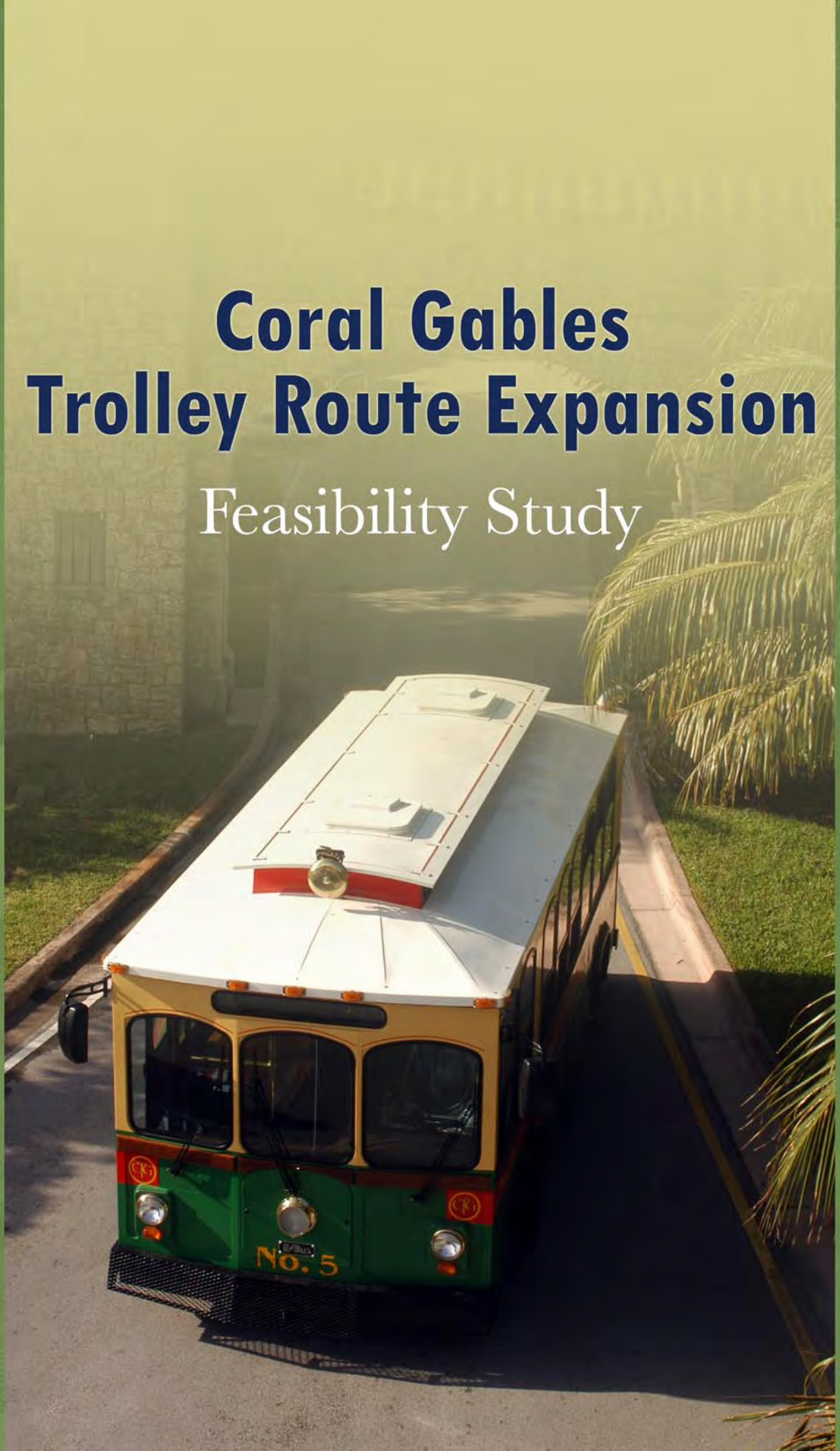
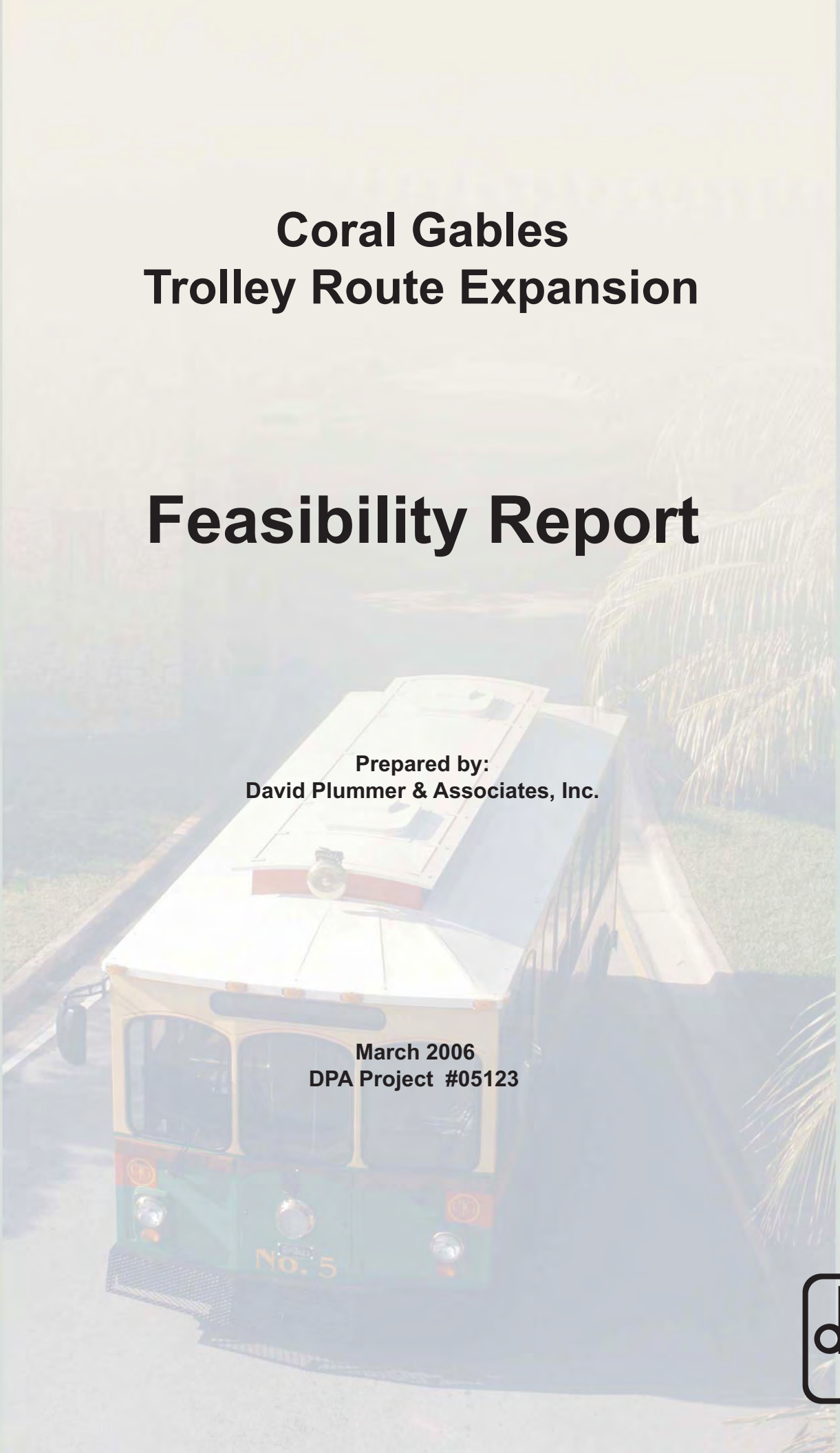
Coral Gables Trolley Route Expansion

Feasibility Study



Coral Gables
Trolley Route Expansion

Feasibility Report



Prepared by:
David Plummer & Associates, Inc.

March 2006
DPA Project #05123

TABLE OF CONTENTS

Page

List of Exhibits ii

EXECUTIVE SUMMARY iii

1.0 INTRODUCTION 1
- 1.1 Project Background 1
- 1.2 Study Objective 3
- 1.3 Study Methodology 3

2.0 STUDY AREA 4
- 2.1 Existing Transit Service 4
- 2.2 Other Circulators 6

3.0 OPERATING OPTIONS 7
- 3.1 Preliminary Area Analysis 7
- 3.2 Routes/Alignments 8
- 3.3 Travel Time Runs 13
- 3.4 Operating Options 14
  - 3.4.1 Stop Locations 14
  - 3.4.2 Boarding Process 15
  - 3.4.3 Hours of Operation and Headways 15
- 3.5 Vehicular / Staffing Requirements 16
- 3.6 Ridership Estimates 17
- 3.7 Fare Structure 18

4.0 COSTS 19

5.0 CONCLUSIONS AND RECOMMENDATIONS 21

Appendix A: MDT Metrobus Route Information / Potential Coconut Grove Circulator Extension
Appendix B: Travel Time Runs
Appendix C: Preliminary Trolley Stop Locations

LIST OF EXHIBITS

Exhibit		Page
1	Location Map	2
2	Metrobus Routes	5
3	Flagler Street Route	10
4	University of Miami Route	11
5	Riviera Business District Route	12
6	Route Cost Breakdown	20

EXECUTIVE SUMMARY

In November 2003, the City of Coral Gables launched an intracity circulator, known as the Coral Gables Trolley, to help relieve localized traffic congestion, increase transit ridership, offset parking shortages, and improve the pedestrian environment of city's Central Business District (CBD). The Coral Gables Trolley has been extremely successful and surpassing many projections within the first year. Ridership during the 2005 calendar year was over 700,000 boardings. With the tremendous success of the existing trolley system, the City of Coral Gables has requested a feasibility study of expanding the existing trolley service to other areas in Coral Gables.

As part of this study, five distinct areas were preliminarily analyzed to determine the feasibility of extending the trolley. These five areas are: the area between SW 8 Street and Flagler Street, the MacFarlane Homestead Historic District, the University of Miami, the Red Road area, and the Riviera Business District.

After preliminary analysis, it was determined that the MacFarlane Homestead Historic District and the Red Road area did not provide the necessary potential ridership to justify the extension of the trolley route. The Red Road area will get limited trolley service if the Riviera Business District route is chosen. The MacFarlane Homestead Historic District can be served by the existing Coconut Grove Circulator and connect to the Coral Gables Trolley at the Douglas Metrorail Station. Miami Dade Transit would need to expand this route west to either Brooker Street or Jefferson Street.

After further analysis that included travel time runs and coordination with the City, two specific trolley routes were developed. These routes are the Flagler Street Route and the Riviera Business District Route. The Flagler Street Route will run north and south along Ponce de Leon Boulevard between SW 8 Street and Flagler Street. This route will provide a connection

between the existing trolley route and the medical office buildings just north of SW 8 Street and the Flagler Street corridor.

The Riviera Business District Route was developed to provide convenient access from/to the Riviera Business District and surrounding attractions and offices with the University of Miami. The route will also connect to the existing Ponce de Leon Boulevard Route at the Douglas Metrorail station. The Riviera Business District Route will run along the southwest leg of Ponce de Leon Boulevard and cross US-1 via Alhambra Circle.

It is recommended that the Flagler Street Route maintain approximately an 8-minute headway and the Riviera Business District Route a 15 – 20 minute headway. In order to provide these headways, the Flagler Route would require one additional vehicle and the Riviera Business District Route would need two vehicles.

The costs of extending the trolley system were estimated with assistance from the City's Trolley Manager. The approximate capital costs associated with both routes are $1,000,000 to 1,200,000 and the approximate annual maintenance and operations costs are $500,000 to $600,000.

1.0 INTRODUCTION

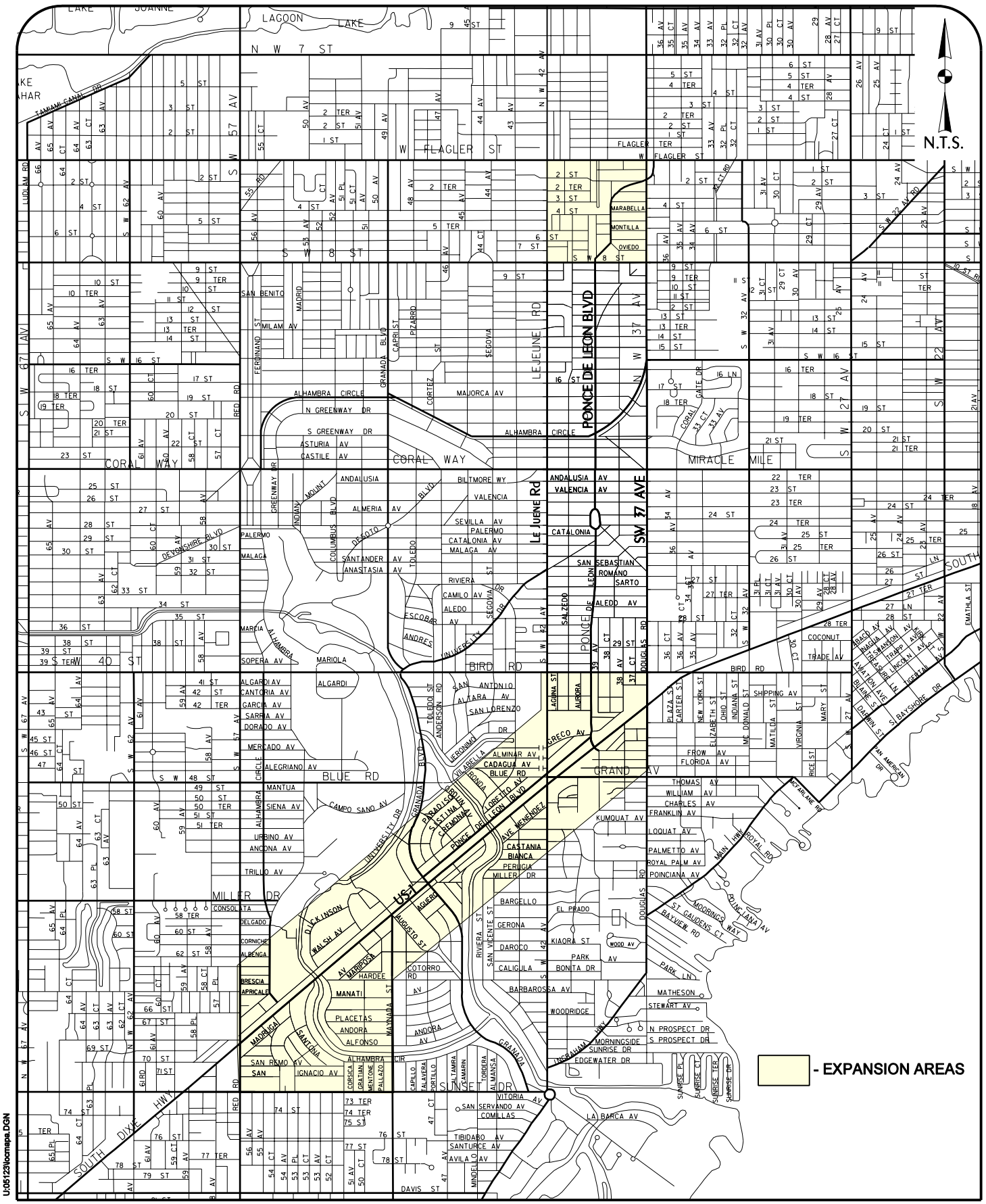
1.1 Project Background

In November 2003, the City of Coral Gables launched an intracity circulator, known as the Coral Gables Trolley, to help relieve localized traffic congestion, increase transit ridership, offset parking shortages, and improve the pedestrian environment of city's Central Business District (CBD). The Coral Gables Trolley's main route is along the Ponce de Leon Boulevard from SW 8 Street to the Douglas Road Metrorail station. There is also a spur that runs along Miracle Mile/Biltmore Way from SW 37 Avenue to the Biltmore Hotel.

The Coral Gables Trolley has been extremely successful and surpassing many projections within the first year. Ridership during the 2005 calendar year was over 700,000 boardings. With the tremendous success of the existing trolley system, the City of Coral Gables has requested a feasibility study of expanding the existing trolley service to other areas in Coral Gables. The City wants to explore the feasibility of expanding the existing Ponce de Leon Boulevard Route north to the Flagler Street corridor and south (across US-1) to the MacFarlane Homestead Historic District. Other routes to consider include a new route along Ponce de Leon Boulevard from the Douglas Metrorail station to the University of Miami, Red Road and/or the Riviera Business District (see Exhibit 1 for location map).

The success of the existing trolley system can be attributed to several specific factors that should also be taken into account when considering the potential route expansion. Those factors include:

- Short headways
- Interconnectivity between the trolley and existing mass transit system (i.e., Metrorail)
- Free fare
- Connectivity to major activity centers



dpe	PROJECT: CORAL GABLES TROLLEY ROUTE EXPANSION FEASABILITY STUDY	TITLE: LOCATION MAP	EXHIBIT No. 1

1.2 Study Objective

The objective of this study is to assess the feasibility of routes that connect the Coral Gables Trolley to the Flagler Street corridor, the MacFarlane Homestead Historic District, the University of Miami, and the Riviera Business District. When these new routes are developed, they will consider population density, activity centers, interconnection to other transit systems, and coverage area. Preliminary trolley stops/spacing will also be identified.

1.3 Study Methodology

The data collection and analysis presented in this report were performed in accordance with the scope of work presented to the city of Coral Gables. Data collection included existing transit service for corridors that may potentially provide connectivity to the new trolley routes and review of the University of Miami Hurry 'Cane Shuttle and the Coconut Grove Circulator. Routes and alignments were developed with the coordination of the Coral Gables Trolley Manager.

2.0 STUDY AREA

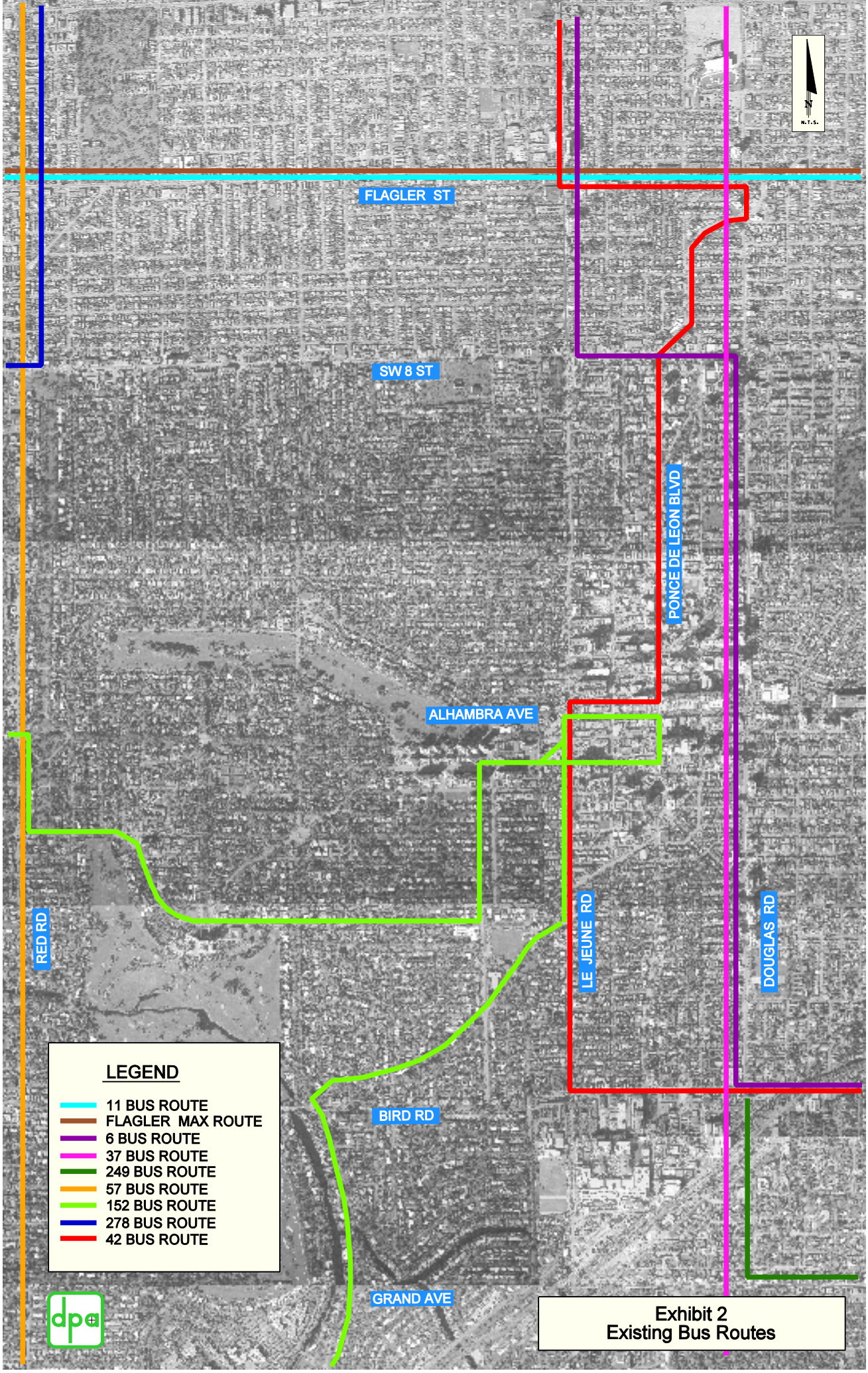
2.1 Existing Transit Service

Information regarding particular existing transit services within the City of Coral Gables was obtained from Miami-Dade Transit (MDT). The routes that run on Flagler Street, Douglas Road, and Red Road were reviewed since they may potentially provide connectivity to the new trolley routes. On Flagler Street, the following routes run within the City limits: Routes 11, 42, and Flagler Max (51). Routes 6 and 37 run along Douglas Road, while routes 57, 152, and 278 run along Red Road. These existing routes are shown in Exhibit 2.

The headways on these three corridors were reviewed during the AM (7:00 AM – 9:00 AM), Midday (11:00 AM – 1:00 PM), and the PM (4:00 PM – 6:00 PM) peak periods. During the peak hours, the headways for the routes on Flagler Street vary from 8 to 30 minutes. Route 11 has a headway of 8 to 10 minutes, Route 42 is 30 minutes, and Route 51 varies between 15 and 30 minutes. The headways for the routes on Douglas Road are between 30 and 60 minutes. Route 6 has a headway of 60 minutes, while Route 37 has a headway of 30 minutes during the peak hours. Similarly, the headways for the routes on Red Road vary between 30 and 60 minutes during the peak hours. Route 57 has a headway of 30 to 60 minutes, Route 152 has a headway of 30 minutes, and Route 278 also has a headway of 30 minutes.

Additionally, ridership information was obtained from MDT for these routes. During the peak periods, the ridership varies between 71 – 120 on Flagler Street, 33 – 66 on Douglas Road, and 4 - 45 on Red Road.

Detailed route information is included in Appendix A.


FLAGLER ST
SW 8 ST
PONCE DE LEON BLVD
ALHAMBRA AVE
RED RD
LE JEUNE RD
DOUGLAS RD
BIRD RD
GRAND AVE
N.T.S.
LEGEND
11 BUS ROUTE
FLAGLER MAX ROUTE
6 BUS ROUTE
37 BUS ROUTE
249 BUS ROUTE
57 BUS ROUTE
152 BUS ROUTE
278 BUS ROUTE
42 BUS ROUTE
dpe
Exhibit 2
Existing Bus Routes

2.2 Other Circulators

The University of Miami Hurry 'Cane Shuttle is free of charge to students, faculty, staff and visitors. It provides service to most of the major campus buildings, parking lots/garages, and the University Metrorail station. The two main routes are the Fountain/Stanford Route and the Dickenson Route. These routes operate during the fall and spring semesters Monday through Friday from 7:00 AM – 12:00 AM (midnight). The Fountain/Stanford Route offers an express route that runs Monday through Friday from 7:00 AM – 12:00 PM and 4:00 PM – 6:00 PM. During the summer, the Fountain/Stanford Route hours are from 7:00 AM – 7:00 PM. The headways during the fall and spring semester are between 4 to 5 minutes and at 10 to 15 minute intervals during the summer.

The Hurry 'Cane Shuttle also offers routes during the fall and spring terms servicing Coconut Grove, Shops at Sunset Place / Publix, the neighboring University Centre, and Crandon Park Beach. The Coconut Grove Route operates Friday and Saturday nights from 8:00 PM - 3:30 AM. The Shops at Sunset Place / Publix route operates on Friday and Saturday from 8:00 PM to 2:00 AM with 20 to 30 minute headways. The University Center Route provides service to the shopping center across US-1 and operates nightly from 5:00 PM - 11:00 PM. The Crandon Park Beach Route provides service from UM to Crandon Park Saturday and Sunday from 10:00 AM - 5:00 PM.

The Coconut Grove Circulator Route (Route 249) is owned and operated by Miami-Dade County. This route offers service to and from the Coconut Grove Metrorail Station, Miami City Hall, and the Douglas Road Metrorail Station. The Coconut Grove Circulator Route has a headway of 15 minutes during the peak periods. Ridership during the peak hours varies between 3 and 13 riders.

3.0 OPERATING OPTIONS

3.1 Preliminary Analysis

As part of this study, five distinct areas were preliminarily analyzed to determine the feasibility of extending the trolley. These five areas are: the area between SW 8 Street and Flagler Street, the MacFarlane Homestead Historic District, the University of Miami, the Red Road area, and the Riviera Business District.

The area bounded by Flagler Street on the north, SW 8 Street on the south, Douglas Road to the east, and LeJeune Road on the west is predominantly residential and has a number of street closures to prevent cut-through traffic. However, Ponce de Leon Boulevard traverses the area providing a direct connection to the businesses on SW 8 Street and those just north of Flagler Street. This area also provides an opportunity for connectivity to the existing bus routes on Flagler Street.

The MacFarlane Homestead Historic District is a small residential area located on the east side of US-1, north of Grand Avenue. To provide access to this historic neighborhood from the existing trolley route, the route has to be diverted to either SW 37 Avenue or Grand Avenue.

The University of Miami area provides an opportunity to connect to one of the major activity centers within the city. The University of Miami has a population of approximately 15,000 students and 10,000 employees.

The Red Road area is primarily residential with some businesses that provide services to the University and its students. Access to and from the area is cumbersome because of the difficulty of crossing Red Road.

The Riviera Business District area consists primarily of office buildings and commercial uses. The area is also near the Shop at Sunset Place and the South Miami central business district. This area is also considered an activity center.

After preliminary analysis of the areas described above, it was determined that the MacFarlane Homestead Historic District and the Red Road area did not provide the necessary potential ridership to justify the extension of the trolley route.

The Red Road area will get limited trolley service if the Riviera Business District route is chosen. This is because the River Business District route will run on Ponce de Leon Boulevard to South Alhambra Circle before crossing US-1 and northbound on Red Road to Ponce de Leon Boulevard.

The MacFarlane Homestead Historic District can be served by the existing Coconut Grove Circulator. This circulator currently runs from the Coconut Grove Metrorail Station to the Douglas Road Metrorail Station via SW 27 Avenue, South Bayshore Drive, Grand Avenue, and SW 37 Avenue (see Appendix A for full route). MDT would need to expand this route west to either Brooker Street or Jefferson Street. Then it could return to Douglas Road to finish the route at the Douglas Road Metrorail Station (see Appendix A for suggested routes). Once at the Douglas Road Metrorail Station, residents from this district could board the Coral Gables Trolley.

3.2 Routes / Alignments

After the selection of the areas where potential ridership, as well as, defined activity centers exist, three specific trolley routes were developed. These routes are the Flagler Street Route, the University of Miami Route and the Riviera Business District route. The Flagler Street Route is a direct extension of the existing route that runs along Ponce de Leon Boulevard between SW 8 Street and the Douglas Road Metrorail station. Whereas the other two reviewed routes will run

independently from the existing route in order to maintain the headways on the existing trolley route.

The proposed Flagler Street Route will run north and south along Ponce de Leon Boulevard between SW 8 Street and Flagler Street. This route will provide a connection between the existing trolley route and the medical office buildings just north of SW 8 Street and the Flagler Street corridor.

The University of Miami Route was developed to provide University personnel and students a convenient access to the Coral Gables CBD, particularly the Miracle Mile area. This route will run along the southwest leg of Ponce de Leon Boulevard into the University of Miami via Stanford Circle. This route will connect to the existing Ponce Route at the Douglas Metrorail station.

The Riviera Business District Route was developed to provide convenient access from/to the Riviera District and surrounding attractions and offices with the University of Miami. The route will also connect to the existing Ponce de Leon Route at the Douglas Metrorail station. The Riviera Business District Route will run along the southwest leg of Ponce de Leon and cross US-1 via Alhambra Circle. The alignment of the Riviera Business District Route south of US-1 is centered upon the largest and most concentrated of commercial areas. The route connects back to Ponce de Leon Boulevard by crossing US-1 via Red Road.

Exhibits 3 through 5 illustrate on a base aerial of the Coral Gables area, the proposed route alignments for the Flagler Street Route, the University of Miami Route, and the Riviera Business District Route respectively.

LEGEND

FULL ROUTE

FLAGLER ST

LE JEUNE RD

PONCE DE LEON BLVD

DOUGLAS RD

SW 8 ST

DOUGLAS ENTRANCE

N

N.T.S.

dpa

Exhibit 3
Flagler Street Route

LEGEND

FULL ROUTE

N

N.T.S.

DOUGLAS ROAD METRORAIL STATION

VILLAGE OF MERRICK PARK

LE JEUNE RD

BLUE RD

SOUTH DIXIE HWY

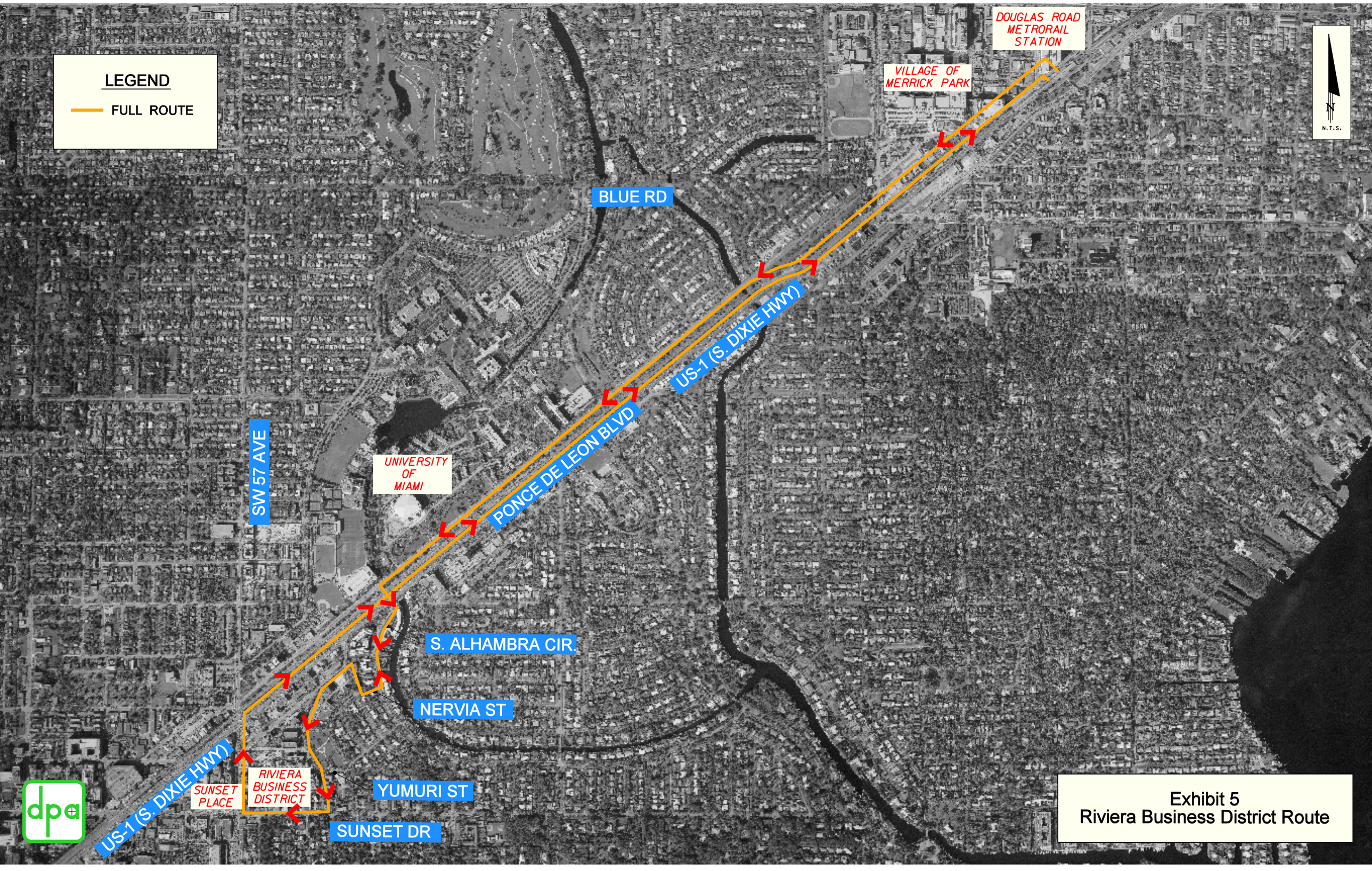
PONCE DE LEON BLVD

STANFORD DR

UNIVERSITY OF MIAMI

dpa

Exhibit 4
University of Miami Route


LEGEND
FULL ROUTE
DOUGLAS ROAD METRORAIL STATION
VILLAGE OF MERRICK PARK
BLUE RD
US-1 (S. DIXIE HWY)
PONCE DE LEON BLVD
SW 57 AVE
UNIVERSITY OF MIAMI
S. ALHAMBRA CIR.
NERVIA ST
YUMURI ST
SUNSET DR
SUNSET PLACE
RIVIERA BUSINESS DISTRICT
US-1 (S. DIXIE HWY)
N
N.T.S.
dpa
Exhibit 5
Riviera Business District Route

3.3 Travel Time Runs

Based on the three conceptual routes, travel time runs were conducted for each route. The City provided one of its vehicles from its fleet of eight to conduct travel time runs, since the trolleys maneuver differently than a passenger vehicle. Travel time runs were collected on Tuesday, January 17, 2006 through Friday, January 20, 2006. Three runs for each route was collected during the AM peak period (7:00 AM – 9:00 AM), Midday peak period (11:00 AM – 1:00 PM), and PM Peak period (4:00 PM – 6:00 PM).

It should be noted that when the travel time runs for the University of Miami Route and the Riviera Business District Route were conducted from the Ponce Circle. After coordination and discussions with the City's Trolley Manager, it was suggested that these routes should be connect with the existing trolley stop at the Douglas Road Metrorail Station. Therefore a conservative 3.5 minutes were added to each of these routes based on travel time run to/from Ponce Circle and the Douglas Road Metrorail Station.

The time it takes for each route to complete a roundtrip are as follows:

Flagler Street Route	7 - 9 Minutes
University of Miami Route*	18 – 20 Minutes
Riviera Business District Route*	26 – 34 Minutes

*Based on travel time run, includes a 3.5 minute adjustment.

Detailed travel time run spreadsheets are included in Appendix B.

3.4 Operating Options

The extension of the existing trolley route to the Flagler Street corridor only led to one possible alignment due to the demographics and connectivity in the area. However, two distinct alignments and routes were developed for the southwest leg of Ponce de Leon Boulevard routes.

The Riviera Route has the highest potential ridership and can connect a remote activity center and the CBD of the city of South Miami to the CBD of the city of Coral Gables. Also, after meeting with the University of Miami Parking and Transportation Director, the University would be most interested in the Rivera Business District Route, since it provides students a route that will cross US-1 to many commercial areas. The University of Miami Hurry 'Cane Shuttle provides access to Sunset Place only on Friday and Saturday afternoons/nights.

Therefore, the Flagler Street Route and the Riviera Business District Route were the only two routes considered in the remainder of this study.

3.4.1 Stop Locations

The Flagler Street Route is intended to provide connection between the existing trolley route and the medical office buildings just north of SW 8 Street and the Flagler Street corridor. This route, however, traverses through a predominantly residential area, except for the medical office buildings just north of SW 8 Street. Therefore the majority of the trolley stops for the Flagler Street Route will be provided to the areas that are expected to attract the most riders, however trolley stops will also be provided along the residential area along Ponce de Leon Boulevard between SW 8 Street and Douglas Road. The preliminary trolley stop locations for the Flagler Street Route are in Appendix C.

The existing trolley route has relatively closely-spaced, conveniently located stops in order to attract a high number of riders, since the distance that people are willing to walk to catch the

circulator is generally proportional to the distance they wish to ride it. However, the Riviera Business District demographics are different then that of the area served by the existing trolley route. The area along Ponce de Leon Boulevard between Douglas Station and Granada Boulevard is primarily residential and provides fewer commercial attractions compared to the existing trolley route. The University of Miami and the Riviera Business District are expected to have the most potential ridership. Therefore these areas will have more relatively closely-spaced trolley stops then the residential area between Douglas Station and Granada Boulevard. The preliminary trolley stop locations for the Riviera Business District Route are also in Appendix C.

3.4.2 Boarding Process

It is anticipated that the circulator will continue to be a free service. Therefore boarding and alighting would be very quick and efficient, as patrons would be able to board without having to take time paying fares. Circulator systems of this type are generally well-patronized because they offer the promise of quicker service in addition to no fare. In some cases, the time savings achieved by offering free service can offset the need to acquire an additional vehicle or hire an additional driver.

3.4.3 Hours of Operations and Headways

Since the Flagler Street Route is an extension of the existing Ponce de Leon Boulevard trolley route, the hour of operations and headways are recommended to remain the same. The trolley currently operates Monday through Thursday from 6:30 AM to 8:00 PM and offers longer hours on Fridays from 6:30 AM to 10:00 PM. Similarly, the existing trolley route has an approximate 8-minute headway.

The commercial areas along the Riviera Business District Route open for business at 10:00 AM and since this route will primary serve as a connection between the University of Miami to the

Riviera Business District and Coral Gables CBD, it is recommended that the operating hours be from 10:00 AM - 8:00 PM Monday through Friday. According to travel time runs, discussed in Section 3.3, it takes 26 to 34 minutes to complete the entire Riviera Business District Route during the peak periods. In coordination with the City's Trolley Manager, 15-20 minute headways should be maintained at this route.

3.5 Vehicular/Staffing Requirements

The City currently has 8 low-floor, low-emissions trolley vehicles with a vintage body and aesthetics. Five of the vehicles are hybrid electric and three are low-emissions diesel. The city is in the process of ordering four additional vehicles to use at the existing routes.

As discussed in Section 3.4.3, the Flagler Route is to maintain approximately an 8-minute headway and the Riviera Business District Route a 15 – 20 minute headway. In order to provide these headways, the Flagler Route would require one additional vehicle and the Riviera Business District Route would need two vehicles. This would increase the existing 8 vehicles in the City's fleet to 11 vehicles.

Per the City's Trolley Manager and based on the hours of operations, each additional vehicle would require 1.5 drivers. Therefore the three additional vehicles will require the City to hire four full-time drivers and one part-time driver. Additionally, one mechanic and one cleaner would be needed for the three additional vehicles in the fleet.

It is important that the city evaluates the capacity of the existing Trolley Depot. Due to the success of the trolley system, the number of trolleys has increased significantly from the original estimated number. With the proposed route extensions, the number of trolleys in the system could increase to 15 vehicles. The cost of expanding or relocating the Trolley Depot could significantly increase the cost of the system.

3.6 Ridership Estimates

As discuss earlier, one of the reasons for the success of the existing trolley system is its ability to attract a vast number of weekday employees and to provide residents a direct connection to the Metrorail system. Therefore, when estimating the potential ridership of the two proposed extended routes these criteria were considered.

The 2005 Miami-Dade County Transportation Model was reviewed for population and employment estimates along the proposed routes. For the Flagler Street Route, Traffic Analysis Zones (TAZ) 765-766 and 779-780 were considered. The model estimates that approximately 2,000 employees and residents are within ¼ -mile in either side along the proposed Flagler Street Route. The ¼ -mile is the industry-accepted standard for a reasonable walking distance to a circulator service of this type. The number of employees and residents within the ¼-mile distance is what is considered the potential riders. In addition to the 2,000 potential riders in the area, there are approximately 150 MDT bus riders using the Flagler Street and Douglas Road routes (during the peak period) that could use the trolley system as connectivity to their final destination.

According to Miami-Dade Transportation Model estimates for the year 2005, the Riviera Business District (traffic analysis zones 1079-1083, 1086-1091, and 1101-1102) has approximately 8,000 potential riders within ¼ -mile in either side of the proposed route. This number includes potential riders from the University of Miami.

To estimate the annualize number of boardings per year that each of the proposed routes could have, a percentage is applied to the number of potential riders. This is done because even though there are a large number of potential riders within the routes the actual number of riders is smaller. A range between 1% and 3% was applied to the total potential riders for each route to estimate the total ridership. The Flagler Street Route will have between 10,000 - 30,000 yearly boardings. The

Riviera Business District Route is expected to have between 40,000 – 60,000 yearly boardings respectively.

In addition to the targeted population along the corridor, there is a group of "bonus riders" that will use the system. This group includes:

- Visitors to Coral Gables who will be attracted to the service
- Riviera Business District employees that will be attracted to the circulator/Metrorail for meetings in downtown Miami.
- Area employees who have business at the Riviera Business District during the course of the day.
- Shoppers destined for Miracle Mile, the Village of Merrick Park or the Shops at Sunset Place.

Because they are not specifically targeted, it is difficult to assess how many would be attracted at the new routes. However, it can be safely assumed that this number would be small in comparison to the base riders.

3.7 Fare Structure

As discussed with the City's Trolley Manager, the circulator will continue to be a free service. The benefits of having a free circulator system are apparent. Free fare gives the system the opportunity to maximize its ridership, reflecting the City's desire for a successful system. Also, there would be less potential for operational delays along the route. The desired headways would therefore be easier to maintain.

4.0 COSTS

Vehicle procurement is generally the largest capital cost. According to the City, the cost of a new vintage diesel vehicle is approximately $300,000. In order to maintain the existing 8 minute headways for the existing trolley route, the Flagler Street extension would require one additional vehicle, for a cost of $300,000. For the Riviera Business District Route two vehicles would be required to maintain 15 – 20 minute headways, for a cost of $600,000. Additional capital costs are required for signs and amenities. Based on City figures, it costs approximately $3,000 for signs and amenities. For the Flagler Street Route, 8 preliminary trolley stops were identified; this translates to a total cost of $24,000. Twenty preliminary trolley stops were identified for the Riviera Business District Route, for a total cost of $60,000 for signs and amenities. Therefore the total capital costs associated with the Flagler Street Route and the Riviera Business District Route are $324,000 and $660,000 respectively.

The operating costs determined for this project are based upon a per-hour operating figure of $30 per hour as provided by the City. Based on existing operation hours of 6:30 AM to 8:00 PM Monday through Thursday and 6:30 AM to 10:00 PM on Fridays, the Flagler Street Route service schedule is equal to 69.5 bus-hours per week. Assuming an additional 2 hours a day for deadhead time (i.e., travel to and from the facility before and after each shift) would amount to total estimate of 79.5 bus-hours per week. Applying the $30 per hour operating rate yields a weekly cost of $2,400 or an annual cost of approximately $125,000. For the Riviera Business District Route, the operating hours as discussed in Section 3.4.3 amounts to 60 bus-hours per week (including 2 hours a day for deadhead time). This route requires two buses for a total of 120 operating hours per week. Therefore, the Riviera Business District Route will have an operating cost of approximately $3,600 per week or an annual cost of $190,000.

The City of Coral Gables Trolley Manager stated that the three additional vehicles will require the City to hire an additional mechanic and cleaner. Based on the figures provided by the City, a mechanic costs the City an approximate $30 per hour and a cleaner $20 per hour for a total cost of

$50 per hour. Based on an eight-hour work day, this will cost the City approximately $2,000 per week or $104,000 per year.

Part and maintenance costs are expected for each vehicle with the usual wear and tear. The City estimates that 10% of the total cost of a vehicle is required annually for parts and maintenance. For the Flagler Street Route, parts and maintenance costs will be $30,000 and $60,000 for the Riviera Business District.

Exhibit 6 provides the breakdown of the costs associated with the Flagler Street Route and the Riviera Business District Route.

Exhibit 6
Route Cost Breakdown

Expenditure	Flagler Street Route	Riviera Business	Total for Both Routes
Capital Cost[1]	$324,0000	$660,000	$984,000
Annual Operating Cost	$125,000	$190,000	$315,000
Annual Mechanic/Cleaner Cost	$104,000		$104,000
Annual Parts/Maintenance Cost	$30,000	$60,000	$90,000

Source: City of Coral Gables

[1] Capital cost includes vehicle procurement and trolley signs.
[2] Mechanic and cleaner costs is based on total personal needed for the addition of 3 vehicles to the City's fleet.

The approximate capital costs associated with both routes are $1,000,000 to 1,200,000 and the approximate annual maintenance and operations costs are $500,000 to $600,000.

5.0 CONCLUSIONS AND RECOMMENDATIONS

A feasibility study to extend the existing trolley system within the city of City of Coral Gables has been completed. The proposed expansion will provide connectivity to Flagler Street by expanding the existing trolley route on Ponce de Leon Boulevard north of SW 8 Street and additionally providing a separate route along Ponce de Leon Boulevard from Douglas Station to the University of Miami and the Riviera Business District.

The extension of the existing trolley route to the Flagler Street corridor only led to one possible alignment due to the demographics and connectivity in the area. Two distinct alignments and routes were developed for the southwest leg of Ponce de Leon Boulevard routes. However after examining the two routes and meeting with the University of Miami and the City of Coral Gables Trolley Manager, the Riviera Business District Route was the only route considered to connect the Coral Gables CBD, the University of Miami and the Riviera Business District.

Since the Flagler Street Route is an extension of the existing Ponce de Leon Boulevard trolley route, the hour of operations and headways are recommended to remain the same, operating Monday through Thursday from 6:30 AM to 8:00 PM and Fridays from 6:30 AM to 10:00 PM, with an approximate 8 minute headway. It is estimated that the Flagler Street Route will have between 10,000 - 30,000 yearly boardings. In order to maintain the existing 8-minute headways for the existing trolley route, the Flagler Street extension would require one additional vehicle.

The Riviera Business District Route will primary serve as a connection between the University of Miami to the Riviera Business District and Coral Gables CBD and it is recommended that the operating hours be from 10:00 AM - 8:00 PM Monday through Friday and have a 15 – 20 minute headway. It is estimated that the Riviera Business District Route will have between 40,000 - 60,000 yearly boardings. In order to maintain the desired 15 -20 minute headways, the City would need to obtain two vehicles.

As discussed with the City's Trolley Manager, the circulator will continue to be a free service. The benefits of having a free circulator system are apparent. Free fare gives the system the opportunity to maximize its ridership, reflecting the City's desire for a successful system. Also, there would be less potential for operational delays along the route. The desired headways would therefore be easier to maintain.

The costs of extending the trolley system were estimated with assistance from the City's Trolley Manager. The approximate capital costs associated with both routes are $1,000,000 to 1,200,000 and the approximate annual maintenance and operations costs are $500,000 to $600,000.

It is important that the city evaluates the capacity of the existing Trolley Depot. Due to the success of the trolley system, the number of trolleys has increased significantly from the original estimated number. With the proposed route extensions, the number of trolleys in the system could increase to 15 vehicles. The cost of expanding or relocating the Trolley Depot could significantly increase the cost of the system.

Report.doc

Appendix A
MDT Metrobus Route Information

Coral Gables Trolley Route Expansion
Bus Data

Flagler Street Routes

- Routes 11, 42, and Flagler Max (51)

Frequency and Headway

Bus Route	Direction	AM PEAK		MD PEAK		PM Peak	
		Frequency	Headway	Frequency	Headway	Frequency	Headway
11	EB	15	8 min	13	10 min	15	8 min
	WB	15	8 min	12	10 min	15	8 min
42	EB	4	30 min	4	30 min	4	30 min
	WB	4	30 min	4	30 min	4	30 min
Flagler Max (51)	EB	8	15 min	4	30 min	7	15 min
	WB	6	15 min	4	30 min	8	15 min

Ridership

Peak Period	Direction	Ridership			
		Route 11	Route 42	Route 51	Total
AM Peak	EB	23	3	34	60
	WB	38	6	16	60
MD Peak	EB	10	6	14	30
	WB	23	4	14	41
PM Peak	EB	22	7	30	59
	WB	21	3	9	33

Coral Gables Trolley Route Expansion
Bus Data

Douglas Road Routes

- Routes 6 and 37

Frequency and Headway

Bus Route	Direction	AM PEAK		MD PEAK		PM Peak	
		Frequency	Headway	Frequency	Headway	Frequency	Headway
6	NB	1	60 min	2	60 min	2	60 min
	SB	-	-	2	60 min	1	60 min
37	NB	4	30 min	4	30 min	4	30 min
	SB	4	30 min	4	30 min	4	30 min

Ridership

Peak Period	Direction	Ridership		
		Route 6	Route 37	Total
AM Peak	NB	1	7	8
	SB	4	21	25
MD Peak	NB	7	17	24
	SB	7	3	10
PM Peak	NB	3	46	49
	SB	5	12	17

Coral Gables Trolley Route Expansion
Bus Data

Red Road Street Routes

- Routes 57, 152, and 278

Frequency and Headway

Bus Route	Direction	AM PEAK		MD PEAK		PM Peak	
		Frequency	Headway	Frequency	Headway	Frequency	Headway
57	NB	4	30 min	2	60 min	3	30 min
	SB	4	30 min	2	60 min	4	30 min
152	NB	4	30 min	4	30 min	4	30 min
	SB	4	30 min	4	30 min	4	30 min
278	NB	4	30 min	4	30 min	4	30 min
	SB	5	30 min	4	30 min	4	30 min

Ridership

Peak Period	Direction	Ridership			
		Route 57	Route 152	Route 278	Total
AM Peak	NB	2	1	1	5
	SB	37	1	2	40
MD Peak	NB	0	1	1	2
	SB	0	1	1	2
PM Peak	NB	11	1	2	15
	SB	1	1	1	3

Coral Gables Trolley Route Expansion
Bus Data

Coconut Grove Circulator

Frequency and Headway

Bus Route	Direction	AM PEAK		MD PEAK		PM Peak	
		Frequency	Headway	Frequency	Headway	Frequency	Headway
249	EB	8	15 min	8	15 min	8	15 min
	WB	8	15 min	8	15 min	8	15 min

Ridership

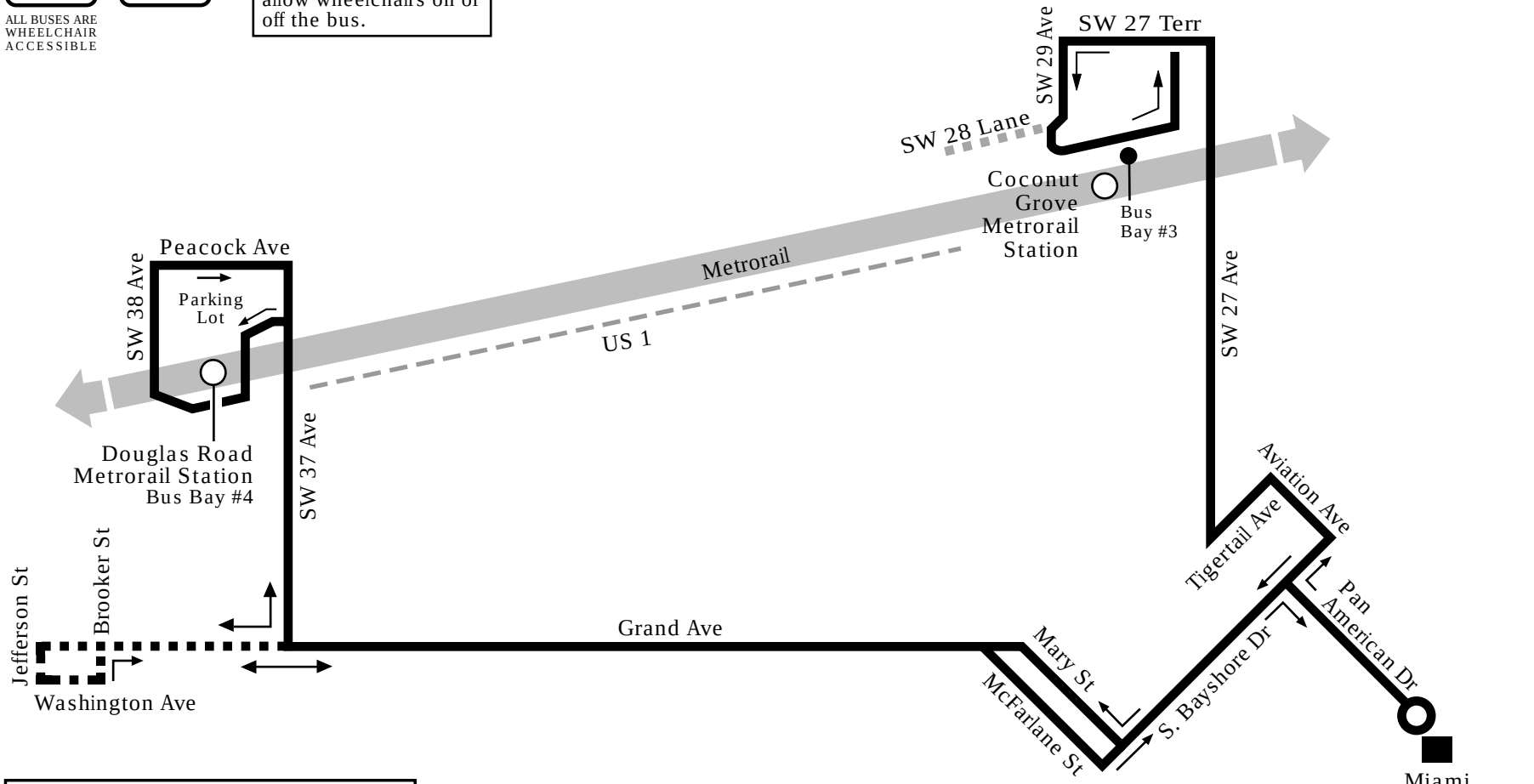
Peak Period	Direction	Total Ridership
AM Peak	EB	3
	WB	7
MD Peak	EB	3
	WB	7
PM Peak	EB	13
	WB	11

Coconut Grove Circulator
Route 249

ALL BUSES ARE WHEELCHAIR ACCESSIBLE

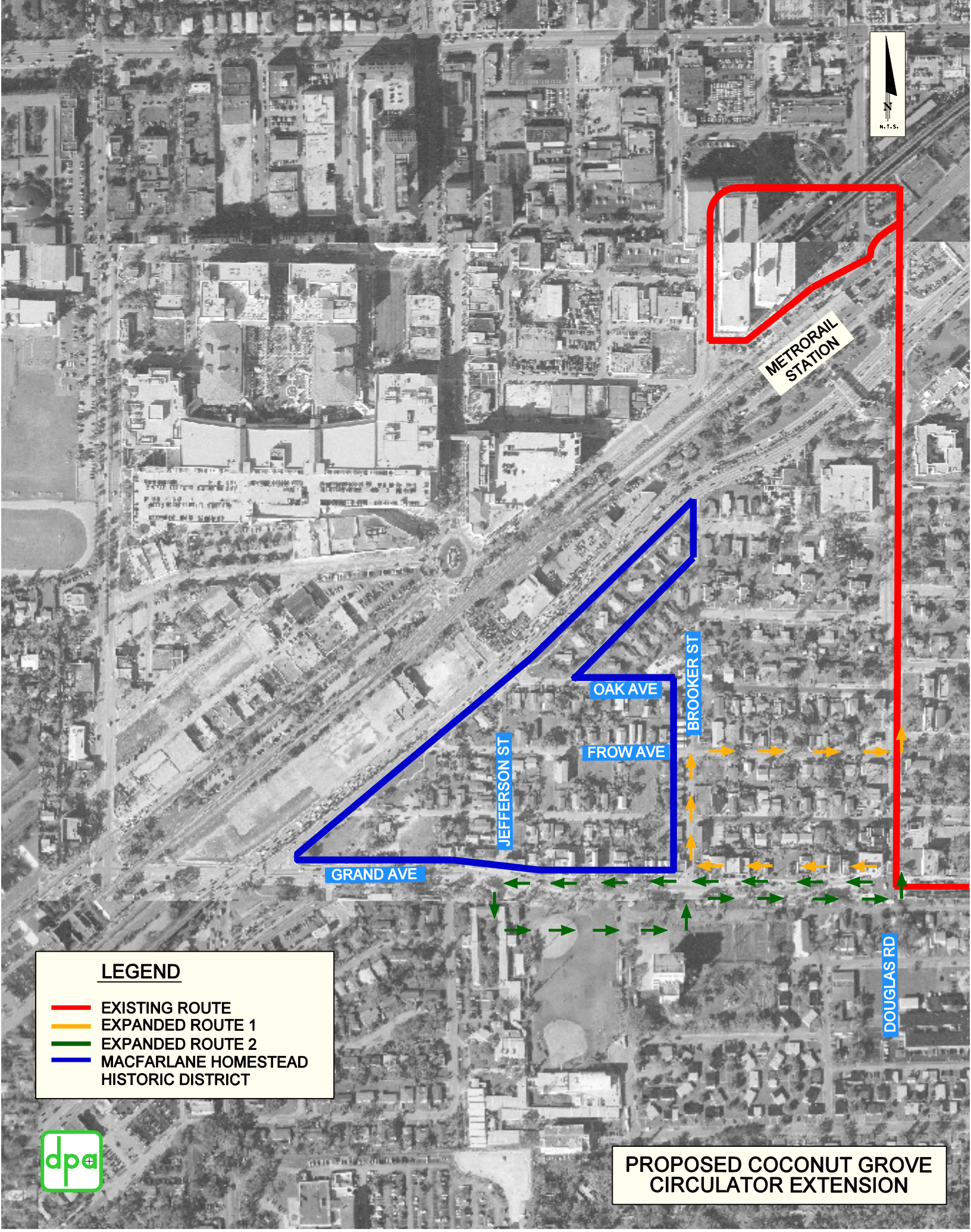
BIKE & RIDE

WHEELCHAIRS
Stop the bus at any location near the stop to allow wheelchairs on or off the bus.



Extension to McFarlane Homestead area effective November 19, 2006

7/06


N
N.T.S.
METRORAIL STATION
OAK AVE
BROOKER ST
FROW AVE
JEFFERSON ST
GRAND AVE
DOUGLAS RD
LEGEND
EXISTING ROUTE
EXPANDED ROUTE 1
EXPANDED ROUTE 2
MACFARLANE HOMESTEAD HISTORIC DISTRICT
dpa
PROPOSED COCONUT GROVE CIRCULATOR EXTENSION

Appendix B
Travel Time Runs

Coral Gables Trolley Route Expansion
Travel Time Summary

Route	Peak Period	Average Travel Time[1]	Adjusted Average Travel Time[2]
Flagler Street Route	AM Peak	06:14	06:14
	MD Peak	06:21	06:21
	PM Peak	09:03	09:03
University of Miami Route	AM Peak	16:16	19:46
	MD Peak	13:51	17:21
	PM Peak	14:19	17:49
Riviera Business District Route	AM Peak	30:41	34:11
	MD Peak	21:55	25:25
	PM Peak	29:31	33:01

[1] University of Miami, Red Road, and Riviera Business District Routes begin and end at Ponce Circle.

[2] Travel times for University of Miami and Riviera Business District Routes adjusted by a conservative 3.5 minutes to account for route extension to Douglas Road Metrorail Station.

Coral Gables Trolley Route Expansion
Flager Street Route

Date: 01/17/2006

From	To	Trial 1 - Start Time 7:48 AM		Trial 2 - Start Time 8:02 AM		Trial 3 - Start Time 8:09 AM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Galiano St / SW 8 St	Ponce de Leon Blvd / SW 8 St	00:27	00:27	00:25	00:25	00:33	00:33
Ponce de Leon Blvd / SW 8 St	Ponce de Leon Blvd / Douglas Rd	02:53	02:26	02:15	01:50	02:08	01:35
Ponce de Leon Blvd / Douglas Rd	Flagler St / Douglas Rd	03:47	00:54	03:04	00:49	02:58	00:50
Flagler St / Douglas Rd	Flagler St / Ponce de Leon Blvd	04:00	00:13	03:18	00:14	03:12	00:14
Flagler St / Ponce de Leon Blvd	Ponce de Leon Blvd / Douglas Rd	04:55	00:55	04:15	00:57	04:16	01:04
Ponce de Leon Blvd / Douglas Rd	Ponce de Leon Blvd / SW 8 St	07:03	02:08	05:48	01:33	05:52	01:36

Date: 01/17/2006

From	To	Trial 1 - Start Time 11:30 AM		Trial 2 - Start Time 11:38 AM		Trial 3 - Start Time 11:47 AM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Galiano St / SW 8 St	Ponce de Leon Blvd / SW 8 St	00:47	00:47	00:50	00:50	00:38	00:38
Ponce de Leon Blvd / SW 8 St	Ponce de Leon Blvd / Douglas Rd	03:02	02:15	03:11	02:21	02:52	02:14
Ponce de Leon Blvd / Douglas Rd	Flagler St / Douglas Rd	04:12	01:10	04:15	01:04	03:52	01:00
Flagler St / Douglas Rd	Flagler St / Ponce de Leon Blvd	04:28	00:16	04:30	00:15	04:36	00:44
Flagler St / Ponce de Leon Blvd	Ponce de Leon Blvd / Douglas Rd	05:01	00:33	05:00	00:30	04:55	00:19
Ponce de Leon Blvd / Douglas Rd	Ponce de Leon Blvd / SW 8 St	06:43	01:42	06:39	01:39	05:42	00:47

Date: 01/17/2006

From	To	Trial 1 - Start Time 4:30 PM		Trial 2 - Start Time 4:45 PM		Trial 3 - Start Time 4:56 PM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Galiano St / SW 8 St	Ponce de Leon Blvd / SW 8 St	01:03	01:03	00:55	00:55	01:05	01:05
Ponce de Leon Blvd / SW 8 St	Ponce de Leon Blvd / Douglas Rd	03:39	02:36	04:01	03:06	02:37	01:32
Ponce de Leon Blvd / Douglas Rd	Flagler St / Douglas Rd	05:18	01:39	05:29	01:28	03:21	00:44
Flagler St / Douglas Rd	Flagler St / Ponce de Leon Blvd	05:35	00:17	05:43	00:14	03:38	00:17
Flagler St / Ponce de Leon Blvd	Ponce de Leon Blvd / Douglas Rd	06:40	01:05	06:56	01:13	05:07	01:29
Ponce de Leon Blvd / Douglas Rd	Ponce de Leon Blvd / SW 8 St	09:30	02:50	09:43	02:47	07:57	02:50

Average Peak Hour Travel Time

From	To	AM Peak Hour	Midday Peak Hour	PM Peak Hour
		Average Travel Time	Average Travel Time	Average Travel Time
Galiano St / SW 8 St	Ponce de Leon Blvd / SW 8 St	00:28	00:45	01:01
Ponce de Leon Blvd / SW 8 St	Ponce de Leon Blvd / Douglas Rd	01:57	02:17	02:25
Ponce de Leon Blvd / Douglas Rd	Flagler St / Douglas Rd	00:51	01:05	01:17
Flagler St / Douglas Rd	Flagler St / Ponce de Leon Blvd	00:14	00:25	00:16
Flagler St / Ponce de Leon Blvd	Ponce de Leon Blvd / Douglas Rd	00:59	00:27	01:16
Ponce de Leon Blvd / Douglas Rd	Ponce de Leon Blvd / SW 8 St	01:46	01:23	02:49
Average Total Travel Time		**06:14**	**06:21**	**09:03**

Coral Gables Trolley Route Expansion
University of Miami Route

Date: 01/18/2006

From	To	Trial 1 - Start Time 7:49 AM		Trial 2 - Start Time 11:10 AM		Trial 3 - Start Time 4:09 PM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	01:23	01:23	01:31	01:31	01:35	01:35
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	02:31	01:08	02:45	01:14	02:58	01:23
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	04:32	02:01	04:23	01:38	05:03	02:05
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	05:32	01:00	05:07	00:44	06:21	01:18
Ponce de Leon Blvd / Stanford Dr	Stanford Circle	06:48	01:16	06:36	01:29	07:39	01:18
Stanford Circle	Ponce de Leon Blvd / Stanford Dr	08:30	01:42	09:16	02:40	09:12	01:33
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / Granada Blvd	09:44	01:14	10:03	00:47	10:27	01:15
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	11:15	01:31	11:07	01:04	12:15	01:48
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	16:27	05:12	12:55	01:48	13:14	00:59
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	17:23	00:56	13:53	00:58	14:53	01:39

Date: 01/19/2006

From	To	Trial 1 - Start Time 7:36 AM		Trial 2 - Start Time 11:10 AM		Trial 3 - Start Time 4:20 PM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	01:41	01:41	01:15	01:15	01:39	01:39
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	02:49	01:08	02:17	01:02	03:09	01:30
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	04:49	02:00	03:52	01:35	05:01	01:52
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	05:35	00:46	04:39	00:47	05:44	00:43
Ponce de Leon Blvd / Stanford Dr	Stanford Circle	06:58	01:23	06:00	01:21	07:01	01:17
Stanford Circle	Ponce de Leon Blvd / Stanford Dr	08:42	01:44	08:16	02:16	08:21	01:20
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / Granada Blvd	09:50	01:08	09:39	01:23	09:32	01:11
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	11:27	01:37	10:44	01:05	11:18	01:46
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	13:58	02:31	12:29	01:45	13:11	01:53
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	14:57	00:59	13:29	01:00	14:15	01:04

Date: 01/20/2006

From	To	Trial 1 - Start Time 7:30 AM		Trial 2 - Start Time 11:05 AM		Trial 3 - Start Time 4:03 PM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	00:55	00:55	01:43	01:43	01:29	01:29
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	02:08	01:13	02:50	01:07	02:58	01:29
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	03:16	01:08	04:41	01:51	04:49	01:51
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	03:56	00:40	05:46	01:05	05:36	00:47
Ponce de Leon Blvd / Stanford Dr	Stanford Circle	05:11	01:15	06:53	01:07	07:05	01:29
Stanford Circle	Ponce de Leon Blvd / Stanford Dr	06:54	01:43	08:54	02:01	09:08	02:03
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / Granada Blvd	08:09	01:15	10:17	01:23	10:17	01:09
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	09:33	01:24	11:24	01:07	11:28	01:11
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	15:38	06:05	13:13	01:49	12:56	01:28
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	16:27	00:49	14:11	00:58	13:49	00:53

Average Peak Hour Travel Time

From	To	AM Peak Hour	Midday Peak Hour	PM Peak Hour
		Average Travel Time	Average Travel Time	Average Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	01:20	01:30	01:34
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	01:10	01:08	01:27
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	01:43	01:41	01:56
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	00:49	00:52	00:56
Ponce de Leon Blvd / Stanford Dr	Stanford Circle	01:18	01:19	01:21
Stanford Circle	Ponce de Leon Blvd / Stanford Dr	01:43	02:19	01:39
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / Granada Blvd	01:12	01:11	01:12
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	01:31	01:05	01:35
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	04:36	01:47	01:27
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	00:55	00:59	01:12
Average Total Travel Time		**16:16**	**13:51**	**14:19**

Coral Gables Trolley Route Expansion
Riviera Business District Route

Date: 01/18/2006

From	To	Trial 1 - Start Time 8:29 AM		Trial 2 - Start Time 12:00 PM		Trial 3 - Start Time 4:44 PM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	00:37	00:37	02:15	02:15	03:02	03:02
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	01:39	01:02	03:25	01:10	04:32	01:30
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	03:32	01:53	05:15	01:50	07:25	02:53
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	04:15	00:43	06:03	00:48	08:01	00:36
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / S Alhambra Cir	06:08	01:53	07:53	01:50	11:30	03:29
Ponce de Leon Blvd / S Alhambra Cir	Nervia St / S Alhambra Cir	07:45	01:37	09:57	02:04	14:21	02:51
Nervia St / S Alhambra Cir	Nervia St / Santona St	08:21	00:36	10:15	00:18	14:50	00:29
Nervia St / Santona St	Yumuri St / Monza St	09:11	00:50	10:39	00:24	15:37	00:47
Yumuri St / Monza St	Yumuri St / Sunset Dr	11:11	02:00	11:05	00:26	17:12	01:35
Yumuri St / Sunset Dr	Red Rd / Sunset Dr	12:21	01:10	13:00	01:55	18:18	01:06
Red Rd / Sunset Dr	US-1 / Red Rd	18:38	06:17	16:07	03:07	23:19	05:01
US-1 / Red Rd	Ponce de Leon Blvd / Red Rd	18:45	00:07	17:16	01:09	23:33	00:14
Ponce de Leon Blvd / Red Rd	Ponce de Leon Blvd / S Alhambra Cir	22:11	03:26	17:36	00:20	25:38	02:05
Ponce de Leon Blvd / S Alhambra Cir	Ponce de Leon Blvd / Standford Dr	23:55	01:44	19:28	01:52	27:27	01:49
Ponce de Leon Blvd / Standford Dr	Ponce de Leon Blvd / Granada Blvd	24:46	00:51	20:17	00:49	28:16	00:49
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	25:26	00:40	21:18	01:01	29:46	01:30
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	30:00	04:34	23:05	01:47	31:15	01:29
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	30:42	00:42	23:59	00:54	32:04	00:49

Date: 01/19/2006

From	To	Trial 1 - Start Time 8:30 AM		Trial 2 - Start Time 11:55 AM		Trial 3 - Start Time 4:46 PM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	00:43	00:43	00:44	00:44	00:45	00:45
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	01:39	00:56	01:45	01:01	02:02	01:17
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	02:40	01:01	03:31	01:46	04:55	02:53
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	03:23	00:43	04:27	00:56	05:39	00:44
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / S Alhambra Cir	04:48	01:25	06:18	01:51	07:52	02:13
Ponce de Leon Blvd / S Alhambra Cir	Nervia St / S Alhambra Cir	07:46	02:58	08:14	01:56	08:40	00:48
Nervia St / S Alhambra Cir	Nervia St / Santona St	08:02	00:16	08:29	00:15	09:54	01:14
Nervia St / Santona St	Yumuri St / Monza St	08:42	00:40	09:09	00:40	10:37	00:43
Yumuri St / Monza St	Yumuri St / Sunset Dr	10:57	02:15	10:34	01:25	12:47	02:10
Yumuri St / Sunset Dr	Red Rd / Sunset Dr	11:43	00:46	11:46	01:12	14:50	02:03
Red Rd / Sunset Dr	US-1 / Red Rd	14:02	02:19	14:13	02:27	15:48	00:58
US-1 / Red Rd	Ponce de Leon Blvd / Red Rd	14:11	00:09	14:25	00:12	19:03	03:15
Ponce de Leon Blvd / Red Rd	Ponce de Leon Blvd / S Alhambra Cir	17:31	03:20	15:57	01:32	20:08	01:05
Ponce de Leon Blvd / S Alhambra Cir	Ponce de Leon Blvd / Standford Dr	19:37	02:06	17:03	01:06	21:58	01:50
Ponce de Leon Blvd / Standford Dr	Ponce de Leon Blvd / Granada Blvd	21:03	01:26	17:34	00:31	22:32	00:34
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	22:48	01:45	18:48	01:14	24:08	01:36
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	28:04	05:16	19:46	00:58	26:02	01:54
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	29:38	01:34	20:56	01:10	26:59	00:57

Date: 01/20/2006

From	To	Trial 1 - Start Time 8:21 AM		Trial 2 - Start Time 11:43 AM		Trial 3 - Start Time 4:48 PM	
		Time	Travel Time	Time	Travel Time	Time	Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	01:12	01:12	00:50	00:50	03:07	03:07
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	02:14	01:02	01:48	00:58	04:32	01:25
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	03:17	01:03	02:55	01:07	07:47	03:15
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	03:55	00:38	04:32	01:37	08:58	01:11
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / S Alhambra Cir	05:28	01:33	06:06	01:34	11:51	02:53
Ponce de Leon Blvd / S Alhambra Cir	Nervia St / S Alhambra Cir	08:26	02:58	08:18	02:12	14:14	02:23
Nervia St / S Alhambra Cir	Nervia St / Santona St	08:42	00:16	08:34	00:16	14:58	00:44
Nervia St / Santona St	Yumuri St / Monza St	09:22	00:40	09:12	00:38	15:38	00:40
Yumuri St / Monza St	Yumuri St / Sunset Dr	11:35	02:13	11:00	01:48	17:01	01:23
Yumuri St / Sunset Dr	Red Rd / Sunset Dr	12:29	00:54	11:50	00:50	18:25	01:24
Red Rd / Sunset Dr	US-1 / Red Rd	19:20	06:51	14:13	02:23	21:22	02:57
US-1 / Red Rd	Ponce de Leon Blvd / Red Rd	19:35	00:15	14:28	00:15	22:08	00:46
Ponce de Leon Blvd / Red Rd	Ponce de Leon Blvd / S Alhambra Cir	21:53	02:18	15:36	01:08	23:25	01:17
Ponce de Leon Blvd / S Alhambra Cir	Ponce de Leon Blvd / Standford Dr	24:03	02:10	16:53	01:17	25:21	01:56
Ponce de Leon Blvd / Standford Dr	Ponce de Leon Blvd / Granada Blvd	24:39	00:36	17:26	00:33	26:01	00:40
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	25:55	01:16	18:53	01:27	27:00	00:59
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	30:47	04:52	19:55	01:02	28:40	01:40
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	31:43	00:56	20:50	00:55	29:30	00:50

Average Peak Hour Travel Time

From	To	AM Peak Hour	Midday Peak Hour	PM Peak Hour
		Average Travel Time	Average Travel Time	Average Travel Time
Ponce de Leon Blvd / Ponce de Leon Blvd	Ponce de Leon Blvd / LeJeune Rd	00:51	01:16	02:18
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Riviera Dr	01:00	01:03	01:24
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / Granada Blvd	01:19	01:34	03:00
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Stanford Dr	00:41	01:07	00:50
Ponce de Leon Blvd / Stanford Dr	Ponce de Leon Blvd / S Alhambra Cir	01:37	01:45	02:52
Ponce de Leon Blvd / S Alhambra Cir	Nervia St / S Alhambra Cir	02:31	02:04	02:01
Nervia St / S Alhambra Cir	Nervia St / Santona St	00:23	00:16	00:49
Nervia St / Santona St	Yumuri St / Monza St	00:43	00:34	00:43
Yumuri St / Monza St	Yumuri St / Sunset Dr	02:09	01:13	01:43
Yumuri St / Sunset Dr	Red Rd / Sunset Dr	00:57	01:19	01:31
Red Rd / Sunset Dr	US-1 / Red Rd	05:09	02:39	02:59
US-1 / Red Rd	Ponce de Leon Blvd / Red Rd	00:10	00:32	01:25
Ponce de Leon Blvd / Red Rd	Ponce de Leon Blvd / S Alhambra Cir	03:01	01:00	01:29
Ponce de Leon Blvd / S Alhambra Cir	Ponce de Leon Blvd / Standford Dr	02:00	01:25	01:52
Ponce de Leon Blvd / Standford Dr	Ponce de Leon Blvd / Granada Blvd	00:58	00:38	00:41
Ponce de Leon Blvd / Granada Blvd	Ponce de Leon Blvd / Riviera Dr	01:14	01:14	01:22
Ponce de Leon Blvd / Riviera Dr	Ponce de Leon Blvd / LeJeune Rd	04:54	01:16	01:41
Ponce de Leon Blvd / LeJeune Rd	Ponce de Leon Blvd / Ponce de Leon Blvd	01:04	01:00	00:52
Average Total Travel Time		**30:41**	**21:55**	**29:31**

Appendix C
Preliminary Stop Locations

Preliminary Bus Stop Locations

Flagler Route

1. Ponce de Leon Boulevard between SW 8 Street and Galiano Street (east side)
2. Ponce de Leon Boulevard between Alcantarra Avenue and Marabella Avenue (east side)
3. Ponce de Leon Boulevard between Carmona Avenue and Douglas Road (east side)
4. Douglas Road between Ponce de Leon Boulevard and Flagler Street (east side)
5. Ponce de Leon Boulevard between Flagler Street and Douglas Road (west side)
6. Ponce de Leon Boulevard between Douglas Road and Campina Court (west side)
7. Ponce de Leon Boulevard between Boabadilla Street and Cibao Court (west side)
8. Ponce de Leon Boulevard between Avila Court and SW 8 Street (west side)

Riviera Business District Route

Stop locations along Ponce de Leon Boulevard are for both the north and south side unless otherwise noted.

1. Ponce de Leon Boulevard between the Ponce Circle and LeJeune Road
2. Ponce de Leon Boulevard between LeJeune Road and Suarez Street
3. Ponce de Leon Boulevard between Orduna Drive and Donatello Street
4. Ponce de Leon Boulevard between Carillo Street and Stanford Drive
5. Ponce de Leon Boulevard between Stanford Drive and Merrick Street
6. Ponce de Leon Boulevard between Merrick Street and South Alhambra Circle
7. Alhambra Circle between US 1 and Nervia Street (west side)
8. Santona Street between Nervia Street and Madruga Avenue (north side)
9. Madruga Avenue between Santona Street and Yumuri Street (west side)
10. Madruga Avenue between Monza Avenue and Venera Avenue (west side)
11. Yumuri Street between San Ignacio Avenue and Sunset Road (west side)
12. Sunset Road between Yumuri Street and Red Road (north side)
13. Red Road between Sunset Road and San Remo Avenue (east side)
14. Red Road between San Remo Avenue and US 1(east side)

David Plummer & Associates

TRANSPORTATION•CIVIL•STRUCTURAL•ENVIRONMENTAL