report on catchment areas in the United States identified similar distances for bicycle and mass transit connections in Florida and other states.

Research by Piet Rietveld and Vanessa Daniel in 2004 found that trips for work and education dominate the transit system. These authors also found that people who make work-related trips tend to prefer quicker transit modes and routes, which tend to be relatively expensive, while people making education-related trips prefer cheaper modes of transportation.

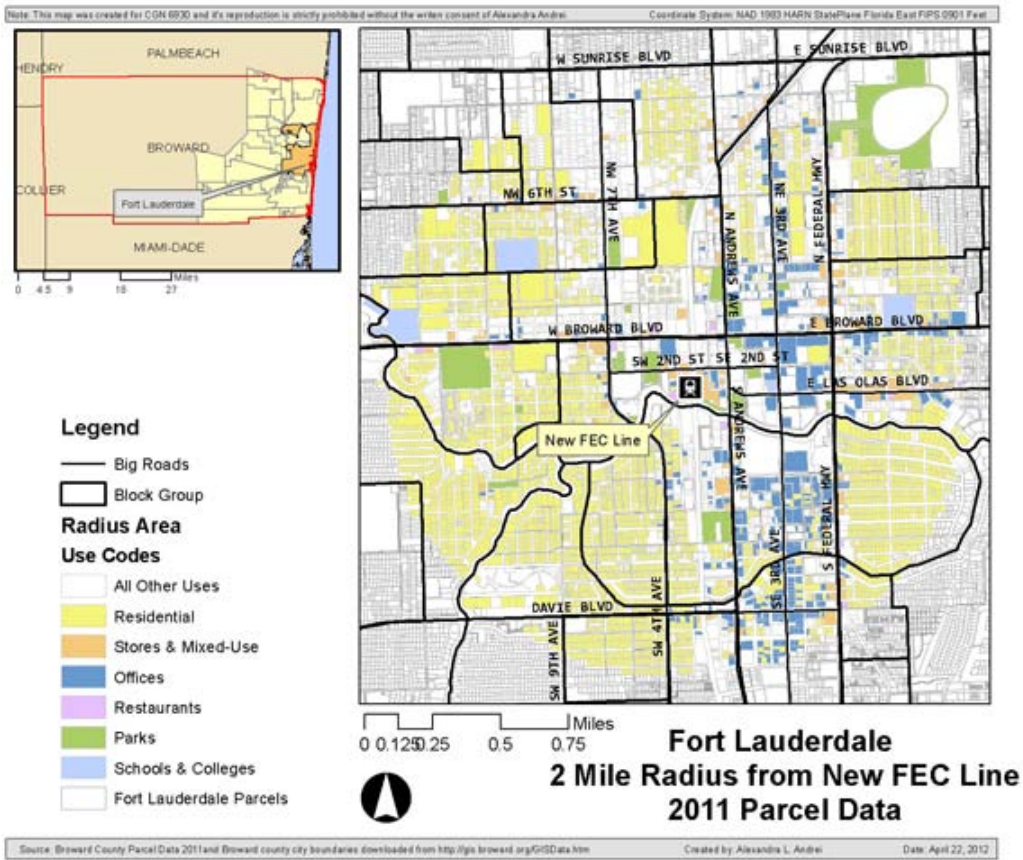
Ready, Set, Go!

With these factors in mind, it is possible to analyze the catchment area for the proposed new train station in central Fort Lauderdale in relation to various points of interest and other means of transport.

The bicycle network for central Fort Lauderdale needs to be designed in accordance with certain independent variables, such as existing and proposed transit stations and the **existing bicycle routes within the two-mile catchment area**. In addition, certain routes, such as those to offices, schools, and colleges, must be given priority because they are considered the most commonly used in bicycle and motorized transport.

Gaps in bicycle amenities in the catchment area can be identified, with an eye toward one-quarter to one-half mile spacing between bicycle routes. This spacing provides sufficient options for cyclists to choose their routes according to their travel purpose.

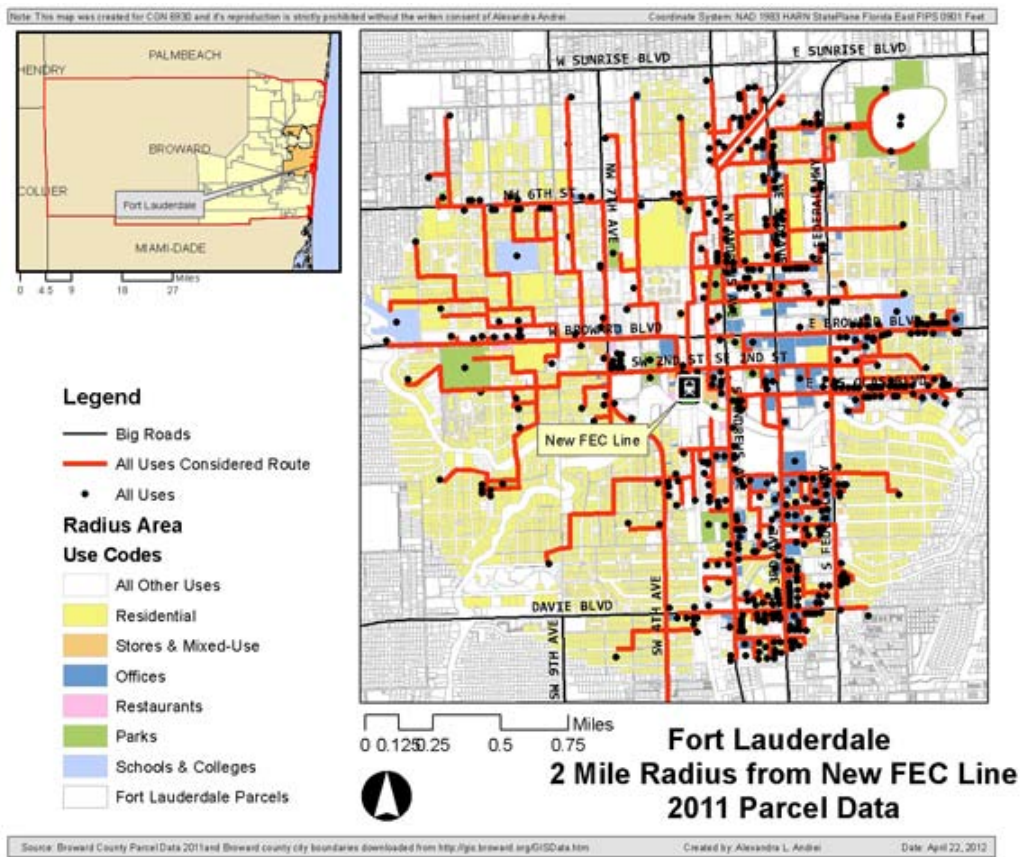
With these guidelines in place, the movement of people between the new train station and restaurants, offices, schools and colleges, shopping and mixed use developments, residential areas, and parks can be analyzed, thus casting a wide net over various activities and services that people typically like to reach by bicycle. Parcel data and use code data were used in order to understand the city center's land use make-up.



A generalized illustration of the land uses in the vicinity of the general location of the proposed FEC station. The vibrant business mix in the area could promote a transit-oriented community in the future. Image Alexandra Andrei.

Routes to and from the Train Station

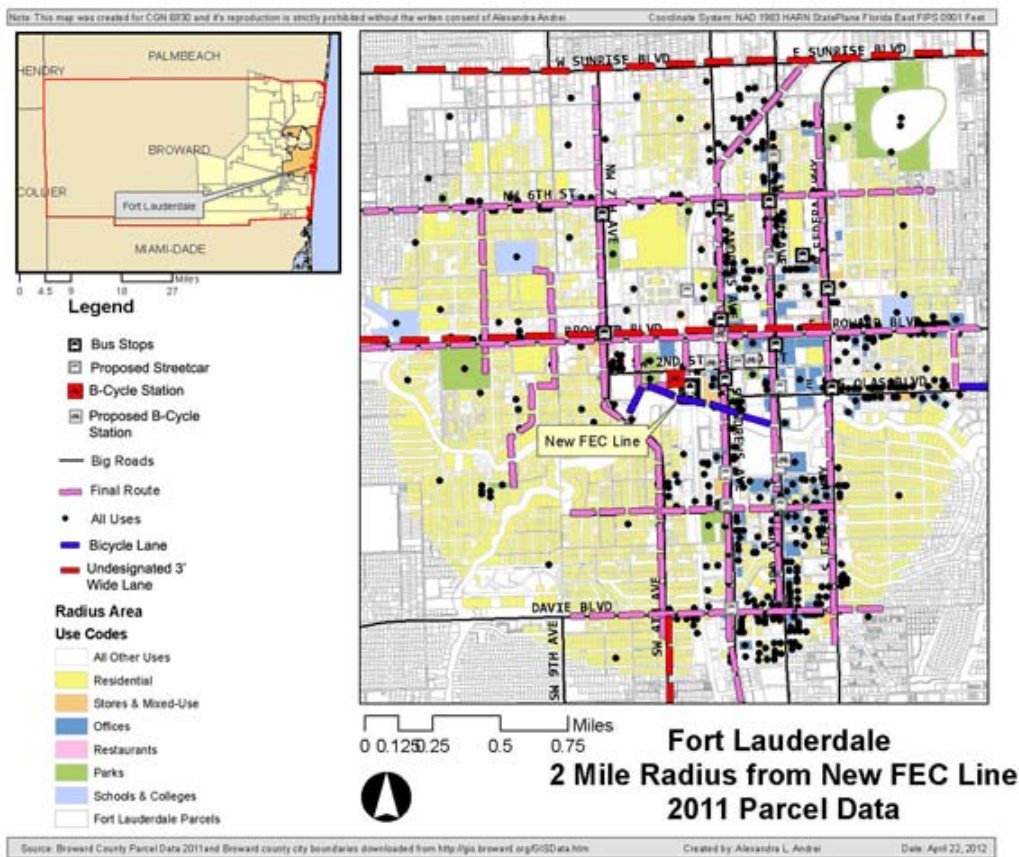
The use codes embedded in the Fort Lauderdale parcel data were analyzed using a tool from ArcGIS v. 10 that generates possible bicycle routes based on Fort Lauderdale's street network, the quickest path to and from the rail station, and other variables. Once bicycle routes for all the use codes have been generated, they can be mapped for analysis in relation to existing and future public transit stops within the two-mile radius.



The congested network of all possible bicycle routes, as generated by the ArcGis v. 10 tool. Image Alexandra Andrei.

Establishing all of the possible routes generated by the ArcGis v. 10 tool would create a complicated, congested bicycle network. The routes therefore needed to be adjusted to establish a more workable network. The analysis accomplished this by coordinating the bicycle routes with existing and future transit stops, eliminating routes that were too close to each other and outlining a network with one-quarter to one-half mile spacing between routes.

Beginning with the two-mile catchment area for the FEC station, the analysis delineated some possible destinations, such as businesses, that need to be connected to the station. The next step was to identify the bicycle route from these points of interest to the new station. The analysis then ranked the variables by considering the type of travel that dominates the transit system. Travel to work and to school was ranked the highest, followed by trips to restaurants, shopping, mixed use developments, residential areas, and parks. Also, keeping in mind the desired one-quarter to one-half mile bicycle route spacing within this two-mile radius, the analysis eliminated some routes by applying a second level of filtration that considered existing and future public transit stops in the catchment area. When unnecessary and overlapping routes are eliminated, keeping only those that connect with existing and future transit stops, the result is a workable bicycle network.



The final bicycle route network, along with existing and future transit stations and bicycle rental facilities. Image Alexandra Andrei.

Making the Connections

As municipalities aim to improve their transportation systems, Fort Lauderdale would benefit from an integrated bicycle network, especially with the proposed new FEC passenger rail line coming in the next few years. This network would help to further the principles of Fort Lauderdale's downtown master plan, which emphasize providing alternatives to cars; encouraging walking, public transit, and cycling; encouraging compact development; and surrounding the city center with strong walkable and mixed-income neighborhoods.

Bicycle routes could be integrated into the current car-dominated environment by reducing the width of some traffic lanes to 11 feet or removing a traffic lane. This would create room for bus stops and larger sidewalks along with bicycle lanes. To integrate bicycle routes successfully, the planning process should consider not only street layout but also hindrances. Compared with a motorist, a cyclist finds it more difficult to stop and start; therefore, coordinating stop signals and limiting stop signs along bicycle routes would increase the chance of success for this type of road sharing. Some of these suggestions could be considered in the bicycle master plan currently being developed by the City of Fort Lauderdale Department of Transportation & Mobility.

Resources

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Alexandra Andrei received a bachelor's degree in architecture in May 2010 from Florida Atlantic University, where she received high credit for her thesis projects based on sustainable development and sensitive responsiveness to the local historic site. Andrei is currently in her last year of graduate studies in urban and regional planning at the same institution, where her research focuses on city center revitalization strategies and inter-business connectivity within the urban context. She is currently seeking employment in urban planning.
