Electric Transit Circulator Feasibility Study

Miami-Dade Metropolitan Planning Organization

FINAL REPORT

Prepared by

The Center for Urban Transportation Research

CUTR

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ELECTRIC TRANSIT CIRCULATOR FEASIBILITY STUDY

In addition to Miami-Dade Transit, a number of other jurisdictions in Miami-Dade County currently operate circulator services and several more are planning or seriously considering such services. Increased interest in local circulators coupled with a growing interest in electric vehicle technology has prompted examination of the possibility of using electric or hybrid-electric vehicles to run local circulators in Miami-Dade. The MPO contracted with CUTR to explore possibilities and problems of inaugurating such services in the Electric Transit Circulator Feasibility Study.

With the documented successes of electric transit shuttle programs in other areas of the country such as Santa Barbara (CA) and Chattanooga (TN) and, locally, the exceptional accomplishments of the Electrowave operating on Miami Beach, initially cursory local interest in electric vehicle technology has now grown significantly in South Florida.

Pure electric and hybrid-electric transit vehicles offer many benefits including a quiet, smooth ride for patrons and a vastly improved nearly silent presence near pedestrians and streetside diners; a marked improvement in the public image of transit; increased ridership (some of which can be directly attributed to the "futuristic" feel of the vehicles—it is remarked that they are actually fun to experience!); reduced operating costs due to greater fuel efficiency; reduced maintenance costs due to the simplicity of the electric motors; an improvement in air quality due to significantly reduced or totally eliminated emissions; and leadership opportunities for the transit operator within its community in terms of recognition as a "pioneer" and an "innovator." With these benefits, electric and hybrid-electric vehicles can help transit operators achieve the goals of increasing ridership while contributing significantly to their community's quality of life and it's positive development.

Both pure electric and hybrid-electric transit minibuses have demonstrated numerous environmental benefits including substantially reduced emissions, odor, and noise. Either of these variants of electric vehicles (EVs) are less expensive to operate and maintain than conventional (diesel or gas engine-powered) minibuses. An EV is simply a vehicle that uses a rechargeable battery for fuel, replacing other fuels. Hybrid-electric vehicles (HEVs) use more than one fuel for propulsion, one of which is a rechargeable battery. Electric transit minibuses have boosted transit ridership and improved the image of public transit, while contributing to constructive community development in a variety of communities across the country. With the documented successes of electric transit shuttle programs, interest in electric vehicle technology is growing significantly in South Florida. A number of cities and other areas within Miami-Dade

County were examined for potential suitability for electric transit circulator services as a part of this feasibility study.

The full report introduces the technological aspects of electric vehicle propulsion and discusses the infrastructure typically required to operate and maintain a fleet of electric or hybrid-electric vehicles. From technological and infrastructure requirements points of view, implementation of electric vehicle technology is certainly possible as has been convincingly demonstrated by the successful Electrowave service on Miami Beach. Safety considerations novel to electric-powered vehicles are quite manageable. There are opportunities for partnering among many of the local areas within the county to help share capital facilities, technical expertise, and possibly even some operations. There is also a solid list of "lessons learned" from municipalities that have instituted electric vehicle transit circulator services that can guide localities that wish to establish such services in their own areas. The major challenge involved with establishing an electric or hybrid-electric local transit circulator service is the capital cost of such vehicles. Electric minibuses cost anywhere from twice to five times as much as conventional minibuses, and capital funding for transit is difficult, though not impossible, to secure. Hence, local areas must have compelling reasons to choose using electric vehicles for local circulator services.

Given the high capital costs of electric minibuses and the scarcity of funds to pay for them, it is unlikely that it will be feasible to establish electric vehicle transit circulator service in all of the areas included in this study, at least in the near future. However, the following criteria can be utilized to verify where using electric vehicles would make the most sense:

- ***Electric minibuses should be utilized in densely developed areas and/or areas of high pedestrian activity.***
- ***Electric minibuses are very appropriate in areas that are being redeveloped.***
- ***Electric minibuses are most appropriate on routes that anticipate constant stop-and-go operations due to heavy boarding and alighting of passengers.***
- ***Electric minibuses are appropriate as a way of attracting people to use remote parking facilities.***
- ***Electric minibuses routes should connect with other regional transit services.***
- ***Electric minibuses make more sense where synergistic sharing of resources, major facilities, and interlocal service agreements may be expected.***
- ***Electric minibuses are more likely to succeed where local entities are willing to provide increased matching money to help pay for vehicles and service.***

Using the criteria described above, the study areas that could be considered *more likely* candidates for implementing electric transit circulator services in the near future include Aventura, downtown Miami, Coconut Grove, Coral Gables, and Everglades and Biscayne National Parks. These areas have either high density, multiple pedestrian activities, or relatively high visibility as well as traffic congestion and connections with the regional transit system, and high environmental sensitivity, or some combination of these characteristics. All of them also have plans for circulators, or are already providing local circulator services.

Areas that could be considered *somewhat likely* candidates for implementing electric transit circulator services in the near future include North Miami Beach, North Miami, Homestead/Florida City, Hialeah, South Miami, and "Downtown" Kendall. With the exception of Hialeah and North Miami Beach, these areas do not currently provide transit circulator services; North Miami and Kendall have, however, completed circulator studies, and South Miami ran a rubber-tired "trolley" shuttle in the past. These areas do not currently have either the densities or pedestrian environments normally associated with well utilized electric circulators; and services would not be characterized by frequent stop-and-go movements.

Areas that, at this time, have considered some sort of shuttle but appear to be the *least likely* candidates for EVs include Sunny Isles Beach, Bal Harbour, Surfside, Miami Lakes, and Airport West. None of these areas currently have the combination of density, pedestrian activity, or redevelopment that is normally associated with electric circulator services. However, if funds were available, there is no reason electric vehicles should not be used in these areas if they are in fact desired.

It should be noted that any of the communities that have been referred to as "somewhat likely" or "least likely" might leapfrog areas that referred to as "more likely" if they identify local funding and generate enough interest and energy to create the partnerships necessary to support an electric vehicle circulator service.

Recommendations

Localities that wish to pursue the implementation of electric vehicle transit circulator services should be fully aware of the following steps to success:

1. ***A thorough plan detailing the need for, and nature of, a local circulator service needs to be developed.***

2. ***A well-placed champion or champions must be found if the project is to succeed.***

3. ***The community must assign a project leader.***

4. ***The project leader should take advantage of a number of technical resources that are available.***

5. ***They should review how Broward County developed its community-based, public-private volunteer organization known as EV Ready Broward.***

6. ***Local communities that adjoin each other and are interested in implementing electric vehicle circulator service should partner with each other for facilities, vehicles, and expertise.***

The Electric Transit Circulator Feasibility Study identified the areas in Miami-Dade County that appear to be good and reasonable areas to establish electric transit vehicle circulator services. The full Final Report makes clear that electric vehicle technology is still developing and improving, but it is advanced enough for more local communities to be confident in its reliability. The capital cost of this technology is more expensive than conventional fueled vehicles and funding is not abundant. However, there are a variety of sources available, or that could be available, and a well-planned service proposal could generate support from a multitude of sources. When determining feasibility of additional electric transit vehicle circulator services in the county, one might well conclude that, while they will not be easy to establish, if there is truly a will, then there will be a way to do it.

Figure 2
North Dade Study Areas

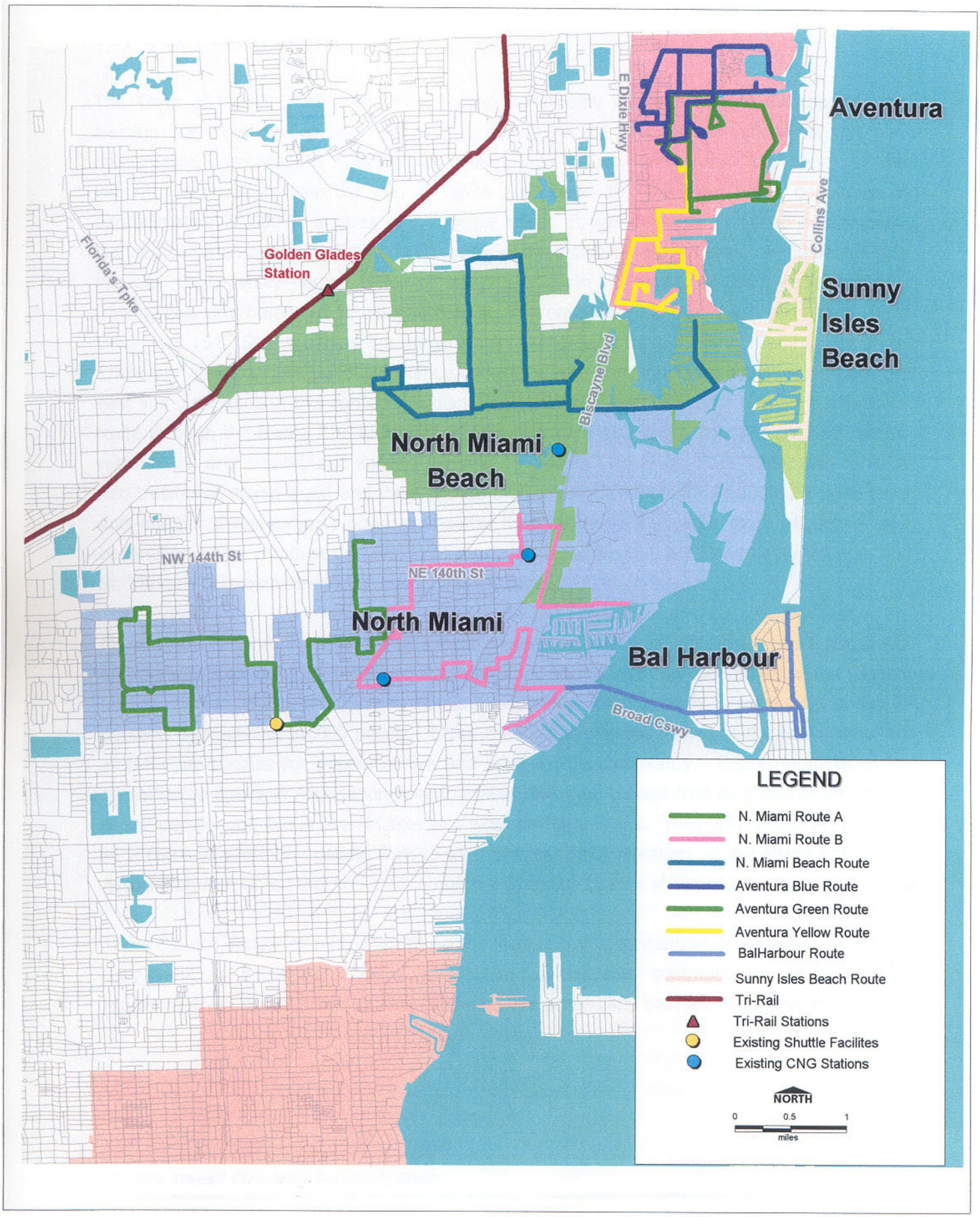

Figure 3
Miami Lakes-Hialeah-Airport West Study Areas

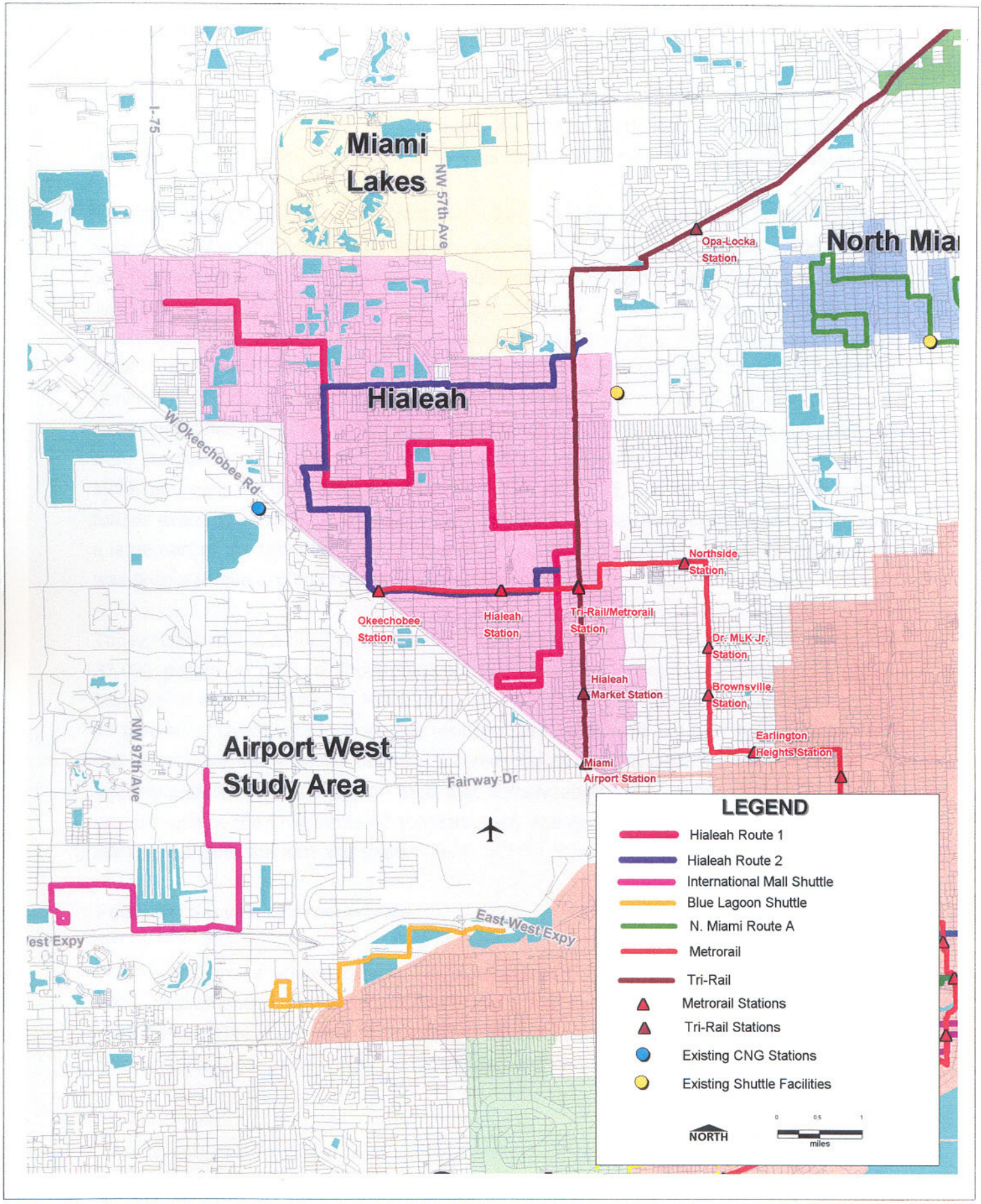

Figure 4
Downtown Miami Study Area

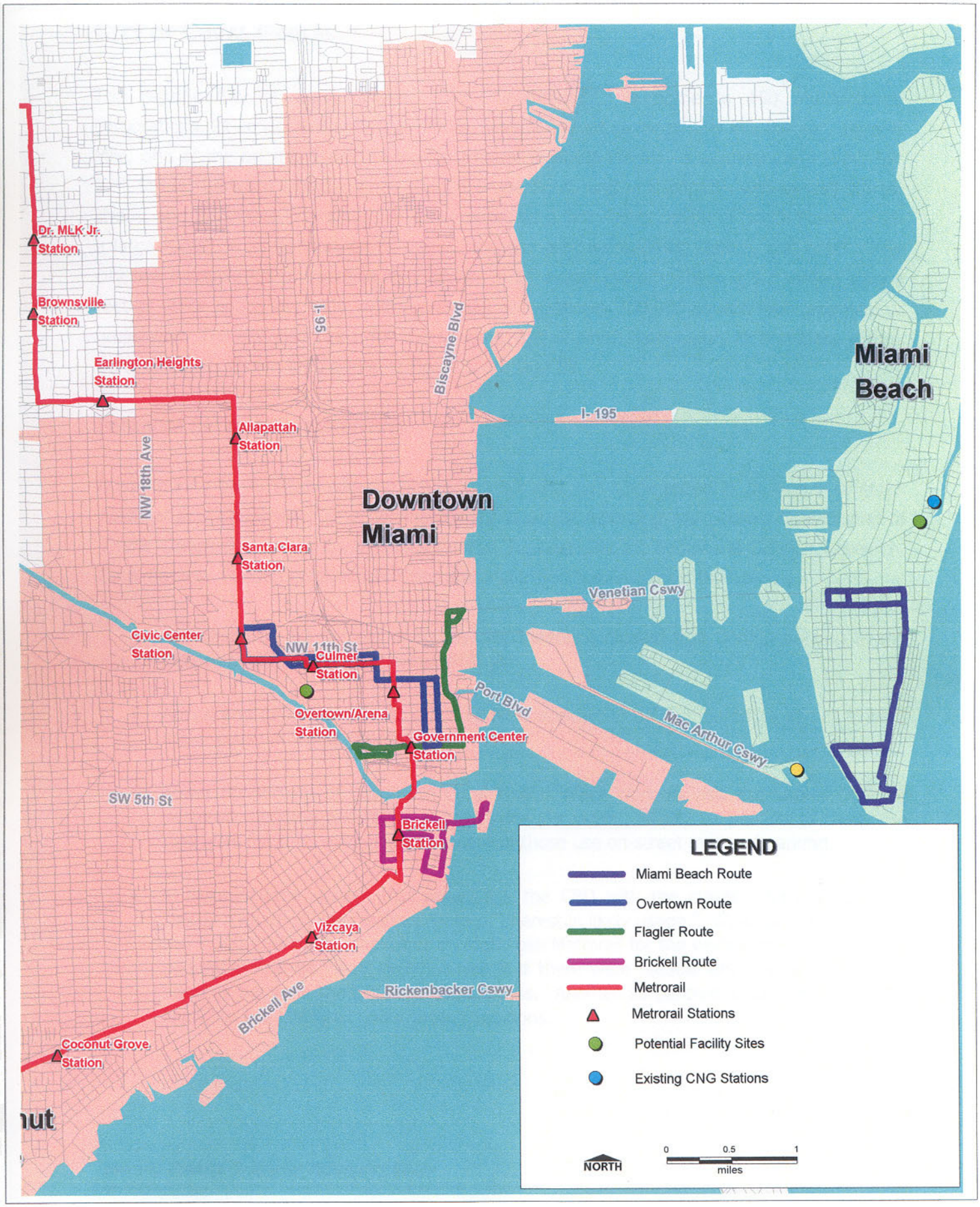
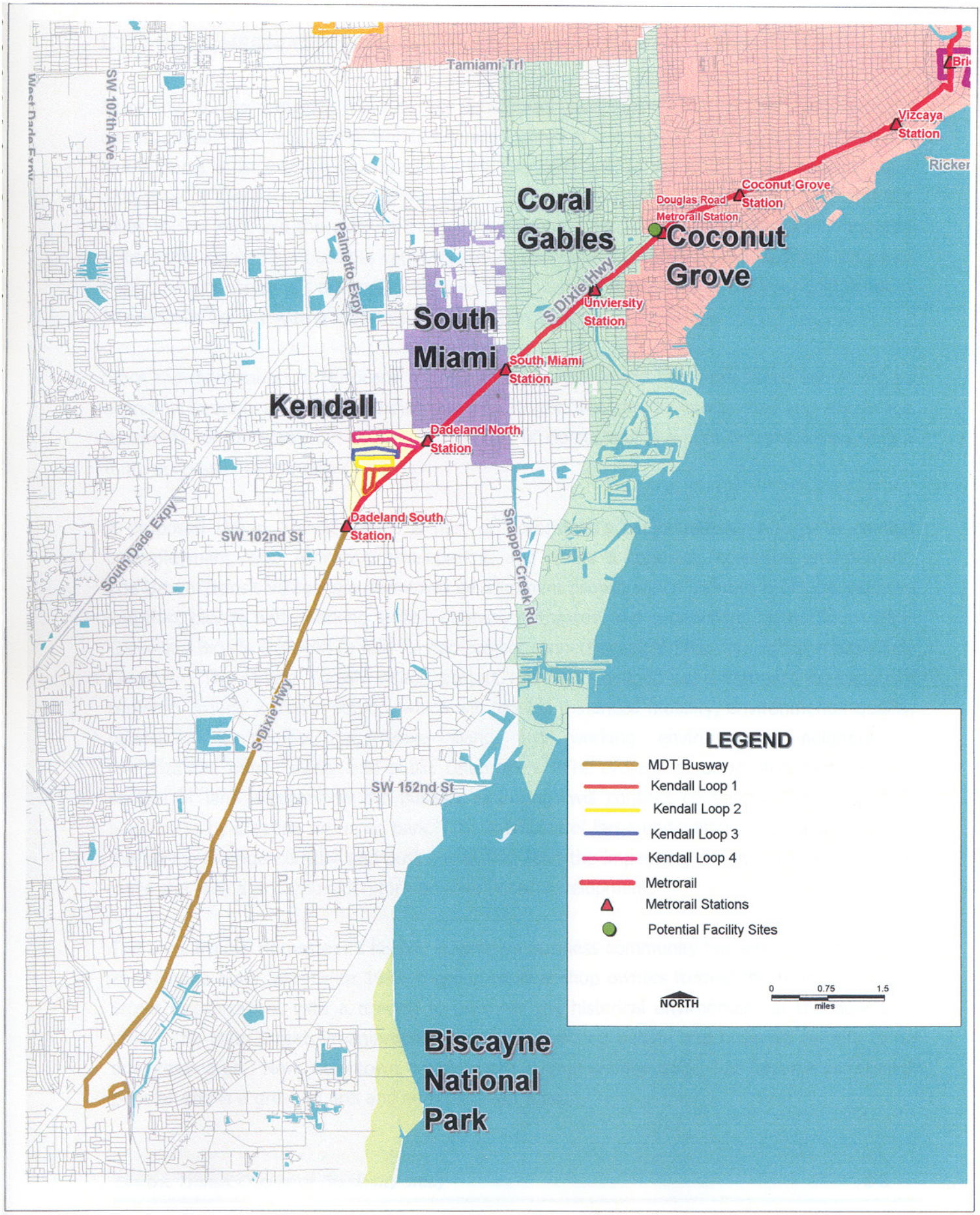
Figure 5
Coral Gables-Coconut Grove-South Miami Study Areas