

Final Report



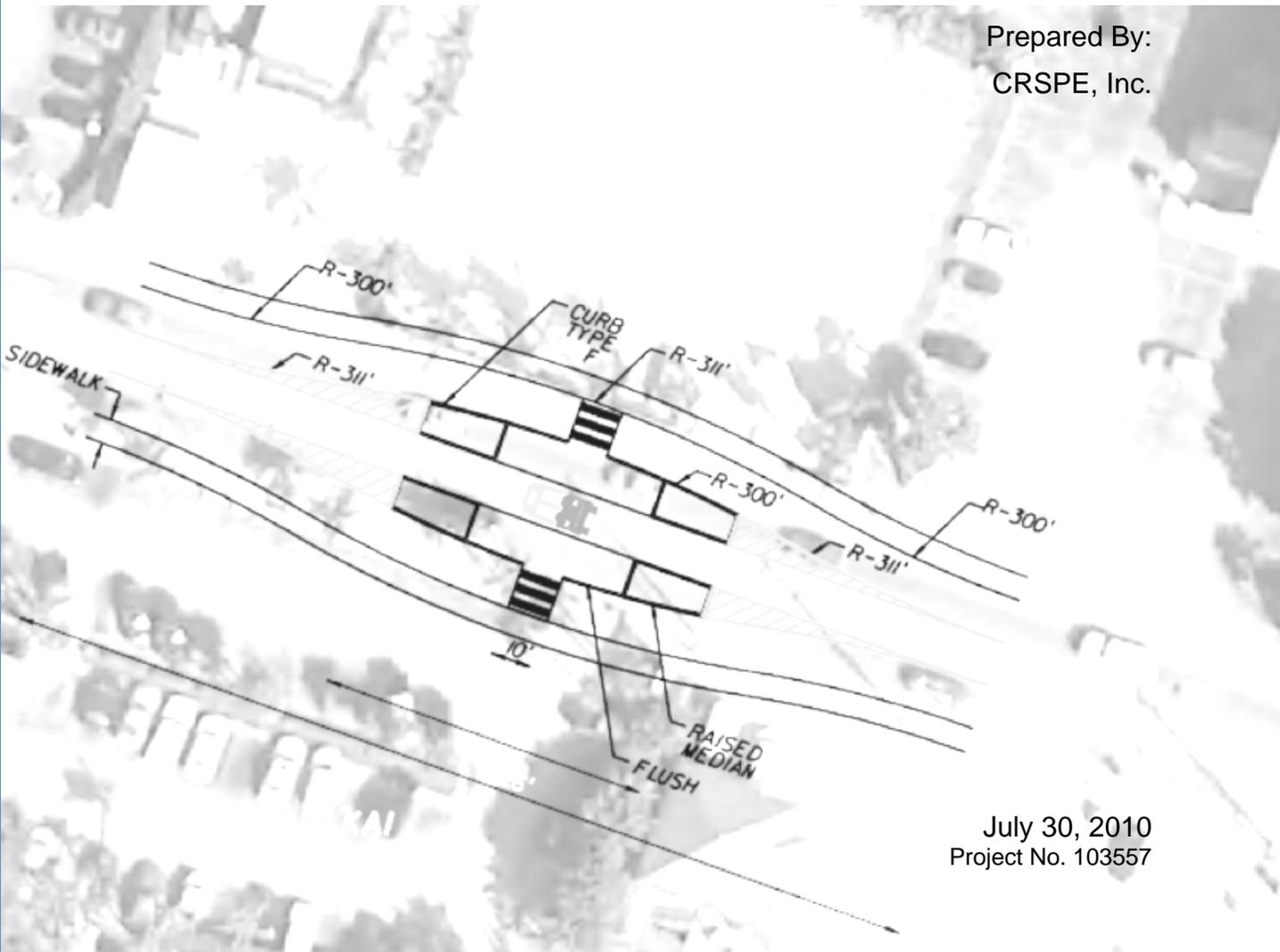
Fort Myers Beach Trolley – Sketch Analysis

For:

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Prepared By:
CRSPE, Inc.



July 30, 2010
Project No. 103557

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Executive Summary

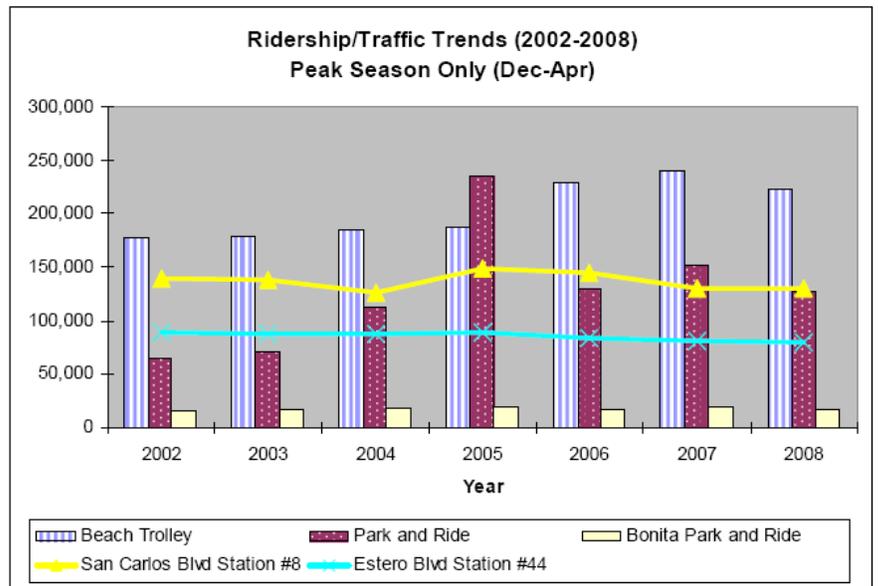
Background

Public transit service, in the form of the Beach Trolley and Park and Ride Trolleys, has played a significant role in the transportation system for Fort Myers Beach and Estero Island for many years. Traffic congestion on the island continues to be exceptionally heavy during peak season, and the geography of the island lends itself particularly well to transit service. Therefore, the potential for improving transit service to and from the island, as well as on the island itself, continues to be investigated.

Estero Boulevard, the primary roadway serving Fort Myers Beach, and San Carlos Boulevard, which provides access to and from the island, experience exceptionally heavy congestion. The trolley service has the ability to make a significant positive impact on quality of life, convenience, and the environment. The purpose of this report is to determine the potential impact of improvements to transit service for the island, and to document the potential reduction in fuel use and greenhouse gas emissions of these improvements.

Study Process

The study team reviewed existing Trolley services to and from the island, as well as those services on the island. A comparison was made between existing transit ridership and traffic trends recorded by Lee County at different count stations. Recent reports show traffic flow has not increased in several years. This includes years when traffic would not have been affected by the economic downturn. As traffic in



other areas of the county has increased, this indicates that latent demand for the facility exists. It is therefore likely that Estero Blvd. currently operates, and has been operating, at capacity with no room for additional vehicles. Additional

capacity to accommodate demand is needed. As increases to roadway width are impractical even if they were desirable, transit service becomes the alternative most likely to be able to provide needed capacity.

An online survey was conducted to determine factors that influence use of the Fort Myers Beach Trolley. The primary purpose of the online survey was to:

- Determine what amenities or operational changes would improve the likelihood of trolley ridership, and how much increase in ridership could be anticipated. The two highest responses were:
 - a transit-only lane to bypass congestion, and
 - waiting less than 15 minutes between trolleys.
- Identify how many trips could be anticipated to be shifted from automobiles to the trolley, and estimate how many trips would be new trips.

Trolley Alternatives

Three alternatives were developed to improve Trolley service to Fort Myers Beach. Alternatives were based upon previous studies, feedback from local staff, the online survey, and from reviewing ridership trends. Conceptual designs are available within the full report, Section 4. The alternatives (which are not mutually exclusive) are:

- Alternative A: Modify the Summerlin Square Park and Ride route to terminate in or near Lynn Hall Park rather than Bowditch Park
- Alternative B: Capital Improvements to San Carlos Boulevard to incorporate a Trolley-only Lane. Three options are considered for this alternative:
 - Five Lane Option with Shared Center Turn/Trolley Lane
 - Five-lane Option with exclusive Trolley Only Lane
 - Six-lane Option with Center Turn Lane and Separate Trolley Lane
- Alternative C: Capital Improvements to Estero Boulevard Stops and a Trolley-only Lane on Estero Boulevard.

Carbon Reduction

FMB Trolley service has the opportunity to play a prominent role in reducing carbon emissions for Fort Myers Beach and the surrounding areas by providing an effective and efficient alternative to the personal automobile for travel to and from Fort Myers Beach. Each of the alternatives addresses congestion and the reduction of carbon emissions by incorporating improvements to Trolley service and facilities. Reductions occur because:

- The trolley-only lane will offer a much quicker trip to Fort Myers Beach which will result in a significant modal shift to the trolleys.
- Traffic on the roadway will also improve because the roadway is operating more efficiently due to the reduced traffic queue.

The carbon reduction for improved trolley use on San Carlos Boulevard was calculated using three different types of vehicles – standard diesel, diesel-electric hybrid, and a hydrogen fuel cell or electric-hydrogen hybrid that uses no fossil fuels. A reduction was estimated for a conservative 10 percent mode shift estimate and an aggressive 20 percent mode shift.

4 MPG Transit		
	10 Percent Mode Shift	20 Percent Mode Shift
Daily Auto Fuel Savings (gal)	404	1,015
Daily Change in Transit Fuel Use (gal)	170	402
Daily Total Net Change in Fuel Use (gal)	235	613
Annual Total Net Change in Fuel Use (gal)	28,185	73,604
Annual Total Carbon Savings (metric tons)	222	586

15 MPG Transit		
	10 Percent Mode Shift	20 Percent Mode Shift
Daily Auto Fuel Savings (gal)	404	1,015
Daily Change in Transit Fuel Use (gal)	-58	4
Daily Total Net Change in Fuel Use (gal)	463	1,013
Annual Total Net Change in Fuel Use (gal)	55,540	121,518
Annual Total Carbon Savings (metric tons)	498	1,068

Hydrogen Transit		
	10 Percent Mode Shift	20 Percent Mode Shift
Daily Auto Fuel Savings (gal)	404	1,015
Daily Change in Transit Fuel Use (gal)	-141	-141
Daily Total Net Change in Fuel Use (gal)	546	1,157
Annual Total Net Change in Fuel Use (gal)	65,488	138,791
Annual Total Carbon Savings (metric tons)	598	1,243

Improved transit service and transit facilities will result in carbon reduction, a reduction of other pollutants, and reduction in fuel use. The Trolley service has the ability to make a significant positive impact on quality of life, convenience, and the environment. As the proposed Trolley improvements come to fruition over the next few years, LeeTran and the community of Fort Myers Beach, as well as communities and businesses along San Carlos Boulevard, will see significant benefits from increased mobility.

Section 1: Introduction

Public transit service, in the form of the Beach Trolley and Park and Ride Trolleys, has played a significant role in the transportation system for Fort Myers Beach for many years. In 2005, significant upgrades were made to the Trolley service. These included:

- Next bus, a real-time trolley information system,
- Trolley-only lane on the Matanzas Pass bridge leading to the island,
- Reduced headways,
- Free trolley trips, and
- Accommodation for beach gear.

These changes resulted in an exceptional spike in Park and Ride Trolley use. Since that time, Trolley use has returned to levels more in line with normal growth. The current headways are not as short as they were in 2005, and the service is no longer fare free. These factors and others are why ridership has remained at levels more in line with normal growth.

Traffic congestion on the island continues to be exceptionally heavy during peak season, and the geography of the island lends itself particularly well to transit service. Therefore, the potential for improving transit service to and from the island, as well as on the island itself continues to be investigated.

Estero Boulevard, the primary roadway serving Fort Myers Beach, experiences exceptionally heavy congestion. The Trolley transit service has the ability to reduce the number of vehicle trips to and from, as well as, on Fort Myers Beach reducing this congestion. The Trolley, therefore, represents the potential in Fort Myers Beach to make a significant positive impact on quality of life, convenience, and the environment.

The purpose of this report is to determine the potential impact of improvements to transit service on the island, and to document the potential reduction in fuel use and greenhouse gas emissions of these improvements.

Section 2: Existing Trolley Services

Trolley Services

During peak season, mid-December through the end of April, existing public transit service for Fort Myers Beach consists of three routes.

- Fort Myers Beach Trolley
- Bonita Springs Trolley
- Summerlin Square Park and Ride

Fort Myers Beach Trolley is the on-island public transit service that runs from Bowditch Point Park on the northern end of Estero Island to Lover's Key State Park just south of Estero Island. During peak season, three peak vehicles are operated for this route. Service begins at 6:20 a.m. and ends at approximately 10:30 p.m., seven days per week. Headways begin at 60-minute service, then to 30-minute from 7:20 a.m. until 9:50 a.m., then 20-minute service until 10:10 a.m. The mid-day service is every 12 minutes till approximately 8:45 p.m., then to 30-minute headways. Figure 2-1, shown on the following page, presents the route and schedule times for the peak season. Three peak season trolleys are funded by the county and two additional by the Town of Fort Myers Beach for a total of five vehicles.

The **Bonita Springs Trolley** provides access to the island from the south. Service begins in the K-mart Shopping Center in Bonita Springs, travels west on Bonita Beach Road, and then travels north to the northern end of Lover's Key Park. Service operates from 7:30 a.m. to 9:15 p.m. seven days per week. One peak vehicle operates during peak season with service every 60 minutes.

The **Summerlin Square Park and Ride Trolley** service begins at the Park and Ride facility located in the Summerlin Square Shopping Center on San Carlos Blvd. This route operates from 7:00 a.m. to 9:40 p.m., seven days per week. The Trolley travels along San Carlos Boulevard picking up passengers at designated trolley stops along the way. This route also has a stop at the park-and-ride lot near the northern base of the Matanzas Pass Bridge and then travels to the transit facility at Bowditch Point Park. The Trolley traverses the same route in reverse back to the Summerlin Square Park and Ride lot. Three buses are provided for this Trolley route during peak season. Headways begin with 30-minute service, increase to every 20 minutes throughout the day until 6:40 p.m., then to 45-minute service. Figure 2-3 illustrates the route and schedules for the Summerlin Square Trolley service.

Figure 2-1

Beach Trolley



Know When to Go!

Get real-time trolley arrival information on your PDA or cell phone.

Text messaging:

Type in the address: 41411

Type in: nbus ftmyers, followed by the stop I.D. number on the trolley stop sign

Internet phones:

Enter the URL www.nextbus.com

Select "ftmyers."

Select your stop from the list

NextBus arrival signs are located at Summerlin Square, Bowditch Park, Lynn Hall Park, and the Main Street parking lot.



MONDAY - SUNDAY SERVICE

SOUTHBOUND

Bowditch Park	Times Square	Santini Plaza	Lovers Key
1	2	3	4
6:20	6:25	6:40	6:45
7:20	7:25	7:40	7:45
7:50	7:55	8:10	8:15
8:20	8:25	8:40	8:45
8:50	8:55	9:10	9:15
9:20	9:25	9:40	9:45
9:50	9:55	10:10	10:15
10:10	10:15	10:30	10:35
10:22	10:27	10:42	10:47
10:34	10:39	10:54	10:59
10:46	10:51	11:06	11:11
10:58	11:03	11:18	11:23
11:10	11:15	11:30	11:35
Every 15 Minutes until			
7:10	7:15	7:30	7:35
7:25	7:30	7:45	7:50
7:40	7:45	8:00	8:05
7:55	8:00	8:15	8:20
8:10	8:15	8:30	8:35
8:25	8:30	8:45	8:50
8:40	8:45	9:00	9:05
8:55	9:00	9:15	9:20
9:10	9:15	9:30	9:35
9:25	9:30	9:45	9:50
9:55	10:00	10:15	10:20

NORTHBOUND

Lovers Key	Santini Plaza	1st Street/ Old San Carlos	Bowditch Park
4	3	2	1
	5:50	*	6:20
6:50	6:55	7:10	7:15
7:50	7:55	8:10	8:15
8:20	8:25	8:40	8:45
8:50	8:55	9:10	9:15
9:20	9:25	9:40	9:45
9:50	9:55	10:10	10:15
10:20	10:25	10:40	10:45
10:40	10:45	11:00	11:05
10:52	10:57	11:12	11:17
11:04	11:09	11:24	11:29
11:16	11:21	11:36	11:41
11:28	11:33	11:48	11:53
11:40	11:45	12:15	12:20
Every 15 Minutes until			
7:40	7:45	8:15	8:20
7:55	8:00	8:15	---
8:10	8:15	8:30	8:35
8:25	8:30	8:45	8:50
8:40	8:45	9:00	9:05
8:55	9:00	9:15	9:20
9:10	9:15	9:30	---
9:25	9:30	9:45	9:50
9:40	9:45	10:00	---
9:55	10:00	10:15	10:20
10:25	10:30	10:45	---

Shaded trip provides Monday - Saturday service only.

PM Times are in **Bold** - All times are approximate

* This trip travels to Summerlin Square instead of Times Square, arriving at 6:10 a.m.

--- Trip ends at Summerlin Square instead of Bowditch Park Via Fifth Street.

Figure 2-2

Bonita Springs Trolley



MONDAY - SUNDAY SERVICE

NORTHBOUND

Bonita K-Mart	Bonita Beach	Lovers Key
3	2	1
7:30	7:40	7:55
8:30	8:40	8:55
9:30	9:40	9:55
10:30	10:40	10:55
11:30	11:40	11:55
12:30	12:40	12:55
1:30	1:40	1:55
2:30	2:40	2:55
3:30	3:40	3:55
4:30	4:40	4:55
5:30	5:40	5:55
6:30	6:40	6:55
7:30	7:40	7:55
8:25	8:35	8:45

SOUTHBOUND

Lovers Key	Bonita Beach	Bonita K-Mart
1	2	3
8:00	8:15	8:25
9:00	9:15	9:25
10:00	10:15	10:25
11:00	11:15	11:25
12:00	12:15	12:25
1:00	1:15	1:25
2:00	2:15	2:25
3:00	3:15	3:25
4:00	4:15	4:25
5:00	5:15	5:25
6:00	6:15	6:25
7:00	7:15	7:25
7:55	8:10	8:20
8:50	9:05	9:15

PM Times are in **Bold** - All times are approximate

Check for real-time trolley arrivals for your stop by visiting www.NextBus.com.

Figure 2-3

Summerlin Square Park and Ride



MONDAY - SUNDAY SERVICE

SOUTHBOUND

Summerlin Square	Bowditch Park
1	2
7:00	7:15
7:30	7:45
8:00	8:15
8:40	9:00
9:00	9:20
9:15	9:35
9:30	9:50
9:50	10:10
10:05	10:25
10:20	10:40
Every 20 Minutes until	
3:55	4:15
4:10	4:30
4:30	4:50
4:45	5:05
5:00	5:20
5:20	5:40
5:35	5:55
5:50	6:10
6:10	6:30
6:25	6:45
6:40	7:00
7:25	7:45
8:10	8:30
8:55	9:15

NORTHBOUND

Bowditch Park	Summerlin Square
2	1
7:15	7:30
7:45	8:00
8:15	8:35
9:05	9:25
9:25	9:45
9:40	10:00
9:55	10:15
10:15	10:35
10:30	10:50
10:45	11:05
Every 20 Minutes until	
4:20	4:40
4:35	4:55
4:55	5:15
5:10	5:30
5:25	5:45
5:45	6:05
6:00	6:20
6:15	6:35
6:35	6:55
6:50	7:10
7:00	7:20
7:45	8:05
8:30	8:50
9:20	9:40

PM Times are in **Bold** - All times are approximate

During the off-season, the three routes are combined into one route called the Beach Trolley. The service operates to/from the Summerlin Park and Ride lot to the island and to the Bonita Springs K-Mart, from 5:50 a.m. to 9:10 p.m. Two trolleys are provided for the route and headways vary between 60 and 70 minutes. Figure 2-4 shows the map and schedules for the off-season Trolley service.

Figure 2-4: Off-season Trolley Service

Beach Trolley Map



MONDAY - SUNDAY SERVICE

SOUTHBOUND

Summerlin Square	Bowditch Park	Times Square	Santini Plaza	Lovers Key State Park	Key K-Mart	Bonita K-Mart
1	2	3	4	5	6	
6:10	6:20	6:25	6:40	6:45	7:05	
7:15	7:30	7:35	7:50	7:55	8:15	
8:20	8:30	8:35	8:50	8:55	9:15	
9:25	9:40	9:45	10:00	10:05	10:25	
10:25	10:40	10:45	11:00	11:05	11:25	
11:35	11:50	11:55	12:10	12:15	12:35	
12:35	12:50	12:55	1:10	1:15	1:35	
1:45	2:00	2:05	2:20	2:25	2:45	
2:45	3:00	3:05	3:20	3:25	3:45	
3:55	4:10	4:15	4:30	4:35	4:55	
4:55	5:10	5:15	5:30	5:35	5:55	
6:05	6:20	6:25	6:40	6:45	7:05	
7:05	7:20	7:25	7:40	7:45	8:05	

NORTHBOUND

Bonita K-Mart	Lovers Key State Park	Santini Plaza	First St. @ Old San Carlos	Bowditch Park	Summerlin Square
6	5	4	7	2	1
--	--	5:50	--	--	6:10
7:10	7:30	7:35	7:50	7:55	8:10
8:20	8:40	8:45	9:00	9:05	9:20
9:20	9:40	9:45	10:00	10:05	10:20
10:30	10:50	10:55	11:10	11:15	11:30
11:30	11:50	11:55	12:10	12:15	12:30
12:40	1:00	1:05	1:20	1:25	1:40
1:40	2:00	2:05	2:20	2:25	2:40
2:50	3:10	3:15	3:30	3:35	3:50
3:50	4:10	4:15	4:30	4:35	4:50
5:00	5:20	5:25	5:40	5:45	6:00
6:00	6:20	6:25	6:40	6:45	7:00
7:10	7:30	7:35	7:50	7:55	8:10
8:10	8:30	8:35	8:50	8:55	9:10

Shaded trip provides Monday - Saturday service only.

PM Times are in **Bold** - All times are approximate

Park and Ride Improvements

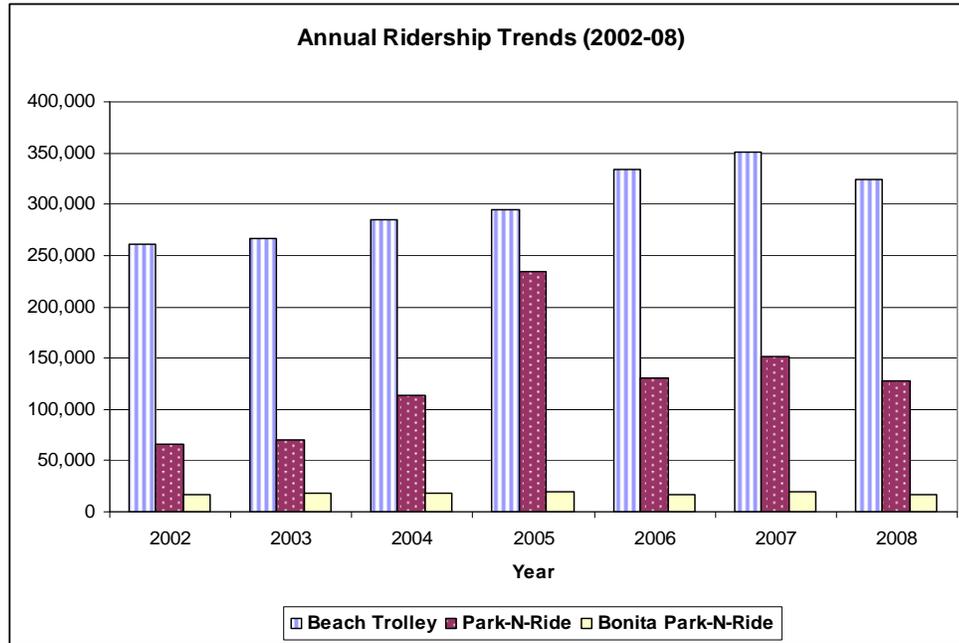
During the heavy use of the Park and Ride Route during the peak season of 2005, the need for a separate park and ride facility to service the potential demand for this route became apparent. Because of the route's popularity, the park and ride facility had to be moved out of the Summerlin Square Shopping Plaza and onto an adjacent vacant property. Temporary facilities were provided, and continued to be used during season through 2009.

Currently, due to economic conditions, an exceptional opportunity exists to purchase raw land in the vicinity of the Summerlin Road/San Carlos Boulevard Intersection, even, potentially, the land used for the temporary park and ride facility in 2005. Initially, surface parking alone would likely accommodate demand; however, provision should be made so that a parking deck could be constructed in the future. Interestingly, it should be noted that the private parking deck at Shell Point Village, a retirement community near Summerlin Square, uses its parking deck as a hurricane shelter. Due to the proximity of both Fort Myers Beach and Sanibel Island to the likely location of a park and ride facility, this strategy should also be included as part of the planning of any park and ride facility.

Ridership Trends

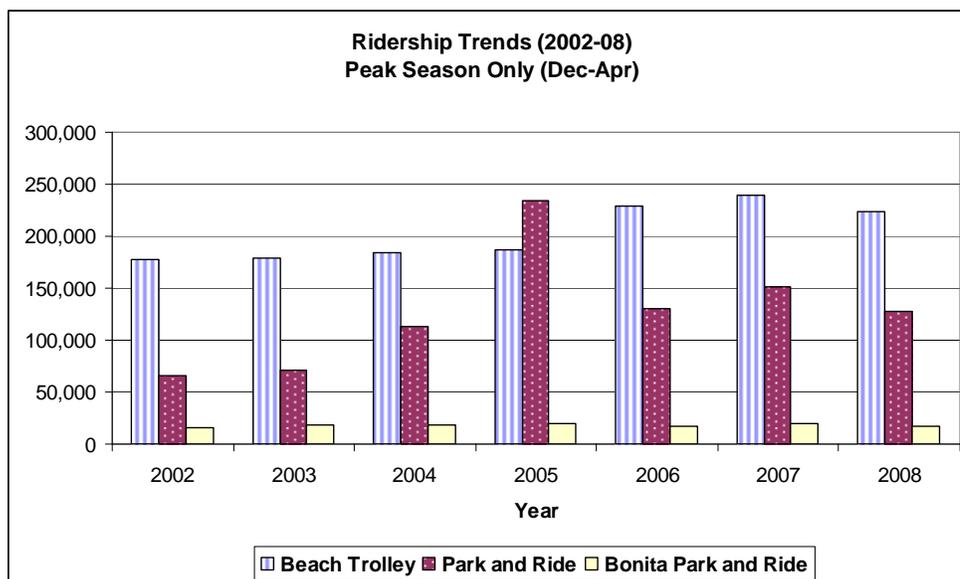
Ridership trends for the Trolley services from 2002-2008 are shown in the following pages. The current fare for all Trolley services is \$0.50 per one-way trip, \$3.00 for a 3-day pass, or a Trolley Day Pass for \$1.50 during the peak season. It should be noted that in 2005, the Summerlin Square Park and Ride route offered free service to encourage use of the service. That year also included the addition of other amenities for transit riders including gear storage, bridge bypass lane, and revenues for additional advertising of transit services. These changes were likely the reason for the spike in ridership for the Park and Ride service. Figure 2-5 presents the trend data.

Figure 2-5



The above chart also shows the growth in the Beach Trolley over the past five years, and the slow, but steady growth of the Summerlin Square Park and Ride service. The downturn in the economy in 2008 is likely one reason for the decrease in ridership, and new data shows the decrease did continue in 2009. Figure 2-6 presents the peak season only ridership trends from 2002 to 2008. Approximately 79 percent of the total ridership for the three routes is provided during the peak months of December to April.

Figure 2-6

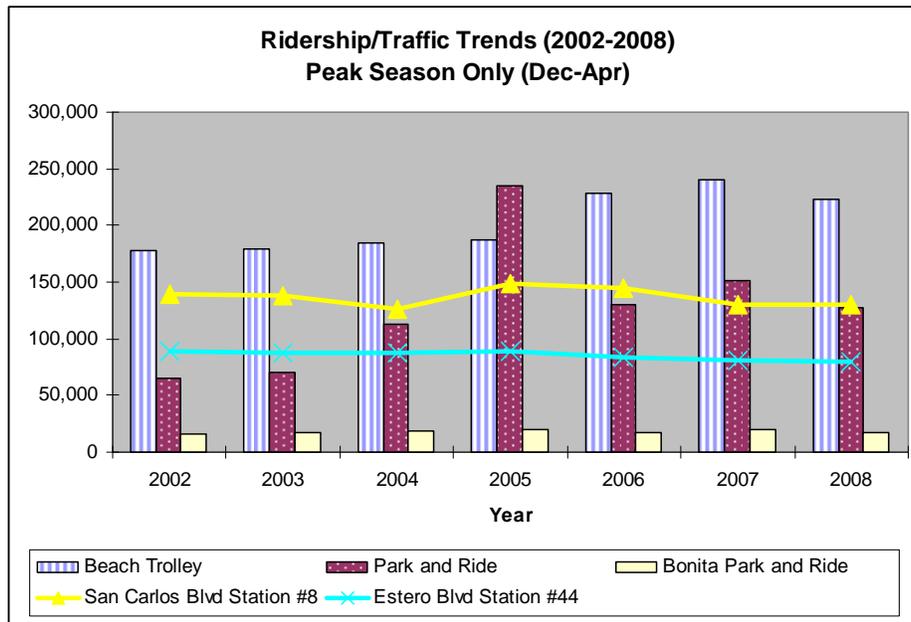


During peak season, the Beach Trolley provides 61 percent of the total ridership. The Summerlin Square Park and Ride service provides 35 percent of the total ridership during peak season, and the Bonita Park and Ride provides the remaining 4.5 percent of the total ridership.

Traffic Count Data

Understanding the ridership trends in the previous section is important to gauge appropriate service levels and adjustments to service. The consultant team is also interested in reviewing ridership trends on the three Trolley transit routes to local traffic count data, which are recorded at San Carlos Blvd Station #8 and Estero Blvd State #44. Figure 2-7 presents trends for the peak season ridership patterns and the local traffic counts.

Figure 2-7



To establish overall trends for traffic flow to/from Fort Myers Beach and on the island, the consultant team reviewed the *Traffic Count Report 2008*, prepared by Lee County Department of Transportation. Overall traffic during peak season has decreased slightly at the San Carlos Blvd Station #8 since 2005, when the economy was at a peak. Average total traffic during the peak season is approximately 137,000 for San Carlos Blvd Station #8 and approximately 85,000 for Estero Blvd Station #44.

Ridership on the Summerlin Square Park and Ride service has decreased overall since 2005, but had an increasing trend for 2007, which is not a reflective trend in the San Carlos Blvd counts. The Estero Blvd Station #44 counts have remained

stable over the past seven years, as has the Bonita Springs Park and Ride Trolley service.

Figure 2-8 on the following pages presents the detailed statistics for ridership and traffic count data. The table also indicates service characteristics that were in place each year that likely affected transit ridership patterns, such as storage, fares, additional advertising, etc.

Figure 2-8

Fare & Services	Metric	Routes Or Count Location	Ridership												Total Peak Season (Dec-Apr)	Total Off-Season (May-Nov)	Total	
			Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov				
FY 02																		
Nextbus	No	Beach Trolley	17,840	34,098	39,178	58,173	28,992	13,151	12,205	13,707	12,194	8,383	9,045	13,996	178,281	82,681	260,962	
Upgraded Trolley Stops	No	Park-N-Ride	4,495	13,824	16,722	22,974	7,456								65,471	0	65,471	
Park-N-Ride Headways		Bonita Park-N-Ride	1,882	3,906	3,802	4,936	1,646								16,382	0	16,382	
Beach Trolley Headways		San Carlos Blvd Station #8	23,092	30,371	30,622	28,363	26,355	22,841	24,096	25,853	23,092	21,084	21,837	24,598	138,803	163,401	302,204	
Bonita Park-N-Ride Headways		Estero Blvd Station #44	15,811	18,256	18,582	17,930	17,930	15,974	15,648	14,833	13,366	14,833	16,789	16,789	88,509	106,928	195,437	
Off Island Parking	Yes																	
Gear Storage	No																	
Bridge Bypass Lane	No																	
Additional Advertising	No																	
Park-N-Ride Fare	Free																	
Beach Trolley Fare	\$0.25																	
Bonita Park-N-Ride Fare	\$0.25																	
FY 03																		
Nextbus	No	Beach Trolley	16,662	27,788	35,520	54,413	44,604	15,553	12,870	13,625	11,618	9,172	11,218	13,599	178,967	87,655	266,642	
Upgraded Trolley Stops	No	Park-N-Ride	3,363	11,658	17,556	24,090	14,070								70,737	0	70,737	
Park-N-Ride Headways		Bonita Park-N-Ride	1,233	3,658	4,684	5,023	3,315								17,693	0	17,693	
Beach Trolley Headways		San Carlos Blvd Station #8	22,908	30,129	30,378	28,137	26,145	22,659	23,904	25,647	22,908	20,916	21,663	24,402	137,697	162,099	299,796	
Bonita Park-N-Ride Headways		Estero Blvd Station #44	15,617	18,032	18,354	17,710	17,710	15,778	15,465	15,295	14,651	13,202	14,651	16,583	87,423	105,625	193,048	
Off Island Parking	Yes																	
Gear Storage	No																	
Bridge Bypass Lane	No																	
Additional Advertising	No																	
Park-N-Ride Fare	Free																	
Beach Trolley Fare	\$0.25																	
Bonita Park-N-Ride Fare	\$0.25																	
FY 04																		
Nextbus	No	Beach Trolley	16,074	29,049	40,131	54,608	44,468	17,065	17,068	18,686	8,293	7,981	13,290	18,104	184,330	100,487	284,817	
Upgraded Trolley Stops	No	Park-N-Ride	4,167	13,489	26,354	45,284	24,078								113,372	0	113,372	
Park-N-Ride Headways		Bonita Park-N-Ride	1,189	3,857	4,616	5,231	3,558								18,521	0	18,521	
Beach Trolley Headways		San Carlos Blvd Station #8	21,068	27,709	27,938	25,877	24,045	20,839	21,984	23,587	21,068	19,236	19,923	22,442	126,637	149,079	275,716	
Bonita Park-N-Ride Headways		Estero Blvd Station #44	15,617	18,032	18,354	17,710	17,710	15,778	15,465	15,295	14,651	13,202	14,651	16,583	87,423	105,625	193,048	
Off Island Parking	Yes																	
Gear Storage	No																	
Bridge Bypass Lane	No																	
Additional Advertising	No																	
Park-N-Ride Fare	Free																	
Beach Trolley Fare	\$0.25																	
Bonita Park-N-Ride Fare	\$0.25																	
FY 05																		
Nextbus	Yes	Beach Trolley	19,500	30,421	41,206	55,433	40,288	19,114	16,185	15,826	14,115	10,482	13,727	19,066	186,848	108,515	295,363	
Upgraded Trolley Stops	No	Park-N-Ride	6,826	26,960	56,091	94,460	48,242								234,619	0	234,619	
Park-N-Ride Headways		Bonita Park-N-Ride	1,342	4,130	4,610	5,799	3,604								19,485	0	19,485	
Beach Trolley Headways		San Carlos Blvd Station #8	24,840	32,670	32,940	30,510	28,350	24,570	25,920	27,810	24,840	22,680	23,490	26,460	149,310	175,770	325,080	
Bonita Park-N-Ride Headways		Estero Blvd Station #44	15,908	18,368	18,696	18,040	18,040	16,072	15,744	15,580	14,924	13,448	14,924	16,892	89,052	107,584	196,636	
Off Island Parking	Yes																	
Gear Storage	Yes																	
Bridge Bypass Lane	Yes																	
Additional Advertising	Yes																	
Park-N-Ride Fare	Free																	
Beach Trolley Fare	\$0.25																	
Bonita Park-N-Ride Fare	\$0.25																	

Vehicle Characteristics

The Trolley service operates a rubber-tired vehicle whose design, and internal features invoke the feel of old time trolleys. The bus stops are marked with bus stop signs along the routes for boarding and deboarding passengers.

Summary

The Trolley ridership presented in this chapter provides a snapshot of the service trends for the past five years. This information will be used in the assessment of alternatives for future Trolley service.

Section 3: Beach Trolley Online Survey

Purpose

An online survey through Zoomerang.com was conducted to assist in determining factors that influence use of the Fort Myers Beach Trolley, operated by LeeTran. The primary purpose of the online survey in relationship to the Beach Trolley Study was to:

- determine what amenities or operational changes would improve the likelihood of trolley ridership, and how much increase in ridership could be anticipated.
- additionally, the survey sought to identify how many trips could be anticipated to be shifted from automobiles to the trolley, and
- estimate how many trips would be new trips.



**LeeTran
Beach Trolley
Survey**

This report focuses on the above three areas. Other useful survey results are available for LeeTran, the Town of Fort Myers Beach, or other parties with interests in Fort Myers Beach. The survey questionnaire is presented in Appendix A, and the full survey results are shown in Appendix B.

Outreach

Several methods were used to publicize the online survey, such as flyers and a press release to over 70 media outlets, including television, radio, magazine, newspaper, and online publications. In some cases, a link to the survey was posted on the media website for easy access. A link to the survey was also provided on the LeeTran website. Appendix C presents the press release.

Flyers were color-coded to allow analysis of respondents from different sources. The flyers were distributed to residents and visitors at the intersection of Pine Ridge Road and San Carlos Blvd in April to promote survey participation. Flyers were also distributed on the Beach Trolley and to local businesses through the Fort Myers Beach Chamber of Commerce. Appendix D illustrates the survey flyer.

Survey participants were self-selected, meaning persons learning of the survey had the choice of whether or not to participate. To encourage survey participation, a \$100 cash drawing was offered. All survey participants were eligible for the prize. A gentleman, identifying himself as a Fort Myers retiree, was the winner of this prize.

Results

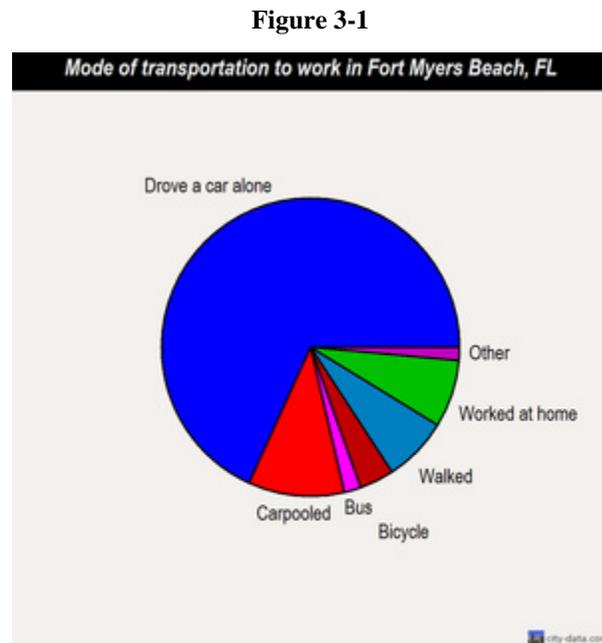
The survey was available for input from March 30, 2009 to April 15, 2009. In total, 261 usable responses were obtained. While a smaller response than desired, the results had a +/-6 percent confidence interval at a 95 percent confidence level for questions involving the entire population of survey takers. Approximately 27 percent of the survey respondents indicated they took the trolley for their last trip to Fort Myers Beach. The remaining 73 percent of survey respondents were not typical transit users, which represents a good cross section of answers from residents and visitors.

Transit Mode Split

One objective of this report is to generally estimate the existing transit mode split for travel to Fort Myers Beach. However, the scope of work for this study did not include an extensive travel survey effort. The consultant team used two mechanisms with existing data to estimate the transit mode split.

2000 US Census

The first method is from the 2000 US Census Bureau. The chart shown in Figure 3-1 includes the Mode of Transportation to Work, which not surprisingly illustrates the majority of trips are by single occupant vehicle.



Taking the bus to work resulted in less than five percent of total trips as shown on the chart. One note for this data source is the trips taken are 'To work', which is not always the primary reason for going to Fort Myers Beach. The online survey indicated that approximately 60 percent of the trips were for recreation.

To summarize this data source, we believe the travel patterns to work are similar to travel patterns to recreation for Fort Myers Beach, meaning most persons use their automobile as the primary mode of travel, and that transit is a small portion of the trips. The following method using recent traffic counts also supports similar findings.

2008 Traffic Counts and 2008 Ridership

Traffic counts at San Carlos Blvd Station were recorded in 2008 at 26,000 average daily trips (ADT) during peak season. The Park-N-Ride transit route averaged approximately 30,450 monthly one-way trips during the 2008 peak season. Approximately 30 days of service were provided, which equates to approximately 1,025 daily one-way trips for the Park-N-Ride service during peak season. Using these ridership calculations and the daily traffic counts, the

consultant team estimated approximately four percent of daily traffic is made by the Trolley.

Transit Model Split Estimate

Using the two methods discussed above and the online survey results, the consultant team estimates a transit mode split of **four percent**. To calculate more exact results by person trip, the consultant team recommends conducting a detailed travel survey that would be extremely useful for the travel demand model for the County and/or region.

Factors Influencing Trolley Ridership

Objectives of the study and online survey are to determine what amenities or service changes will it take to have residents and visitors use the Beach Trolley as a viable mode of transportation. Question 22 asked: *Which of the following options would make you more likely to ride the trolley? (please check all that apply)* Figure 3-2 on the following page presents the responses. The two highest responses at 71 percent each were:

- A transit only lane to bypass congestion, and
- Waiting less than 15 minutes between trolleys



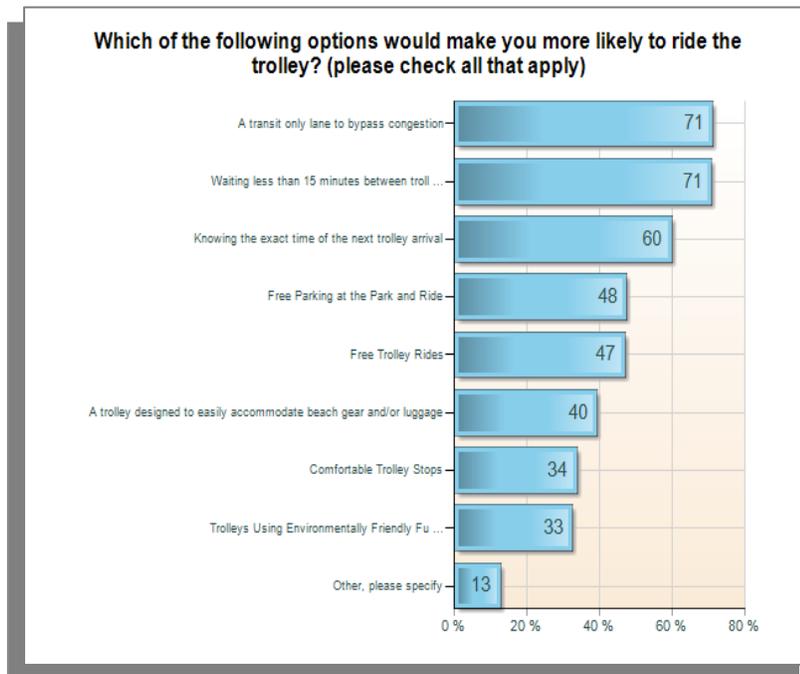
The third highest response was '*knowing the exact time of the next trolley arrival*' with 60 percent of total respondents selecting this response. All other factors, including free parking and free trolley rides were indicated as factors by less than 50 percent of respondents.

The responses from this question verified previously held assumptions by staff and the consultant team that removing the Trolley from the congested conditions (such as in a Trolley-only Lane) in and around Fort Myers Beach, as well as providing frequent Trolley service are key factors in improving trolley ridership.

The third highest response of '*knowing the exact time of the next trolley arrival*' is currently in place on Fort Myers Beach. To enhance this response, additional kiosks should be planned in the future to promote the service and provide accurate information to passengers.

Using the two most frequent responses, the likely mechanisms to improve Trolley usage to/from Fort Myers Beach are more frequent service and the development of Trolley-only lanes.

Figure 3-2



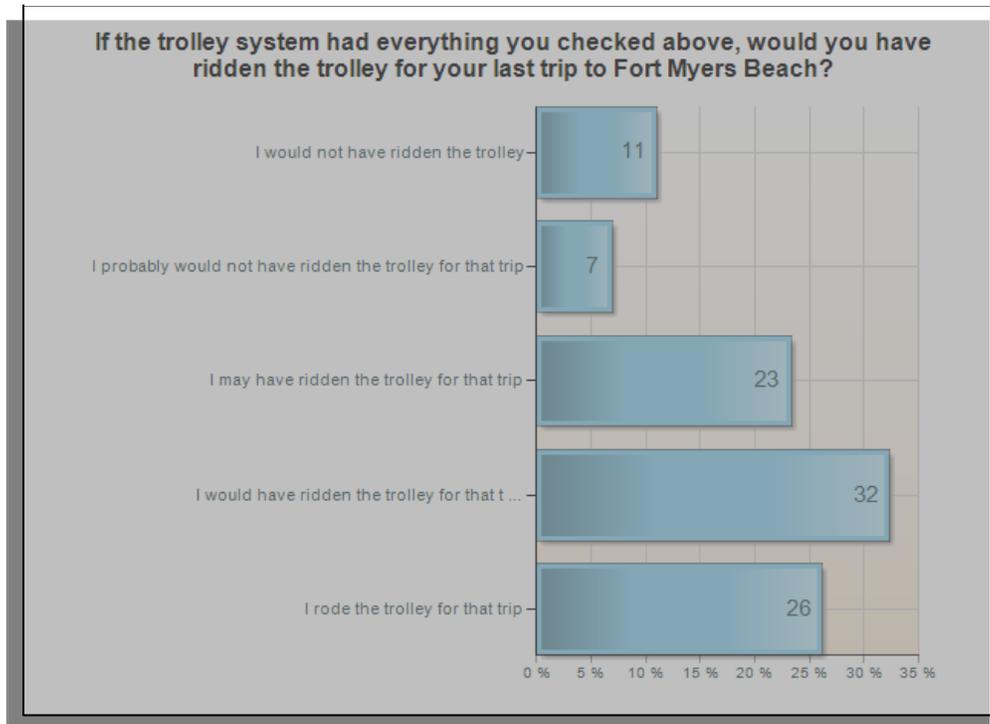
Should these changes be made for the Trolley service, it is important to know how much will ridership increase. Question 23 of the online survey asked: *If the trolley system had everything you checked above, would you have ridden the trolley for your last trip to Fort Myers Beach?*

Figure 3-3, shown on the following page, presents the results of the question. Approximately 55 percent of the total respondents indicated that they would have/may have ridden the Trolley for that trip. To further analyze the question, the non-Trolley rider (73% of responses) responses were reviewed. The non-Trolley rider response indicated that over two-thirds of the remaining individuals indicated that they would have or might have ridden the Trolley for that trip.

This is further confirmed by the follow-up Question 24: *If the trolley had everything you checked above, are there other trips around Fort Myers Beach you would consider making by trolley?* Approximately 91 percent of respondents indicated that if all improvements they have requested were in place, they would consider making any additional trips around Fort Myers Beach by trolley.

As this is a stated preference survey, it is very possible that this percentage is overstated. However, it does indicate that improved service would likely have a significant impact on trolley ridership.

Figure 3-3

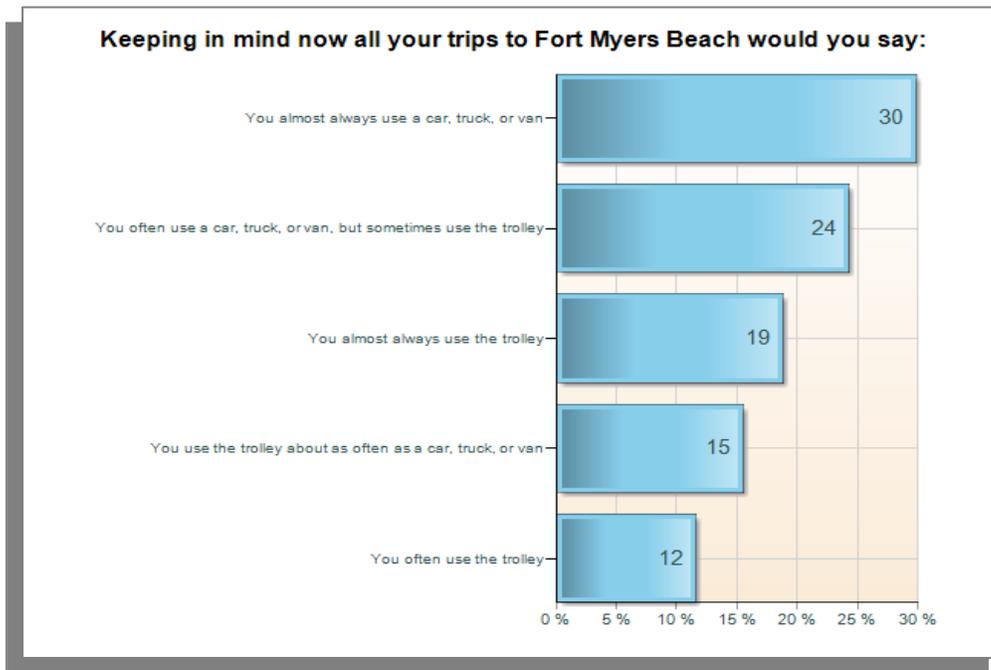


Latent Demand

Improved transportation service often increases the total number of trips that are made to any given location. This pent up demand is referred to as latent demand. With significant congestion in and around Fort Myers Beach it is not surprising that improved transit service would result in increased person trips to Fort Myers Beach. Question 25 asked: *If the trolley had everything checked above would you come to Fort Myers Beach?* Over 70 percent of survey respondents indicated that they would make trips *much more often* or *somewhat more often* to Fort Myers Beach.

To provide guidance on likely mode shift changes from cars/light trucks to trolleys, cross classification of answers was used. Cross classification allows the comparison of the answers to one question based on how another question was answered. In this case, Question 19 asked: *Keeping in mind now all your trips to Fort Myers Beach would you say: 1) you almost always use a car, truck or van; 2) You often use a car, truck, or van, but sometimes use the trolley; 3) You use the trolley about as often as a car, truck, or van; 4) You often use the trolley; 5) You almost always use the trolley.* In other words, how often do they use the Trolley? Figure 3-4, on the following page, presents the responses.

Figure 3-4

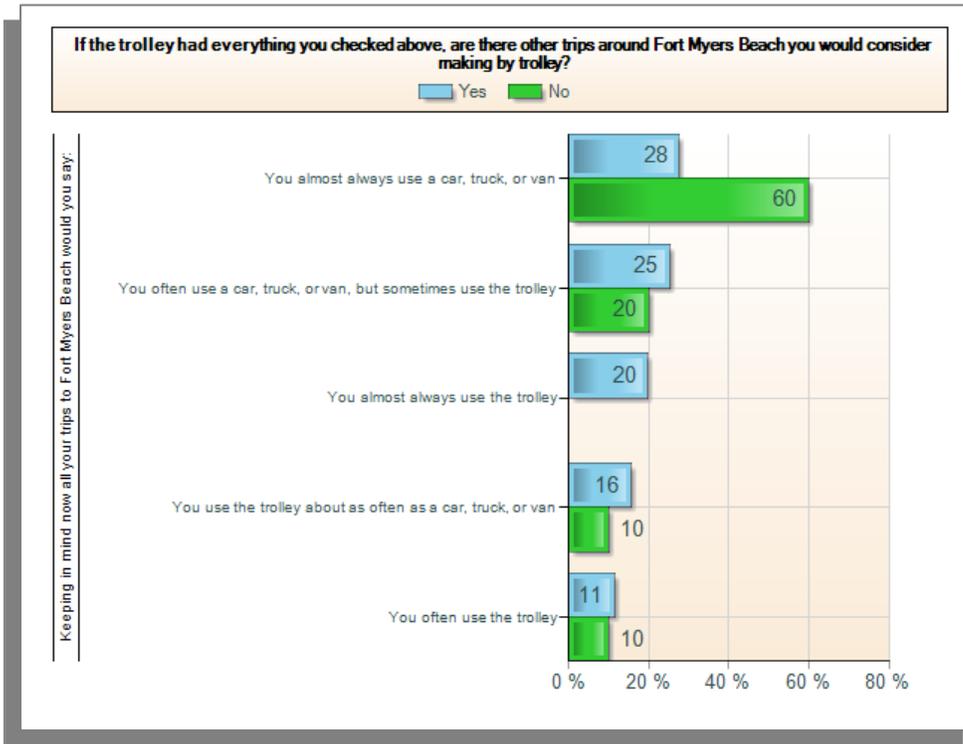


By cross classifying the results of Question 19 and 24, an indication can be found of what percentage travelers to/from Fort Myers Beach might switch from automobiles and light trucks to the Trolley, if improvements are in place. Figure 3-5, on the following page, shows the results of this cross tabulation. Approximately 28 percent and 25 percent of respondents, who almost always use a car and often use a car, would consider making trips with the Trolley if all improvements were made.

Not surprisingly over 50 percent of persons that rode the Trolley for their last trip to Fort Myers Beach almost always use the Trolley. More importantly, for the purposes of this study, over 75 percent of respondents that '*almost always use a car, truck, or van for their trip*' indicated that they would have ridden/may have ridden the trolley for that trip.

Approximately 68 percent of respondents who often use a car, truck, or van but sometimes use the trolley indicated that they would have ridden the Trolley for that trip. This indicates that travelers other than frequent trolley users are willing to consider making trips to Fort Myers Beach, if the Trolley service provides the amenities that they find desirable.

Figure 3-5



To facilitate the queuing analysis discussed in Section 5, trip demand was calculated for one direction. As the directional split over a 24 hour period is 50 percent – 50 percent, it was assumed that for every transit trip onto Fort Myers Beach, there would be a transit trip off of Fort Myers Beach.

The consultant team summarized the demand estimates in two views – conservative and aggressive growth, as shown in Figure 3-6. All estimates are in person trips. The mode shift would be achieved through the identified improvements to the headways and through establishing a Trolley-only lane. In addition to the capital and operating improvements to the Trolley and roadway facilities, an aggressive marketing plan would need to be completed by LeeTran. Marketing will play a critical part in the success of improving congestion and shifting single occupant vehicles to the Trolley transit service. If people, residents and/or visitors, do not know about the service, they will not use it.

Figure 3-6 Demand Estimates			
	Trolley Avg Daily Ridership	Transit Mode Split	Avg Mthly Trolley Ridership
Existing	1,200	4%	30,704
Conservative	4,220	10%*	108,704
Aggressive	7,280	20%*	186,704
<i>Note: * indicates additional mode shift and existing.</i>			

The following paragraphs discuss the calculations of demand estimates shown in the table. The existing mode shift estimate is four percent, with traffic counts at approximately 26,000 AADT daily trips at San Carlos Blvd Station #8. Approximately 13,000 daily vehicle trips are onto Fort Myers Beach and 13,000 vehicle trips leave Fort Myers Beach on average. Based on peak season traffic patterns, peak season one-way traffic was calculated to be just over 14,400. Based on surveys conducted in 2003, an average auto occupancy of 2.1 was used to convert 14,400 vehicle trips to just over 30,200 person trips. The Park and Ride service provides approximately 1,200 average daily transit trips during peak season.

The survey results discussed on the previous pages indicated 28 and 25 percent of single occupant vehicle users (car/light truck) would change their mode of transportation if all amenities were in place. Using that knowledge from the survey responses, the consultant team developed a conservative mode shift estimate and an aggressive estimate.

The conservative demand estimate, an additional 10 percent mode shift, is calculated by taking 10 percent of existing daily traffic ($30,200 \times 10\% = 3,020$). The 3,020 is added to existing ridership ($3,020 + 1,200 = 4,220$) and results in approximately 4,200 average daily trips. Similarly, the aggressive demand estimate is calculated by taking 20 percent of existing daily traffic plus the existing 4 percent results in average daily one-way trips of approximately 7,280.

As LeeTran plans for future growth with changes to the Trolley service, calculating the capacity of the existing service is another statistic that will continue to be monitored. According to the *2006 Transit Development Plan*, there is an excess capacity for Route 490, the Summerlin Square Park and Ride, of 32.7 percent. The capacity is based on existing vehicle inventory provided by LeeTran. Average seating capacity for all traditional bus routes is calculated by dividing total seating capacity for all vehicles in the fleet by the total number of vehicles. As service is improved and headways are decreased, additional buses will be needed for the service; thus, forcing the calculation of a new capacity ratio.

Other significant changes to the community that would support an increase in transit ridership include:

- Increased parking fees
- Implementing higher densities
- Implementing congestion pricing (toll roads or impact fees)
- Improved pedestrian facilities

These ideas and many others must begin with a vision for the Fort Myers Beach area. Citizens must be involved to support their vision and implement changes. Previous planning efforts should be reviewed and revived to address the congestion through the corridors. The Trolley Transit service is a viable alternative to Fort Myers Beach congestion and must have community support from elected officials to transit riders to make a difference.

Summary

Based on survey results, the remainder of this sketch level plan focuses on opportunities to improve headways, as well as provide Trolley-only lanes to allow trolleys to avoid congested traffic conditions.

Section 4: Operational/Capital Alternatives

Section 4 of this report addresses operational and capital alternatives to improve Trolley service to Fort Myers Beach. The alternatives were developed based on previous studies, feedback from local staff, from the online survey, and from reviewing ridership trends for the services. As noted in the Survey Analysis chapter of this report, the primary factors that may influence travel mode shift to the Trolley service were:

- A Trolley-only Lane to bypass congestion, and
- Waiting less than 15 minutes between trolleys

Alternatives for Fort Myers Beach Trolley Service have been discussed for many years, with many concepts brought forward. Almost without exception, concepts presented in this report have their roots entrenched in concepts previously presented. This report, therefore does not necessarily present new concepts but rather presents the pros and cons of why these concepts are feasible and why they deserve implementation. No concepts requiring extensive capital improvements or right-of way purchase were included.

Alternative A: Modify Summerlin Square Park and Ride route to NOT serve Bowditch Park

Alternative A recommends rerouting the Summerlin Square Park and Ride service. The route would terminate at the Times Square area on Estero Blvd., then travel back to Summerlin Square. Current ridership from Times Square to Bowditch Park is the lowest performing area of the route for the Summerlin Square Park and Ride route. Bowditch Park would continue to be served by the Beach Trolley route, and transfers could be made near the Times Square area for passengers traveling north on the island.

The termination point for the new route has two options, which include an on-street termination point or terminating at Lynn Hall Memorial Park, one of the island's primary attractions.

A: On-street Location: The on-street location would use existing parking spaces as the transfer area. The Trolley would turn right off the Matanzas Pass Bridge and turn right at Old San Carlos Boulevard to the designated location. Figure 4-1, on the following page, shows the termination area for the on-street option and the new route alignment returning to the Summerlin Square Park and Ride lot.

The primary advantage of this location is the ease of maneuvering through traffic to ensure the Trolley does not get caught in the congested areas. Passengers would be dropped at a safe, accessible facility that has activities in the immediate area. Passengers traveling northbound to Bowditch Park would have an easy transfer at this site. A disadvantage of this on-street location is that approximately four to five parking spaces would be removed to accommodate the Trolley service. Transit amenities, such as shelters/benches, Nextbus kiosks, signage, etc. would be added to the site.

A: Lynn Hall Park Location: The Lynn Hall Park location is a second option for the Summerlin Square Park and Ride realignment. This facility is one of the main facilities where people want to travel and the service would be at the doorstep. The Trolley would travel along San Carlos Blvd, turn right on Estero Boulevard at the base of the Matanzas Pass Bridge, then turn left from the middle turn lane to the facility. The existing dropoff area would need to be modified for the Trolley to use. Transit amenities, such as shelters/benches, Nextbus kiosks, signage, etc. would need to be coordinated with the existing management. Figure 4-1, shown on the previous page, presents the Trolley routing alignment and termination point at Lynn Hall Park.

The advantage of this site is getting passengers to the destination where they want to go. The site would need to be modified to accommodate Trolley service, but has minimal conflicts with other traffic traveling in/out of the facility. A disadvantage of this site is extra travel time in and out of the facility and into traffic headed off of the island.

A: Advantages/Disadvantages:

The advantage of making the Summerlin Square Park and Ride Trolley route shorter is to provide additional revenue hours, which will ultimately decrease headway times. Another advantage to this modification is that many of the current passengers are not interested in traveling to Bowditch Park, but in traveling south on the island. This change will allow passengers to depart at the Times Square location, which is near the island's main attractions.

A disadvantage of this route modification is that passengers wanting to travel to Bowditch Park will not have direct service and will need to transfer.

Alternative B: Capital Improvements to San Carlos Blvd to incorporate a Trolley-only Lane

Alternative B addresses the request for Trolley-only lanes to bypass congestion along San Carlos Blvd, north of Hurricane Bay. Three concepts were developed for consideration. The current conditions of the roadway are shown in Figure 4-2 on the following pages. Each of the designs does not require additional right-of-

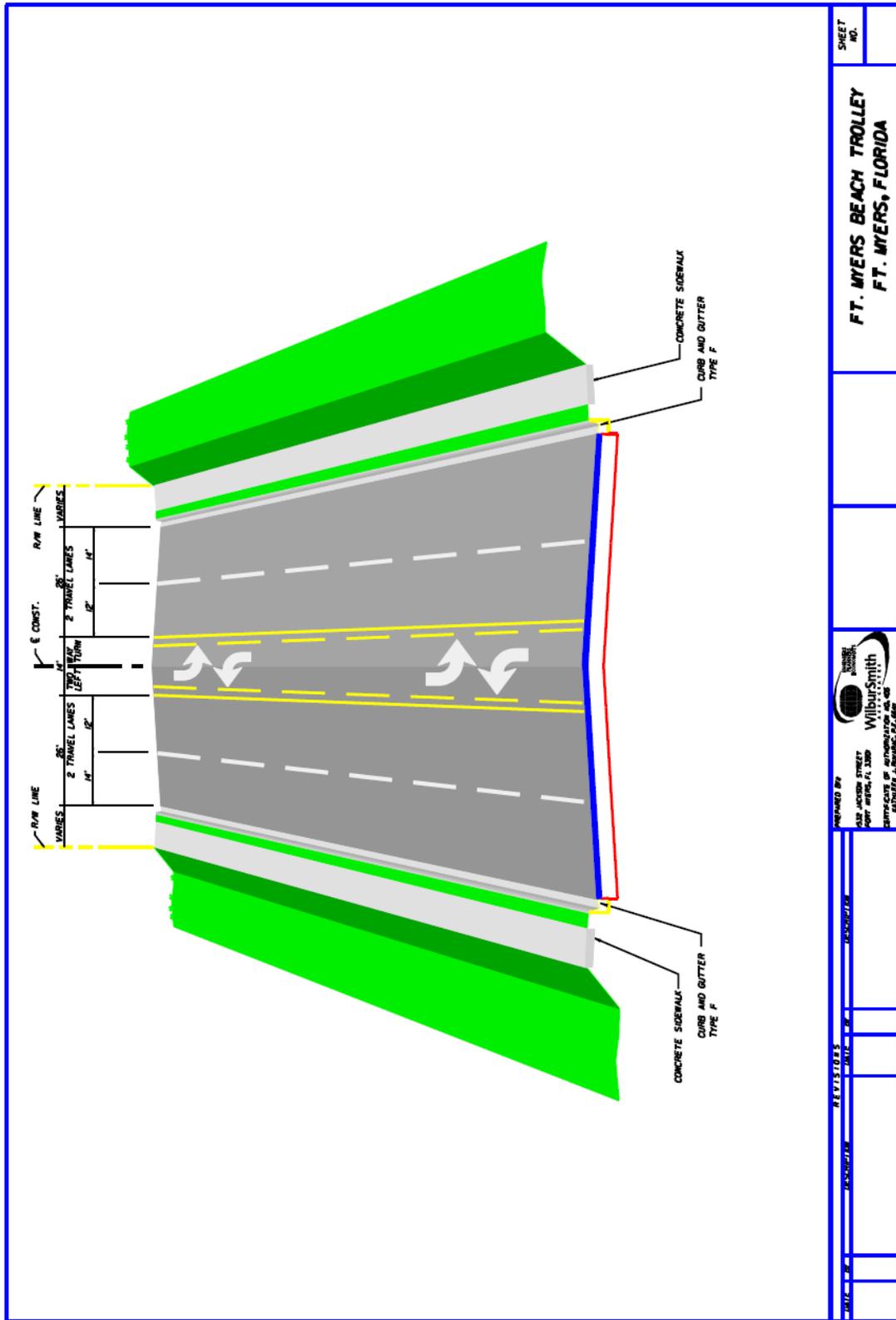
way, however, if additional roadside transit amenities, such as shelters or benches are incorporated, provisions for additional right-of-way may be needed. Right of way of this type could be obtained by purchase, or possibly, donation.

B1: Center Turn/Trolley-only-lane Option

One option for incorporating a Trolley-only lane into the existing right-of-way is to have a dual purpose middle lane between the two northbound and two southbound travel lanes. The 14' center lane would continue operating as a turn lane, just as today. However, during congested operating times, the Trolley route would travel in this lane. The existing northbound and southbound bike lanes and sidewalks would remain in place. Figure 4-3, shown on the following pages, presents the Trolley-only center lane option.

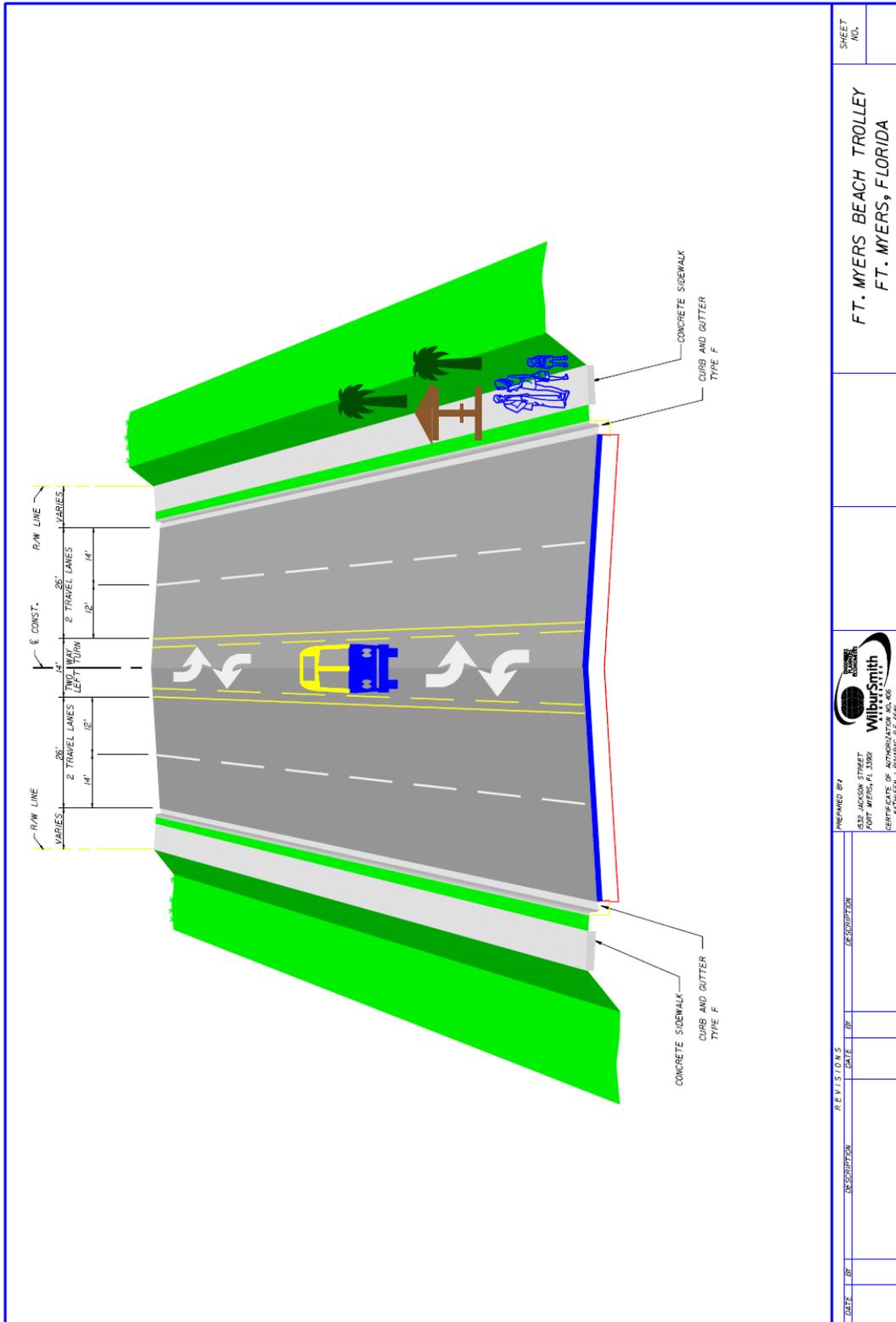
The advantage of this option is maintaining existing lane width and modes within the design. One disadvantage of this option is the potential conflict between oncoming Trolley buses and vehicles making potential east/west turns. There is also potential for driver confusion due to the atypical travel lane in the middle of the corridor. An additional disadvantage is the difficulty of passenger loading/unloading with a primary center lane of travel. The vehicle would need to maneuver through congested traffic to load/unload, which would likely increase travel time.

Figure 4-2 San Carlos Blvd Typical Roadway Section, North of Hurricane Bay



SHEET NO.	
FT. MYERS BEACH TROLLEY FT. MYERS, FLORIDA	
25000 FT 25000 FT 25000 FT	
DATE REVISION	
 WilburSmith ENGINEERS ARCHITECTS PLANNERS 412 JACKSON STREET FORT MYERS, FL 33901 PHONE: 813.939.1400 FAX: 813.939.1401	
DATE	DESCRIPTION

Figure 4-3 Trolley-Only Center Lane



DATE		REVISIONS		DATE		DESCRIPTION	
PREPARED BY KATHLEEN A. BOURGEOIS, P.E., P.E. 4532 JACKSON STREET FORT MYERS, FL 33901 CERTIFICATE OF AUTHORIZATION NO. 405  WILBURSMITH ENGINEERS, ARCHITECTS & PLANNERS							
PROJECT NO. 11-0700 DISCIPLINE: CIVIL SHEET NO. 11-0700-01							
FT. MYERS BEACH TROLLEY FT. MYERS, FLORIDA							

B2: Five-lane Option

A second option for incorporating a Trolley-only Lane is to have a 5-lane corridor. Four corridors for auto traffic, two 13' northbound travel lanes and two 13' southbound travel lanes. No middle turn lane is incorporated into this option. Sidewalk is available on both sides of the corridor. A 14' southbound Trolley-only Lane is adjacent to the southbound travel lanes. Raised bump lane dividers and striping would be one method of marking the Trolley-only lane. Figure 4-4 presents the five-lane option.

One advantage of this option is having a wide travel lane for the Trolley-only lane. Bicycles would be accommodated by using the sidewalks as a multi-use path, which would be widened to accommodate all users. The disadvantages of this option are the removal of the middle turn lane. Northbound turning traffic would be stopped in the travel lane, which may result in increased travel time due to delays to turning vehicles. Residents and businesses along San Carlos Boulevard who are traveling north may also have additional delays due to turning vehicles. These disadvantages deserve significant consideration from an operational and safety perspective.

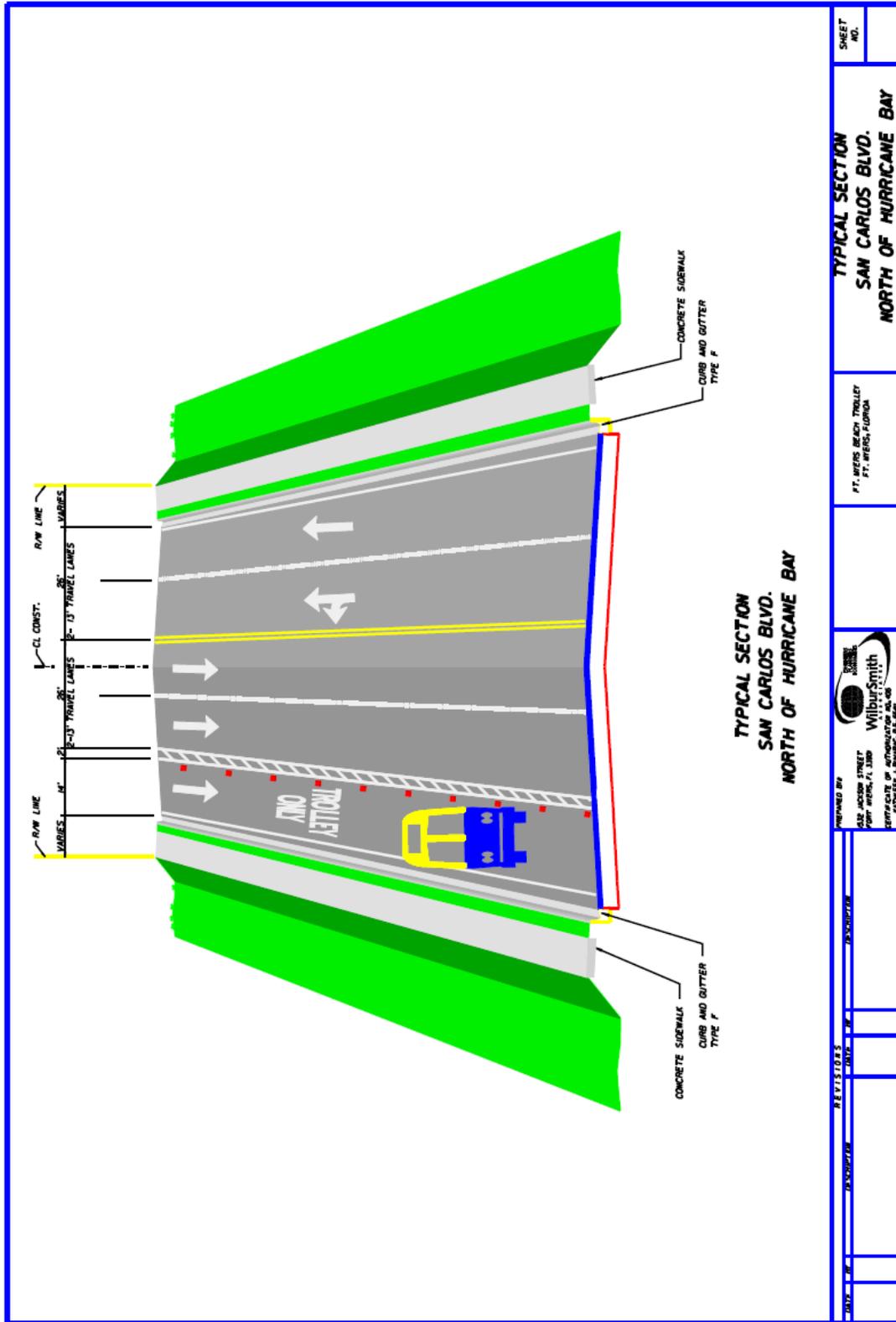
B3: Six-lane Option

The third option for the Trolley-only lane is to create a six-lane corridor within the existing right-of-way. Two northbound and southbound travel lanes are 11' wide, and a middle turn lane is maintained with a 12' width. The Trolley-only southbound lane is adjacent to the travel lanes and is 10' in width, the minimum requirement for a transit vehicle. Raised bump lane dividers and striping would be one method of marking the Trolley-only lane. The curb and gutter measurement is also displayed due to the tight configuration of the 10' trolley-only lane. Figure 4-5 presents the six-lane option.

This option has a dedicated Trolley-only lane which allows the vehicle to bypass all other congestion along the bridge. Similar to the five-lane option above, bicycles would be accommodated by using the sidewalks as a multi-use path, which would be widened to accommodate all users. Residents and businesses along San Carlos Boulevard maintain a turning lane for northbound travel for merging into traffic. The main disadvantage of this option is the narrow lane widths. One major advantage of this option is that all modes of travel are accommodated.

Regardless of the option selected, strong consideration should be given to modifying the mainland approach to the Matanzas Pass Bridge to provide better access for the trolley to the bridge trolley lane. This modification was considered in a preliminary design report completed in September, 2006 by Tindale-Oliver and Associates (TOA). The report recommends widening in the "retained fill" section that would allow both northbound lanes to continue on the bridge. There would be no impact on the bridge structure itself, and no street relocations would be necessary. This would allow trolleys to access the bridge trolley lane without

Figure 4-4 Five-Lane Option San Carlos Blvd



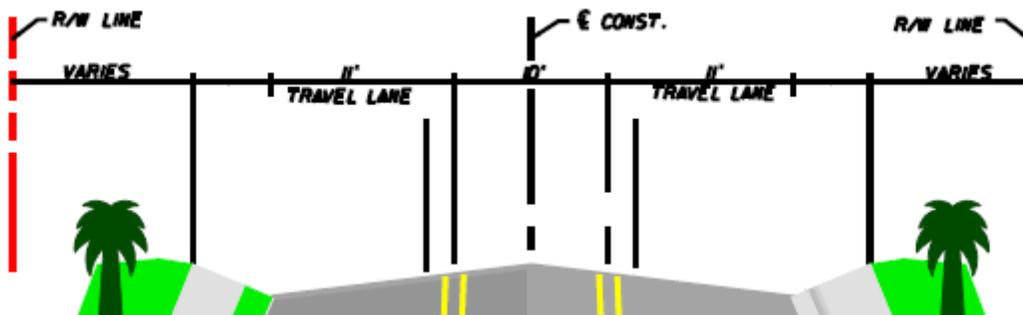
DATE	BY	DESCRIPTION	PREPARED BY JILL ANDERSON, PROJECT MANAGER FT. MYERS BEACH TROLLEY DEPARTMENT OF ADMINISTRATION & LOGISTICS 1000 W. COLLEGE AVENUE		 WildcatSmith ENGINEERS	FT. MYERS BEACH TROLLEY FT. MYERS, FLORIDA 10/10/2009	SHEET NO. TYPICAL SECTION SAN CARLOS BLVD. NORTH OF HURRICANE BAY

needing to merge left into a mixed use lane and then right into the trolley only lane. The proposed design also relocates the current Park and Ride stop at the base of the bridge from the Park and Ride lot itself to curbside on San Carlos Boulevard. Again, consideration of these modifications is recommended with any of the alternatives described herein.

Alternative C: Capital Improvements to Estero Blvd Bus Stops and Trolley-only Lane

Alternative C presents capital improvements to Estero Boulevard, the primary roadway on the island, to address the exceptionally heavy traffic during peak season. Changes to accommodate a mixed-flow and free-flow Trolley service on Estero Boulevard have the potential to make a significant positive impact on quality of life, convenience, and the environment, by reducing this congestion. Right-of-way along Estero Boulevard is limited and varies significantly from 50 to 100 feet.

A Trolley-only lane on the island provides a strong identity for public transit. The restricted lane can reduce travel time if designed to work properly. By focusing on moving people instead of simply moving vehicles, the proposed Trolley improvements will help reduce congestion. The existing roadway along Estero Boulevard varies; however, typically there are two 11' travel lanes and a 10' center turn lane, as shown below.



Alternative C presents a Trolley-only center lane for Estero Boulevard. The Trolley would travel in mixed flow if traffic conditions were favorable. However, as congestion increased, the Trolley would have the option of traveling in the center lane. Left turns would also be permitted. Some communities that have existing center lane transit use are on Canal Street in New Orleans and Market Street in San Francisco (both of which now have shared trolley and bus use).¹ Median lanes are usually separated from general traffic lanes by a raised curb, rumble strips or bumps.

¹ http://www.fta.dot.gov/assistance/technology/research_4358.html

C: Advantages/Disadvantages:

Median lanes are much less likely to be congested by other traffic than curbside lanes. On the other hand, they do present a few disadvantages relative to curbside lanes:

- Left-turning traffic conflicts.
- Passengers must cross traffic lanes to reach stops.
- Because of the need for passenger loading areas in the center of the street, the overall street width needed can be larger than in the case of curbside lanes.

The consultant team developed a sample scenario for a Trolley-only lane as shown in Figure 4-6 on the following page. This example is near the Lani Kai Island Resort and Norms Beach Parking. Passenger loading would be in the center of the street with crosswalks clearly marked for pedestrian safety and accessibility.

We reviewed the potential traffic operations and conditions for successful operation of a center Trolley-only lane for Estero Boulevard. The center lane would be for Trolley use only and for left turn traffic, with reversible flow. It is important to provide positive and clear design guidance for the public – informing them of the Trolley-only use. We identified some aspects that need to be incorporated into the design and operation of the center Trolley-only lane.

At intersections, traffic crossing the bus lane must be controlled to maintain traffic safety along the corridor. For mid-block or driveway access which is currently not controlled through much of the corridor, treatments for driveway or mid-block access are similar to those identified for the unsignalized intersections. Some intersections may require only right-turns, and safe U-turn locations should be identified.

The actual bus stops for the peak direction of travel are located in the center lane. The Trolley service has designated stops, and these stops would be maintained, if feasible. In the next phases of this study, a detailed on/off passenger count will be required to identify priority stop locations and design elements. In addition, traffic, pedestrian, and turning movement counts should be completed to ensure an adequate design including lane widths. It will also be necessary to develop standards relating to driveway and cross street access. Finally, a study will be needed to determine whether riders waiting for a trolley would always wait at the edge of the roadway, or would move to the actual stop in the center lane to wait for the next trolley. Initially, from a safety and consistency perspective, waiting at the edge of the traveled pavement is deemed most likely, however, an additional study is warranted prior to a final decision being reached.

It is anticipated that trolleys would use the center lane only in the direction of heaviest travel and would use the regular traffic lane in the off-peak direction. Consideration can be given to implementing a bi-directional route in the center

Figure 4-6 Sample Trolley-only Lane Estero Blvd



lane; however, this adds a layer of complexity to scheduling that could prove problematic. Assuming peak directional use only, changes in the direction using the center lane could be made based on time of day, or based on observed traffic conditions. Specific decisions would need to be based on additional analysis beyond this sketch level study.

One of the most important roles for the Trolley-only bus stop facility design is to support an appealing, cohesive visual identity for the transit service while at the same time reflecting the character of island.² Some important aspects of design are:

- **High-Quality Design and Passenger Amenities.** High quality design—with particular attention to passenger amenities such as shelters, seating, and lighting—supports a positive public perception of the Trolley service.
- **Urban Design Asset.** The Trolley-only lane presents an opportunity to improve and enrich streetscapes by incorporating new amenities such as landscaping.
- **Elements of Continuity and Variability.** In addition to projecting an image of quality and safety, the Trolley service and facilities should support an integrated system identity, keeping the service visible and recognizable to the community as a distinct “brand.” This is accomplished by establishing consistent themes of form, material, and color and applying these themes in the design of one or more system elements such as shelters, signage, pavements, street amenities, and even vehicles.
- **Context-Sensitive Design.** Although a cohesive, branded identity is desirable for the Trolley service, it is of equal, or greater, importance that the bus stop facilities recognize the unique character of the island.
- **Relationship of Transit to Land Use.** As with all modes of public transit, bus stop locations should be integrated with current and as well as any changes in land use the Town may be considering. In general, higher-density, mixed-use development is most favorable to transit because it generates greater patronage. In almost all areas along Estero Boulevard, this is representative of the Town of Fort Myers Beach.
- **Community Participation.** Bus stop locations and designs should be developed cooperatively with the surrounding community. Community support is essential in identifying and assessing potential sites for transit facilities and for developing design concepts.

The consultant team recommends at a minimum, lane markings on both sides of the center lane with rumble pavement delineations or mountable curbs. There may be the need for some overhead signing or other active warning devices to indicate bus travel direction and for traffic clarification, plus in-lane ITS detection to provide additional alert or announcement of approaching vehicles in the lane. Some communities have color designations, markings, etc. to ensure transit is obvious to all users of the roadway. The following page provides sample transit-

² TCRP Report 90, Bus Rapid Transit, Volume 2: Implementation Guidelines, 2003.

Operational/Capital Alternatives
Fort Myers Beach Trolley



only design schemes. Overall, the design should be similar to at-grade Bus Rapid Transit and light rail guidelines to ensure public safety and effective operation.

Summary

As the proposed Trolley improvements come to fruition over the next few years, LeeTran and the community of Fort Myers Beach will have a clear understanding of the benefits of the project. The planning and development process of the service will be fully integrated into the overall mobility of people on the island.

Section 5: Carbon Reduction

Introduction

As discussed throughout this report, Fort Myers Beach is a popular vacationing and tourism spot for over 1.8 million visitors annually. Estero Boulevard (SR 865) services all vehicular traffic entering or exiting the island. During peak season, January through April, peak period traffic demand greatly exceeds the capacity of Estero Blvd. During the peak months, drivers waiting to come onto the island routinely wait 30 to 45 minutes in traffic, with queues reaching over one mile, to cross Matanzas Pass Bridge at the north end of the island. Once on the island, a six-mile trip from the Matanzas Pass Bridge to the Big Carlos Pass Bridge at the southern end of the island can take an additional 30 to 45 minutes.¹ Travel northbound leaving the island is also heavily congested. The congestion is less during the remaining months.

However, recent traffic count trends from Lee County's Annual Traffic Count Report and the FDOT Florida Traffic Information Report show traffic flow has not increased in several years. This includes years when traffic would not have been affected by the economic downturn. As traffic in other areas of the county has increased, this likely indicates that latent demand for the facility exists. It is therefore likely that Estero Blvd. currently operates, and has been operating at capacity, with no room for additional vehicles. This conclusion is consistent with observation of roadway operation during peak season.

The Role of Transit

The Fort Myers Beach and Park and Ride Trolleys have the opportunity to play a prominent role in reducing carbon emissions for Fort Myers Beach and the surrounding areas by providing an effective and efficient alternative to the personal automobile for journeys to and from Fort Myers Beach. This report describes alternative solutions to address congestion and the methodologies for reducing carbon emissions with improvements to Trolley service and facilities.

The goal of implementing a trolley-only lane is to decrease traffic congestion, which results in a cleaner environment and greener transportation solution for Lee County. By making the changes, the trolley-only lane will significantly reduce the peak season commute for those using the trolley. This will result in a significant modal shift to the trolleys, which will remove hundreds of cars on the

¹ Predicted driver response to a cordon toll around Fort Myers Beach, FL, M.W. Burris, K.T. Lanan. *Advances in Transportation Studies an international Journal* Section B 5 (2005).

roadway. Traffic on the roadway will also improve because the roadway is operating more efficiently due to the reduced queue. These savings are small in and of themselves; however, they add up over time and result in less emissions, cleaner air, and a significant saving in fuel. When vehicles move efficiently, rather than in a very inefficient “stop and go” manner, fuel use and pollutant emissions are significantly reduced.

Idling

A simple but effective way to reduce the greenhouse gas emissions—while also reducing negative health effects—is reduced idling of vehicles, including buses. Drivers often have vehicles running for long periods of time in congested roadways, at traffic lights, to warm up the vehicles, or other reasons. The assumption that idling produces lower emissions than restarting a vehicle is refuted by the EPA. Also, idling is proven to cause engine damage and can worsen gas mileage. By implementing solutions such as the trolley-only lane, idling will be reduced due to the increase in traffic flow for vehicles, autos, buses and others.

Section 3 of this report discusses in detail the estimated trolley mode share of four percent for the Fort Myers Beach area. This is an excellent start for the community, but to improve the local environment and future carbon reduction goals, greater improvements such as the trolley-only lane should be made.

Methodology for Calculating Carbon Reduction

The consultant team began the methodology with data from Lee County 2008 and 2007 Traffic Count Report; in particular estimating the impact of improved trolley use on San Carlos Boulevard, north of Hurricane Bay. Many traffic assumptions were based on County Permanent Count Station #8. Count Station #8 is located on San Carlos Boulevard (SR865), 200 feet south of Prescott Street. Based on data from Count Station #8, a 115 percent peak season factor and a 50 percent directional split were assumed. An average auto occupancy of 2.1 persons per vehicle was developed from the *2003 In Lane Survey for the Town of Fort Myers Beach*, and was used in the calculations. The 2008 Average Annual Daily Traffic (AADT) on this portion of San Carlos Boulevard was approximately 25,000 vehicles.

Existing Data

Peak Season Southbound traffic patterns were identified on an hourly basis. The hourly traffic percentages were taken from Count Station 8 and applied to the 25,000 AADT which resulted in Average Hourly Traffic by hour of the day.

The next step included calculating directional traffic using the assumed 50 percent directional split, and then applying the 115 percent peak season

adjustment factor, which resulted in 14,411 vehicles for the peak season southbound. Converting the volumes to hourly person trips was the next step, as shown in Figure 5-1. The assumption of 2.1 average auto occupancy was multiplied by the peak season southbound volumes by hour.

To determine the existing transit use, the four percent mode split previously discussed was applied to the hourly person trips. This results in a calculated value of 1,200 daily trips made by public transit.

Figure 5-1, shown below, presents the traffic data calculations.

Figure 5-1 Traffic Calculations

Hour	Percentage Peak Season Southbound	Average Hourly Traffic	Directional Split 50%	Peak Season Adjustment	Hourly Person Trips	Existing Mode Split Transit 4% ADT Per Trps
1	0.90%	225	113	129	272	11
2	0.80%	200	100	115	242	10
3	1.20%	300	150	173	362	14
4	0.70%	175	88	101	211	8
5	0.75%	188	94	108	226	9
6	1.00%	250	125	144	302	12
7	3.00%	750	375	431	906	36
8	5.20%	1300	650	748	1570	63
9	6.10%	1525	763	877	1841	74
10	6.90%	1725	863	992	2083	83
11	7.10%	1775	888	1021	2143	86
12	7.00%	1750	875	1006	2113	85
13	7.00%	1750	875	1006	2113	85
14	6.80%	1700	850	978	2053	82
15	6.50%	1625	813	934	1962	78
16	6.80%	1700	850	978	2053	82
17	6.90%	1725	863	992	2083	83
18	6.80%	1700	850	978	2053	82
19	5.20%	1300	650	748	1570	63
20	4.10%	1025	513	589	1238	50
21	3.20%	800	400	460	966	39
22	3.00%	750	375	431	906	36
23	2.10%	525	263	302	634	25
24	1.20%	300	150	173	362	14
		25,063	12,531	14,411	30,263	1,211

NOTES: Data from Lee County 2008 and 2007 Traffic Count Report
Count Station #8
San Carlos Blvd (SR 865) 200 feet south of Prescott St.
2008 = 25000 AADT

115% Peak Season Factor

2.1 Weighted Avg Auto Occupancy from 2003 Survey

10 Percent Mode Shift

The next steps of the analysis assumed that upgrades to the trolley service, such as an exclusive transit lane would generate a 10 percent mode shift from auto to public transit. As discussed in Section 3 of this report, a conservative (10%) and an aggressive (20%) projection of shift to transit use after improvements are made was calculated. These calculations were based upon responses to the April 2009 Trolley survey conducted as part of this Sketch Plan analysis. The conservative 10 percent shift is in addition to the existing 4 percent transit mode split. It is assumed for all calculations that the Trolley service would not operate from midnight to 5:00 a.m., which is reflected in Figure 5-2, shown on the following page, with '0' represented during those hours.

Since the modal percentage is based on person trips, modal shift is also based on person trips. Also, as the queue on Estero Boulevard is only southbound, calculations are directional. The hourly person trips were multiplied by 10 percent to determine the projected mode split, which equated to approximately 2,895 person trips per day. The projected vehicles taken off the road with a 10 percent mode shift was calculated by taking the shift in person trips and dividing that by 2.1, the assumed average auto occupancy. Approximately 1,380 vehicles would be taken off the road.

After the above calculation for vehicles taken off the road, the remaining traffic on the roadway was determined by hour. The remaining traffic for peak season southbound was reduced to 13,032 from 14,411, as shown earlier in Figure 5-1.



The next step calculated the number of induced trips or latent demand. The definition for induced trips is: *an increase in total vehicle mileage due to roadway improvements that increase vehicle trip frequency and distance, but exclude travel shifted from other times and routes.* In this case, it is assumed that the reduction in congestion will result in some increase in overall trips to Fort Myers Beach. The methodology assumed for this report is based upon data reported in the *2003 Fort Myers Beach Congestion Mitigation Study, Parking Strategies Report*, which discusses in detail the existing latent demand for the area. Extensive survey efforts were completed as part of that study to determine an estimated latent demand. Based on this analysis, this study used two different levels of induced trips, 5 percent and 10 percent, as shown on the following page.

Figure 5-2 Net Traffic Reduction with 10 Percent Mode Shift

Hour	Hourly Person Trips	Projected Transit Mode Split 10% ADT Per Trps	Proj Vehicles Taken Off Road 10% Only	Remaining Hourly Traffic 10% Only	5% Latent Demand		10% Latent Demand	
					% induced Trips 0.05	Net Traffic Reduction	% induced Trips 0.10	Net Traffic Reduction
1	272	0	0	129	0	0	0	0
2	242	0	0	115	0	0	0	0
3	362	0	0	173	0	0	0	0
4	211	0	0	101	0	0	0	0
5	226	0	0	108	0	0	0	0
6	302	30	14	129	136	8	142	1
7	906	91	43	388	408	24	427	4
8	1,570	157	75	673	706	41	740	7
9	1,841	184	88	789	829	48	868	9
10	2,083	208	99	893	937	55	982	10
11	2,143	214	102	919	964	56	1,010	10
12	2,113	211	101	906	951	55	996	10
13	2,113	211	101	906	951	55	996	10
14	2,053	205	98	880	924	54	968	10
15	1,962	196	93	841	883	51	925	9
16	2,053	205	98	880	924	54	968	10
17	2,083	208	99	893	937	55	982	10
18	2,053	205	98	880	924	54	968	10
19	1,570	157	75	673	706	41	740	7
20	1,238	124	59	530	557	32	583	6
21	966	97	46	414	435	25	455	5
22	906	91	43	388	408	24	427	4
23	634	63	30	272	285	17	299	3
24	362	36	17	155	163	9	171	2
	30,263	2,895	1,379	13,032	13,027	758	13,648	138

In determining an estimate to use for latent demand, it is recognized that demand for access to Fort Myers Beach will continue to increase due to the rapid and continuing growth in Lee County. While this growth has slowed recently due to national economic conditions, there is no doubt, over the mid to long term, it will continue. Changes in traffic operations and parking strategies will make a difference in congestion levels. Observations from the 2003 Study indicate congestion on Fort Myers Beach is much more an issue of too many cars, rather than too many people. The island beaches and businesses can handle a larger number of people, if those people can get to Fort Myers Beach. Further, it is a practical certainty that significant latent demand exists for Fort Myers Beach.²

As previously discussed, surveys taken of drivers entering and exiting Fort Myers Beach indicated that significant numbers of residents/visitors would make additional trips to Fort Myers Beach, if congestion were reduced. Further, it is common to see vehicles turning around on San Carlos Boulevard after they have entered the queue near the base of the bridge to the island. The impact of latent

² Fort Myers Beach Congestion Mitigation Study, Options Report, Fall 2003.

demand, trips that would have been made if congestion were reduced, is a difficult issue to assess, as direct surveys of people who did not make a trip are not possible. However, 2003 survey responses indicate a large majority of people reduce their trips during periods of congestion. The study stated that it is not possible to precisely identify the magnitude of latent demand; however, that it is possible to make an educated projection of it.

In addressing latent demand, the 2003 study recognized that traffic volumes on Estero Boulevard and San Carlos Boulevard have seen little growth over the past decade, while Lee County population continues to increase. It is not unreasonable to think that traffic demand on Fort Myers Beach would increase at least as fast as the County's population. However, growth on San Carlos Boulevard in the vicinity of the Matanzas Pass Bridge, has not kept pace with the overall growth in the County. Use of the County population growth rate as an indicator for growth and demand for access to Fort Myers Beach is felt to be, if anything, conservative. This statement is based on the fact that traffic congestion on the Beach existed prior to the past decade, and a significant amount of latent demand likely existed even then. However, as with everything involved with projection of latent demand, a definitive statement cannot be made. The 2003 study states that San Carlos Boulevard best represents potential latent demand for access to Fort Myers Beach, with a latent demand of 10 percent.²

As shown on the previous page, for a 10 percent modal shift, the consultant team used a conservative latent demand of 5 percent and the suggested latent demand from the 2003 study of 10 percent. The remaining hourly traffic calculations by hour were multiplied by the assumed 5 percent induced trip rate and the assumed 10 percent induced trip rate. The results were an overall net traffic reduction of 758 for a 10 percent mode shift with a 5 percent latent demand. The results of 138 net traffic reduction were significantly less for a 10 percent mode shift with a 10 percent latent demand. Thus, relatively little congestion relief exists with a 10 percent induced demand scenario, but a great deal of relief exists assuming 5 percent induced demand. As the actual induced demand will increase as congestion decreases, it is likely that traffic would stabilize between these two points.

20 Percent Mode Shift

The consultant team also calculated a 20 percent mode shift from auto to public transit after improvements identified in the April 2009 Trolley survey are made for the trolley service. The 20 percent shift is in addition to the existing 4 percent transit mode split. It is assumed for all calculations that the Trolley service would not operate from midnight to 5:00 a.m., which is reflected in Figure 5-3, shown on the following page, with '0' represented during those hours.

Figure 5-3 Net Traffic Reduction with 20 Percent Mode Shift

Hour	Hourly Person Trips	Projected Transit Mode Split 20% ADT Per Trps	Proj Vehicles Taken Off Road 20% Only	Remaining Hourly Traffic 20% Only	5% Latent Demand		10% Latent Demand	
					% induced Trips 0.05	Net Traffic Reduction	% induced Trips 0.10	Net Traffic Reduction
1	272	0	0	129	0	0	0	0
2	242	0	0	115	0	0	0	0
3	362	0	0	173	0	0	0	0
4	211	0	0	101	0	0	0	0
5	226	0	0	108	0	0	0	0
6	302	60	29	115	121	23	127	17
7	906	181	86	345	362	69	380	52
8	1570	314	150	598	628	120	658	90
9	1841	368	175	702	737	140	772	105
10	2083	417	198	794	833	159	873	119
11	2143	429	204	817	857	163	898	122
12	2113	423	201	805	845	161	886	121
13	2113	423	201	805	845	161	886	121
14	2053	411	196	782	821	156	860	117
15	1962	392	187	748	785	150	822	112
16	2053	411	196	782	821	156	860	117
17	2083	417	198	794	833	159	873	119
18	2053	411	196	782	821	156	860	117
19	1570	314	150	598	628	120	658	90
20	1238	248	118	472	495	94	519	71
21	966	193	92	368	386	74	405	55
22	906	181	86	345	362	69	380	52
23	634	127	60	242	254	48	266	36
24	362	72	35	138	145	28	152	21
	30,263	5,790	2,757	11,654	11,580	2,206	12,131	1,654

The hourly person trips were multiplied by 20 percent to determine the projected mode split, which equated to approximately 5,790 person trips per day. The projected vehicles taken off the road with a 20 percent mode shift was calculated by taking the 20 percent ADT and dividing that number by 2.1, the assumed average auto occupancy. Approximately 2,760 vehicles would be taken off the road.

After the above calculation for vehicles taken off the road, the remaining hourly traffic on the roadway was determined by hour. The remaining traffic for peak season southbound was reduced to 11,654 from 14,411, as shown earlier in Figure 5-1.

The next step calculated the number of induced trips or latent demand, which was discussed in detail in the previous section. The consultant team assumed a 5 percent latent demand and a 10 percent latent demand. The remaining hourly

traffic calculations by hour were multiplied by the assumed latent demand rates. The results were an overall net traffic reduction of 2,206 for a 20 percent mode shift with a 5 percent latent demand. The results of 1,654 net traffic reduction were for a 20 percent mode shift with a 10 percent latent demand.

While some congestion remains under the 10 percent mode shift scenario, with a 20 percent mode shift, congestion is virtually eliminated. Because of this, latent demand under the 20 percent mode shift scenario is likely to be higher. Therefore, scenarios that assume only a 5 percent latent demand with a 20 percent mode shift would likely overstate fuel savings and reductions in carbon emissions. For this reason, the 5 percent latent demand assumption with a 20 percent mode shift was not carried forward in the analysis.

Queue

The traffic queue southbound on San Carlos Boulevard was calculated using the calculations above for the 10 percent and 20 percent mode shift, which determine the change in queue length from the change in traffic volume.

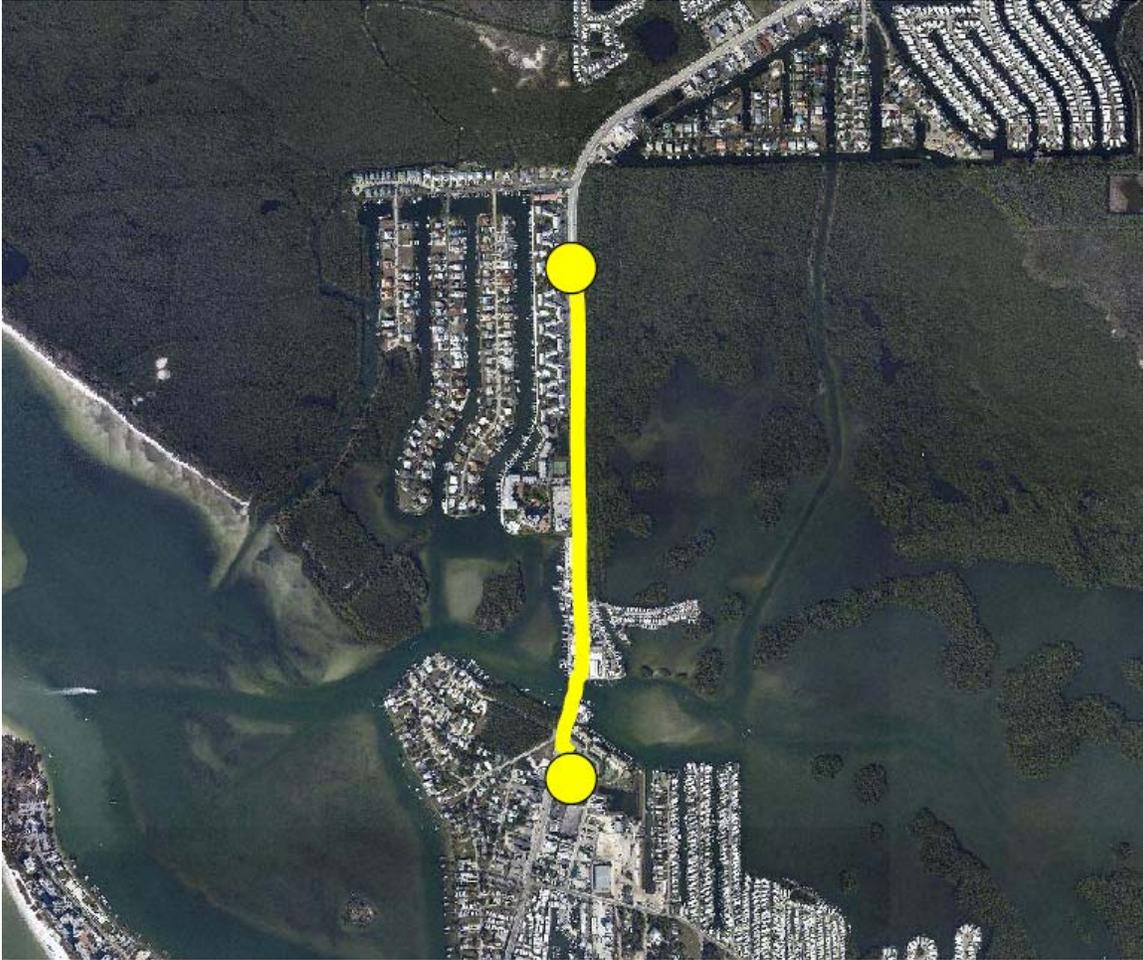
Existing Data

Looking at hourly volumes in the 2008 Lee County Traffic Report, between 9:00 a.m. and 10:00 a.m. the roadway is reaching capacity and queuing begins. This is based on the fact that the volumes tend to plateau at this time. It also agrees with observations in the field, and also coincides with reasonable assumptions regarding roadway capacity. By 7:00 p.m., in a similar manner it is assumed that the queue has dissipated. Based on these assumptions, a simple model of daily queuing was developed. Queues develop and increase when traffic demand exceeds roadway capacity. Queues are reduced and eventually dissipate when demand falls below capacity. Figure 5-4, shown on the following page, presents the results of the assumed queuing model. Each vehicle is assumed to take up 25 feet in the queue, and the queue is assumed to be of equal length in each of the two southbound lanes. Hours during which the queue changes length are shaded. Figure 5-5, on the following pages, shows the assumed maximum queue length on aerial photography. It should be pointed out that this is the maximum queue based on the model. Actual queues are occasionally substantially longer. This is offset by the fact that on days with inclement weather, queues may be substantially shorter.

Figure 5-4 Existing Queue Lengths

Time	Existing Conditions		
	Change in Vehicles in Queue	Vehicles in Queue	Length of Queue (feet each lane)
1:00 AM	0	0	0
2:00 AM	0	0	0
3:00 AM	0	0	0
4:00 AM	0	0	0
5:00 AM	0	0	0
6:00 AM	0	0	0
7:00 AM	0	0	0
8:00 AM	0	0	0
9:00 AM	0	0	0
10:00 AM	40	40	500
11:00 AM	60	100	1,250
12:00 PM	80	180	2,250
1:00 PM	100	280	3,500
2:00 PM	60	340	4,250
3:00 PM	-60	280	3,500
4:00 PM	-70	210	2,625
5:00 PM	-100	110	1,375
6:00 PM	-110	0	0
7:00 PM	0	0	0
8:00 PM	0	0	0
9:00 PM	0	0	0
10:00 PM	0	0	0
11:00 PM	0	0	0
12:00 AM	0	0	0

Figure 5-5 Assumed Maximum Existing Queue Length



10 Percent Mode Shift

The next step in the analysis calculates change in queue length and in Vehicle Miles Traveled (VMT) with a mode shift of 10 percent. Calculations were performed for a 5 percent latent demand and for a 10 percent latent demand. Figure 5-6, on the following page, presents the VMT calculations.

The net traffic reduction, as shown previously in Figure 5-4, was subtracted from the number of vehicles in the queue. For the five percent latent demand, the queue began at 11:00 a.m. with five vehicles, and was dissipated by 3:00 p.m. For the 10 percent latent demand, the queue began at 10:00 a.m. with 31 vehicles and was gone by 3:00 p.m.

Figure 5-6 10 Percent Mode Shift, VMT

Hour	Peak Season Adjustment #Vehicles	Existing		10% Mode Shift @ 5% Latent Demand				10% Mode Shift @ 10% Latent Demand			
		Vehicles in Queue	Length of Queue (ft)	Vehicles Over Capacity	Length (ft)	Delta Queue Difference in Queue Length (ft)	Vehicle Miles Traveled (VMT)	Vehicles Over Capacity	Length (ft)	Delta Queue Difference in Queue Length (ft)	Vehicle Miles Traveled (VMT)
1	129	0	0	0	0	0	0	0	0	0	0
2	115	0	0	0	0	0	0	0	0	0	0
3	173	0	0	0	0	0	0	0	0	0	0
4	101	0	0	0	0	0	0	0	0	0	0
5	108	0	0	0	0	0	0	0	0	0	0
6	144	0	0	0	0	0	0	0	0	0	0
7	431	0	0	0	0	0	0	0	0	0	0
8	748	0	0	0	0	0	0	0	0	0	0
9	877	0	0	0	0	0	0	0	0	0	0
10	992	40	500	(8)	-	500	94	31	390	110	21
11	1021	60	1,250	5	68	1,182	228	50	1,016	234	45
12	1006	80	2,250	24	366	1,884	359	70	1,889	361	69
13	1006	100	3,500	45	925	2,575	491	90	3,013	487	93
14	978	60	4,250	5	983	3,267	605	50	3,637	613	113
15	934	(60)	3,500	(114)	-	3,500	619	-70	2,765	735	130
16	978	(70)	2,625	(121)	-	2,625	486	-79	1,773	852	158
17	992	(100)	1,375	(154)	-	1,375	258	-110	401	974	183
18	978	(110)	-	(165)	-	-	-	-120	0	0	0
19	748	0	0	0	0	0	0	0	0	0	0
20	589	0	0	0	0	0	0	0	0	0	0
21	460	0	0	0	0	0	0	0	0	0	0
22	431	0	0	0	0	0	0	0	0	0	0
23	302	0	0	0	0	0	0	0	0	0	0
24	173	0	0	0	0	0	0	0	0	0	0
	14,411	-	-	-	-	-	3,141	-	-	-	812

The next calculation was the Delta queue, which is the difference between the existing queue and the new queue with the 10 percent mode shift. The Delta queue lengths were used to calculate the change in VMT under extreme conditions. The change in VMT under extreme congestion for the 5 percent latent demand was 2,968, and for the 10 percent latent demand the change in VMT under extreme congestion was 803.

20 Percent Mode Shift

The change in VMT with a 20 percent mode shift to transit was also calculated, using the 10 percent latent demand. The calculation resulted with zero vehicles in the queue. This results in a change in VMT under extreme congestion of 3,152.

While this may initially seem to be a startling result, it reflects the fact that relatively small increases in traffic demand over the available capacity results in significant traffic congestion and queuing. While not completely comparable to traffic flow, filling a glass of water provides an interesting analogy to the situation. Filling the glass to 95 percent of its capacity is relatively simple. Adding the final five percent, without spilling, is more challenging but manageable. Trying to fill a glass to 105 percent of its capacity creates a mess.

On Island Queuing

Analysis of queuing phenomena moving toward Fort Myers Beach is relatively simple as there are few destinations along the length of the queue. Because of this, it is a reasonable assumption that vehicles in the southbound queue are heading for destinations beyond the queue; whether that destination is on San Carlos Island or on Fort Myers Beach.

Queuing on the island, however, is significantly more complicated. There are multiple driveway openings for the entire length of the queue, and many trips do not travel the entire length of the queue itself. For this reason, determining trip length under extreme conditions versus trip length under non-extreme conditions is not possible without significant origin and destination surveys that are beyond the scope of this sketch level study.

However, there is no doubt that queuing on the island does occur, and there would be a significant reduction in fuel use and carbon emissions from greater use of the on-island trolley. Ignoring these reductions is not reasonable, but the type of analysis made for the southbound queue would imply a level of accuracy that simply cannot be claimed for analyzing the queue on the island itself.

Fortunately, there is a Permanent Count Station, number 44, on Estero Boulevard near the Donora Avenue. This Count Station shows the same plateau traffic pattern as Station 8 on San Carlos Boulevard, and field observations confirm the same extreme queuing conditions on San Carlos Boulevard exist on Estero Boulevard. The potential for simply doubling the fuel reduction and

reduction in carbon emissions associated with the southbound queuing was initially considered. However, this approach was rejected as a significant amount of southbound traffic has a destination that is very close to the Matanzas Pass Bridge. As there is no significant congestion northbound once a driver reaches the bridge itself, for analysis purposes, it is assumed that all northbound congestion occurs on Estero Boulevard.

With significantly less traffic at Count Station 44 on Estero Boulevard with an AADT of 14,200 than there is at Count Station 8 with an AADT of 25,000 on San Carlos Boulevard, simply doubling the southbound results is further undermined. With a lower AADT, it is likely there will be less fuel use and carbon reduction on Estero Boulevard, than there will be on the higher volume San Carlos Boulevard. For this reason it was decided to base the reduction in fuel use and carbon emissions on Estero Boulevard and on a portion of the reduction on San Carlos Boulevard based on the difference in AADT.

Fuel Consumption

Reduction in fuel consumption and carbon emissions are associated with reduced congestion and, if the County replaces the current aging trolleys with hybrid or other lower emission technology, by reductions in emissions from the transit fleet itself.

Change Due to Reduced Congestion

By reducing the queue length, the amount of travel under severely congested conditions is reduced. In other words, for the length of the reduced queue, drivers will be moving at an efficient speed of 45 mph versus an inefficient congested speed of 5 mph for the length of the reduction. The change in Vehicle Miles Traveled (VMT) under significant congestion calculated in the previous section is now used to calculate the change in fuel consumption. Fuel use under 45 mph free flow conditions and 5 mph congested conditions were calculated based on research from the Oak Ridge National Laboratory³. Based on those calculations the following fuel consumption per vehicle mile of travel is used in this analysis:

- 45 mph (Free Flow) – 0.0347 gallons per vehicle mile
- 5 mph (Average Speed – vehicles are stopped 50 percent of the time) – 0.1146 gallons per vehicle mile

Again, this difference is due to better efficiency under less congested conditions.

³ *Development of Data-Based Light-Duty Modal Emissions and Fuel Consumption Models* authored by Brian H. West and Ralph N. McGill, Oak Ridge National Laboratory and Jeffrey W. Hodgson, C. Scott Sluder, and David E. Smith, University of Tennessee.

10 Percent Mode Shift

For a 10 percent mode shift with a 5 percent latent demand, the reduction in VMT under congested conditions, 2,968, is multiplied by the difference in fuel consumption between 45 miles per hour free flow and 5 miles per hour average speed, .07990 gallons per vehicle mile. This results in a savings of 237 gallons of fuel per day.

The 10 percent mode shift with a 10 percent latent demand shifts 803 VMT from congested to free flow conditions. Utilizing the same calculation as above yields a savings of 64 gallons of fuel per day. As previously discussed, the 10 percent latent demand assumes that a significant reduction in congestion occurs. Also as previously discussed, it is likely that under a 10 percent mode shift to transit, demand will likely stabilize somewhere between 5 percent and 10 percent. For this reason this analysis will assume that gasoline savings on an average day with a 10 percent mode shift to transit will use the average savings of the 5 and 10 percent latent demand or 151 gallons per day.

20 Percent Mode Shift

Under a 20 percent mode shift to transit, no queue is projected to form on San Carlos Boulevard with a 10 percent latent demand. Under either scenario, the 5 percent or the 10 percent latent demand condition, 3,152 VMT, will be shifted from congested to free flow conditions. This results in 252 gallons of fuel being saved per day.

Change Due to Reduced Number of Trips

In addition to fuel saved due to a reduction in congestion, the vehicles taken off the road due to increased transit use also reduce fuel consumed. As there would be full congestion if these vehicles were not off the road, gasoline consumption has been computed on an hour-by-hour basis to take into account the impact of queuing in the southbound direction. These trips are round trips, so northbound travel also needs to be taken into consideration. As there is no appreciable congestion for northbound travel once the Matanzas Pass Bridge is reached, a speed of 45 mph is assumed for northbound travel.

For the 10 percent mode shift, both the 5 percent and 10 percent latent demand scenarios were calculated, and the average of the two is taken using the same logic previously discussed. For the 20 percent mode shift, only 10 percent latent demand was calculated. The calculation yields 107 gallons per day being saved with a 10 percent mode shift and 395 gallons per day being saved with a 20 percent mode shift.

Fuel Use Due to Transit

As previously discussed, LeeTran already operates significant transit service to and from, as well as on Fort Myers Beach during peak season. Headways on the Island during peak season are 12 minutes and the Park and Ride offers 15 minute headways that increase to 20 minutes during times of the day when traffic

congestion lengthens the trip. With a transit-only lane in place, it would be possible to maintain 15 minute headways throughout the day.

However, increased transit trips would be necessary to accommodate the increased demand for trolleys. With a 10 percent mode shift, during peak hours, headways would need to drop from the current 15 minutes to approximately 8.5 minutes. With a 20 percent mode shift, headways would need to be reduced to 5 minutes. An average trolley capacity of 40 passengers is assumed for these calculations. The current trolleys have a seating capacity of 32, with an additional 20 person capacity for standing. Continually running “crush loads” is not desirable. Based on these assumptions, the number of trolley trips per hour is shown in Figure 5-7 for both a 10 percent and a 20 percent mode shift.

Figure 5-7 Trolleys per Hour

Trolleys Per Hour		
Hour	10 Percent Mode Shift	20 Percent Mode Shift
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	1	2
7	3	6
8	5	10
9	6	12
10	7	12
11	7	12
12	7	12
13	7	12
14	7	12
15	7	12
16	7	12
17	7	12
18	7	12
19	5	10
20	4	7
21	4	6
22	4	6
23	2	4
24	2	2

Because of the increased number of transit trips, fuel use by transit vehicles increases. The net change in fuel use is therefore the decrease in fuel use for automobile plus the increase in fuel use for transit vehicles. This is illustrated in figure 5-8.

Figure 5-8 - Illustration of Fuel Savings Calculation

Net Fuel Savings		
	10 Percent Mode Shift	20 Percent Mode Shift
Daily Auto Fuel Savings (gal)	-258	-647
Daily Change in Transit Fuel Use (gal)	108	256
Daily Total Net Change in Fuel Use (gal)	-150	-391

Additional Factors Effecting Transit Fuel Use

Two additional factors affect the amount of fuel used by transit. First is the fuel efficiency of the transit vehicles. As the trolley routes associated with Fort Myers Beach are excellent candidates for deployment of environmentally friendly vehicles, three options have been considered. First is a standard diesel vehicle, such as is currently used, with a mileage of four miles per gallon (mpg). Second is a diesel-electric hybrid with a estimated mileage of 15 miles per gallon⁴, and finally a hydrogen fuel cell or electric-hydrogen hybrid that uses no fossil fuels.

A second assumption involves the terminus of the Park and Ride Trolley Route:

- Assume the current Bowditch Terminus requires a round trip of approximately 8.0 miles
- Assume a Lynn Hall Park terminus results in a round trip of 6.2 miles.

The resulting efficiency of the transit system under some of these combinations of assumptions sometimes actually results in lower transit fuel use than is currently used, even though a greater number of trips are being made. The total reduction in fuel use considering changes in both automobile and transit fuel use for various assumptions is shown in Figure 5-9.

Figure 5-9: Daily Fuel Use Reduction on San Carlos Boulevard

4 MPG Transit			15 MPG Transit			Hydrogen Transit		
	10 Percent Mode Shift	20 Percent Mode Shift		10 Percent Mode Shift	20 Percent Mode Shift		10 Percent Mode Shift	20 Percent Mode Shift
Daily Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	150	391	Daily Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	295	644	Daily Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	348	737
Daily Net Reduction in Fuel Use (gal - Lynn Hall Terminus)	194	469	Daily Net Reduction in Fuel Use (gal - Lynn Hall Terminus)	307	665	Daily Net Reduction in Fuel Use (gal - Lynn Hall Terminus)	348	737

Annual Fuel Use and Carbon Emission Reduction

Fort Myers Beach is heavily seasonally oriented, and the high level of traffic congestion that occurs during the winter months is practically non-existent at other times. For this reason, annual projections of fuel use savings and carbon

⁴ http://peswiki.com/index.php/Directory:e-Traction_System

reduction are based on a 120 day “season”. In other words, to determine annual reduction the daily savings were multiplied by 120 days. While there would certainly be reduced traffic and increased use of transit during other months of the year, the assumptions regarding changes in mode split are based on surveys performed during peak travel times. Application of this data to non peak months without additional off peak data collation is not appropriate. However, due to the fact that off-season travel is not taken into account, it is likely that the transit benefits stated are conservatively low.

Once fuel use has been determined, calculation of the reduction in carbon emissions is relatively straightforward. The EPA estimates carbon emission rates of 19.4 pounds of carbon dioxide for every gallon of gasoline consumed and 22.2 pounds per gallon for every gallon of diesel fuel consumed. Reflecting the sketch level nature of this analysis, automotive fuel is assumed to be gasoline and transit fuel is assumed to be diesel, except when hydrogen powered vehicles are analyzed. Based on these assumptions, Figure 5-10 shows the annual change in fuel use and carbon reduction for the scenarios analyzed.

Figure 5-10: Annual Fuel Use and Carbon Emission Reduction on San Carlos Boulevard

4 MPG Transit			15 MPG Transit			Hydrogen Transit		
	10 Percent Mode Shift	20 Percent Mode Shift		10 Percent Mode Shift	20 Percent Mode Shift		10 Percent Mode Shift	20 Percent Mode Shift
Annual Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	17,952	46,882	Annual Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	35,376	77,330	Annual Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	41,712	88,402
Annual Total Net Reduction in Fuel Use (gal - Lynn Hall Terminus)	23,298	56,224	Annual Total Net Reduction in Fuel Use (gal - Lynn Hall Terminus)	36,802	79,821	Annual Total Net Reduction in Fuel Use (gal - Lynn Hall Terminus)	41,712	88,402
Annual Total Carbon Reduction (metric tons - Bowditch Terminus)	141.5	373.5	Annual Total Carbon Reduction (metric tons - Bowditch Terminus)	317.0	680.1	Annual Total Carbon Reduction (metric tons - Bowditch Terminus)	381	792
Annual Total Carbon Reduction (metric tons - Lynn Hall Terminus)	195.3	467.6	Annual Total Carbon Reduction (metric tons - Lynn Hall Terminus)	331.3	705.2	Annual Total Carbon Reduction (metric tons - Lynn Hall Terminus)	381	792

Total Fuel Reduction

As previously discussed, however, it is also necessary to take into account fuel use and carbon reduction on Estero Boulevard based on the relative number of trips on Estero Boulevard compared with San Carlos Boulevard. An AADT of 14,200 for Estero Boulevard compared with San Carlos Boulevard’s 25,000 AADT results in a fuel savings projection for Estero Boulevard of 57 percent of the San Carlos Boulevard reduction, or that total reduction equals 157 percent of the San Carlos Reduction. As Bowditch Park is the current and likely continuing northern terminus of the Beach Trolley, calculations including the savings on Estero Boulevard have been performed using the Bowditch Park Terminus scenario. The total annual fuel and carbon reduction for both facilities is shown in Figure 5-11.

Figure 5-11: Annual Fuel Use and Carbon Reduction Including both San Carlos Boulevard and Estero Boulevard

4 MPG Transit		
	10 Percent Mode Shift	20 Percent Mode Shift
Annual Total Net Reduction in Fuel Use (gal)	28,185	73,604
Annual Total Carbon Reduction (metric tons)	222.2	586.4

15 MPG Transit		
	10 Percent Mode Shift	20 Percent Mode Shift
Annual Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	35,376	77,330
Annual Total Carbon Reduction (metric tons - Bowditch Terminus)	317.0	680.1

Hydrogen Transit		
	10 Percent Mode Shift	20 Percent Mode Shift
Annual Total Net Reduction in Fuel Use (gal - Bowditch Terminus)	41,712	88,402
Annual Total Carbon Reduction (metric tons - Bowditch Terminus)	380.8	791.6

Financing Considerations

By decreasing fuel consumption and carbon emissions, enhancements to the Fort Myers Beach Trolley Service aligns with livability and sustainability goals that are becoming increasingly important in almost all types of Federal funding. This has included grants under the American Recovery and Reinvestment Act (ARRA), FTA Small Starts and New Starts Programs, as well as other Federal programs. It is also highly likely that livability and sustainability will be a major part of the eventual reauthorization of the Surface Transportation Act. By pursuing this type of study, LeeTran has positioned itself for funding options that are likely to become available at the Federal level.

Depending on the eventual disposition of energy and environmental legislation, there is also the possibility that the reduction in the emissions of greenhouse gases brought about by these improvements could generate a revenue source through the sale of carbon offsets. Legislation at this point is still extremely volatile, and the potential value of this funding source cannot be quantified. While it may not initially be a particularly large revenue generator, increasing demand for transportation to and from Fort Myers Beach, and the potential for increasing carbon prices over time makes it a situation to monitor as legislation develops.

Summary

The Trolley service is an integral part of Fort Myers Beach community emissions. The recommendations within this report provide a viable project to reduce existing congestion, emissions, and improve quality of life for local residents. This project is evidence of the commitment to reduce the carbon footprint locally, which supports the greater effort for the nation.

Research documents:

- http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_336.pdf
- http://www.apta.com/resources/hottopics/Documents/apta_climate_change_recommended_practice_final_august_14.pdf
- http://apta.com/resources/reportsandpublications/Documents/america_moves_09.pdf
- <http://www.busvic.asn.au/database/files/BusVic%20VCEC%20Congestion%20submission%20final.pdf>

Appendix A: Online Survey Questionnaire



LeeTran Beach Trolley Survey

The information provided by you in this survey will be used to evaluate and improve trolley service on and around Fort Myers Beach. Your input is very important to this process, and once again, thank you for your time.

Unless specifically stated otherwise in the question, please answer all questions on this survey thinking about your last trip to Fort Myers Beach.

- 1 How did you hear about this survey? If you heard in more than one way, please select the first you remember.
- Received or picked up a flyer
 - Heard/saw a radio or television story
 - Word of mouth
 - Link on LeeTran website
 - Other
 - Don't remember or prefer not to answer

SUBMIT

Survey Page 1



LeeTran Beach Trolley Survey

2 What color was the flyer you received?

- White
- Light Yellow
- Light Pink
- Light Blue
- Mailback
- Don't remember



Survey Page 2



LeeTran Beach Trolley Survey

3 On your last trip to Fort Myers Beach were you (please choose the most specific):

- A permanent resident of Fort Myers Beach
- A seasonal (multiple months) resident
- A resident of Lee County
- A resident of Florida
- A resident of the United States other than Florida
- A resident of another country



Survey Page 3

LeeTran Beach Trolley Survey



- 4 Please enter the five digit zip code of your permanent residence.



Survey Page 4



LeeTran Beach Trolley Survey

- 5 Please enter the name of your country of residence:



Survey Page 5



LeeTran Beach Trolley Survey

- 6 How did you travel to Lee County?
- Commercial Airline not as part of a tour or group
 - Private Car

- As part of a tour or group by Bus
- As part of a tour or group by Commercial Airline
- Other/Prefer not to answer



Survey Page 6



LeeTran Beach Trolley Survey

- 7 How did you travel from the airport (or initial destination in Lee County) to Fort Myers Beach?
- Taxi or Limousine Service
 - Rental Car
 - LeeTran Bus
 - Bus or other similar vehicle provided as part of a tour package
 - Rode in/Drove a private car, truck, or van.
 - Other/Prefer not to answer



Survey Page 7



LeeTran Beach Trolley Survey

- 8 Please enter the five digit zip code of your permanent residence.



Survey Page 8



LeeTran Beach Trolley Survey

9 What was the main purpose of your last trip to Fort Myers Beach?

- Commute to or from work
- Work related other than commuting
- Shopping
- School
- Personal Errands
- Beach/Water Recreation - no overnight stay
- Overnight stay at a hotel, condominium, time share, or with friends for recreation/vacation
- Overnight Stay for business
- Medical Appointment
- Other or Prefer not to answer

10 For your last trip to Fort Myers Beach, how did you get to Fort Myers Beach?

- Drove/Rode in car, truck, or van
- Trolley or Bus
- Bicycle
- Walked
- Taxi or Limousine
- Other/Prefer not to answer

A blue arrow-shaped button with the word "SUBMIT" in white capital letters.

Survey Page 9



LeeTran Beach Trolley Survey

11 How did you get to the trolley today?

- Drove to Park and Ride lot
- Walked to Trolley Stop
- Rode Bicycle
- Rode LeeTran Bus
- Other, please specify

12 How did you pay for your trolley trip today?

- Cash
- 3 Day Pass
- Other Pass, including monthly pass
- Other, please specify

A blue arrow-shaped button with the word "SUBMIT" in white capital letters.

Survey Page 10



LeeTran Beach Trolley Survey

13 How many people, total, were in your car/truck/van?

- One (just myself)
- Two (including myself)
- Three (including myself)
- Four (including myself)
- More than four

14 Did you park on the island?

YES NO

SUBMIT 

Survey Page 11



LeeTran Beach Trolley Survey

15 Where did you park?

- Paid public beach access
- Paid public parking lot other than beach access points
- Free parking lot where I'm doing business
- Metered on-street parking
- Private paid parking lot
- Empty vacant lot
- Home, hotel, or condominium
- Other or Prefer not to answer

SUBMIT 



LeeTran Beach Trolley Survey

- 16 Prior to receiving information on this survey, were you aware of trolley/bus service in the Fort Myers Beach area?



LeeTran Beach Trolley Survey

- 17 Have you ever used the Trolley or Bus to travel to, from, or on Fort Myers Beach?



LeeTran Beach Trolley Survey

LeeTran, the Lee County transit agency operates trolleys and buses that provide access to Fort Myers Beach from park and ride lots at the intersection of Summerlin Road and San Carlos Boulevard and at the intersection of Bonita Beach Road and US 41. LeeTran also provides service that runs along the entire group of barrier islands from northern Estero Island to Bonita Beach. For further information, please visit www.rideLeeTran.com.



Survey Page 15



LeeTran Beach Trolley Survey

18 About how often do you ride the trolley?

- Several times per week
- Several times per month
- A few times a year
- very rarely



Survey Page 16



LeeTran Beach Trolley Survey

19 Keeping in mind now all your trips to Fort Myers Beach would you say:

- You almost always use a car, truck, or van
- You often use a car, truck, or van, but sometimes use the trolley
- You use the trolley about as often as a car, truck, or van
- You often use the trolley
- You almost always use the trolley

20 If traffic congestion on and around Fort Myers Beach were reduced, would you make more trips to/from Fort Myers Beach?

Survey Page 17



LeeTran Beach Trolley Survey

21 You have indicated that if traffic congestion were less, you would make more trips to/from Fort Myers Beach. For this question, assume that your normal delay would be reduced by 50%. Choosing the answer that most closely matches your likely number of additional trips, with congestion reduced by 50% would you make:

- Three or more additional trips per week.
- Three or more additional trips per month.
- One or two additional trips per month.
- A few additional trips per year.
- Don't know or prefer not to answer.



LeeTran Beach Trolley Survey

We would now like to ask a few questions regarding your thoughts on trolley service and what would improve trolley service.

22 Which of the following options would make you more likely to ride the trolley? (please check all that apply)

- Free Parking at the Park and Ride
- Waiting less than 15 minutes between trolleys
- Knowing the exact time of the next trolley arrival
- Free Trolley Rides
- A trolley designed to easily accommodate beach gear and/or luggage
- A transit only lane to bypass congestion
- Comfortable Trolley Stops
- Trolleys Using Environmentally Friendly Fuels
- Other, please specify

23 If the trolley system had everything you checked above, would you have ridden the trolley for your last trip to Fort Myers Beach?

- I rode the trolley for that trip
- I would have ridden the trolley for that trip
- I may have ridden the trolley for that trip
- I probably would not have ridden the trolley for

that trip

- I would not have ridden the trolley

24 If the trolley had everything you checked above, are there other trips around Fort Myers Beach you would consider making by trolley?

YES

NO

25 If the trolley had everything checked above would you come to Fort Myers Beach:

- Much more often
- Somewhat more often
- About the same number of trips
- Less often

SUBMIT

Survey Page 19



LeeTran Beach Trolley Survey

We would appreciate some information that will help us make sure our survey reached a broad sample of the population. ***For additional information as to why we ask these types of questions, please [click here](#).***

26 Lee County is a culturally diverse area, particularly with our many visitors. To assist us in developing future surveys, would you please tell us your native language?

- English

- Spanish
- German
- French
- Creole
- Prefer not to answer.
- Other, please specify

27 Are you:

- Male
- Female
- Prefer not to answer

28 Please tell us your age:

- Under 18
- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 or over
- Prefer not to answer

29 Employment Status

- Employed Full Time
- Employed Part Time
- Currently Unemployed (seeking work)
- Not Working Outside the Home
- Retired
- None of the Above or Prefer not to Answer

30 Please tell us your household income, before taxes.

- Less than \$15,000
- \$15,000 to \$24,999
- \$25,000 to \$34,999
- \$35,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 to \$149,999
- \$150,000 or more
- Prefer not to answer



Survey Page 20



LeeTran Beach Trolley Survey

31 Would you be willing to participate in future surveys relating to LeeTran?



Survey Page 21



LeeTran Beach Trolley Survey

32 Please enter your contact information. We will not sell or rent your contact information.

Name:
Email:
Phone:



Survey Page 22



LeeTran Beach Trolley Survey

33 Would you like to be entered into the drawing for a \$100 cash "Thank You" for your participation in this survey?



Survey Page 23



LeeTran Beach Trolley Survey

34 Would you like to be entered into the drawing for a \$100 cash "Thank You" for your participation in this survey?





LeeTran Beach Trolley Survey

- 35 Please enter your contact information so that we can contact you if you win. We will not sell or rent your contact information.

Name:
Email:
Phone:



LeeTran Beach Trolley Survey

Thank you for completing the Beach Trolley Survey! Your responses have been received and added to our survey data.

To return to the survey website, please [click here](#). To visit the LeeTran website, please [click here](#). You may also simply close your web browser.

Again, thank you for your participation!



Appendix B: Online Survey Results

Beach Trolley Deployed 3-31-09

Results Overview



Date: 10/12/2009 1:41 PM PST
 Responses: Completes | Partial
 Filter: No filter applied

The information provided by you in this survey will be used to evaluate and improve trolley service on and around Fort Myers Beach. Your input is very important to this process, and once again, thank you for your time.

Unless specifically stated otherwise in the question, please answer all questions on this survey thinking about your last trip to Fort Myers Beach.

1. How did you hear about this survey? If you heard in more than one way, please select the first you remember.

Received or picked up a flyer		62	24%
Heard/saw a radio or television story		25	10%
Word of mouth		19	7%
Link on LeeTran website		16	6%
Other		139	53%
Don't remember or prefer not to answer		0	0%
Total		261	100%

2. What color was the flyer you received?

White		19	31%
Light Yellow		31	51%
Light Pink		0	0%
Light Blue		5	8%
Mailback		0	0%
Don't remember		6	10%
Total		61	100%

3. On your last trip to Fort Myers Beach were you (please choose the most specific):

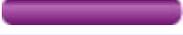
A permanent resident of Fort Myers Beach		46	18%
A seasonal			

(multiple months) resident		53	20%
A resident of Lee County		131	51%
A resident of Florida		7	3%
A resident of the United States other than Florida		18	7%
A resident of another country		4	2%
Total		259	100%

6. How did you travel to Lee County?

Commercial Airline not as part of a tour or group		37	45%
Private Car		42	51%
As part of a tour or group by Bus		0	0%
As part of a tour or group by Commercial Airline		0	0%
Other/Prefer not to answer		3	4%
Total		82	100%

7. How did you travel from the airport (or initial destination in Lee County) to Fort Myers Beach?

Taxi or Limousine Service		10	25%
Rental Car		10	25%
LeeTran Bus		6	15%
Bus or other similar vehicle provided as part of a tour package		0	0%
Rode in/Drove a private car, truck, or van.		13	32%
Other/Prefer not to answer		1	2%
Total		40	100%

9. What was the main purpose of your last trip to Fort Myers Beach?

--	--	--	--

Commute to or from work		20	8%
Work related other than commuting		10	4%
Shopping		21	8%
School		1	0%
Personal Errands		21	8%
Beach/Water Recreation - no overnight stay		120	47%
Overnight stay at a hotel, condominium, time share, or with friends for recreation/vacation		33	13%
Overnight Stay for business		0	0%
Medical Appointment		0	0%
Other or Prefer not to answer		28	11%
Total		254	100%

10. For your last trip to Fort Myers Beach, how did you get to Fort Myers Beach?

Drove/Rode in car, truck, or van		167	65%
Trolley or Bus		69	27%
Bicycle		3	1%
Walked		6	2%
Taxi or Limousine		6	2%
Other/Prefer not to answer		5	2%
Total		256	100%

11. How did you get to the trolley today?

Drove to Park and Ride lot		37	55%
Walked to Trolley Stop		22	33%
Rode Bicycle		2	3%
Rode LeeTran Bus		5	7%
Other, please specify		1	1%

Total	67	100%
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12. How did you pay for your trolley trip today?

Cash		59	89%
3 Day Pass		0	0%
Other Pass, including monthly pass		4	6%
Other, please specify		3	5%
Total		66	100%

13. How many people, total, were in your car/truck/van?

One (just myself)		38	23%
Two (including myself)		75	46%
Three (including myself)		23	14%
Four (including myself)		16	10%
More than four		12	7%
Total		164	100%

14. Did you park on the island?

Yes		147	89%
No		18	11%
Total		165	100%

15. Where did you park?

Paid public beach access		32	22%
Paid public parking lot other than beach access points		9	6%
Free parking lot where I'm doing business		35	24%
Metered on-street parking		6	4%
Private paid parking lot		14	10%

Empty vacant lot		3	2%
Home, hotel, or condominium		45	31%
Other or Prefer not to answer		2	1%
Total		146	100%

16. Prior to receiving information on this survey, were you aware of trolley/bus service in the Fort Myers Beach area?

Yes		173	94%
No		12	6%
Total		185	100%

17. Have you ever used the Trolley or Bus to travel to, from, or on Fort Myers Beach?

Yes		113	65%
No		60	35%
Total		173	100%

LeeTran, the Lee County transit agency operates trolleys and buses that provide access to Fort Myers Beach from park and ride lots at the intersection of Summerlin Road and San Carlos Boulevard and at the intersection of Bonita Beach Road and US 41. LeeTran also provides service that runs along the entire group of barrier islands from northern Estero Island to Bonita Beach. For further information, please visit www.rideLeeTran.com.

18. About how often do you ride the trolley?

Several times per week		34	19%
Several times per month		31	17%
A few times a year		84	46%
very rarely		33	18%
Total		182	100%

19. Keeping in mind now all your trips to Fort Myers Beach would you say:

You almost always use a car, truck, or van		54	30%
You often use a car, truck, or van, but sometimes use the trolley		44	24%
You use the trolley			

about as often as a car, truck, or van		28	15%
You often use the trolley		21	12%
You almost always use the trolley		34	19%
Total		181	100%

20. If traffic congestion on and around Fort Myers Beach were reduced, would you make more trips to/from Fort Myers Beach?

Yes		154	85%
No		28	15%
Total		182	100%

21. You have indicated that if traffic congestion were less, you would make more trips to/from Fort Myers Beach. For this question, assume that your normal delay would be reduced by 50%. Choosing the answer that most closely matches your likely number of additional trips, with congestion reduced by 50% would you make:

Three or more additional trips per week.		31	21%
Three or more additional trips per month.		56	37%
One or two additional trips per month.		27	18%
A few additional trips per year.		29	19%
Don't know or prefer not to answer.		7	5%
Total		150	100%

We would now like to ask a few questions regarding your thoughts on trolley service and what would improve trolley service.

22. Which of the following options would make you more likely to ride the trolley? (please check all that apply)

Free Parking at the Park and Ride		118	48%
Waiting less than 15 minutes between trolleys		176	71%
Knowing the exact time of the next trolley arrival		149	60%

Free Trolley Rides		117	47%
A trolley designed to easily accommodate beach gear and/or luggage		98	40%
A transit only lane to bypass congestion		177	71%
Comfortable Trolley Stops		84	34%
Trolleys Using Environmentally Friendly Fuels		81	33%
Other, please specify		32	13%

23. If the trolley system had everything you checked above, would you have ridden the trolley for your last trip to Fort Myers Beach?

I rode the trolley for that trip		64	26%
I would have ridden the trolley for that trip		79	32%
I may have ridden the trolley for that trip		57	23%
I probably would not have ridden the trolley for that trip		17	7%
I would not have ridden the trolley		27	11%
Total		244	100%

24. If the trolley had everything you checked above, are there other trips around Fort Myers Beach you would consider making by trolley?

Yes		225	91%
No		21	9%
Total		246	100%

25. If the trolley had everything checked above would you come to Fort Myers Beach:

Much more often		83	34%
Somewhat more often		95	39%
About the same number of trips		66	27%

Less often		0	0%
Total		244	100%

We would appreciate some information that will help us make sure our survey reached a broad sample of the population. For additional information as to why we ask these types of questions, please [click here](#).

26. Lee County is a culturally diverse area, particularly with our many visitors. To assist us in developing future surveys, would you please tell us your native language?

English		236	97%
Spanish		2	1%
German		1	0%
French		1	0%
Creole		0	0%
Prefer not to answer.		0	0%
Other, please specify		3	1%
Total		243	100%

27. Are you:

Male		107	44%
Female		133	55%
Prefer not to answer		3	1%
Total		243	100%

28. Please tell us your age:

Under 18		3	1%
18 to 24		5	2%
25 to 34		9	4%
35 to 44		19	8%
45 to 54		52	21%
55 to 64		74	30%
65 or over		76	31%
Prefer not to answer		5	2%
Total		243	100%

29. Employment Status

Employed Full Time		92	38%
Employed Part Time		23	9%
Currently Unemployed (seeking work)		7	3%
Not Working Outside the Home		7	3%
Retired		107	44%
None of the Above or Prefer not to Answer		7	3%
Total		243	100%

30. Please tell us your household income, before taxes.

Less than \$15,000		12	5%
\$15,000 to \$24,999		16	7%
\$25,000 to \$34,999		13	5%
\$35,000 to \$49,999		31	13%
\$50,000 to \$74,999		40	16%
\$75,000 to \$99,999		37	15%
\$100,000 to \$149,999		25	10%
\$150,000 or more		14	6%
Prefer not to answer		55	23%
Total		243	100%

31. Would you be willing to participate in future surveys relating to LeeTran?

Yes		199	82%
No		44	18%
Total		243	100%

33. Would you like to be entered into the drawing for a \$100 cash "Thank You" for your participation in this survey?

Yes		181	92%
No		16	8%
Total		197	100%

34.

Would you like to be entered into the drawing for a \$100 cash "Thank You" for your participation in this survey?

Yes		33	75%
No		11	25%
Total		44	100%

Thank you for completing the Beach Trolley Survey! Your responses have been received and added to our survey data. To return to the survey website, please click [here](#). To visit the LeeTran website, please click [here](#). You may also simply close your web browser. Again, thank you for your participation!

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Appendix C: Trolley Survey Press Release

CRSPE, Inc.

Transportation Engineering, Planning, and Finance

CONTACT:
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239-573-7960,

Joann Haley, LeeTran
239-533-0323

FOR IMMEDIATE RELEASE

Beach Trolleys Could Help Lee County Become Greener

FORT MYERS BEACH, FL, March 30, 2009 – LeeTran is looking at ways the LeeTran Trolleys serving Fort Myers Beach could become even more environmentally friendly. Part of the process includes surveying the public and everyone can help by participating in the online (internet) survey at www.trolleysurvey.com. Each survey respondent becomes eligible for a \$100 cash prize. LeeTran will host the survey through April 15th and everyone is invited to participate whether they currently ride the trolleys or not.

The surveys are part of the data collection effort of a study to determine how the LeeTran Trolley Service can further reduce traffic congestion on and around Fort Myers Beach. The project will look at potential trolley enhancements and their possible effect on increasing trolley ridership to reduce congestion. The potential savings in carbon emissions and fossil fuel use will then be projected. The potential benefits from switching to trolleys that are powered by more environmentally friendly fuels will also be considered. “If we can find ways to entice more drivers to leave their cars off the island and take the trolley, we can reduce the amount of time cars spend idling in traffic. Not only does this reduce emissions, it also saves fuel!” said Steve Myers, Director of LeeTran. “Between stimulus funds, potential grants, and provisions being discussed for the reauthorization of federal surface transportation funding, there may also be the opportunity to obtain trolleys that operate on more environmentally friendly fuel to replace our existing trolleys as the fleet ages,” continued Myers.

To be eligible for the cash prize, the survey must be completed on or before April 15, 2009. Persons may respond only once. Persons who would prefer to take the survey in writing can send a self-addressed stamped envelope to CRSPE, Inc. 1414 S.E. 17th Avenue, Suite 104, Cape Coral, FL 33990 to obtain a copy.

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Appendix D: Survey Flyer



LeeTran wants to
know what you
think!

Your Ride Is Here



LeeTran wants to
know what you
think!

Your Ride Is Here

LeeTran is looking for ways to make the Beach
Trolley Service even better for you-*and our*
environment!

You can help by taking a short survey on the
beach trolley (whether you ride the trolley or
not) at www.beachtrolley.com. You could even
win \$100 just for *letting us know what you think!*

LeeTran is looking for ways to make the Beach
Trolley Service even better for you-*and our*
environment!

You can help by taking a short survey on the
beach trolley (whether you ride the trolley or
not) at www.beachtrolley.com. You could even
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LeeTran wants to
know what you
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