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RESOLUTION NO. 2016-54

A RESOLUTION OF THE MAYOR AND VILLAGE COUNCIL OF THE VILLAGE OF PALMETTO BAY, FLORIDA; RELATING TO THE IBUS COMPREHENSIVE OPERATIONAL ANALYSIS (COA) FINAL REPORT; ACCEPTING THE RECOMMENDATIONS OF THE IBUS COA FINAL REPORT DOCUMENTS AND RECOMMENDATIONS, AS PREPARED BY THE CORRADINO GROUP, INC.; FURTHER AUTHORIZING THE VILLAGE MANAGER TO ACQUIRE CONCURRENCY FROM MIAMI-DADE TRANSPORTATION AND PUBLIC WORKS DEPARTMENT PRIOR TO PROCEEDING WITH IMPLEMENTATION OF REPORT FINDINGS; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Village entered into an agreement with The Corradino Group, Inc. for the purposes of a Comprehensive Analysis for the Palmetto Bay transit system; and

WHEREAS, this operational analysis examined the entire IBus transit system; and

WHEREAS, it explores transit in general, its purpose, and the typical markets it serves, and why it serves them; and

WHEREAS, the final report findings details that the Village's transit service functions poorly due to maintenance and operational issues, in particular underperforming routes; and

WHEREAS, the comprehensive operational analysis as prepared by The Corradino Group provides opportunities for enhancement of the Village's transit operation that can easily and quickly be implemented to gain significant improvements in ridership.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND VILLAGE COUNCIL OF THE VILLAGE OF PALMETTO BAY, FLORIDA, AS FOLLOWS:

Section 1. It is recommended that the Village Council accept the recommendations of the Comprehensive Operational Analysis Final Report and authorize the Village Manager to acquire concurrency from both CITT and Transportation and Public Works Department prior to proceeding with the implementation and recommendations of the final report findings. A copy of the COA Final Report findings is attached.

Section 2. This Resolution shall become effective upon the date of its adoption herein.

PASSED AND ADOPTED this 11th day of July 2016.

1 Attest:

2 Missy Arocha
3 Missy Arocha
4 Village Clerk

Eugene Flinn
Eugene Flinn
Mayor

5
6 APPROVED AS TO FORM AND LEGAL SUFFICIENCY FOR THE USE
7 AND RELIANCE OF THE VILLAGE OF PALMETTO BAY, FLORIDA ONLY:

8
9 Dexter W. Lehtinen
10 Dexter W. Lehtinen
11 Village Attorney

12
13
14
15
16 FINAL VOTE AT ADOPTION:

- 17
- 18 Council Member Karyn Cunningham YES
- 19
- 20 Council Member Tim Schaffer YES
- 21
- 22 Council Member Larissa Siegel Lara YES
- 23
- 24 Vice-Mayor John DuBois YES
- 25
- 26 Mayor Eugene Flinn YES



Eugene Flinn

Mayor

John DuBois

Vice Mayor

Karyn Cunningham

Councilmember District 1

Tim Schaffer

Councilmember District 2

Larissa Siegel

Lara

Councilmember District 3

Edward Silva

Village Manager

VILLAGE OF PALMETTO BAY

iBUS Comprehensive Operational Analysis

Final Report

Route Analysis/Potential Service Improvements

September, 2015



PALMETTO BAY

9495 SW 180th Street
Palmetto Bay, FL 33157

www.palmettobay-fl.gov

305.969.5011

Executive Summary:

This Comprehensive Operations Analysis has examined the entire IBus transit system. It does so by placing the service into context, by looking at the land use and development patterns in Miami Dade County. It explores transit in general, its purpose, and the typical markets it serves, and why it serves them.

As part of the analysis a significant amount data was collected. This includes the location, timing, and spacing of transit in the area. Local accessibility to transit was examined, and compared to surrounding communities. Alternative ridership populations were sought, specifically the youth population. Service to the Downtown was evaluated and planned. A discussion of the necessity and impacts of a park and ride facility has been provided. The existing IBus service was evaluated. Passengers who currently ride the system were surveyed, and the system was compared with other circulator systems in Miami Dade County.

In light of this data collection and analysis, service options have been presented as options for each route. These options were combined into 4 alternatives, from which recommendations were made for how to proceed with the service.

In short, the service currently functions poorly do to maintenance and operational issues, in particular due to Route A. The community is naturally not transit accessible, and this situation is exacerbated through the duplication of MDT routes and ridership markets. All of this however presents opportunities for enhancement that can easily and quickly be implemented to gain significant improvements.

Ultimately it is recommended that the Village:

- Immediately Reconfigure the Existing Service, With New Buses and Marketing
- Review Ridership, Customer Satisfaction, and Financial Metrics within 12 Months.
- If Improvements are Shown (Which They Will Be) then Consider, Increasing Service, by either Reconfiguring the routes, implementing routes servicing the schools at various levels, and or adding weekend service.

This option can be done for the same budget as service are being provided for today.

To implement these suggestions it is recommended that the Village Immediately:

- Market the System
- Purchase Buses
- Operate internally

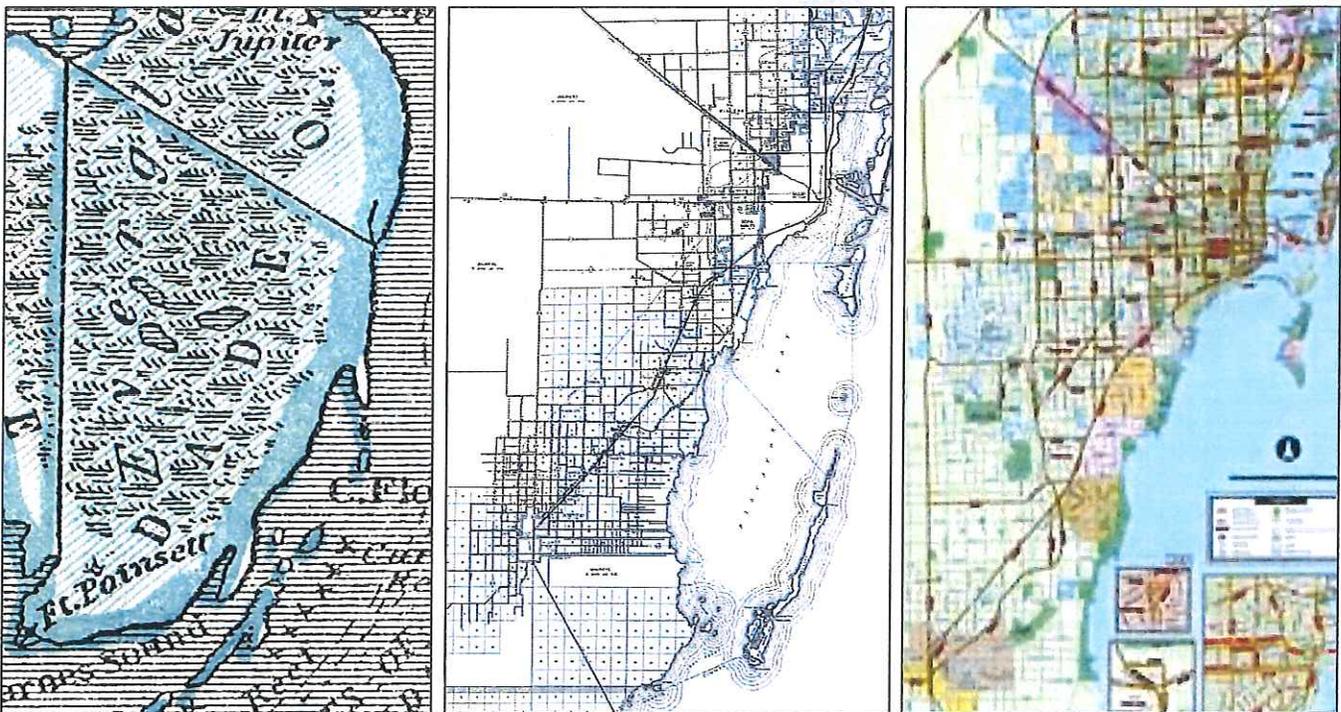
If after a year it is decided to continue then we should:

- Purchase Tracking Equipment



Transit In Miami Dade County

Miami Dade County is young in terms of development. Just over 100 years ago, Flagler's Railway cut a path along what is now US-1. Our communities then began to develop in the 1950's. Today Florida is one of the fastest growing states in the Union, but we have an immature transportation system almost completely reliant on roadways. Our development occurred in a post-World War II era; the transit systems that developed in the Northeast of the United States, never developed here. Development is going to continue, and as we can clearly see, the roads can't handle additional travel demand. South Dade is relatively uncongested compared to other locations in the region; however, South Dade will soon look like North East Miami Dade County. A drive to the Aventura Mall on a weekday afternoon is a perfect example of what is coming.



In South Dade we are fortunate. Flagler's Railway has already been repurposed. It is the Metrorail and Busway. We have the beginnings of high level transit already, while other communities, like Miami Beach do not. The Palmetto Bay Circulator is a progressive, forward thinking concept, fitting of one of the most desirable, well run places to live in our region. Perpetuating it is an investment in the future.

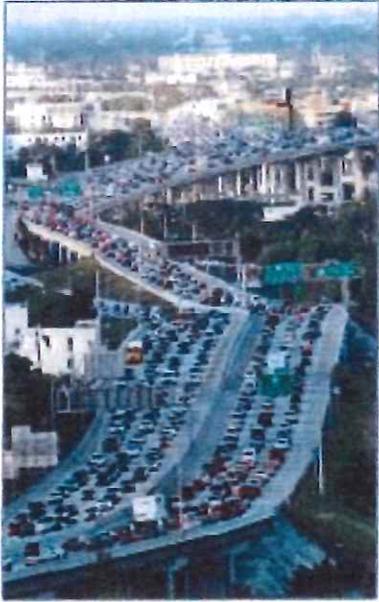
Today, regionally, we find ourselves at a crisis point. The decisions we make in the next few years will take us in a direction that will shape the way our children function within the area. Other communities have been here before. In some areas they have chosen to predominantly rely on roadways to service the mobility needs. Others have diversified the transportation systems. Only personal preference can determine which option is correct for each community.



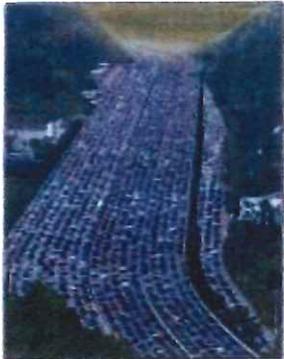
WHAT DO WE WANT TO BE?



Yesterday



Today



Tomorrow



Communities that diversify their systems with transit, are supply capacity in a different form. They take advantage of higher capacity vehicles to move more people in the same physical space, therefore making the system more efficient. This can be done on the existing roadways or by using the funding currently used for roadways to build future right of ways that are purposed for transit.

| IT'S ALL ABOUT CAPACITY



Who Rides Transit

There are two primary markets for transit riders, 1) transit dependents (those without regular access to personal vehicles), and 2) choice riders (those who have access to personal vehicles, yet choose to use transit). In Miami Dade County, the preponderance of the transit system is focused on transit dependent populations. Yet in our area of the County, we can be fortunate to be served by the Busway, which is appealing to choice riders. Choice ridership is most likely to be attracted when transit travel times and costs are competitive with the private auto. These factors must be considered when targeting a particular ridership market. Choice ridership is best served through the provision of frequent, high amenity, service with a guaranteed seat (versus standing).

Transit dependent persons in our area are: the elderly, the young (middle school, high school, college), and commuters without access to personal vehicles. The community is young and affluent and highly mobile. This mobility is overwhelmingly satisfied by the personal automobile. The greatest transit dependent population numerically are the youth, followed by the elderly. Meanwhile the iBUS almost exclusively serves a transit dependent commuter population that lives outside the community, but works in the community.

|TRANSIT, WHO RIDES

TWO PRIMARY MARKETS

1

Those Who Have A Choice
(Choice Riders)

2

Those Who Do Not Have A Choice
(Transit Dependent)

- ✓Who Do We Want To Serve?
- ✓Who Should We Serve?
- ✓We Have Opportunities For Both

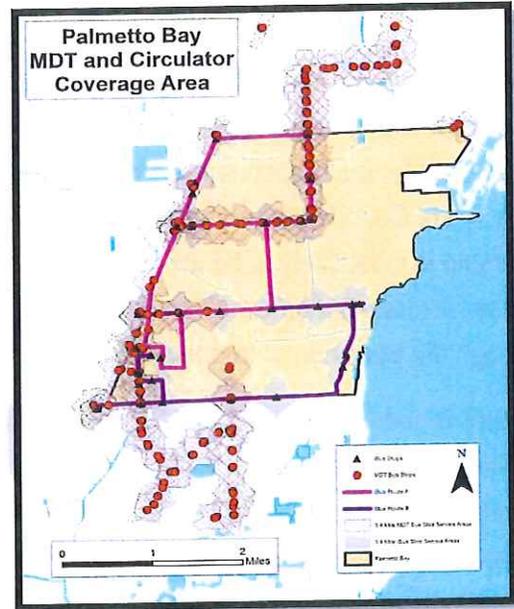
To make transit attractive to choice riders it must be:

- As fast as door-to-door trip times and as expensive as an automobile
- It must compete with the car
- The community must be willing to tolerate the subsidy

Transit dependent populations are typically served by buses as opposed to rail. This is the primary market for transit in Miami Dade County.

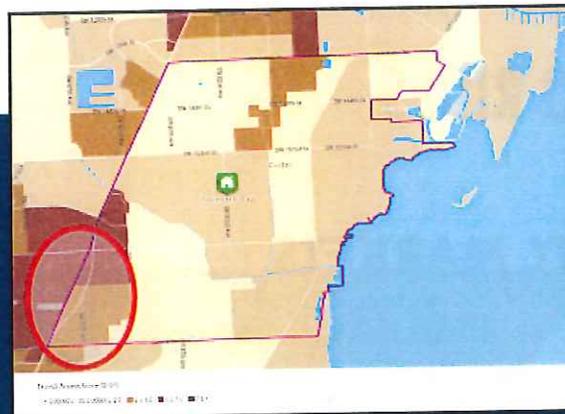


The analysis shows that Palmetto Bay does not have good transit access. It is less accessible than both Pinecrest and Cutler Bay, yet this presents significant opportunities. The primary reasons for this are that the community is low density, and that I bus routes serve the same population and cover much of the same routing as MDT, by duplicating 65% of MDT Routes. Also the Downtown Area is not well developed.



ACCESS TO TRANSIT

- ✓ Palmetto Bay 1.85 Cars/House
Transit Access Score 1.1
- ✓ Pinecrest 1.77 Cars/House
Transit Access Score 5.7
Pinecrest - 7x more likely
- ✓ Cutler Bay 1.79 Cars/House
Transit Access Score 1.5
Cutler Bay - 2.5x more likely



The Youth Population

An examination of the youth population shows significant ridership potential. Twenty seven percent (27%) of the population are school children within two miles of a school, and not serviced by school buses. The policy of requiring middle and high school students to get to school on their own, if they live within a two-mile radius of the school, has created a transit dependent population of youth.

An examination of this topic finds that, historically, students and the general public on the same bus are not a good mix, especially where students are in the majority. Students may be more spirited than the general public in ways that the general public can find offensive. By the same token, some parents have misgivings about having their children ride on a bus with adult strangers. For this reason planners have generally kept service to schools separate from service to the general public.



On-board Passenger Survey

Passengers riding the buses were surveyed. Survey results show that the IBus primarily serves commuters. Responders said they were going to work or going home from work. Almost all are riding daily, a characteristic of a commuter. Most of those who responded are not residents of Palmetto Bay, but rather, are employed in Palmetto Bay. Almost all riders arrive via the Busway to reach their destination in Palmetto Bay and return to the Busway in the evening. Almost all riders were going home from work. More than half the ridership is boarding/alighting at the Palmetto Bay Village Center, reinforcing the understanding that it is the only significant employment destination on the east side of Palmetto Village.

With few exceptions, the riders mostly do not have access to a car. Almost all are female, and Spanish is the predominant language spoken. Most appear to be in domestic service, but a number of riders get on and off the bus at the bus stop that serves the Village Center, so, some riders may work there.

Riders are very interested in having more transit amenities on the buses are routes. Their desires include:

- Bus cleanliness;
- Bus heating, A/C;
- Driver friendliness;
- Driver appearance;
- Buses on time;
- Bus stop locations;
- Hours of operation;
- Schedules; and,
- Safety at Bus Stops

Service Options

In light of the data collection and analysis done for this study service options were developed. These included options for Route A, Route B and a Special Weekend Route.

Route A is underperforming, and therefore where the most impactful opportunities arise. Four service options are available.

- Midday Modified
- School Service, 1 Bus to:
 - Palmetto HS
 - Southwood Middle
- School Service, 2 Buses to:
 - Palmetto HS
 - Southwood Middle
 - Palmetto Middle
- Optional Midday, On-Demand Service

SERVICE OPTIONS ROUTE A

- ✓ Continue Basic Function
- ✓ Modify the Route
- ✓ Convert to School Routes
- ✓ Explore On-Demand Service

DESTINATION	SW 152 Street / US1	SW 153 Street / SW 63 Avenue	Coral Reef Park	SW 152 Street / SW 77 AV	SW 144 Street / SW 77 Avenue	SW 136 Street / SW 77 Avenue	SW 136 Street / US1	SW 144 Shopping Plaza / SW 145 Street / US1	Public	SW 152 Street / US1	SW 153 Street / SW 65 Avenue	SW 153 Street / SW 63 Avenue	SW 148 Street / SW 63 Avenue	SW 144 Street / SW 63 Avenue	SW 148 Street / SW 63 Avenue	SW 144 Street / SW 63 Avenue	SW 148 Street / SW 63 Avenue	SW 144 Street / SW 63 Avenue	SW 148 Street / SW 63 Avenue
A.M. Schedule	10:00 AM	10:04 AM	10:05 AM	10:10 AM	10:15 AM	10:20 AM	10:25 AM	10:30 AM	10:35 AM	10:40 AM	10:45 AM	10:50 AM	10:55 AM	11:00 AM	11:05 AM	11:10 AM	11:15 AM	11:20 AM	11:25 AM
P.M. Schedule	11:20 AM	11:25 PM	11:25 PM	11:30 PM	11:35 PM	11:40 PM	11:45 PM	11:50 PM	11:55 PM	12:00 PM	12:05 PM	12:10 PM	12:15 PM	12:20 PM	12:25 PM	12:30 PM	12:35 PM	12:40 PM	12:45 PM

Out of Service @ 1:30 PM



- Thalatta Estates;
- Montgomery Botanical Center;
- Fairchild Tropical Botanic Garden;
- Palmetto Bay Village Center and the Library;
- Coral Reef Park summer events such as the Splash Bash;
- Black Point Marina;
- The Falls Shopping Center; and,
- Palmetto Bay Park.

As a specific example, an interest was expressed to have direct iBUS service to Dadeland from the Municipal Center area, with frequent headways.

Alternatives

From these options, 4 alternatives have been developed. These are combinations of various options for each route.

ALT 0

Minimal Action

ALT 1

Reconfigure Routes, Same Hours,
On Demand

ALT 2

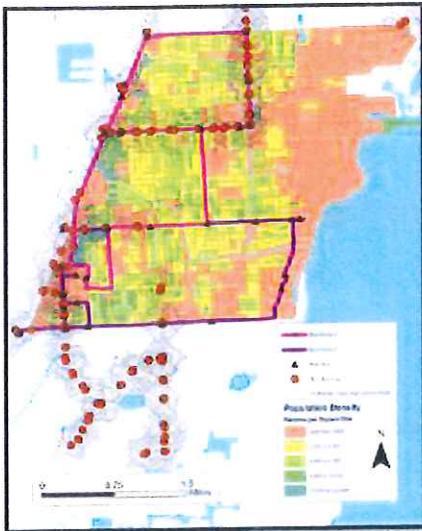
Alt 1 + School Service + More Hours

ALT 3

Alt 2 + 3rd Bus



ALTERNATIVE 0



ALT 0

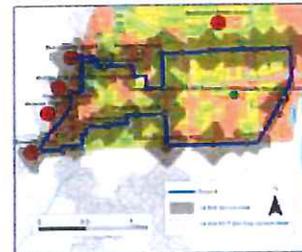
Minimal Action

Route A		
✓ Reconfigure 8.3 Miles		\$63,250
Route B		
✓ Reconfigure 8.9 Miles		<u>\$75,900</u>
Total		\$145,475
% of Current Bjt		100%
✓ Replace Buses		

ALTERNATIVE 1

• Route A – On Demand Midday Service	\$56,925
• Route B – Reconfigure	\$75,900
• 8.3 Miles	
• On Demand Administrative Support	\$44,275
• Marketing	<u>\$ 2,500</u>
Total	\$179,600

% of Current Bjt 120%



ALT 1

Reconfigure Routes, Same Hours, On Demand

✓ Reconfigure Route B, Add On Demand

Alternative 1 is the basis for each subsequent alternative. It would provide the following:

- Reconfigured Route B, will Increase Efficiency, and Improve Coverage in the Densest Areas
- Predictable "Clockwise" Service
- 1hr Headways

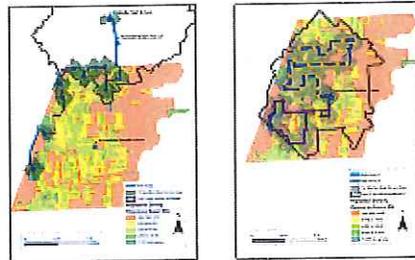


- All Stops will have Signs, Some Benches and Shelters Added
- Service Similar to Today (7am – 9am, 2pm – 5pm)
- Same Ridership (Transit Dependent Commuters)
- Connecting the Busway with More Service
- Convert Route A to On-Demand

ALTERNATIVE 2 Alternative 1 + School Service + More Time

Route A	
• AM School Service	\$44,275
• On Demand Midday Service	\$75,900
• PM School Service	\$56,925
Route B	
• Reconfigured (7am – 7pm)	\$170,775
On Demand Administrative Support	\$44,275
Marketing	<u>\$ 2,500</u>
Total	\$375,676

% of Current Budget 260%

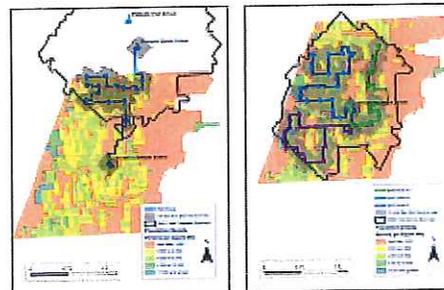


ALT 2
Alt 1 + School Service + More Hours

ALTERNATIVE 3 Alternative 2 + 3rd Bus

Route A	
• AM School Service	\$44,275
• On Demand Midday Service	\$75,900
• PM School Service	\$56,925
Route B	
• Reconfigured (7am – 7pm)	\$170,775
On Demand Administrative Support	\$44,275
3 rd Bus	\$88,550
Marketing	<u>\$ 2,500</u>
Total	\$455,400

% of Current Budget 310%



ALT 3
Alt 2 + 3rd Bus



Recommendations

It is believed that this can be a successful service, in terms of ridership, costs and intrinsic value to the community as a necessary basis to begin providing the ability for people to move without a car. In future iterations it will be an integral service to Palmetto Bay's Downtown, and a vital link to the remainder of the region via Busway, Metrorail. It is important that confidence be built back into the system.

Regardless of any other decisions, in looking at the future of the Palmetto Bay iBus system, it is essential to put new buses into service and to put up bus stop signs. Some form of marketing is also essential.

As is demonstrated by the experience with the bus air conditioning and other maintenance issues, owning buses and keeping them in good operating condition is challenging. The overwhelming reason for current maintenance issues is the age of the vehicles. New vehicles would greatly diminish maintenance issues; nevertheless, if the Village owns buses, the pattern could repeat at some future date.

A fundamental question is whether Palmetto Bay should own its vehicles, as it does today, or meet its vehicle needs as part of a lease or turnkey vendor.

In most business situations, owning is considered marginally cheaper than leasing, when equipment has a long service life. There are some tax advantages to owning, principally in claiming depreciation. And, operating costs may be marginally lower, if there is less deadhead getting buses to and from the beginning and ends of routes.

Another obvious advantage of the Village purchasing its own buses is it can get the vehicles it wants, rather than what is provided by a vendor. But in buying so few vehicles, there is no economy of scale, so the Village would likely pay a premium amount.

Table 2: Bus Ownership Pros and Cons

Owner	Advantage	Disadvantage
Palmetto Bay	Full control of bus features. Use of existing maintenance workers, if there are such Village staff. Tax advantages through depreciation.	No economy of scale on purchases. Requires dedicated maintenance staff and facilities for bus storage and maintenance, or a reliable outside vendor. Full capital cost is paid up front. Money must be budgeted ahead to allow for future bus purchases.
Vendor	Village responsibilities reduce to managing the vendor contract.	Little control over vehicle selection (if not stipulated in contract, old equipment could be provided) Operating costs could be marginally higher, if buses are housed and maintained at a distance.

Source: The Corradino Group



The decision on ownership is tied to operations. Operations can be managed wholly by Village staff, as is the case today, or it could be provided by a vendor – public or private (Table 3).

Table 3: Operations Pros and Cons

Operator	Advantage	Disadvantage
Palmetto Bay Staff	Full control of routes and flexibility to change. Full control of drivers and courtesy expectations.	Requires dedicated transit staff, including backups. Requires adequate driver and maintenance staff training, and facilities. For future school and demand-response options, someone must take calls and schedule rides.
Vendor	Hands off operations. Reliable spare vehicles and drivers Control of routes and flexibility to change, if in contract provisions. Control of drivers through contract language.	Requires understanding of service negotiations and contracting. Need to manage non-municipal staff. Need to establish performance criteria and monitor same.
MDT	Full integration with MDT system, including Cutler Bay. Elimination of redundancy with MDT routes. Reliable spare vehicles and drivers. User friendly for riders making transfers and using the MDT system.	Potentially higher cost of service. Different system objectives. Lack of control.

Source: The Corradino Group

the system does continue, marketing will need to be provided as will bus stop amenities, including up to 27 signs and 5 shelters. Eventually a bus tracking system will need to be put in place.

Finally it is recommended that the Village implement Alternative 0, which would immediately reconfigure the existing service, with new buses and marketing.

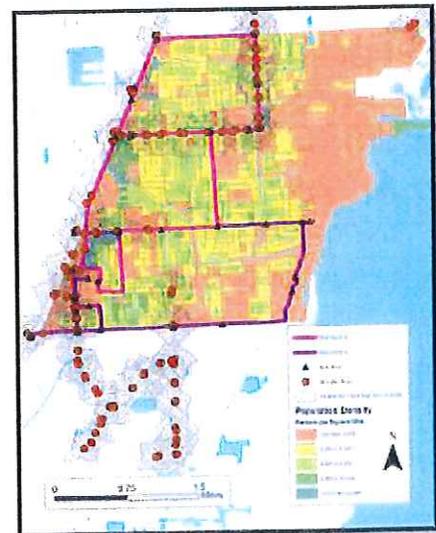
ALTERNATIVE 0

This option can be done for the same budget as service are being provided for today.

Within 12 months it is recommended that the Village review ridership, customer satisfaction, and financial metrics. If improvements are shown, then consider, increasing service, by either reconfiguring the routes, implementing routes servicing the schools at various levels, and or adding weekend service.

To implement these suggestions it is recommended that the Village Immediately:

- Market the System
- Purchase Buses
- Operate Internally



If after a year it is decided to continue then we should:
Purchase Tracking Equipment



Introduction:

Miami Dade County is young in terms of development. Just over 100 years ago, Flagler's Railway cut a path along what is now US-1. Our communities then began to develop in the 1950's. Today Florida is one of the fastest growing states in the Union, but we have an immature transportation system almost completely reliant on roadways. Our development occurred in a post-World War II era; the transit systems that developed in the Northeast of the United States, never developed here. Development is going to continue, and as we can clearly see, the roads can't handle additional travel demand. South Dade is relatively uncongested compared to other locations in the region; however, South Dade will soon look like North East Miami Dade County. A drive to the Aventura Mall on a weekday afternoon is a perfect example of what is coming.

In South Dade we are fortunate. Flagler's Railway has already been repurposed. It is the Metrorail and Busway. We have the beginnings of high level transit already, while other communities, like Miami Beach do not. The Palmetto Bay Circulator is a progressive, forward thinking concept, fitting of one of the most desirable, well run places to live in our region. Perpetuating it is an investment in the future.

SUMMARY OF FINDINGS

The iBUS system currently operates Route A: 10 AM–2 PM, and Route B: 7-9 AM and 2–5PM, Monday to Friday, except holidays. Ridership has declined in recent years.

iBUS duplicates MDT route coverage, but does not share stops, making transfers difficult. Bus stops are not marked and buses have long outlived their useful lifespan, compromising service reliability. Most riders are commuters traveling to/from the Busway to domestic service and are Spanish speaking. Schedules and web site communications should be bilingual.

The way the iBUS routes are currently routed and scheduled allows them to be modified in beneficial ways:

- Route A can be kept in service through the day, serving students in the morning and afternoon, while maintaining circulator or on demand service during the midday.
- Route B can be run consistently in one direction with more service hours and possibly serving a park and ride lot.

The key is to target the correct populations and implement a service that is efficient, effective and affordable. This report puts these issues into context, exploring the current state of the service, and benchmarking it with other systems, so we can manage our expectations. This Final Report explores the demography of the Village and suggests potential service population's and routes. Finally it suggests potential operational characteristics. It is the goal of



this report to provide the Village with quality information in order for it to make the best decision possible.

Corradino understands the purpose of this Comprehensive Operational Analysis is to evaluate the iBus shuttle service and provide insight into how it can best evolve to serve the residents of and visitors to Palmetto Bay. Corradino has evaluated iBus service and its relationship to transit circulators in the Village of Pinecrest and the Town of Cutler Bay, and connectivity to Metro-Dade Transit (MDT) service. This study explores the existing service and potential market for shuttle service within the Village of Palmetto Bay in order to

- Determine whether its two existing routes should be reconfigured, discontinued, or consolidated.
- Evaluate the current operating model in light of fiscal and market needs.

For this project it is understood that the Village wants to explore expanded transit populations. One targeted population is younger residents. For this to occur it is important to understand all relevant city and county services, the interfaces among them, and who Palmetto Bay's iBus is serving today. To understand the existing and potential ridership, we evaluated the demographic make-up of Palmetto Bay as well as the geographic dispersion of the student population, and conducted an on-board survey of the iBus ridership.

This is the Final Report on a comprehensive operational analysis of Palmetto Bay's iBus system. designed to make recommendations to improve Palmetto Bay iBUS service. The first TM covered Task 1 - Data Collection and Task 3 – Market Analysis; more specifically, the topics covered were:

- Staffing Operations and Vehicle Stock

- Routes A and B Hours of Operation and Routes
- Information and Marketing
- School Data Related to New Service to Students
- New Technology
- Demographics/Transit Generators/Transit Propensity
- On-board Transit Survey

TM 2 focused on Task 4 – Route Analysis and Potential Service Improvements.

The data collection efforts and findings are discussed first.



Existing iBUS Conditions

Palmetto Bay owns three functioning buses, each with a capacity of 20 seated passengers. The buses are wheelchair lift equipped and carry bike racks on the front. Two buses are available for service and one is used as a spare. Having a spare is a necessity under any circumstance; however, the spare does not serve its function adequately, as it sometimes breaks down itself when put into service. Drivers are employed by the Village of Palmetto Bay and work part time.

Bus stops are generally unmarked, and many are located in areas with no sidewalks. Thus, persons requiring wheelchair assistance do not always have a dedicated concrete landing pad onto which they would alight from the bus.

The buses were purchased when the iBus service was initiated in 2006, so the buses are almost a decade old, compared to a recommended service life for that type of bus of 5 years (Table 1). Bus breakdowns are a recurring issue. During the study, the need to repair the air conditioning units put bus

operations entirely out of service from June 29, 2015 to July 1, 2015.

iBus service is now provided on Routes A and B (Figure 1). There is significant overlap between iBus and MDT's routes. The background of the graphic shows population density as a reference. The denser areas (darker green and blue) are near US 1.

Historical ridership data indicate a decline from approximately 12,000 in 2008 to 5,376 in 2013. Recent ridership reports indicate a daily average of 25 for April through June 2015. Route A's ridership ranged from a high of 69 persons in April 2015 (3.4 riders per day) to 12 (fewer than 1 rider per day) for the month of June 2015. Route B garners more riders, ranging from 511 in April 2015 (over 25 riders per day) to 549 for the month of June 2015 (over 27 riders per day).

Route A

Route A operates only during the midday (10 AM to 2 PM), making four one hour runs, each comprised of two loops: 1) a northern counter-clockwise loop

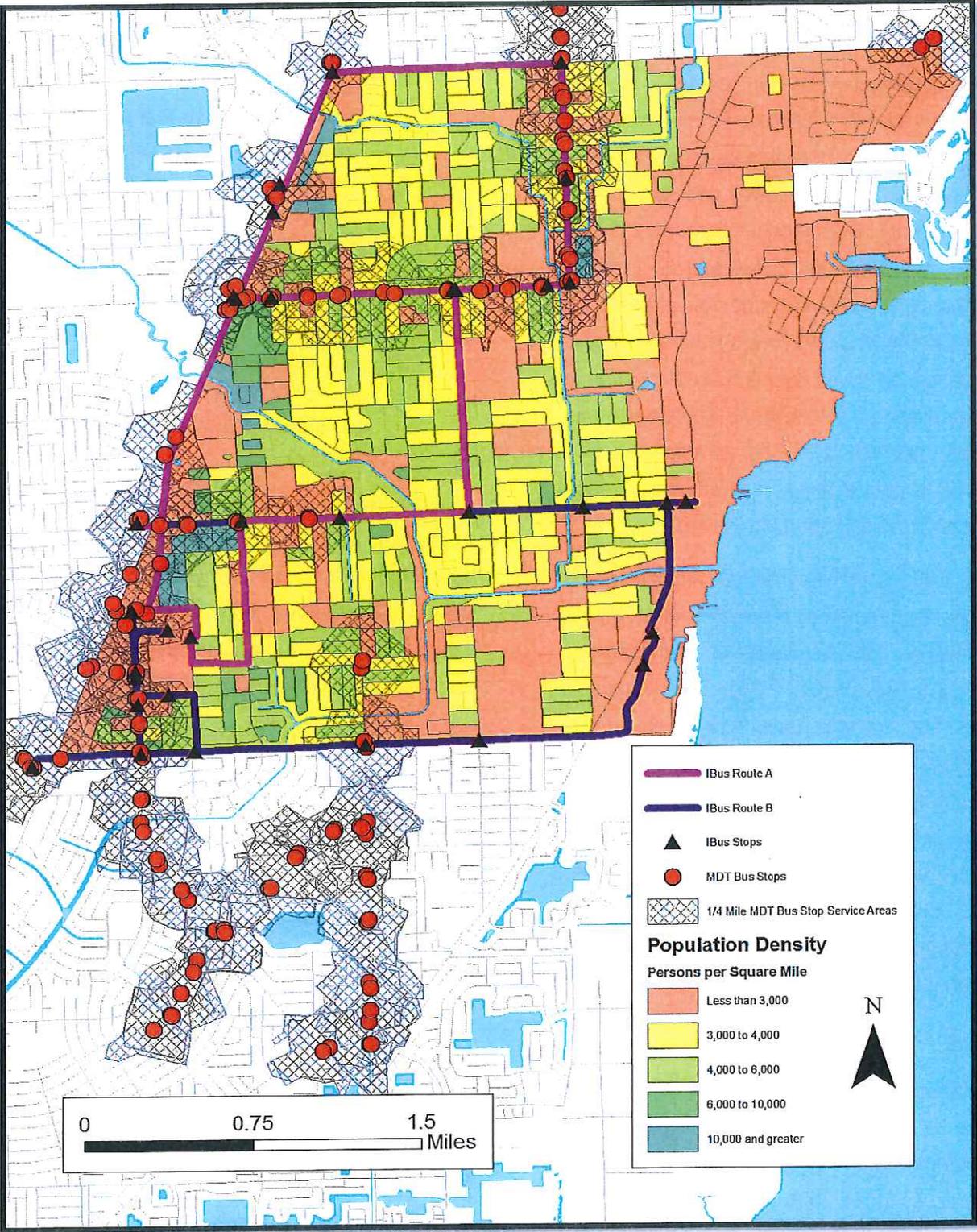
Table 1: Minimum Service-life categories for Buses and Vans

Category	Typical Characteristics			Minimum Life (Whichever comes first)	
	Length	Approx. GVW	Seats	Years	Miles
Heavy-Duty Large Bus	35 to 48 ft /60 ft artic.	33,000 to 40,000	27 to 40	12	500,000
Heavy-Duty Small Bus	30 ft	26,000 to 33,000	26 to 35	10	350,000
Medium-Duty and Purpose-Built Bus	30 ft	16,000 to 26,000	22 to 30	7	200,000
Light-Duty Mid-Sized Bus	25 to 35 ft	10,000 to 16,000	16 to 25	5	150,000
Light-Duty Small Bus, Cutaways, and Modified Van	16 to 28 ft	6,000 to 14,000	10 to 22	4	100,000

Source: Useful Life of Transit Buses and Vans, http://www.fta.dot.gov/documents/Useful_Life_of_Buses_Final_Report_4-26-07_rv1.pdf



Figure 1: Existing Palmetto Bay iBUS Routes and MDT Route Coverage



Source: Village of Palmetto Bay and The Corradino Group



starting at the Busway and SW 152nd and following SW 152nd east, SW 77th north, SW 136th west, and US 1 south; then 2) a southern clockwise loop starting at the Busway and SW 152nd and following SW 152nd east, SW 82nd south, and SW 168th west, and then working through the Franjo Triangle/Municipal Center area back north to the Busway and SW 152nd. There are only 16 designated stops over the length of the two loops. Stops are not marked by bus stop signs and buses stop only at designated points (as shown on the web system map and iBus pamphlet). Even if an individual looks at the map (provided on the web), he would not know where to go to catch the bus, as a dot on a map is not equivalent to a sign that indicates exactly where to stand and not miss the bus.

Figure 1 shows that several MDT bus stops are present along the same roadway section where there may be only one iBus stop. (An option would be to make all MDT stops iBus stops also.) Some transit systems have up to ten stops in a mile. The 16 stops shown on the route map brochure may not produce an adequate coverage area for the route. Based on the standard assumed walk distance to transit of $\frac{1}{4}$ mile, there should be at least three stops per mile. Route A with a length of over 10 miles has only 1.5 per mile, about have of the minimum standard.

Route B

Route B operates in the morning (7 AM to 9 AM) prior to the beginning of Route A service and in the afternoon (2 PM to 5 PM) after Route A service ends for the day.

- The first morning runs clockwise beginning at the Busway and SW 168th and following SW

168th east, Old Cutler Road south (via the Branch Library and Palmetto Bay Village Center), and SW 184th back west to the Franjo Triangle area. It then reverses and runs backwards, counter-clockwise, via SW 184th, Old Cutler Road, and SW 168th to the Busway. It then runs that pattern clockwise again, then counterclockwise ending at Village Center and not getting back to the Busway.

- The first afternoon run is counter-clockwise beginning at the Municipal Center, then east on SW 184th, north on Old Cutler Road (via Village Center and the Branch Library), and west on SW 168th to the Busway. That bus then retraces its route clockwise. It makes two more clockwise runs, then ends the day with skip-stop service counter-clockwise to the Busway.

The clockwise/counterclockwise pattern of Route B is confusing. With bus stops marked only on maps, it is likely that riders find out by word of mouth where to go to catch the bus, and where it goes. There are just over two stops per mile (19 stops /8 miles). This is 1 stop per mile below the standard.

No service on the iBUS is provided on Saturdays or Sundays or on the following holiday's observed by the Village of Palmetto Bay: New Year's Day; Martin Luther King, Jr. Day; President's Day; Memorial Day; Independence Day; Labor Day; Columbus Day; Veteran's Day; Thanksgiving Day; Day after Thanksgiving; and Christmas Day.

Information and Marketing

Route information for the iBUS is provided on the Palmetto Bay website web site:

(<http://www.palmettobay-fl.gov/content/ibus-bus-circulator-service#>).



Service changes and updates are listed under "Department News." Unlike some MDT routes, the iBUS does not have an online system allowing users to see the location or expected arrival times of the bus (see related information in Appendix A). Route information, including routes maps and schedules, together with instructions on how to ride the bus are on line, and on brochures available at the Village Center (Figure 2). The route map is shown in Figure 3. The brochures are not widely distributed.

While maps are provided, bus stops are not marked by signage nor are bus schedules available at the stop. Bus stop signage and infrastructure, as well as route timetables, advertise the system. Their lack limits knowledge of the system. Bus ridership is affected by the knowledge of the system. While the iBUS itself is clearly marked, this exposure is limited to those who see the bus. Knowledge of the shuttle's existence is hindered by its lack of visibility, and the lack of information negatively impacts user-friendliness of the system, and by extension, ridership retention and growth. The lack of transit infrastructure may also hinder ridership as the information prevents an individual from being able to plan a trip.

The on-board survey found almost all riders speak Spanish, and thus information provided should be bi-lingual, including service updates on the website, which is currently in English only.

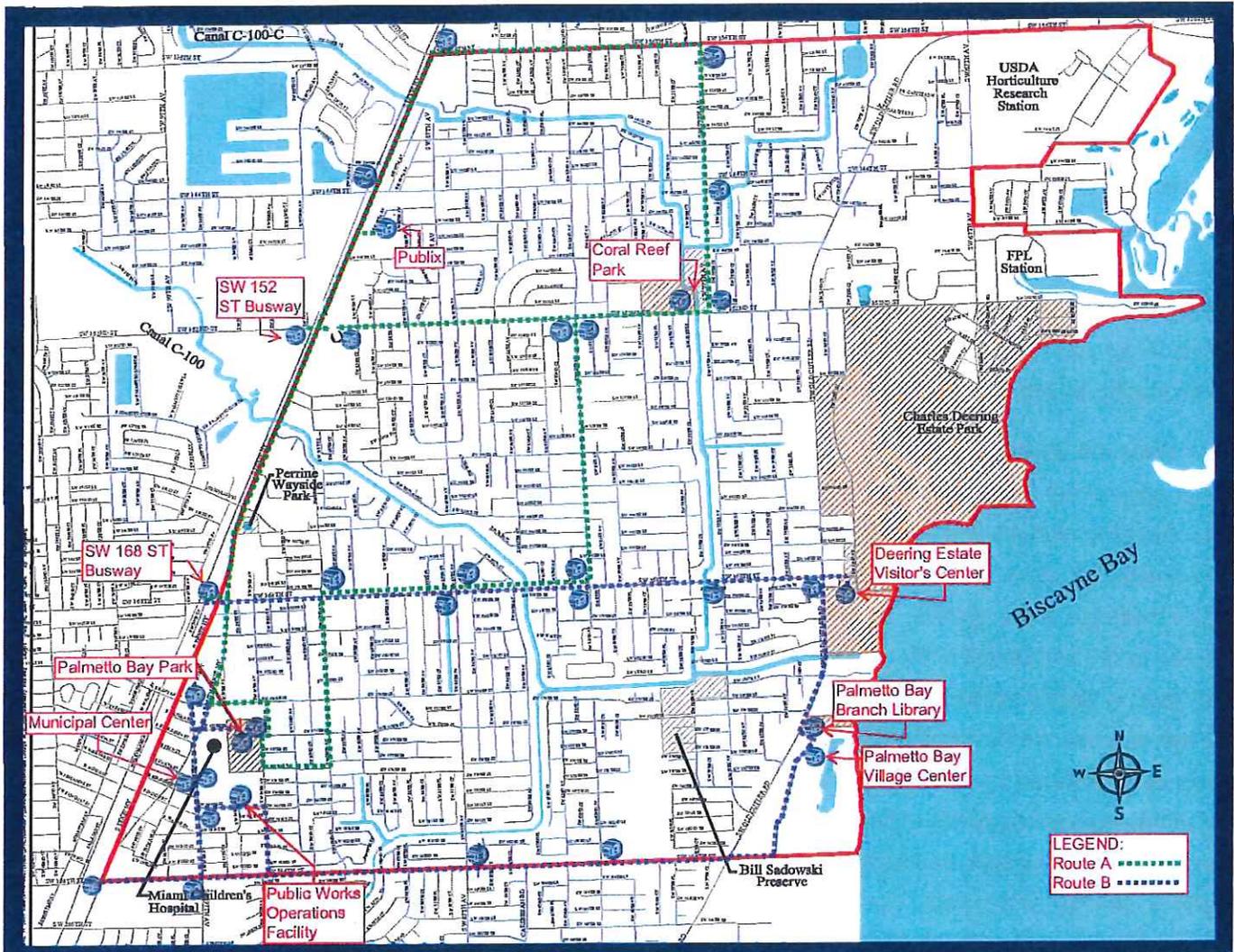


Figure 2: The Village's iBUS brochure

Source: Village of Palmetto Bay



Figure 3: Village of Palmetto Bay iBUS Routes



Source: Village of Palmetto Bay

Demographics/Transit-related Information

There are two primary markets for transit riders, 1) transit dependents (those without regular access to personal vehicles), and 2) choice riders (those who have access to personal vehicles, yet choose to use transit). In Miami Dade County, the preponderance of the transit system is focused on transit dependent

populations. Yet in our area of the County, we can be fortunate to be served by the Busway, which is appealing to choice riders. Choice ridership is most likely to be attracted when transit travel times and costs are competitive with the private auto. These factors must be considered when targeting a particular ridership market. Choice ridership is best served through the provision of frequent, high amenity, service with a guaranteed seat (versus standing).



Transit dependent persons in our area are: the elderly, the young (middle school, high school, college), and commuters without access to personal vehicles. The community is young and affluent and highly mobile. This mobility is overwhelmingly satisfied by the personal automobile. The greatest transit dependent population numerically are the youth, followed by the elderly. Meanwhile the iBUS almost exclusively serves a transit dependent commuter population that lives outside the community, but works in the community.

Palmetto Bay is a community of 23,863 persons (2013 est.); 12 percent of the population is aged 65 and over, and children comprise 28 percent of the population. While aging as a community, with a median age rising from 38 in 2000 to 41 in 2013, the Village has also attracted families with children, which has increased as a share of the population over time (US Census 2013 estimate).

Corradino imported US 2010 Census data for individual blocks into GIS to allow plotting of population densities. American Community Survey (ACS) data are collected between decennial censuses and thus provide newer data, however, the ACS data are only available for block groups (aggregations of blocks). That is, the data are not so fine-grained, and so do not provide as much precision as the block data from the 2010 Census. The 2010 data show blocks with apartment complexes more accurately, for example. This is important in establishing anchor points to be served by transit.

Figure 4 shows population densities. The blue and darker green areas have the greatest population density. The map shows that population is denser nearer to US 1.

VILLAGE OF PALMETTO BAY

At a glance:

Population: 23,863 (2013 est.)

Elderly Population: 12.2% of population (2,905 – 2013 est.)

Youth Population: 27.7% of population (6,509 – 2013 est.)

Area: 8.8 sq. miles

Neighboring Communities: Cutler Bay, Pinecrest, Unincorporated Miami-Dade County

iBUS Routes: A and B

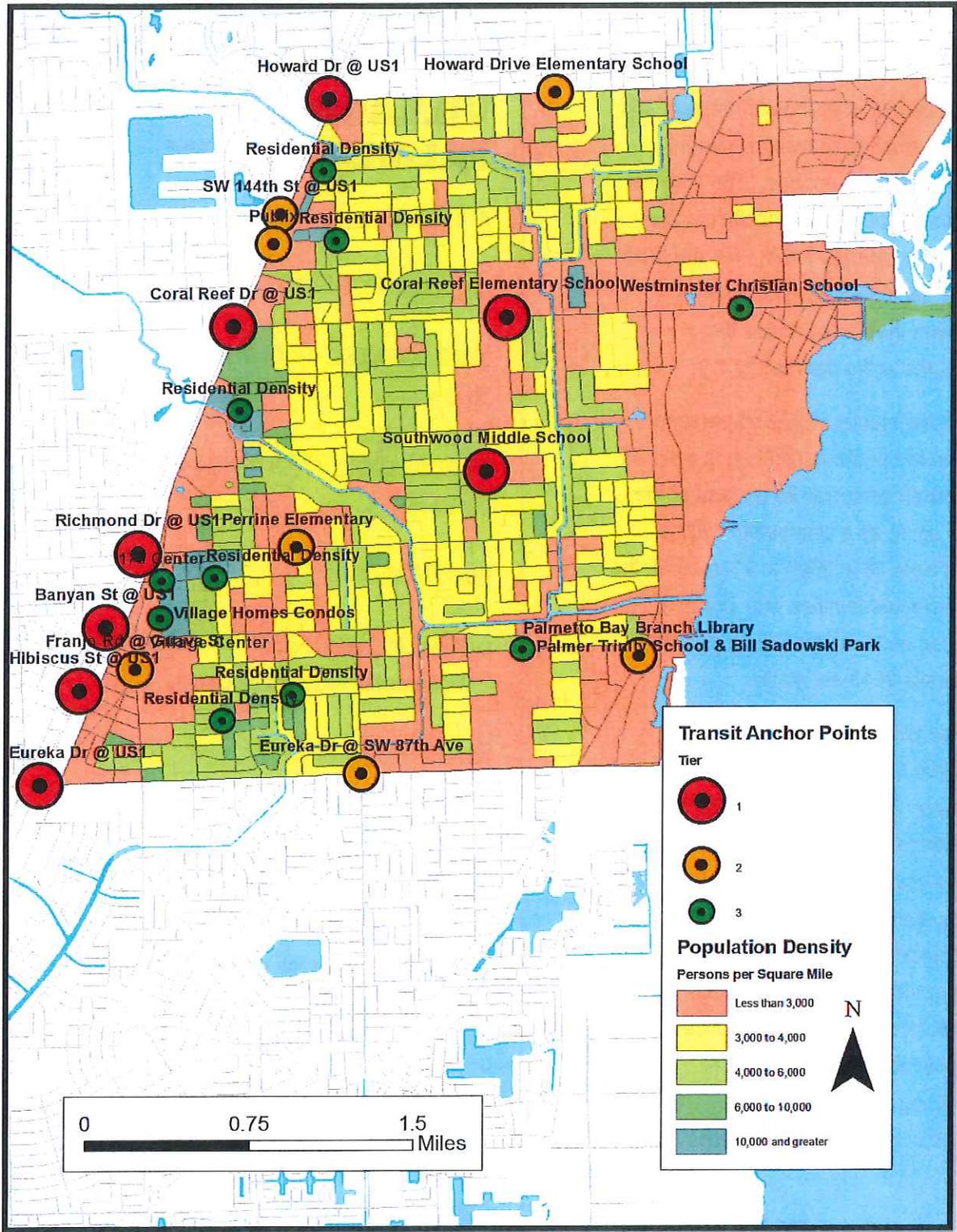
MDT Routes Servicing Palmetto Bay and Adjacent Areas: 1, 31, 34, 38, 52, 57, 57, 136, 252, 287

Major Thoroughfares: Old Cutler Road, US-1, Ludlam Road, SW 136th Street, SW 152nd Street, SW 168th Street, SW 184th Street

Transit Points of Interest: Palmetto Bay Village Center, SW 168th Street/Busway, SW 168th Street and Old Cutler Road, Village of Palmetto Bay Branch Library, SW 184th Street/Busway



Figure 4: Palmetto Bay Population Density – 2010



Source: The Corradino Group



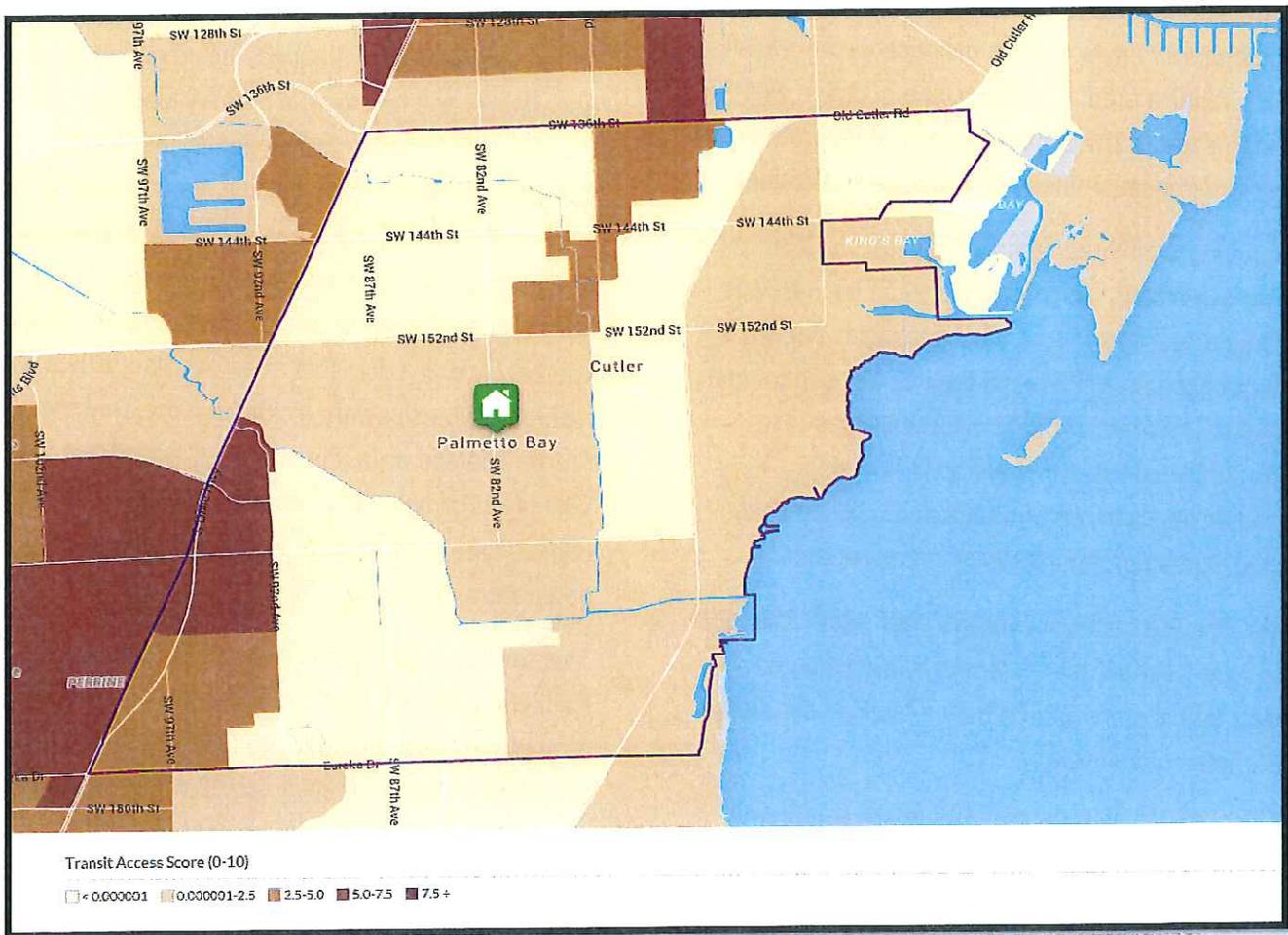
A primary indicator of transit use is population density, so it is logical for a community-based transit system to serve such areas. (A notable exception is the gated community on Paradise Point, which would be very difficult to serve.)

Secondary demographic indicators of transit use include income, age, and disability status. Palmetto Bay residents have an average of 1.85 cars per household, with an average transit expenditure of \$14/year. Residents, on average, take about 10 transit trips per year (Center for Neighborhood Technology, 2015). In short, they are currently more

likely, and overwhelmingly choose, to drive. At the same time, transit access is poor in Palmetto Bay, even with iBUS and Miami-Dade Transit service (Figure 5). This presents both considerations for the current system and opportunities for service expansion.

This is supported by the fact that in neighboring communities, transit accessibility and ridership is significantly higher. Comparatively, Pinecrest residents are about seven times more likely to take transit. Pinecrest has an average of 1.77 cars per household, with an average transit expenditure of

Figure 5: Village of Palmetto Bay Transit Access Score



Source: Center for Neighborhood Technology



\$90/year. The transit access score, unlike Palmetto Bay's low average of 1.1, is 5.7 in Pinecrest, indicating moderately high connectivity, and aids in the transit trips per resident of the community, at an average of 68 trips per resident each year.

To the south, Cutler Bay's transit access score is higher than Palmetto Bay's, at 1.5. On average, its residents are 2.5 times more likely to ride transit, at an average 24 trips a year, and have expenditures of \$32 dollars on transit. This number will continue to rise as Cutler Bay further develops its circulator. The average autos per household in Cutler Bay is 1.79.

Transit service (MDT and iBUS combined) covers approximately 32 percent of Palmetto Bay, assuming the standard $\frac{1}{4}$ mile walking distance as the transit stop's capture area. This poses the question whether transit usage is low because of individual preferential choices or because these choices are constrained

On average, all three communities have similar levels of car ownership, which is higher than Miami-Dade County's average of 1.54 per household. Yet, we see that despite this similarity in the number of personal vehicles, the level of transit accessibility is consistently correlated with transit ridership. Communities with better transit accessibility have higher ridership, regardless of car ownership.

Improving the service coverage area within Palmetto Bay would benefit the residents by providing an option that is currently not truly a feasible choice for 2/3 of the community.

As can also be seen in Figure 6, there is a large overlap between MDT routes and the iBUS. While some overlap is necessary to ensure appropriate transfers between multiple systems, current overlaps represent 1.85 mi² of the 2.83 mi², or 65 percent, of

the iBUS's coverage area, based on the existing stop locations.

At this level of route duplication, where close to two-thirds of the Palmetto Bay shuttle is in competition with MDT routes, the two bus systems are in direct competition with each other. This is particularly evident with Route A, where the overlap is 1.24 mi² of the 1.60 mi² coverage area (78 %).

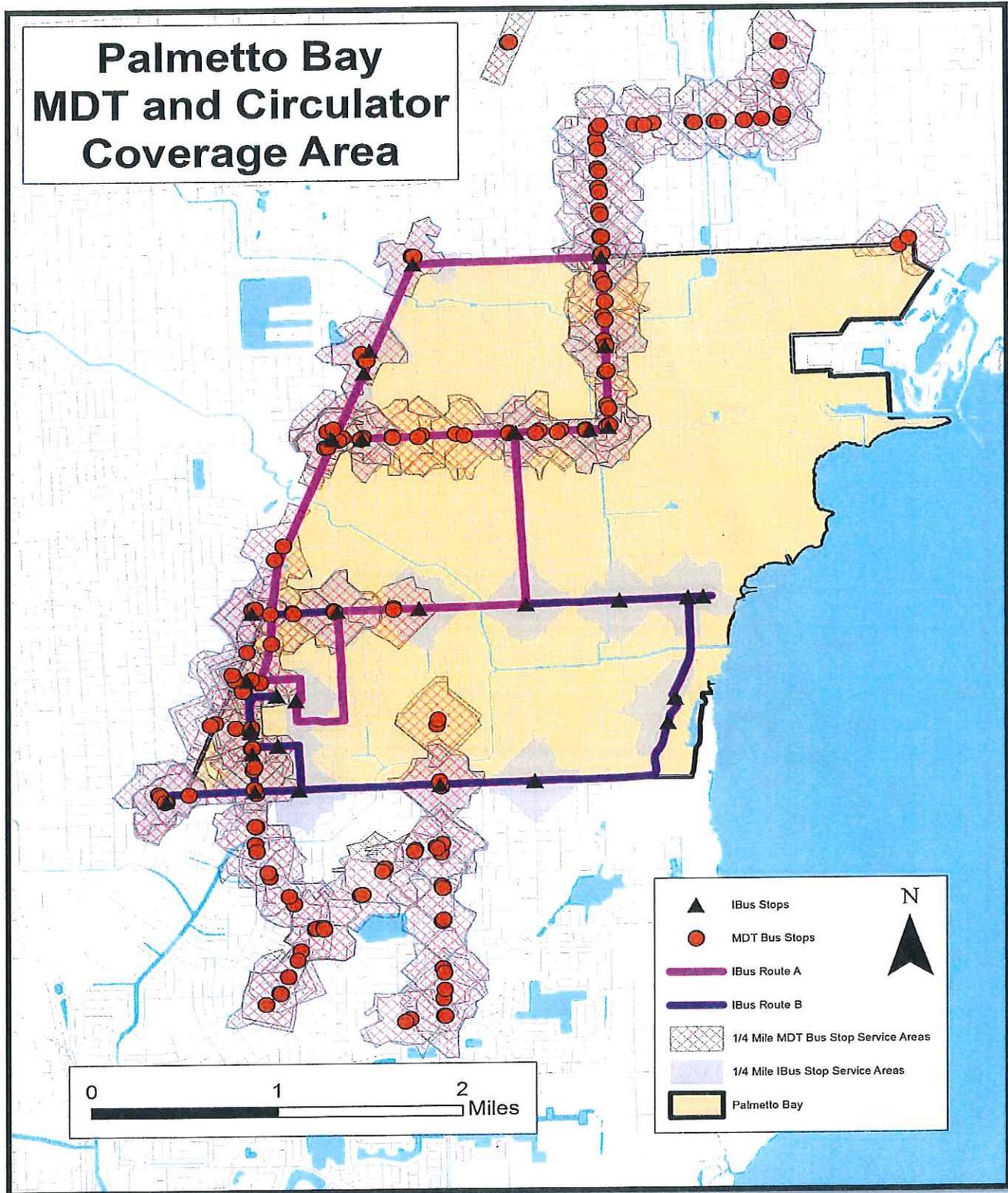
Assisted living facilities generally should be serviced by transit systems. Palmetto Bay has two such facilities, servicing families and persons with disabilities, located in the west of the Village (Shimberg Center). These have been mapped in Figure 7.

Other data sets were mapped, including key transit generators, and land use, a primary indicator of transportation needs. Transit generators for the purposes of this analysis include schools, the Village Center, local shopping areas, including markets such as Publix, park and ride locations, existing MDT transit stops, parks, and other sites of recreational interest. Additionally, points representing clusters of residential density were included in the analysis. The Franjo Triangle area, the proposed Downtown for the Village of Palmetto Bay, is naturally served by connections to the Village Hall and other existing generators, based on $\frac{1}{4}$ mile walking distance.

The service areas for Palmetto High School, Palmetto Middle School, and Southwood Middle School were also brought into GIS, together with the 2-mile boundaries for each school within which there is no public school bus service (see discussion below).



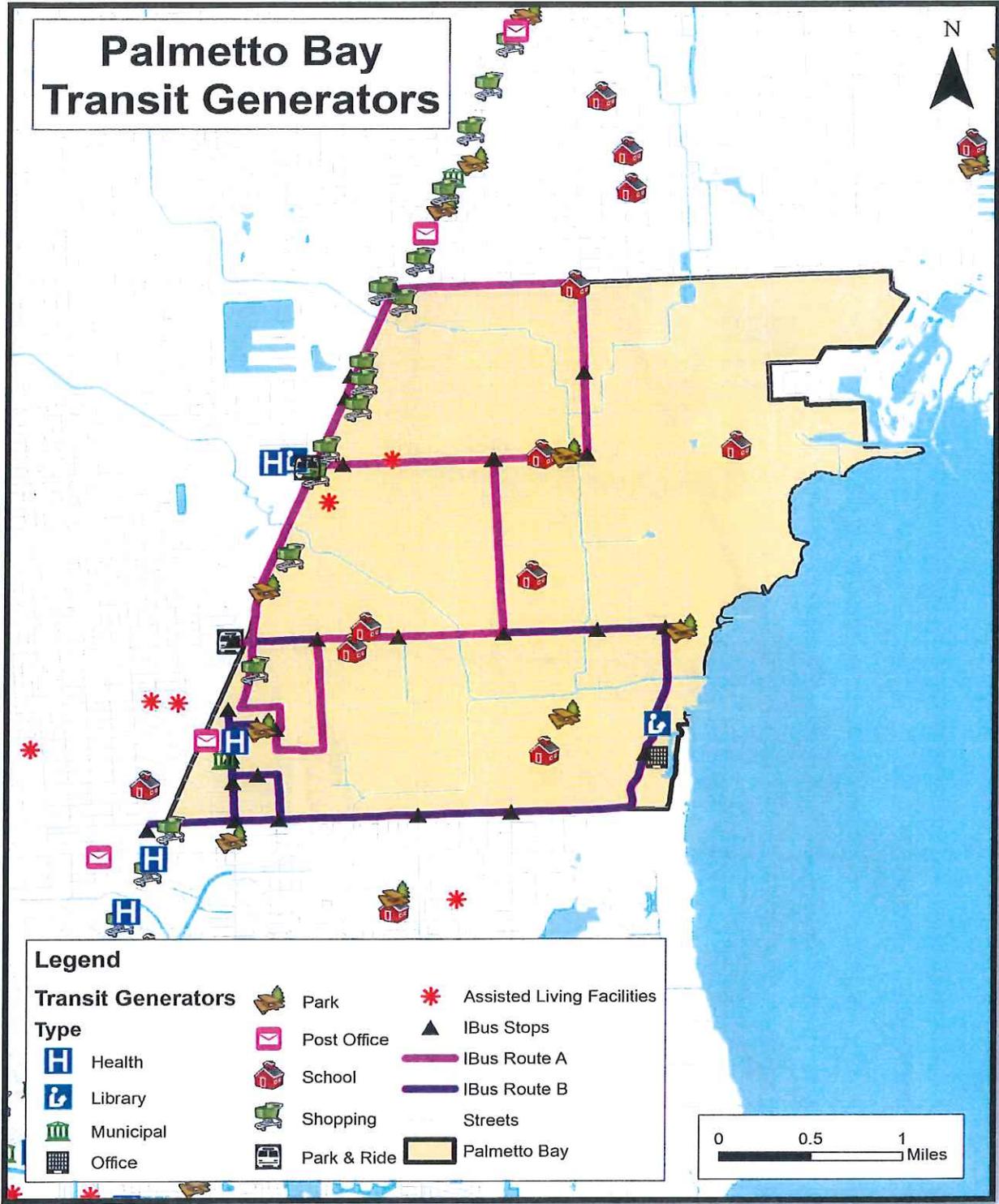
Figure 6: Transit Coverage Areas



Source: Miami-Dade Transit, Village of Palmetto Bay, The Corradino Group



Figure 7: Transit Generators Map



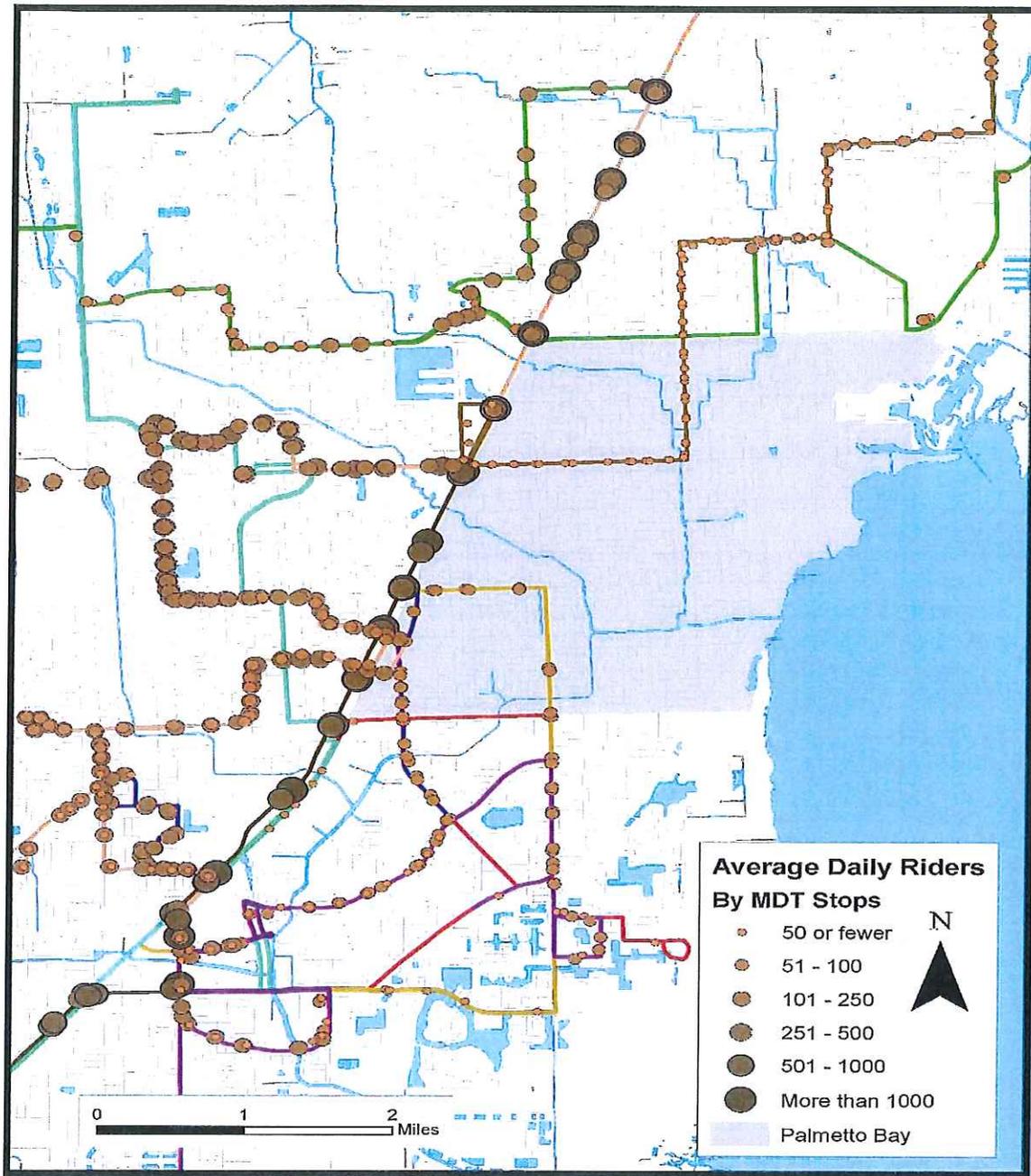
Source: Miami-Dade County, The Corradino Group, Shimberg Center for Housing



Finally related to ridership, MDT average daily patronage levels (boardings less alightings run cumulatively from the beginning of the route) were plotted by stop, along with MDT park and ride lots

and Busway stations (Figure 8). One can see the heavy ridership on the Busway, and the relatively light ridership on the lines that pass through Palmetto Bay.

Figure 8: Average Daily Ridership at MDT Stops



Source: MDT and The Corradino Group



Data for Service to Students

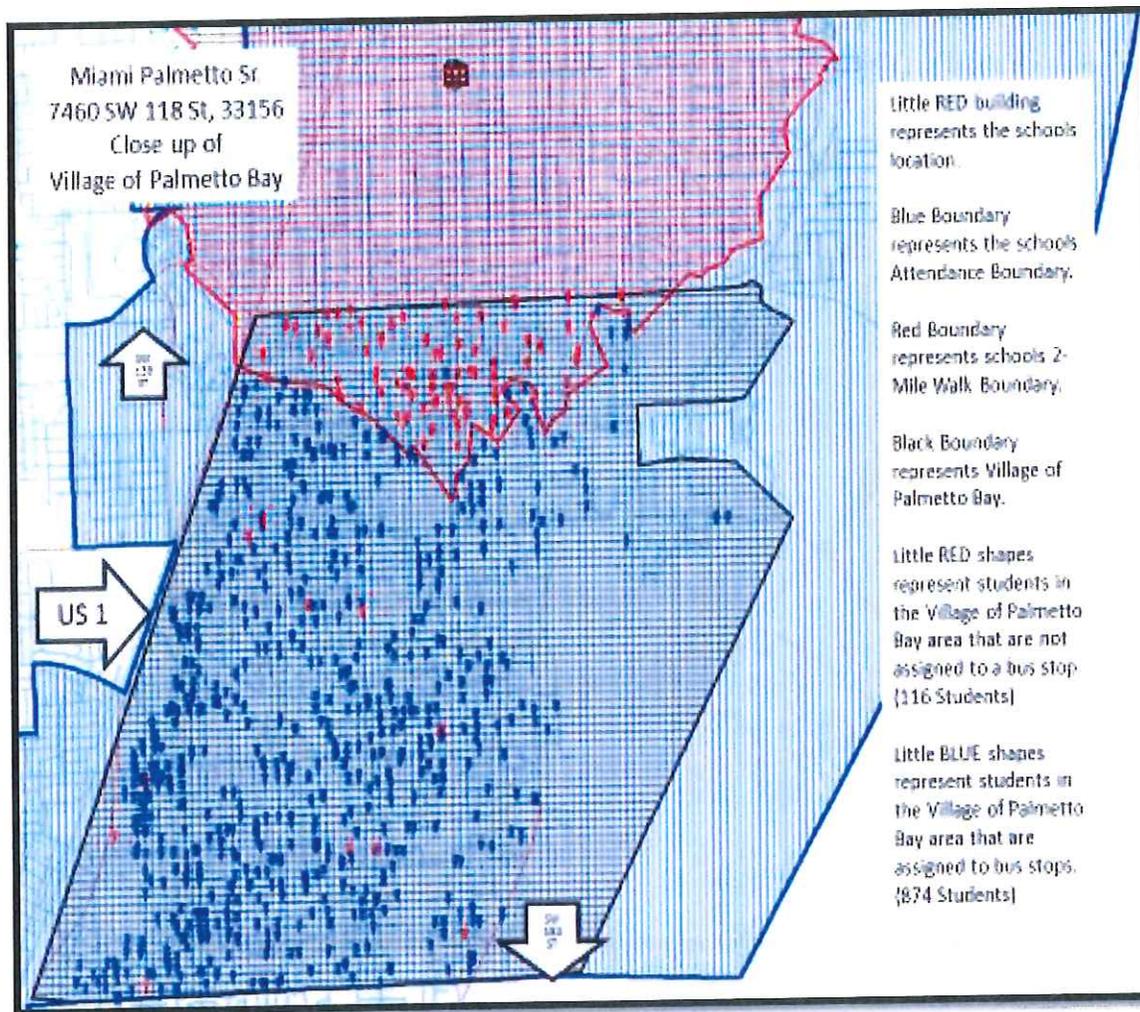
School children represent a special case in Miami Dade County. Children living within two miles of their school are not served by the Miami Dade school bus system and must find their own way to school.

Based on interest expressed by the Village, Corradino explored potential service to the schools.

Data about where students live was provided by the Miami-Dade County School Board. The data were provided in graphic form only (a picture of dots) to protect information about students. A geocoded

computer file that could be read by GIS was not provided. Figures 9, 10, and 11 show the student distribution of Palmetto Senior High School, Palmetto Middle School, and Southwood Middle School, respectively. The blue dots indicate students assigned to a school bus stop and the red dots indicate students not assigned. For analytical purposes, student locations could be inferred by seeing the density of dots on the map provided, rather than any direct use of data in the GIS software.

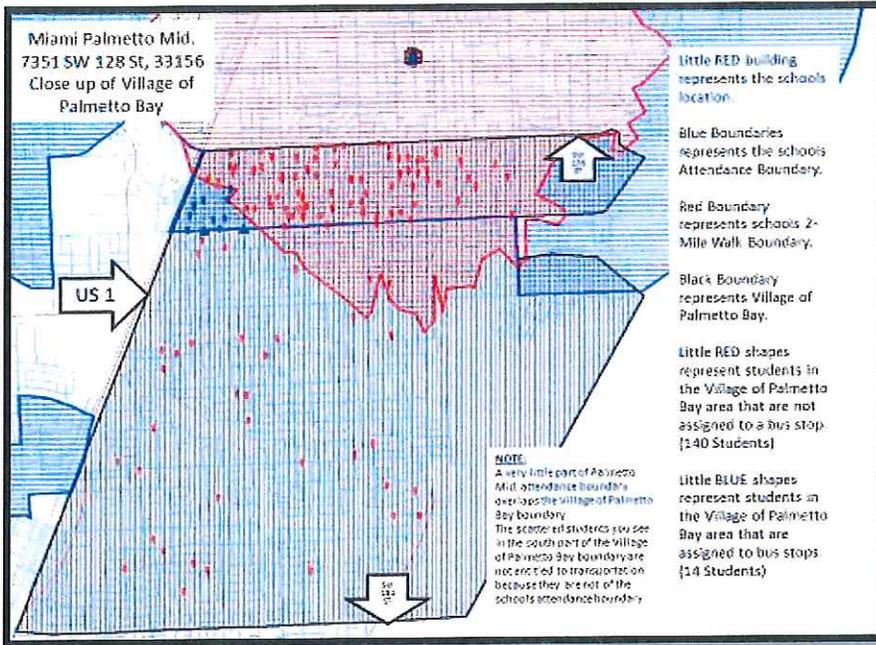
Figure 9: Palmetto Senior High School Student School Bus Assignments



Source: Miami-Dade County Public Schools

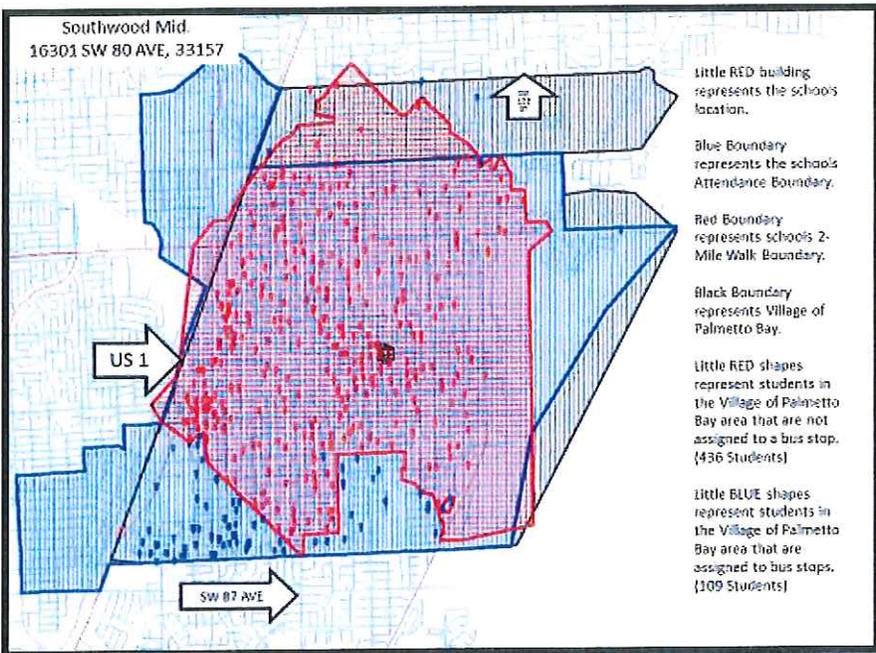


Figure 10: Palmetto Middle School Student School Bus Assignments



Source: Miami-Dade County Public Schools

Figure 11: Southwood Middle School Student School Bus Assignments



Source: Miami-Dade County Public Schools



The policy of requiring middle and high school students to get to school on their own, if they live within a two-mile radius of the school, has created a transit dependent population of youth.

An examination of this topic finds that, historically, students and the general public on the same bus are not a good mix, especially where students are in the majority. Students may be more spirited than the general public in ways that the general public can find offensive. By the same token, some parents have misgivings about having their children ride on a bus with adult strangers. For this reason planners have generally kept service to schools separate from service to the general public.

As it happens, iBus Route A is now scheduled during the midday only, so its schedule would allow it to serve schools in the morning and afternoon. Route A today operates only between 10 AM and 2 PM. This fits well with the school start times in the morning and departure times in the afternoon.

The work scope called for interviewing students to determine their ridership needs. However, after careful consideration, it was determined not to do interviews, because only one bus with 20 seats appears to be available. (To provide a second bus, a new bus would have to be purchased, or the decision would have to be made to abandon the service now being provided to commuters on Route B during the morning and afternoon.) With only one bus available, a survey of students could lead to a false sense of the expansiveness of the service to be provided and leave some parents disappointed that their child couldn't get one of the limited number of seats.

Instead, GIS was used to plot population densities using 2010 US Census data. These data together with information about the school service areas and

the corresponding areas where students are not assigned to a school bus route allowed for the development of potential school bus stops.

School service became a focal point during the development of alternatives.

On-board Passenger Survey

With few exceptions, the riders mostly do not have access to a car. Almost all are female, and Spanish is the predominant language spoken. Most appear to be in domestic service, but a number of riders get on and off the bus at the bus stop that serves the Village Center, so, some riders may work there.

The survey asked which amenities were: very important, important, somewhat important, and not important. There was almost no differentiation in response among the amenities:

- Benches;
- Shelters;
- Sidewalks;
- Trash receptacles;
- Next bus real time info

“Very important” was checked by most riders for most categories, with shelters and route information scoring slightly higher than other categories, and trash receptacles slightly lower. It is logical that these categories would be rated highly, as there are few shelters and route information is basically on-line with no bus stop signs.

Riders were asked to rate bus service in the following categories:

- Bus cleanliness;
- Bus heating, A/C;
- Driver friendliness;
- Driver appearance;
- Buses on time;
- Bus stop locations;
- Hours of operation;
- Schedules; and,
- Safety at Bus Stops



Again, most categories were ranked "very important" by almost everyone.

The survey provided an open-ended opportunity to comment. One request was to add another run in the morning and one in the afternoon. A number of riders asked that transit users be notified when there is a bus breakdown. Unfortunately, the only way to meet this need is through an alert system incorporated into a fully developed "next bus" app. A service alert can be put on the website, but riders will not make a habit of checking the website every time they take the bus.

The survey data is attached as Appendix A to Technical Memorandum #1.



Alternatives

Transit riders tend to be very conservative. People know the service they have and tend to be wary of service changes, until experience shows the new service is as good as the old. As new services involve changes in geographic coverage and schedules, there is always some initial temporary reduction of ridership. Ultimately, riders will adjust and with changes in coverage, ridership is expected to increase.

An obvious geographic reality in Palmetto Bay is that only a few roads are available for through routing of buses. This geographic consideration restricts the iBUS routing in specific areas of the Village. The canal system and discontinuous street patterns greatly limit the roads over which a bus can run, and thus limit the effective coverage area. While the identification of specific pedestrian pathways that will increase on-foot mobility is beyond the scope of this study, the addition of specific linkages in the Village would benefit the iBUS by increasing transit accessibility and market capture.

Key to determining the transit market are the previously discussed transit generators. However, as most commercial locations are already served, and with parks and schools closely tied to residential areas, evaluation of system operations and transit market capture more appropriately should be looked at from a population access standpoint. A dominant factor is the orientation of population density on the west side of the Village. A number of apartment complexes there are not presently served by the iBUS. Destinations on the east side are limited. The Village Center is the exception. Palmetto Bay's mid-

section has few origins/destinations other than homes, except for schools, which are being addressed separately, and parks. The conclusion related to market demand predominately favors an east-west orientation connecting to the Busway. There is little evident demand for north-south service due to the lack of transit generators; the exception being for flow-through traffic to relieve intercity pressure on Old Cutler Road.

Operations:

The Palmetto Bay Circulator operates in one of the most desirable places to live in our region. This route analysis has examined target populations to implement service that is efficient, effective and affordable. This report puts potential transit service into context, summarizing what was learned in the first TM with respect to the demography of the Village and transit generators, the kinds of riders on the system today, the locations of students who are now not eligible for school bus service by the Miami Dade Public School system, and the interface with the Miami-Dade Transit (MDT) system routes and Busway.

Based on the information collected to date, and despite the current low ridership, a two bus system continues to appear reasonable, holding a third bus as a spare. That said, it is essential to purchase new buses or contract for service. The current bus set is not reliable and cannot be made to be reliable. All three vehicles are well beyond their effective service lives.

Potential changes to routes A and B are discussed below. The discussion of Route A covers a modified midday circulator service coupled with morning and afternoon service to schools. An alternative on demand service is discussed later.



Route A Circulator:

To recap, Route A operates weekdays 10 AM to 2 PM, making four one hour runs, each comprised of a northern counter-clockwise loop and a southern clockwise loop (Figures 1 and 3). Buses stop only at the 16 designated (but unmarked) points. Several MDT bus stops are present along the same roadway sections where there may be only one iBUS stop. Parts of Route A overlap MDT Route 136 (along SW 136 Street), Route 57 (along SW 77th Avenue and SW 152nd Street), and Route 286 (SW 168th Street).

For Route A, the competition with Miami-Dade Transit routes is not likely to encourage new ridership. We note that while Route A's ridership is low, the MDT routes have riders. Continuing overlapping service is not likely to encourage additional ridership in the future, and ridership has more potential for growth by expanding access via increased coverage in new areas, with improved transfers to/from MDT. This is particularly important given the general lack of actual transit coverage within Palmetto Bay. However, we caution that while there is potential, this does not necessarily translate into immediate results. Additional investment into information distribution regarding the service and other key aspects of transit service development, as well as building up levels of service reliability, will be required to capture any market potential for Route A via route revisions.

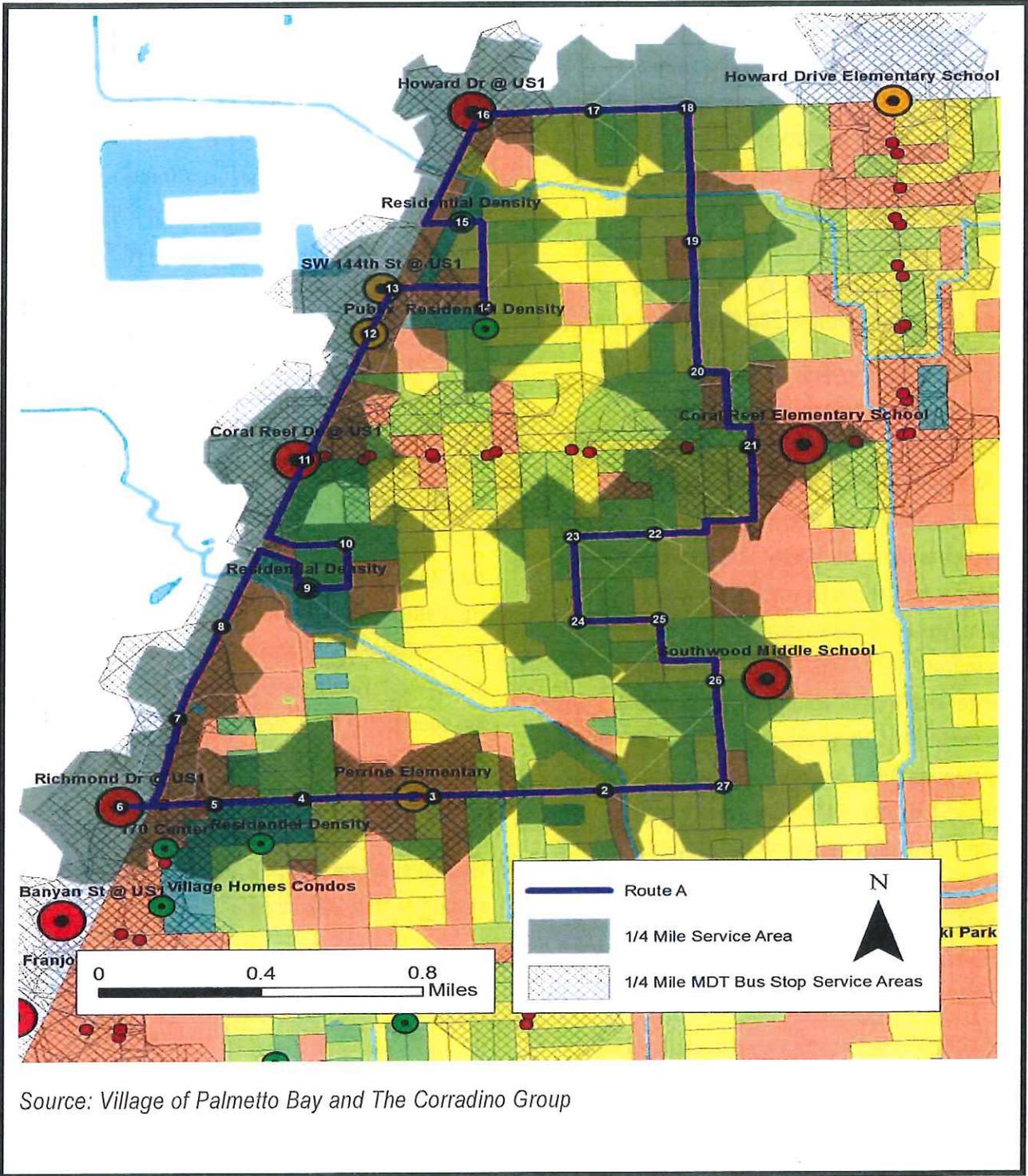
While a questionnaire could be sent to the community to ascertain potential transit demand, experience indicates it would not generate a statistically reliable result. (Many people say they would ride, but they are thinking of very frequent service, not what can in practice be put on the street in Palmetto Bay.) We

therefore provide recommendations for Route A on a population and service coverage basis (Figure 12).

Based on 2010 Census population data, the coverage of this revised Route A will provide access to approximately 7,240 residents. Information from the 2010 US Census indicates that 3 percent of Palmetto Bay's population uses transit, equating to a Route A which should have at least 200 monthly riders. At the same ridership levels as the County and Pinecrest, Palmetto Bay's neighbor, both of which have either higher transit access scores and/or a higher investment into transit, 5 percent or more of the Palmetto Bay's population could ride transit. Applying Miami-Dade County's transit usage rate to Palmetto Bay, with a reliable, well-advertised system, Route A should have a base of upwards of 400 monthly riders, as opposed to the 3rd Quarter high of 69 riders reported in April 2015. For a community of Palmetto Bay's size and geography, this is an acceptable amount and will promote multimodal goals. Additional ridership may also result from better linkages to the MDT system, through increased access. We, however, stipulate that this is only a potential estimate based on population demographics, and ridership forecasting on low-volume systems is highly dependent on the marketing strategies employed by the system.



Figure 12: Proposed Route A



The midday circulator service provided by Route A could be continued, but on a modified route (Figure 2). Its focus would continue to be on areas of residential density and commercial activity along US 1, including Publix. The most significant changes would be to a single, clockwise loop and a realignment of the route. Right turns are more swiftly and safely made than left turns and are standard practice in the transportation industry. (Route B would likewise operate in a clockwise loop). The timing of the loops would be based on maximizing the integration of Route A with Route B and the MDT routes, but the alignment would be shifted off the MDT routes where feasible, while still allowing transfers at key points.

The on-board survey found iBUS riders do not today transfer to/from MDT routes other than at the busway. This is in part because of the overlap of the routes and lack of common bus stops. Within Palmetto Bay, iBUS and MDT have similar coverage in north Palmetto Bay.

Changing Route A would expand the transit coverage in the community without compromising the ability to transfer to/from the MDT system. Route A would retain connections to the Busway, while providing local service along US 1. An essential element will be to install bus stop signs to mark boarding locations, with as many shelters as the budget and right-of-way allow. Additional stops should be put in place, as shown in the graphic, to decrease walk distances. A public involvement program will be necessary in advance of implementation.

Route A could have a built-in transfer point with Route B at the intersection of SW 82nd Avenue and SW 168th Street (see point 27 in Figure 12). Shelters and potentially a bus pull-out should be added at this

intersection. Route A would be westbound along SW 168th Street and Route B would be eastbound. This could be a layover point for one or both buses. Driver rules may require passengers to disembark during a layover time, emphasizing the desirability of a bus shelter here.

The midday, 10:00 AM - 2:00 PM, route length for Route A (and Route B also) would be just over 8 miles. Assuming an average 10 miles per hour (mph) route speed, the loop would be completed in about 50 minutes. This provides for 10 minutes of float in the system for bathroom breaks and layovers.

Riders of Route A will be able to access the Town Center and the future Downtown area either through disembarking at the north end of the downtown area or a quick transfer to Route B.

The potential Route A configuration presented does not serve the east side of Palmetto Bay. Given the lack of population density and transit anchors there, this is justified. Every transit system with fixed routes must make judgements about where to put service.

Service would continue to be provided in east Palmetto Bay for those with special needs by Special Transportation Service (STS), the shared-ride public transportation service of Miami-Dade County in compliance with the complementary paratransit service provisions of the Americans with Disabilities Act (ADA) of 1990. STS operates throughout most of urbanized Miami-Dade County, and can be used for work, school, shopping, recreation, and medical trips. STS provides door-to-door transportation for people with disabilities who are unable to use Metrobus, Metrorail, or Metromover.



Route A School Service:

As Route A is now active only in the midday, it could provide school service in the morning and afternoon.

The exploration of service to schools began with an understanding of: 1) the areas not currently being served by the buses of the Miami-Dade Public School system, and 2) the hours of the school day.

High school and middle school start and end times are shown below. The high school day begins and ends earlier than the middle schools.

	Palmetto High School	Southwood/Palmetto Middle School
Start time	7:20 AM	9:10 PM
End time	2:20 PM	3:50 PM

Source: School Web Sites.

A limitation, compared to a school bus is that the iBUSES now in operation have only 20 seats. A standard school bus has a maximum capacity of 72 passengers. So, in terms of ridership expectations, it should be understood an iBUS has nowhere near the carrying capacity of a school bus.

It is reasonable to assume that students should not be on a bus more than about 45 minutes. In Pinecrest, for example, the high school and middle school routes range from 30 to 45 minutes. Setting a travel time limit allows working backwards from the school start times to determine pickup times.

If students should be off the bus in the morning at Palmetto High School by 7:10 AM (to make it to class at 7:20 AM), the iBUS should be en route to pick up high school students as early as 6:25 AM. Using Geographic Information System (GIS) analysis allows determined a "best route" given the likely location of students and the shortest time path to serve them. An example route that does this is presented in

Figure 13. It could begin south of SW 168th Street, pass through Palmetto Bay's densest areas, and proceed through the Metro-Dade School system "no pick-up zone" to the high school.

After the bus completes its run to the high school, it could work its way outbound through the high school traffic to begin picking up a second set of students to deliver them to a middle school, either Palmetto or Southwood. Because Southwood Middle School is in the Village of Palmetto Bay and the 2-mile no school bus service area covers much of the Village, it is more logical to serve Southwood than Palmetto Middle School.

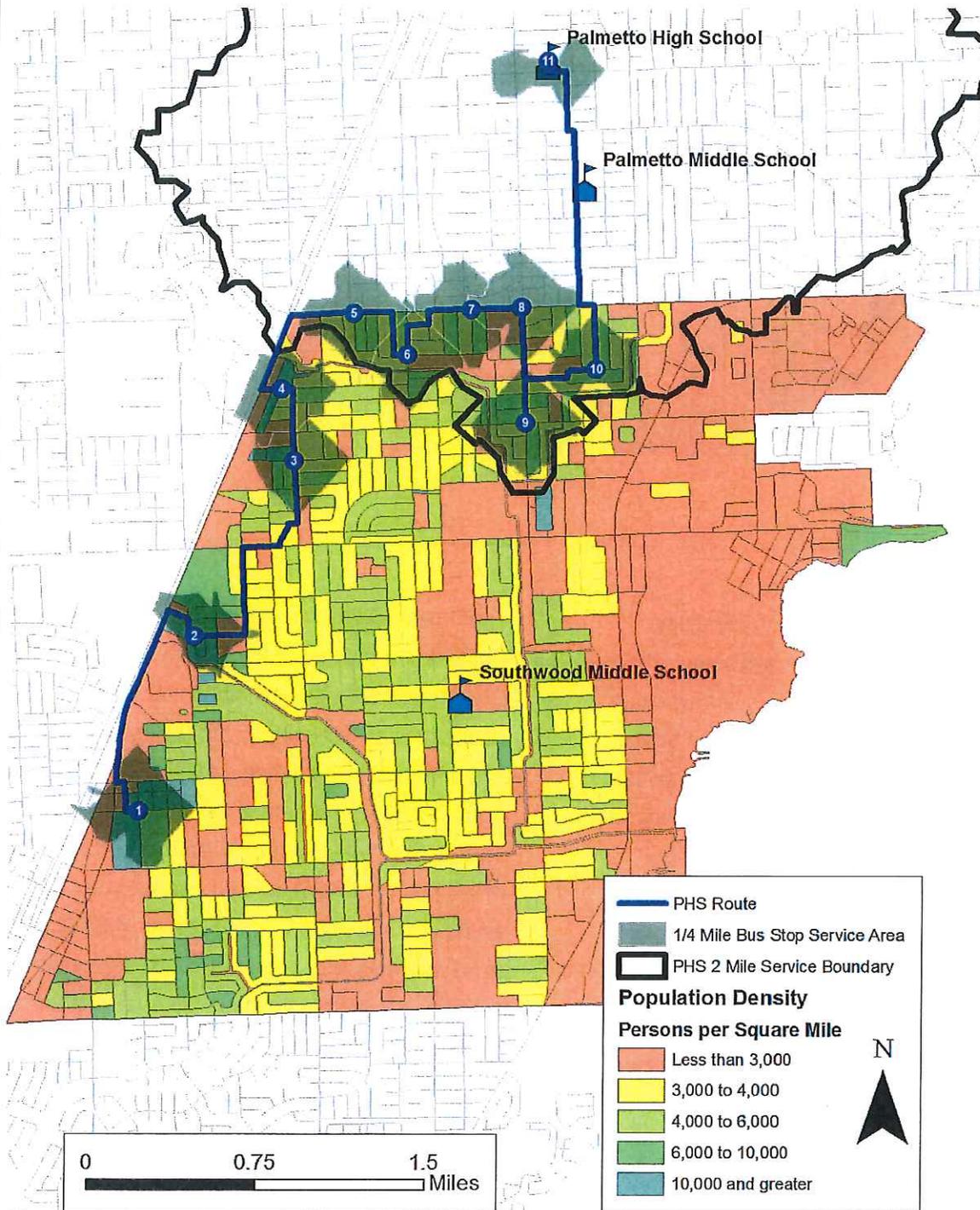
The earliest drop-off time for the Southwood Middle School is posted on the web as 8:30 AM. A question is how to make the best use of the bus after leaving Palmetto High School and before the latest possible drop-off time at Southwood Middle School, which is 9 AM (given that students must be in class by 9:10 AM). Considering the geography that could be covered, the limit of 20 seats on the bus, and the desire not to backtrack the bus, it was determined that two runs could be made to Southwood Middle School (assuming the first run drops students 10 minutes before the official earliest drop-off time).

Given the time windows set by the start and stop times of the schools, a GIS algorithm was used to provide example first and second runs to Southwood Middle School.

To have broad coverage and offer the most opportunity to pick up students, the bus must take an indirect path, within the time window and constraints of getting students to school not too early and not too late. The service provided by the Pinecrest People Mover shows an example of how buses serving schools must take circuitous routes (Figure 14).



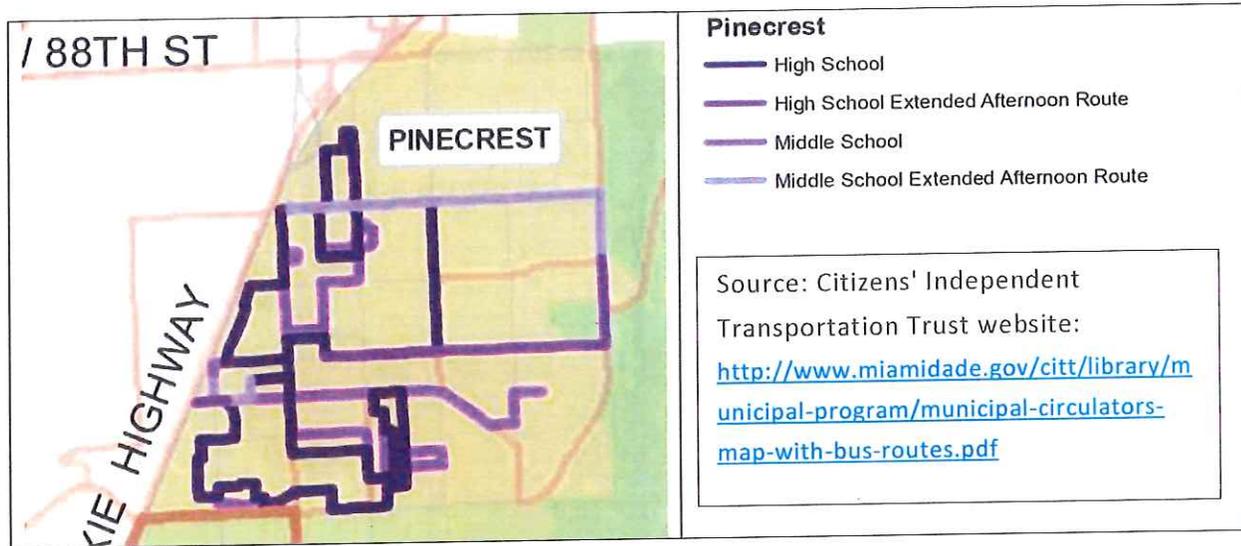
Figure 13: Potential Palmetto High School Route



Source: The Corradino Group



Figure 14: Pinecrest School Routes



Source: Citizens' Independent Transportation Trust website:
<http://www.miamidade.gov/citt/library/municipal-program/municipal-circulators-map-with-bus-routes.pdf>

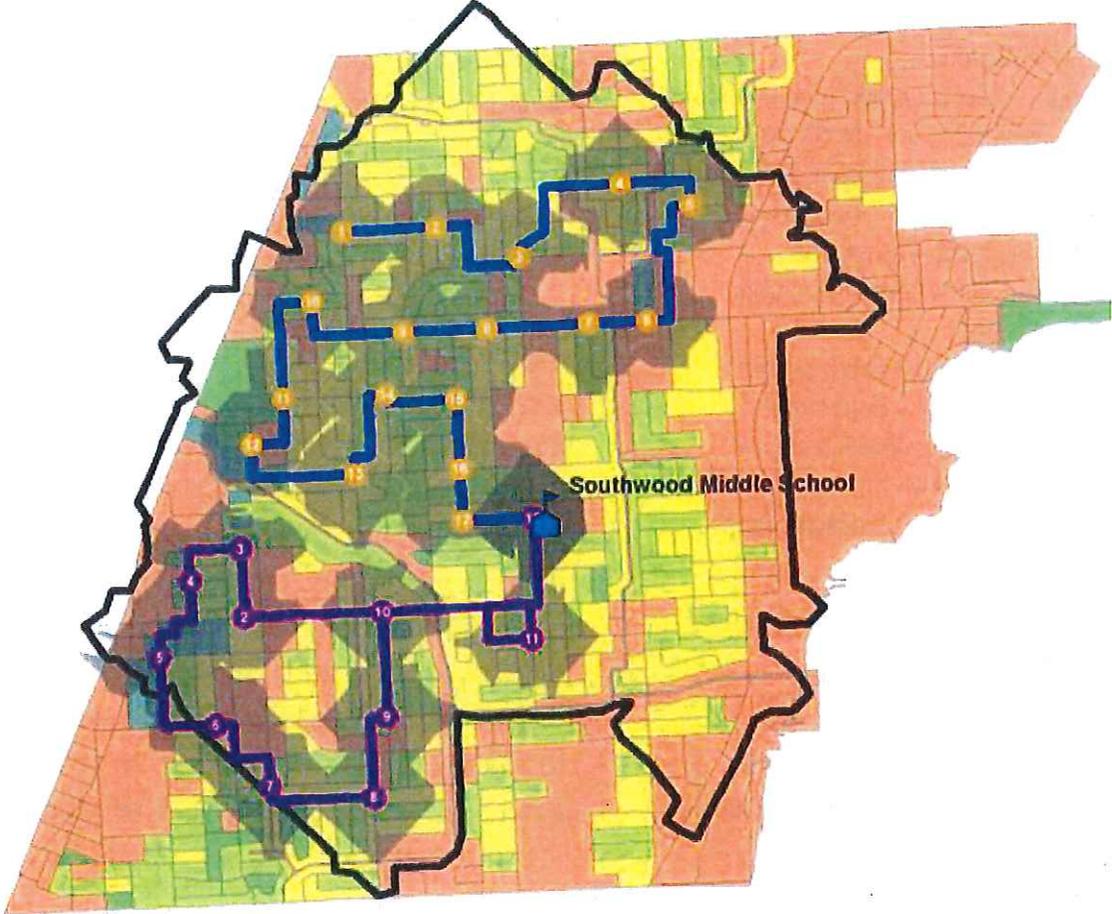
The results of the analysis of routes potentially serving Southwood Middle School presented reflects the current bus availability, with one bus devoted to school service. After leaving Palmetto High School the bus would deadhead to the residential area near the Publix store, then work its way south through the neighborhoods to the Southwood Middle School, making its first drop there at 8:20 AM (blue route in Figure 15).

If the bus were allowed to make a drop-off ahead of the currently allowed time (by ten minutes), the bus could make a second run to serve students south of the middle school. This could potentially double the number of students being provided with transportation. The second run (purple route in Figure 15) would make it back to Southfield Middle School by 9 AM. Note that it will be important to work out with school officials the routine of drop-offs so iBUSES do not get caught up in school traffic.

That bus could then revert to service on the revised Route A. At the end of the midday service, Route A could again serve the schools to take students home. Palmetto High School gets out first, so the bus would begin there. It would then serve the Southwood Middle School south route, which is shorter, to get back to the middle school to make a second home delivery. When done with that second run, the bus would proceed north to the Palmetto High School to serve students who stayed there for after school activities. Pinecrest provides this kind of after school service. There is no point in formulating a route for this service, as it would be based on demand and vary through the year. A cost has been provided below in the implementation section, based on reasonable service assumptions.



Figure 15: Southwood Middle School Example Service
(One Bus in School Service)

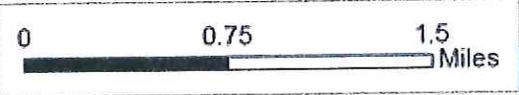


-  SMS Route N
-  SMS Route S
-  1/4 Mile Bus Stop Service Area
-  SMS 2 mile Service Boundary

Population Density
Persons per Square Mile

-  Less than 3,000
-  3,000 to 4,000
-  4,000 to 6,000
-  6,000 to 10,000
-  10,000 and greater

N

Source: The Corradino Group



A summary of the iBUS school service activity, considered here as an expansion of Route A follows:

- 6:25am-7:10am – Student collection and delivery to Palmetto High School
- 7:40am-8:20am – Student collection and delivery to Southwood Middle School – North Route
- 8:25am-9:00am – Student collection and delivery to Southwood Middle School – South Route
- 9:00am-2:00pm – Route A as revised
- 2:30pm-3:15pm – Student distribution from Palmetto High School
- 3:50pm-4:25pm – Student distribution from Southwood Middle School – South Route
- 4:25pm-5:05pm – Student distribution from Southwood Middle School – North Route
- 5:10pm-5:54pm – After school delivery from Palmetto High School

Whereas routes serving schools have been created here to show proof of concept, the actual establishment of routes might best follow the example of Pinecrest, which provides an on-line application for use of its People Mover (which serves the schools only). Students enter their name, address, and school online. Pinecrest has one bus for a northern route and one for a southern route. Each serves Palmetto High School, then Palmetto Middle School. The last day to submit a request for the fall 2015 term was Friday, July 17, 2015. So, rather than dictating a route up front, Pinecrest has students apply for service first and then tries to serve them. Any school service will require scheduling on the part of a Palmetto Bay employee (see implementation section).

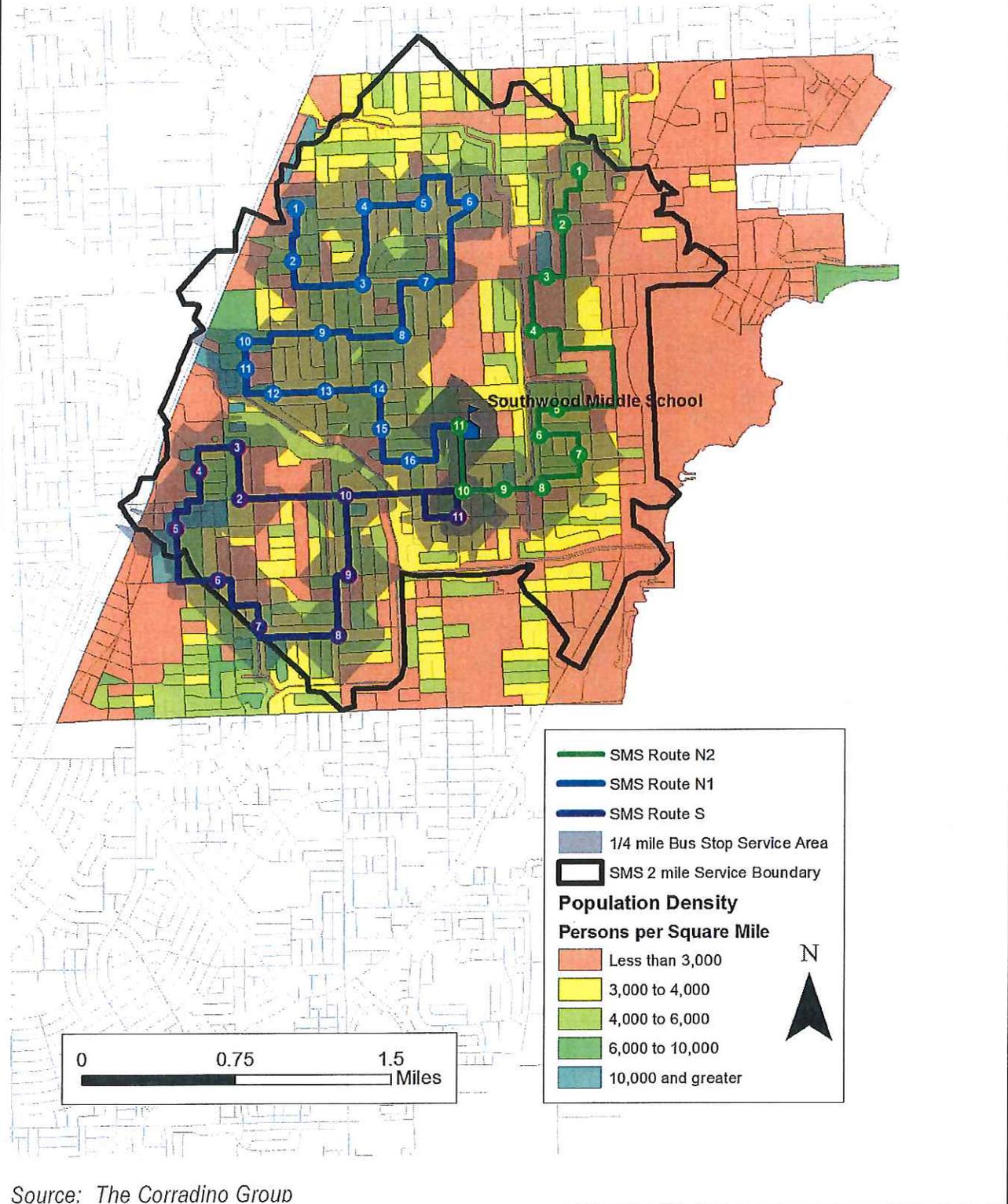
Route A School Service – Two Buses in School Service:

Before returning to the discussion of Route B in non-school service, a longer term example of school service with two buses devoted to school service instead of only one bus is provided.

In this situation the service to Palmetto High School would remain the same, but the bus would next serve a modified Southwood Middle School's north route (Figure 16, blue route), to reflect the fact that another, second, bus is in service and also serving Southwood Middle School. The second bus would serve Southwood Middle School's south route unchanged (Figure 16, purple route), then serve a second north route to Southwood Middle School (Figure 16, green route) and then one run to Palmetto Middle School (Figure 17, blue route). Under this bus scenario, both middle schools are served. The three bus system means three buses are on the street, so a fourth bus, as a spare, would still be required.

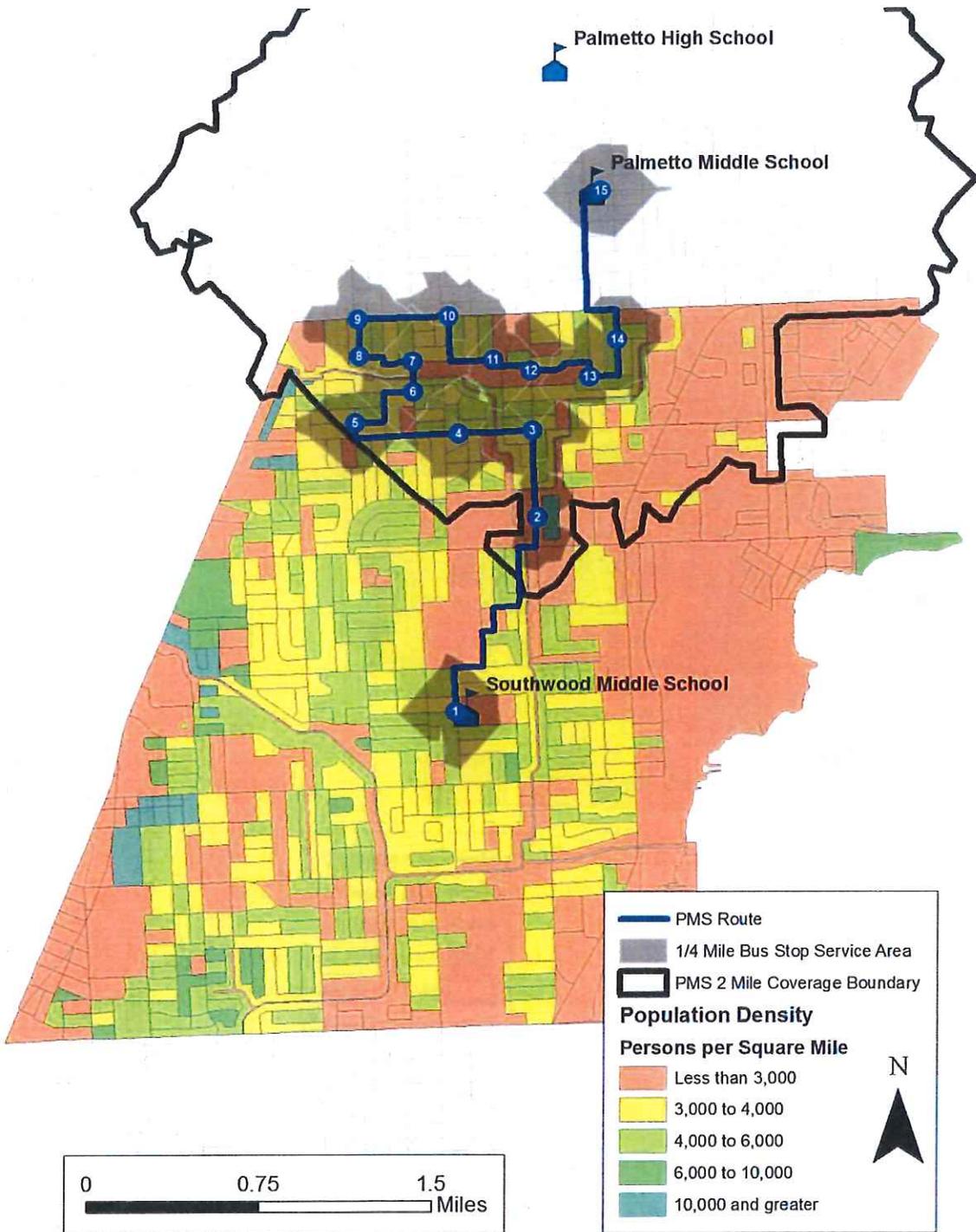


Figure 16: Southwood Middle School Example Service
(Two Buses in School Service)



Source: The Corradino Group

Figure 17: Palmetto Middle School Example Service
(Two Buses in School Service)



Source: The Corradino Group



Route A Optional Midday On Demand Service:

An option to providing continued midday fixed route service would be to provide on demand service. Many systems in South Florida have such service. It provides a different kind of service with different advantages, but has similar costs on a per hour basis.

Whereas most riders today are not residents of Palmetto Bay, on demand system could be restricted to residents. Having restrictions on the service, however, usually requires a certain level of administration to prequalify riders, and would not allow for use by tourists and visitors.

Importantly, on demand service requires that there be a dispatcher to schedule trips. North Miami Beach structures their service such that calls must be made three days in advance, with certain destinations served on certain days at certain hours. The advantage of such an approach is that the complexity of a many-to-many systems is somewhat reduced. If riders are grouped at one trip end, there is more efficiency than if callers can go anywhere. Matching trips is very difficult in many to many setups, as there is less potential for ridesharing.

With the desire to serve school students, the service option considered here is for mid-day service only, substituting for the current circulator service.

However, a similar service could be developed for special events, especially on weekends, utilizing this on demand model.

Route B Circulator Service:

To recap Route B (Figures 1 and 3) operates in the morning (7 AM to 9 AM) prior to the beginning of

Route A service and in the afternoon (2 PM to 5 PM) after Route A service ends for the day.

- The morning runs generally alternate between clockwise runs beginning at the Busway and SW 168th, and counter-clockwise.
- The first afternoon service is similarly a mix of clockwise and counter-clockwise runs.

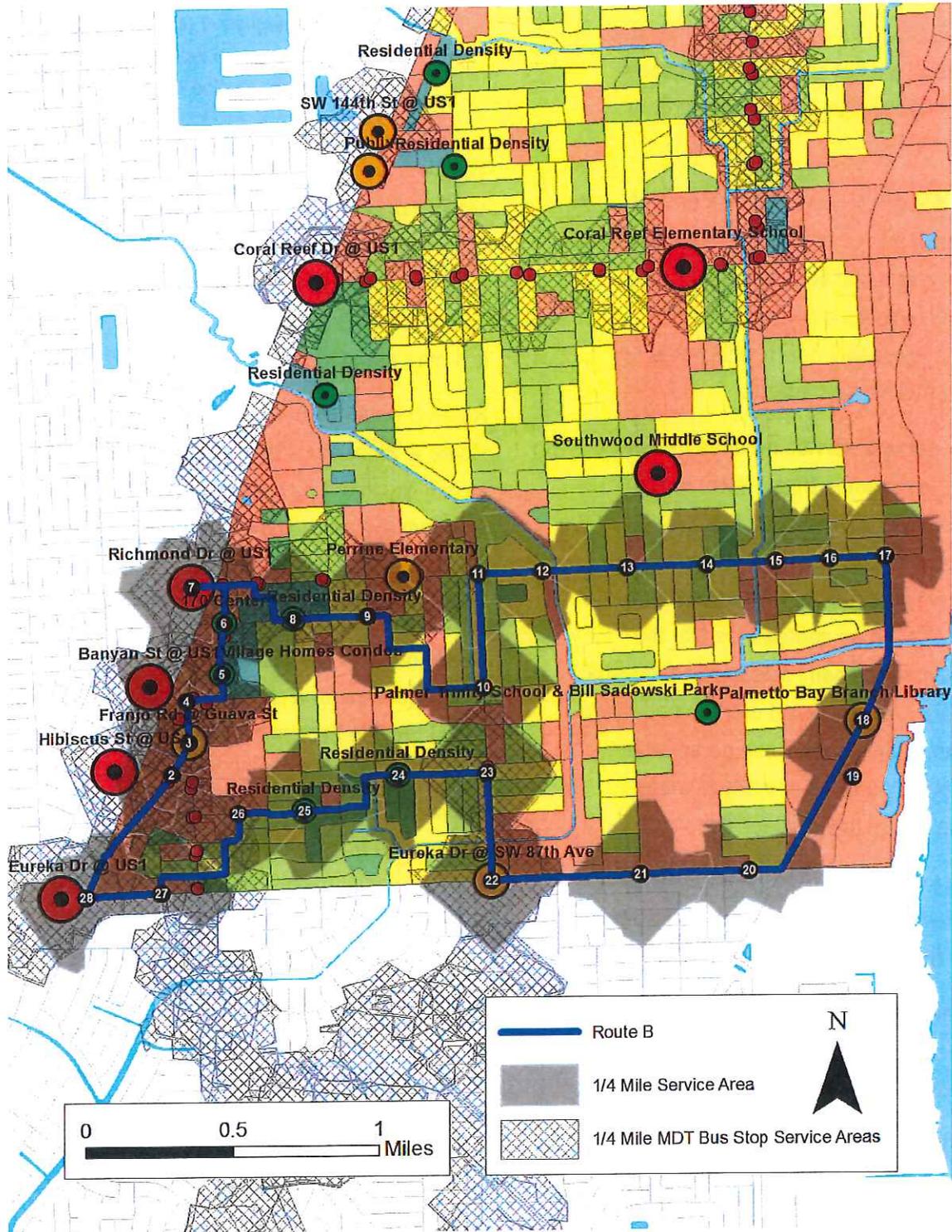
The clockwise/counterclockwise pattern of Route B is confusing. With bus stops marked only on maps, it is likely that riders find out by word of mouth where to go to catch the bus, and where it goes. There are just over two stops per mile (19 stops / 8 miles). This is 1 stop per mile below the standard.

Route B currently has better service coverage than Route A. However, the accessibility of the transit system is limited by the few number of stops. Existing ridership averages in excess of 500/month. Reconfiguring Route B and providing more reliable service should result in additional riders.

Based on 2010 Census population data, the coverage area for a revised Route B (Figure 18) would provide access to approximately 2,238 families. At an average of 3.33 persons per family in Palmetto Bay, this equates to 7,786 persons. Information from the 2010 US Census indicates that 3 percent of Palmetto Bay's population uses transit, equating to a route which should have at least 200 riders/month. At the same ridership levels as the County and Pinecrest, Palmetto Bay's neighbor, both of which have either higher transit access scores and/or a higher investment in transit, 5 percent or more of the population ride transit. Applying Miami-Dade County's transit usage rate to Palmetto Bay, with a reliable, well-advertised system, Route B should have a base upwards of 400 monthly riders, if service were provided throughout the day.



Figure 18: Route B Modified



Source: The Corradino Group



Increased service coverage should have a potential for small ridership increases, with little extra investment necessary, other than for route and service information distribution, and signing bus stops. Better linkages to Cutler Bay and other system routes could potentially raise this number higher, but as with Route A, this is contingent on the quality and reliability of the system, and marketing.

Route B as presently configured is very difficult to follow. Based on what we know of patronage and the lack of signed bus stops, the Consultant believes ridership is a matter of word of mouth and trial and error. A domestic employee gets a job, and by speaking with others (all we interviewed were Hispanic) learns the iBUS comes at such and such a time and picks people up at this location. Then that individual learns more about options. What is clear from the survey work is that Route B's ridership derives from the Busway, and serves non-residents, with many riders getting on or off the bus at Village Center.

A reconfiguration of Route B is proposed that would make all runs clockwise and would share less of its coverage with MDT routes (Figure 18). Its length would be similar to Route A for the loop, which means its travel time would be just about 50 minutes, assuming an average speed of 10 mph.

Service now ends at 5:20 PM, but could be extended into the evening until 7 PM. Survey respondents asked for longer service hours. Likewise service could be provided throughout the day.

While continued population growth is expected, the Village is largely built out. Individual developments may occur, but there is no particular consideration for additional developments, other than with the Palmetto Bay/Franjo Triangle area. That affects

planning for future transit. There is a trend of aging in the community, and if this continues, there will be additional demand for door-to-door transit service by seniors. Some seniors are and will be eligible for MDT's Special Transportation Service (STS), but age alone is not an automatic qualification.

Further, there is a distinction between dependent and discretionary riders. Dependent riders are those who, for financial or other reasons, must use transit. Discretionary riders make a choice to ride transit. Transit must be convenient to attract these riders. Young riders fall between the dependent and discretionary riders. For some trips there is a choice, for other trips, there is a necessity. Ridesharing is common. Thus, choice riders and the young are targets for service changes.

Downtown Palmetto Bay/Franjo Triangle

Plans for the Franjo Triangle area include the development of a downtown area, with commercial and residential uses in a higher density than current development (Figure 19). Most development is likely to occur more than five years in the future. By that point, a new COA will be underway to further evaluate the Circulator system with respect to the new Downtown. Subsequent analyses will incorporate new demographic data for the area representing buildout conditions. From a transit access standpoint, the entire Franjo Triangle area is adequately covered by the Route B service area, and serves as a transfer area to the MDT routes along the Busway.

Downtown/Franjo Triangle development will bring more residents. These residents will be a short walk from the Busway and will be able to walk to many local businesses and restaurants. These residents,



Figure 19: Franjo Triangle Commercial Development (red)

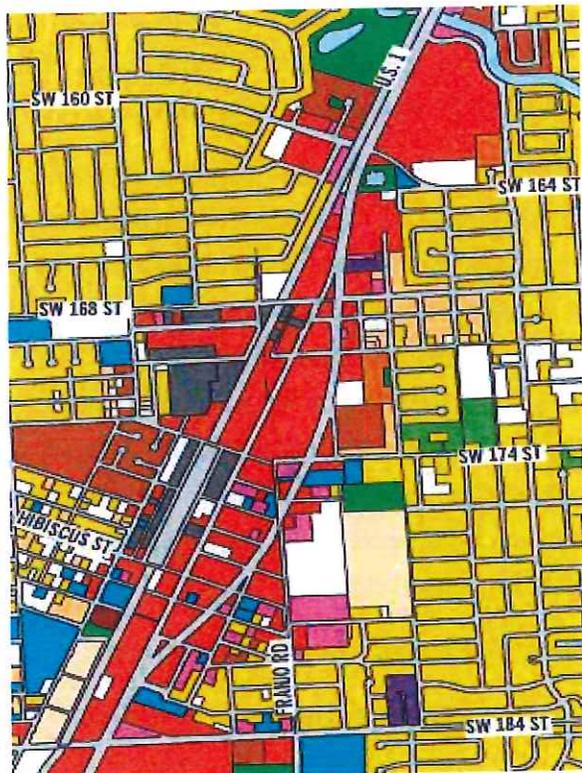


Figure 27. Existing Land Use in the Study Area, 2003

Source: Franjo Triangle Commercial Island – Charrette Report

would however, still benefit from access provided by a circulator.

Local infrastructure improvements such as sidewalk development would enable the iBus system to become a better tool to develop the area. Sidewalks are now discontinuous or absent. The “Franjo Triangle Commercial Island – Charrette Report” (2004) addressed this limitation as shown in Figure 20.

A more Complete Streets approach, including provisions for bus stops and bus pull-outs, would improve the non-motorized environment and enhance transit.

Figure 20: Block Frontages Lacking Sidewalks



Figure 35. Block frontages lacking sidewalks

Source: Franjo Triangle Commercial Island – Charrette Report

A reconfigured Route B and the opportunity to transfer to Route A would enhance access to the Franjo Triangle area to the public library and various parks within Palmetto Bay. Route B as reconfigured would enable residents of the east side of town to take transit to the market and stores on US 1 without driving and free of charge. To prepare for this



change, the Village may consider purchasing a slightly larger bus for Route B route, or an additional bus, to add capacity and reduce headways, to support Downtown Area redevelopment.

From a long range system planning standpoint, the retention of the Circulator not only is in line with the development plans for the Triangle, but provides additional support for the viability of future development.

Intersystem Transfers

Figure 21 shows Routes A and B in the context of the MDT route coverage in south Pinecrest, Palmetto Bay and Cutler Bay. Route A riders could transfer to/from MDT along US 1, SW 136th Street (MDT Rte. 136), at iBUS stop 21 on SW 152nd Street (MDT Rte. 57), and along SW 168th Street (MDT Rte. 287).

Route B riders could transfer to/from MDT along US 1, along SW 168th Street (MDT Rte. 287), at iBUS stops 10 and 23 along SW 87th Avenue (MDT Rte. 287), along SW 184th Street (MDT Rte. 200 serving Cutler Bay), and at iBUS stop 27 (MDT Rte. 1).

As Pinecrest has only service to schools there is really no opportunity for coordination with the Pinecrest system. If Palmetto Bay remains a two-bus system, Palmetto Bay could subsidize Pinecrest to serve Palmetto Bay students who go to Palmetto Bay Middle School. This will require a new interlocal agreement.

Park and Ride

MDT Park and Ride facilities servicing Palmetto Bay include lots at SW 152nd Street and at SW 168th Street. Based on MDT Monthly Ridership Reports, since November 2014, the lot at SW 168th Street has been operating at a 100 percent occupancy monthly;

the lot at SW 152nd Street has been at 97 percent. Both lots service more than just Palmetto Bay, and generally, a 95% lot threshold indicates that additional spaces are necessary and may result in increased transit ridership. For Palmetto Bay, the location and utilization of the Park and Ride poses two key issues.

First, a Palmetto Bay iBUS commuter can reach the Busway in the morning and return in the evening on only a very limited number of bus runs. To say that these transit riders/commuters do not choose transit is thus misleading. Rather, it is more accurate to note that a viable option does not exist for choice riders.

Second, those that wish to use the transit service provided by the Busway may find the Park and Ride lots full, which forces them to stay in their car and drive the rest of the way instead of uses transit. Those who drive to the Park and Ride also add to the intra-Village traffic.

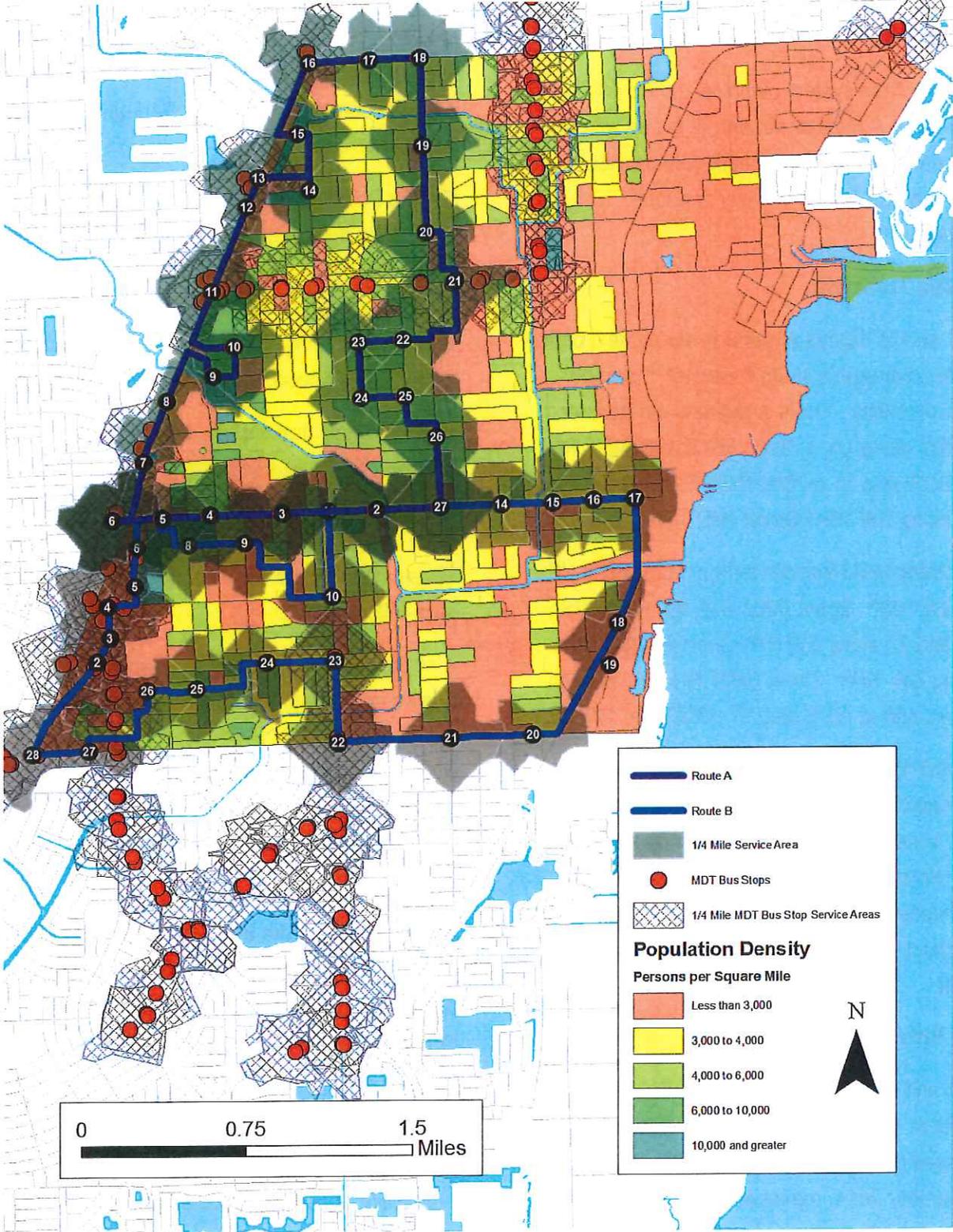
A suggestion made during the course of the study relates to development of a new park and ride lot at the east end of SW 168th Street near Old Cutler Road. There is a vacant parcel there at 7271 SW 168th Street (north side east of Old Cutler Road), which would be suitable. (Figure 22).

Through most of the day the current Route B alignment makes the trip from the Deering Estate Visitor's Center, which is across the street from this parcel, in a 12 minute run to the Busway's 184th Street Station. Service on the revised Route B alignment would take another two minutes or so.

Commuter use of such a park and ride lot would be a function of a number of factors, primarily the cost and availability of parking at the Busway and



Figure 21: Routes A and B with MDT Route Coverage

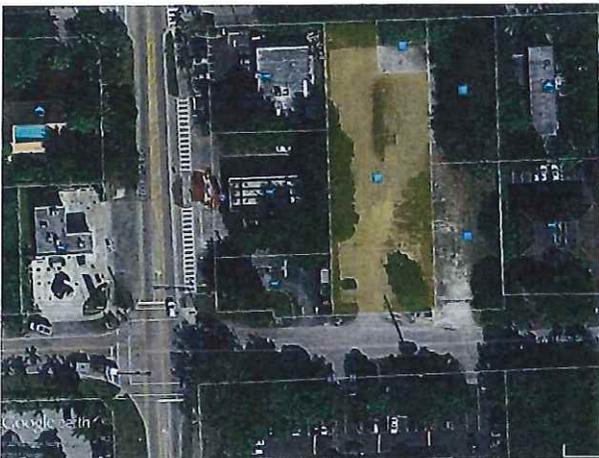


Source: The Corradino Group



convenience. The positioning of the lot at the extreme east side of the community means that some users would be backtracking to get there. On the other hand, there are almost no competing opportunities for parking. There is no very good way to get to the Busway, if the dedicated park and ride lot is full, with only private parking nearby. So the convenience of being delivered to the Busway via a circulator is a real bonus. The Busway park and ride lot on the west side of the Busway on the north side of SW 168th Street is normally at capacity. MDT Route 287 serves the SW 168th Street Busway station, but the route only goes as far east as SW 87th Avenue.

Figure 22: Potential Park and Ride Lot



Source: Google Earth

If parking were free at a new lot, there is no doubt it would get use if it were properly marketed, given measures of demand at existing local park and ride facilities. iBUS ridership would depend on the number of spaces provided. Route B could serve it hourly, as a part of its scheduled route. Typically, park and ride lots fill very early, so a partial run of Route B could precede the regular loop service as a

first run in the morning. Such a run could go direct from the lot to the SW 168th Street Busway station, then turn around and begin its day in circulator service. Later parkers could pick up the circulator and go to the SW 184th Street Busway station. The reverse of this concept could be provided at night. A strength of such service is that iBUSs now predominantly carry workers from the Busway east to neighborhoods in the morning and back west to the Busway in the evening. Park and ride service would load the bus west in the morning and east in the evening, meaning buses would be better loaded in both directions.

Implementation of the lot would have the ancillary benefit of getting Palmetto Bay residents on the iBUS as first time users. There is a much greater chance they would use the bus for other trip purposes once they successfully use the system.

Some park and ride users would be non-residents, unless a permit or other regulatory mechanism is put in place. And, certain responsibilities come with managing a park and ride lot. Beyond maintenance of the pavement, there could be a shelter, a trash receptacle with regularly scheduled pickup, and some liability exposure. An issue at some lots has been their informal use as used car lots, with sellers leaving the vehicle with a "for sale" sign and phone number. And, development of such a property would eliminate it from the tax rolls. All these are administrative costs.



Weekends/Summer and Special Services:

No service on the iBUS is currently provided in the evening, or on Saturdays, Sundays, and the following holiday's: New Year's Day; Martin Luther King, Jr. Day; President's Day; Memorial Day; Independence Day; Labor Day; Columbus Day; Veteran's Day; Thanksgiving Day; Day after Thanksgiving; and Christmas.

The Route A bus could provide a variety of services outside of school hours, and when schools are not in session. There are 180 days in the 2015-16 Miami-Dade Public School system calendar. So there are many weekdays, weekends, and evenings when a bus would be available for other uses, especially during the summer. The Route B bus could also be available on weekends in modified form. All service would a function of available funding. Public events could be served at these times.

A number of destinations are candidates for service. And, MDT buses, including Cutler Bay Route 200 run on Saturdays, so transfers to more destinations are possible. Possible locations to serve are:

- Pinecrest Gardens;
- Pinecrest Farmers Market;
- Deering Estate;
- Thalatta Estates;
- Montgomery Botanical Center;
- Fairchild Tropical Botanic Garden;
- Palmetto Bay Village Center and the Library;
- Coral Reef Park summer events such as the Splash Bash;
- Black Point Marina;
- The Falls Shopping Center; and,
- Palmetto Bay Park.

As a specific example, an interest was expressed to have direct iBUS service to Dadeland from the Municipal Center area, with frequent headways.

Examples of weekend routes are presented in Figure 23 and 24. These routes take into account service to the local points of interest noted above, but can be modified to serve more or less depending on the route.

Shorter circulator routes generally tend to be more successful. Given the distance between Black Point Marina and the Fairchild Tropical Botanic Garden, we recommned multiple routes, with transfer points within Palmetto Bay at a central location with parking, such as the schools, park, or the Village Center.

Optional Weekend Routes 1:

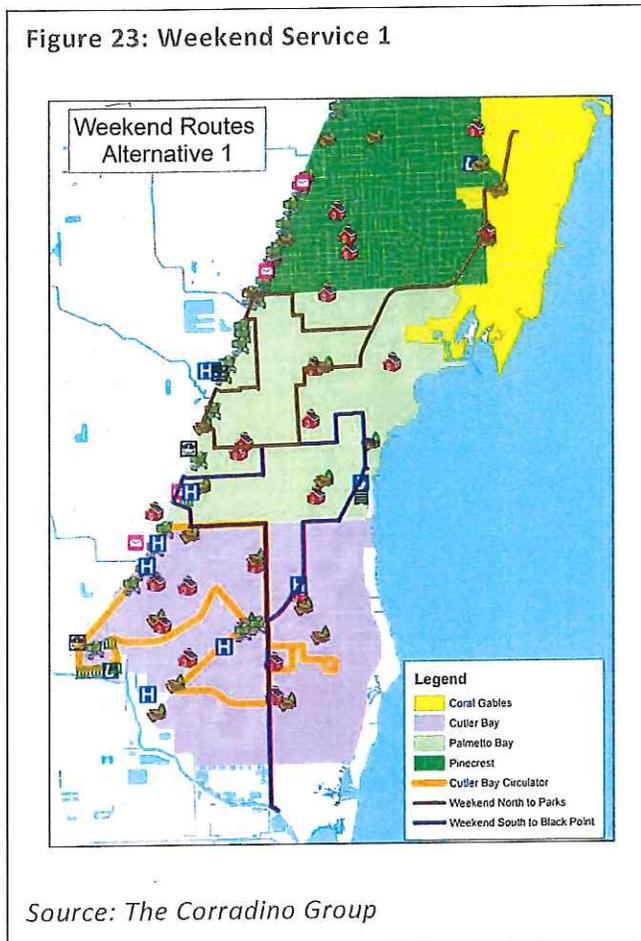
Under this option, a northern and a southern route would serve most of the Village, and allow for all locations to be reached within one bus transfer. The northern route would not only pick up residents, but provide weekend transit access from the Village interior directly to the parks, the Falls Shopping Center, Pinecrest Gardens, and Fairchild Botanical Gardens. In the south, a modified version of Route B could provide weekend access to the local library and parks. Access to Black Point may be achieved either as a spur portion of the route, via a change of Route 200 by Cutler Bay, or an express shuttle. The southern route would connect with the Cutler Bay Circulator along Eureka Drive and SW 87th Street, allowing Palmetto Bay residents additional transit access to Southland Mall.

These routes would intersect with MDT routes at certain junctions, such as at the Busway. Therefore routes would require coordination with MDT, and interlocal agreements for funding from Cutler Bay and/or Pinecrest. Combined, the Palmetto Bay and



Cutler Bay circulator systems have the potential to expand transit access for both communities,

Figure 23: Weekend Service 1

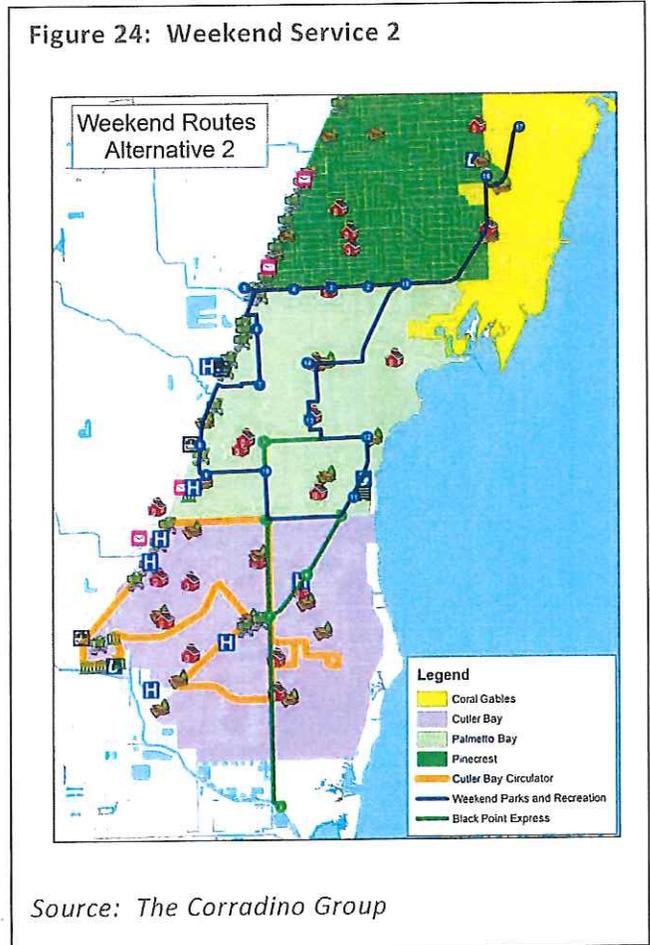


Assuming an average 15 miles per hour (mph) route speed on the weekend, the northern route would be completed in about 67 minutes and the route to Black Point would be completed in 50 minutes. Headways can be reduced through shortening of the route, by changing the frequency of the spur portions of the routes, or through the addition of additional buses.

Option Weekend Routes 2:

Under this option, as with Option 1, all of the aforementioned locations would be serviced. The differences lies in the transfers between routes, and a longer northern route. Option 2 presents a better opportunity to expand service in the north through the

Figure 24: Weekend Service 2



introduction of an additional buses to reduce headways.

As with Option 1, the northern route will provide weekend transit access from the Village interior directly to the Parks, the Falls Shopping Center, Pinecrest Gardens, and Fairchild Botanical Gardens. Access to Black Point may be achieved as this route is designed to be more effective as an express loop. Depending on the headways to the Marina, this may allow the bus assigned to the Black Point route to, at set intervals, switch between servicing routes, to reduce the headways on the longer loop. The southern route would connect with the Cutler Bay Circulator along Eureka Drive and SW 87th Street, allowing Palmetto Bay residents additional transit access to Southland Mall. Compared to Option 1,



Option 2 would reach more residents, but would have a slightly longer travel time to account for in route scheduling.

Assuming an average 15 miles per hour (mph) route speed on the weekends, the northern route could be completed in about 68 minutes and the route to Black Point could be completed in 53 minutes.



Implementation

To implement these suggestions it is recommended that the Village Immediately:

- Market the System
- Purchase Buses
- Operate internally

Regardless of any other decisions, in looking at the future of the Palmetto Bay iBus system, it is essential to put new buses into service and to put up bus stop signs. Some form of marketing is also essential.

As is demonstrated by the experience with the bus air conditioning and other maintenance issues, owning buses and keeping them in good operating condition is challenging. The overwhelming reason for current maintenance issues is the age of the vehicles. New vehicles would greatly diminish maintenance issues; nevertheless, if the Village owns buses, the pattern could repeat at some future date, unless someone at the Village level is fully responsible for maintenance and money is set aside in the budget for the acquisition of new vehicles, years in advance of when they are needed.

The administrative function of running the iBUS is limited today because there is no need to have someone constantly answering phones related to scheduling on demand type service, and no fares are being collected that would have to be managed. If there were on demand service, as is proposed here as an option, several additional administrative functions would become necessary.

An on demand system requires that someone answer the phone and schedule trips. Calls can be limited to certain hours and trip requests can be limited to one day ahead, two days ahead, and the like.

Additionally, depending on Village policy, someone

could be assigned the task of verifying that individuals making a request are Palmetto Bay residents, through some sort of ID or registration. This task could be eliminated if service is open to all for trips with origins and destinations with the Village, and that may be the way to go.

Still trips must be scheduled. If the iBUS system continues to be run by the Village, an employee could be assigned the duty of answering calls and making up the trip runs for the on demand service. This individual would have to be knowledgeable with respect to travel times within the Village to maintain efficiency and neither over nor under-commit vehicles.

The same individual could also be responsible for scheduling school trips as each new school session begins and organizing after school services to delivery students to their homes.

iBus Alternatives

A fundamental question is whether Palmetto Bay should own its vehicles, as it does today, or meet its vehicle needs as part of a lease or turnkey vendor.

In most business situations, owning is considered less expensive than leasing, when equipment has a long service life. There are some tax advantages to owning, principally in claiming depreciation. And, operating costs may be marginally lower, if there is less deadhead getting buses to and from the beginning and ends of routes.

Another obvious advantage of the Village purchasing its own buses is it can get the vehicles it wants, rather than what is provided by a vendor (Table 2). But in buying so few vehicles, there is no economy of scale, so the Village would likely pay a premium amount.



Table 2: Bus Ownership Pros and Cons

Owner	Advantage	Disadvantage
Palmetto Bay	Full control of bus features. Use of existing maintenance workers, if there are such Village staff. Tax advantages through depreciation.	No economy of scale on purchases. Requires dedicated maintenance staff and facilities for bus storage and maintenance, or a reliable outside vendor. Full capital cost is paid up front. Money must be budgeted ahead to allow for future bus purchases.
Vendor	Village responsibilities reduce to managing the vendor contract.	Little control over vehicle selection (if not stipulated in contract, old equipment could be provided) Operating costs could be marginally higher, if buses are housed and maintained at a distance.

Source: The Corradino Group

If the Village acquires new vehicles, a regular maintenance program must be established and monitored. Existing maintenance workers could be retained. Whether to own or purchase service is also influenced by the number and nature of other

The decision on ownership is tied to operations. Operations can be managed wholly by Village staff, as is the case today, or it could be provided by a vendor – public or private (Table 3).

Table 3: Operations Pros and Cons

Operator	Advantage	Disadvantage
Palmetto Bay Staff	Full control of routes and flexibility to change. Full control of drivers and courtesy expectations.	Requires dedicated transit staff, including backups. Requires adequate driver and maintenance staff training, and facilities. For future school and demand-response options, someone must take calls and schedule rides.
Vendor	Hands off operations. Reliable spare vehicles and drivers Control of routes and flexibility to change, if in contract provisions. Control of drivers through contract language.	Requires understanding of service negotiations and contracting. Need to manage non-municipal staff. Need to establish performance criteria and monitor same.
MDT	Full integration with MDT system, including Cutler Bay. Elimination of redundancy with MDT routes. Reliable spare vehicles and drivers. User friendly for riders making transfers and using the MDT system.	Potentially higher cost of service. Different system objectives. Lack of control.

Source: The Corradino Group

vehicles the Village owns, like police cars, fire equipment, parks equipment, and the like.



A full, scheduled, preventive maintenance program must be in place so deferred maintenance does not become the pattern. This means sufficient operating costs must be provided in every Village annual budget. Maintenance costs are accounted for in the operating budgets presented here.

Regardless of who owns buses and operates the system, increasing visibility and awareness of the system is important. A marketing strategy is vital for building community support for a circulator system. Marketing for the system may consist of a coordinated blend of research, community outreach, public relations, promotions, and advertising. The marketing strategy should seek to attract riders by:

- Increasing support of the circulator's role in the community
- Increasing use of the system by providing potential riders with pertinent information

Presently the iBus does not carry many residents of Palmetto Bay, instead functioning to shuttle workers from other locations to jobs in Palmetto Bay, many of them domestic jobs at homes, which, while not carrying residents as passengers, is a real service to residents.

We propose to continue the Route B service that provides that basic function, but enhancing service to local persons by extending service hours under some alternatives. This would support development of the Franjo Triangle area.

We further propose alternatives that include carrying Palmetto Bay high school and middle school students to and from school and changing Route A's fixed route service to a call ahead, on-demand service.

The service alternatives and scenarios have been mapped as applicable and include both capital and

operating costs, vehicle, equipment and facility requirements, potential funding sources and a proposed timeline for implementation.

iBus Service Alternatives and Operating Costs

All service alternatives presented here assume the purchase of new buses - but capital needs vary by alternative.

The alternatives are presented in an additive way, to show how service and cost together would grow over time, as community acceptance and ridership grow. As a general recommendation, an ongoing ridership count program is important, both in reporting to the Citizens Independent Transportation Trust (CITT), but also to understand not just how many people are riding the iBus, but what the patterns are that can be reinforced and what services are being used by residents of Palmetto Bay.

No Action Alternative - Continue Existing Operations

Operating costs are shown in Table 4. The first alternative shown is taking no real action other than replacing the buses with new ones, which is discussed below under Capital Costs.

Alternative 1 – Reconfigured Route B and On-Demand Service (former Route A) With Similar Hours

Alternative 1 would reconfigure Route B to increase efficiency and improve coverage of the densest areas of the Village (Figure 25). Service would be more comprehensible with the route always operating in a clockwise direction, instead of today's mix.

The reconfigured route would be about eight miles long and run with one hour headways (time between buses). All bus stops would have signs in place to mark the stops, and a program would be undertaken to install benches and shelters over time.



Table 4. Alternative Operating Costs

Alt	Rt.		Daily Labor Hours	Annual Labor Hours	Annual Cost @ \$50/hr*	Factor of Exist Budget
0		Existing Service with New Buses				
	A	Reconfigured route (8.3 miles)	5.0	1265	\$ 63,250	
	B	Reconfigured route (8.9 miles)	6.0	1518	\$ 75,900	
		Administration	0.5	127	\$ 6,325	
		Marketing			\$ -	
		Totals	11.5	2910	\$ 145,475	1.0
1		Reconfigured Routes, Same Hours, On-Demand				
	A	On-demand midday service (10:30-2)	4.5	1138.5	\$ 56,925	
	B	Reconfigured route (AM/PM)	6.0	1518	\$ 75,900	
		On-demand Admin support	3.5	886	\$ 44,275	
		Marketing			\$ 2,500	
		Totals	14.0	3542	\$ 179,600	1.2
2		Alt 2 = Alt 1 + School Service + More Hours				
	A	AM school	3.5	886	\$ 44,275	
	A	On-demand midday service (10:30-2)	4.5	1139	\$ 56,925	
	A	PM school	4.5	1139	\$ 56,925	
	B	Reconfigured route (7 AM/7 PM)	13.5	3416	\$ 170,775	
		On-demand Admin support	4.0	886	\$ 44,275	
		Marketing			\$ 2,500	
		Totals	30.0	7464	\$ 375,675	2.6
3		Alt 3 = Alt 2 + 3rd Bus				
	A	AM school	3.5	886	\$ 44,275	
	A	On-demand midday service (10:30-2)	4.0	1012	\$ 50,600	
	A	PM school	4.5	1139	\$ 56,925	
	B	Reconfigured route (7 AM/7 PM)	13.5	3416	\$ 170,775	
		On-demand Admin support	4.0	886	\$ 44,275	
	A	Second school bus	7.0	1771	\$ 88,550	
		Marketing			\$ 2,500.0	
		Totals	36.5	9108	\$ 455,400	3.1

Source: The Corradino Group

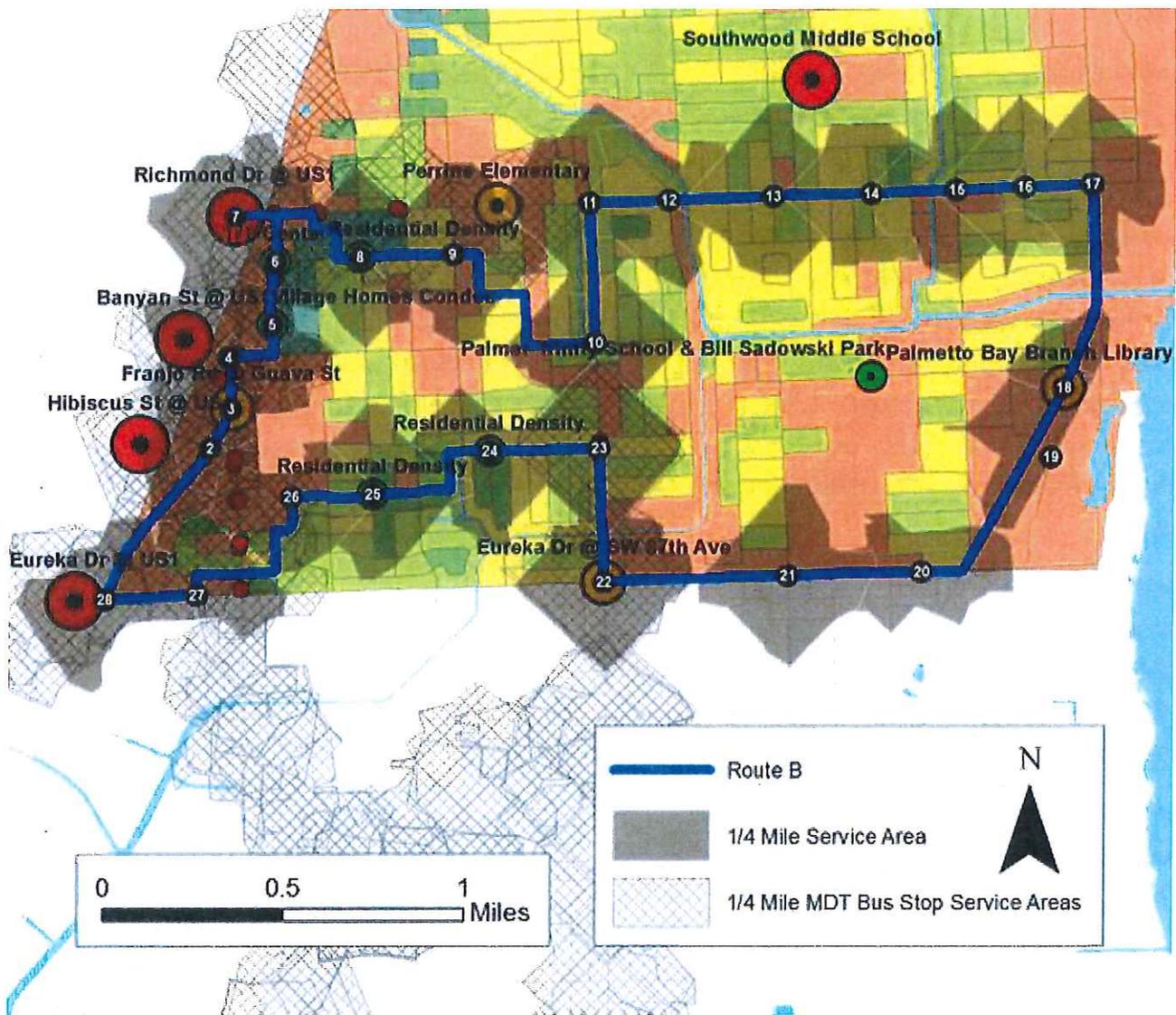


Under Alternative 1 the hours of operation of Route B would be similar to today, in the morning between 7 AM and 9 AM and in the afternoon between 2 PM and 5 PM. It would continue to serve today's ridership group, primarily domestic workers, but would penetrate more neighborhoods and serve more generators. Its primary function would remain carrying riders to and from the busway.

Our recommendation is to revamp Route A and change its function from fixed route to on-demand service. For Alternative 1 the same hours of service would be provided as are now provided in fixed route service. Other systems in south Florida and across the nation provide such service for residents.

On demand service carries an administrative cost. As shown in Table 4, an allowance has been made

Figure 25. Proposed Route B



Source: The Corradino Group



for taking calls from patrons requesting service and scheduling trips. This is over and above administrative functions now being performed.

The adjustments suggested that constitute Alternative 1 is estimated to carry an annual operating cost of about \$180,000, or 20 percent higher than the current system. This is shown in the rightmost column of Table 4.

Alternative 2 = Alternative 1 + School Service + More Hours

Alternative 2 builds on Alternative 1 by adding school service (Figures 13 and 15) to the duties of the Route A bus, before and after it provides on demand service. Alternative 2 also provides substantially more daily hours of service on Route B, with 12 hours of scheduled service. The reader will note that Table 4 shows 13.5 hours of labor associated with the reconfigured Route B. The difference between 12 and 13.5 hours is the allowance for lunch and layovers. These non-revenue hours are built into all the operating cost estimates.

The same individual who does scheduling for the on demand service would also be responsible for establishing school routes each new semester, and scheduling rides home in the afternoon for those students staying after school for activities.

Alternative 2 is estimated to carry an operating cost 2.6 times higher than that of the current system (Table 4).

Alternative 3 = Alternative 2 + 3rd Bus

Alternative 3 builds on Alternative 2 by adding a second bus serving the schools. It is estimated that such service would add another 7 hours of labor

daily. The school bus routes with two buses in service are shown in Figures 16 and 17.

Alternative 3 is estimated to carry an operating cost 3.1 times higher than that of the current system (Table 4).

iBus Capital Costs

Table 1 shows the relationship of bus type to service life for buses and vans as established by the Federal Transit Administration. It shows clearly that Palmetto Bay's buses are far past their expected life. The Iowa Department of Transportation recently issued *Programming Guidance for Transit Vehicles for FY 2016* reflective of substantial research into current bus costs. These costs are used herein for planning purposes. For the capital cost estimate in Table 5, medium-duty buses are recommended for primary service (about \$193,000 each). A light-duty vehicle would be adequate as a spare (about \$86,000). Together these vehicles are estimated to cost \$472,000. Under the Alternative 1 scenario, placement of bus stop signs and the beginning of a program of erecting bus shelters is proposed. Because of the cost of shelters, it could take a number of years to get as many shelters in place as is desired.

Alternative 2 would carry the same capital costs as Alternative 1. Alternative 3 would add another bus in service, if a second bus is used to transport students. Another medium duty bus is recommended, similar to the first two purchased to facilitate a uniform maintenance program and parts supply.

An additional capital cost not in Table 5 would be for equipment to indicate next bus arrival times and bus tracking (Appendix A). These costs are highly variable, depending on the many features involved.



Table 5. Capital Cost

Scenario	Capital Cost Item	Service	Size/Number	Unit Cost	Cost
No Action	Replacement buses				
	1	Route A	17/2 Pass.*	\$ 193,000	\$ 193,000
	1	Route B	17/2 Pass.*	\$ 193,000	\$ 193,000
	1	Spare	14/2 Pass.*	\$ 86,000	\$ 86,000
			Total		\$ 472,000
Alt. 1	Replacement buses				
		Rt. B bus stop signs	27	\$ 100	\$ 2,700
		Shelters	5	\$ 15,000	\$ 75,000
		Total			\$ 549,700
Alt. 2	Replacement buses				
		Rt. B bus stop signs	27	\$ 100	\$ 2,700
		Shelters	5	\$ 15,000	\$ 75,000
		Total			\$ 549,700
Alt. 3	Replacement buses				
	Additional bus				
		Rt. B bus stop signs	27	\$ 100	\$ 2,700
		Shelters	5	\$ 15,000	\$ 75,000
		Total			\$ 742,700

*Iowa Fiscal Year Programming Guidance

Source: The Corradino group and

<http://www.iowadot.gov/transit/pdf/FY%202016%20Programming%20Guidance%20for%20Transit%20Vehicles.pdf>



Annual Capital and Operating Outlay

Table 6 represents costs that could be incurred over the next five years using Alternative 1's operating costs as an example.

In year one the \$420,000 in the budget now would be used to buy two medium-duty buses, with any residual held over to the second year. A new capital allotment in the budget would combine with the first year's funds to purchase the light-duty spare. In the meantime one of the existing buses would serve as the spare.

Bus stop signs would be acquired and put in place in the first year for stops along Route B. (Route A being on demand service.)

In the second year the shelter construction program would begin, with the bulk of the bus purchase out of the way.

program would continue. Capital would be set aside for replacement bus signs and/or shelter work.

The operating costs would be as shown in Table 4 for Alternative 1, including costs for marketing.

If a more expansive alternative is selected, the costs in Table 6 would adjust accordingly.

Table 6. Example 5-Year Cash Flow

		Year				
		1	2	3	4	5
Capital	Buses	\$ 420,000	\$ 52,000			
	Set Aside for Future Buses			\$ 50,000	\$ 51,500	
	Shelters		\$ 15,000	\$ 15,000	\$ 15,000	
	Rt. B Bus Stop Signs	\$ 2,700	\$ 300	\$ 300	\$ 300	
	Capital Subtotal	\$ 422,700	\$ 67,300	65,300	\$ 66,800	
Operating (Alt 1 Example)		\$ 179,600	\$ 184,988	\$ 190,538	\$ 196,254	
	Totals	\$ 602,300	\$ 252,288	\$ 255,838	\$ 263,054	\$ 202,141

In the third year, a capital set-aside would begin for the future round of bus purchases. The shelter



Appendix A

The graphic below shows the basic setup of Nextbus software. What is missing in a future scenario for Palmetto Bay are the Agency

Management and Transit Agency components. It is possible these services could be provided by a vendor or they could be part of an interlocal agreement with MDT

