

MEMORANDUM

DATE: March 18, 2002

TO: Broward County Clean Air Cooperative

FROM: Booth Babcock, LKC Consulting

RE: Preliminary Transit Service Concepts for EV-Circulator System

This memorandum includes detailed descriptions of the route service concepts currently in review as part of the transit development plan for the Broward County Clean Air Cooperative (CAC). This memo is intended to accomplish the following:

- To update the CAC as to the current status of the circulator system development project
- To generate comments and questions from the CAC as a means to refine the attached transit service concepts

This memorandum includes a set of transit service concepts developed by LKC as part of this project. Much of this material was already presented in the first Technical Memorandum for the project and at the January CAC meeting in Fort Lauderdale. Some elements of the transit service concepts have been updated based on comments received at the CAC meeting.

Please direct any comments on any of the attached materials to Booth Babcock at LKC, either via email at booth@lkcinc.com or by telephone / fax, (512) 533-9506.

Introduction

The following memorandum will present the following transit service concepts:

- Route A: Airport Express Service
- Route B: Airport-Cruise Terminal-Convention Center Shuttle
- Route C: Convention Center-Hotel-Las Olas Shuttle
- Route D: Downtown Circulator Routes

Target markets for these services were identified in the first Technical Memorandum for this project. Market data will be summarized in this memorandum.

Route A: Airport Express Service

An airport express route (herein designated Route A) would provide limited stop transit service between downtown Fort Lauderdale, Young Circle in Hollywood, and Fort Lauderdale-Hollywood International Airport (FLL). This service would be targeted both to travelers using FLL and FLL employees. It would replace existing airport service via Route 1 (which would no longer enter the airport).

Target Market

On a given day, FLL serves 43,000 passengers and employees 6,750 people (source: FLL). Transit captures only a small portion of these airport trips. According to Broward County Transit (BCt), in 2000 an average of 190 people per day boarded Route 1 at the airport. An additional 476 passengers boarded the TriRail shuttle at the Fort Lauderdale Airport Station. There is no existing data to show what percentage of these transit boardings are airline passengers and how many are employees. The 666 daily transit boardings represent 1.3% of the approximately 50,000 daily employees and passengers at the airport.

Private automobiles and taxis account for the majority of trips to FLL. In 2000, an average of 24,300 vehicles passed the main airport entrance point. The second largest mode is private shuttle bus service, in particular to the cruise ship terminals at Port Everglades. According to FLL, 4,300 daily passengers are cruise ship patrons, of which the bulk are transported via shuttles operated by cruise ship lines.

If a transit service could capture 3 percent of the air passenger market and 5 percent of the employee market, it would see approximately 2,000 passenger boardings per day (assuming two boardings per day for employees).

Service Concept

In the short-term, Route A would operate in FLL on the lower level access road. Specific stop locations at the airport are to be determined. In the longer term, the route would serve the remote check-in and transportation center at the airport.

Between FLL and downtown Fort Lauderdale, service would operate with limited stops, generally at major route transfer points or at major activity centers (see **Figure 1**). The route would operate on Andrews, which is generally less congested than Highway 1 (see Technical Memorandum 1, **Figure 1.11**). Route A would circulate through the core of downtown Fort Lauderdale to provide curbside service to major employment and educational facilities, and then end at the Broward Central Terminal. The Broward Central Terminal is the busiest point in the BCt system, with over 16,000 daily boardings and alightings. Central Terminal would serve as a connection point between the airport service and regional fixed route and downtown circulator services. The route would layover on Brickell Avenue adjacent to the transit center.

South of the airport, Route A would also serve downtown Hollywood. The route would travel between Hollywood and FLL via Highway 1, terminating at Young Circle. With five routes and 1,400 daily boardings, Young Circle is the third busiest transit facility in the BCt system.

The following service assumptions apply to Route A:

- Span of Service: 6:00 A.M. to 11:00 P.M.
- Frequency: 15 Minutes (Weekday Peak Period) / 30 Minutes (Off-Peak / Weekends)
- Passenger Fare: \$1.00

Route A is shown in **Figure 1**.

Figure 1
Route A Map

Service statistics for Route A are shown in **Table 1**.

**Table 1
Route A Service Statistics**

Statistic	Weekday	Saturday	Sunday	Annual
Peak Vehicles	6	3	3	6
Base Vehicles	3	3	3	3
Vehicle Hours	74.0	54.5	54.5	24,000
Vehicle Miles	1,104.3	810.9	810.9	364,000
Revenue Hours	62.2	43.2	43.2	20,000
Revenue Miles	955.0	707.2	707.2	316,000
Revenue Hours / Vehicle Hours	0.84	0.79	0.79	0.83
Operating Cost	\$4,500	\$3,300	\$3,300	\$1,484,000
Fare Revenue	\$1,137	\$790	\$790	\$370,000
Net Operating Cost	\$3,400	\$2,500	\$2,500	\$1,114,000
Net Cost / Revenue Hour	\$54.69	\$57.84	\$57.84	\$55.70
Net Cost / Revenue Mile	\$3.56	\$3.54	\$3.54	\$3.53
Passenger Boardings	1,960	1,362	1,362	639,000
Passengers / Revenue Hour	31.5	31.5	31.5	32.0
Passengers / Revenue Mile	2.8	1.9	1.9	2.0
Net Cost / Passenger	\$1.73	\$1.84	\$1.84	\$1.74
Fare Recovery	25.3%	23.9%	23.9%	24.9%

Convention Center / Cruise Terminal Shuttle

A convention center / cruise terminal shuttle (herein designated Route B) would provide limited stop transit service between FLL and the Midport and Northport Cruise Ship Terminals and the Broward County Convention Center. This service would be oriented towards conventioners and cruise ship passengers. It would replace existing shuttle services offered by cruise ship lines.

Target Market

According to FLL, on an average weekday, 4,300 cruise ship patrons pass through the airport. Currently, the majority are transported to their cruise terminals by shuttles operated by the cruise ship lines. Some passengers also travel by taxi cab. The following deficiencies have been identified for the current system:

- Multiple cruise ship shuttles loading or unloading simultaneously at the airport causes traffic congestion
- Multiple cruise ship shuttles traveling along the same route represent an inefficient service that is very expensive to the cruise lines
- Because it is not cost effective to operate a shuttle for a limited number of passengers, some arriving passengers are forced to wait around the airport terminals until enough cruise passengers arrive to warrant operating the shuttle

Conventioneers arriving at the airport generally travel to the Broward County Convention Center via private (rented) automobile or taxi. Rental fees can be high and parking is limited at the convention center. During 2000, the Greater Fort Lauderdale Convention and Visitors Bureau (GFLCVB) reported that the convention center received 380,000 annual visitors per year. Of those, 45 percent were from outside of the Fort Lauderdale area, and 30 percent were from out of state. Assuming 90 percent of out-of-state visitors and 50 percent of in-state visitors arrive via FLL, 182,000 annual convention center visitors arrived via FLL (about 500 per day, though demand is not spread evenly across all days).

If a transit service could capture 50 percent of the cruise ship market and 10 percent of the convention market, it would see approximately 2,200 passenger boardings per day.

Service Concept

In the short-term, Route B would serve the convention center, the cruise terminals, and the lower level access road at FLL. Specific stop locations at the airport are to be determined. In the longer term, the route would serve the remote check-in and transportation center at the airport. Note that there may be changes to the suggested routing based on security concerns at Port Everglades.

The route is shown in **Figure 2**. Buses would operate non-stop from the airport to the Midport Terminal, then to the Northport Terminal, then to the loop road in front of the convention center. Buses would layover at the cruise terminals to not block traffic at the airport or the convention center. Midport Service could be eliminated during times when there is no traffic between Midport and the airport.

Route B would operate between 7:00 A.M. and 10:00 P.M., with 30 minute headways. Fare would be \$1.00, although cruise ships may wish to negotiate free service for their patrons. **Figure 2** shows Route B.

Figure 2
Route B

Service statistics for Route B are shown in **Table 2**.

**Table 2
Route B Service Statistics**

Statistic	Weekday	Saturday	Sunday	Annual
Peak Vehicles	2	2	2	2
Base Vehicles	2	2	2	2
Vehicle Hours	27.5	27.5	27.5	10,000
Vehicle Miles	304.5	306.3	306.3	109,000
Revenue Hours	18.4	19.1	19.1	7,000
Revenue Miles	260.4	260.4	260.4	93,000
Revenue Hours / Vehicle Hours	0.67	0.69	0.69	0.70
Operating Cost	\$1,700	\$1,700	\$1,700	\$607,000
Fare Revenue	\$335	\$349	\$349	\$121,000
Net Operating Cost	\$1,400	\$1,400	\$1,400	\$486,000
Net Cost / Revenue Hour	\$76.25	\$73.30	\$73.30	\$69.43
Net Cost / Revenue Mile	\$5.38	\$5.38	\$5.38	\$5.23
Passenger Boardings	577	601	601	208,000
Passengers / Revenue Hour	31.4	31.5	31.5	29.7
Passengers / Revenue Mile	2.2	2.3	2.3	2.2
Net Cost / Passenger	\$2.43	\$2.33	\$2.33	\$2.34
Fare Recovery	19.7%	20.5%	20.5%	19.9%

Convention Center / Hotel Shuttle

A convention center / hotel shuttle (herein designated Route C) would provide limited stop transit service between the convention center and hotels located in the downtown Fort Lauderdale / Fort Lauderdale Beach area. This service would be oriented towards conventioners and tourists. It would replace existing shuttle services offered by some hotels.

Target Market

During 2000, the Greater Fort Lauderdale Convention and Visitors Bureau (GFLCVB) reported that the convention center received 380,000 annual visitors per year. Of those, 45 percent were from outside of the Fort Lauderdale area, and 30 percent were from out of state. Assuming 75 percent of out-of-town visitors would stay at a hotel, approximately 600 conventioners per day would seek hotel rooms. Because convention center business is not spread evenly over every day of the year, the actual number of patrons for a large convention could be much larger than 600.

According to the GFLCVB, there are more than 25,000 hotel and motel rooms in Broward County. Of these, more than 8,000 are located within the study area (see Technical Memorandum 1, **Table 1.6**). Hotels used by conventioners are primarily located near the convention center along 17th Street or along the beach between the 17th Street Bridge and Las Olas Blvd. Movement between the convention center and these hotels is primarily by hotel shuttle bus, taxi, or rented car.

In addition to service between hotels and the convention center, there is also a potential demand among convention center patrons for a connection to shopping and dining areas. The greatest concentrations are along Las Olas Blvd. between Fort Lauderdale Beach and downtown and at the Fort Lauderdale Galleria.

If a transit service could capture 50 percent of the convention center market, it would provide 300-500 trips per day (each way) depending on how busy the convention center is. Lunchtime service to Las Olas and / or the Galleria could capture perhaps 200-300 additional trips per day.

Service Concept

The Convention Center-Hotel Shuttle is primarily oriented towards the needs of convention-goers who are staying in central Fort Lauderdale hotels. During AM Peak, midday, and PM Peak hours (roughly 7:00 A.M. to 7:00 P.M.) the route would connect the convention center with hotels located along 17th Street to the east and west of the convention center and to hotels located along Highway A1A south of Las Olas Blvd. Service would be every 15 minutes.

During lunch (midday) and PM Peak periods, the shuttle would also connect the convention center and hotels to Las Olas Blvd. between downtown and Highway A1A. This service would be market both to conventioners looking for places to go for lunch or dinner and to people staying in the hotels along the route. Service would be every 15 minutes.

In the nighttime period (after 7:00 A.M.) the service would only operate between hotels and Las Olas Blvd. and would bypass the convention center. Service would be every 30 minutes.

Service would at all times also serve the proposed waterbus station at the 17th Street Bridge. Service would

be seven days per week, operating at 30 minute headways on Saturdays and Sundays.

The route is shown in **Figure 3**.

Figure 3
Route C

Service statistics for Route C are shown in **Table 3**.

Table 3
Route C Service Statistics

Statistic	Weekday	Saturday	Sunday	Annual
Peak Vehicles	5	3	0	2
Base Vehicles	4	2	0	2
Vehicle Hours	78.1	49.9	0.0	22,000
Vehicle Miles	773.3	441.9	0.0	220,000
Revenue Hours	63.3	36.1	0.0	18,000
Revenue Miles	621.4	355.3	0.0	177,000
Revenue Hours / Vehicle Hours	0.81	0.72	0.00	0.82
Operating Cost	\$4,800	\$3,100	\$0	\$1,382,000
Fare Revenue	\$1,157	\$659	\$0	\$329,000
Net Operating Cost	\$3,600	\$2,400	\$0	\$1,053,000
Net Cost / Revenue Hour	\$56.86	\$66.46	\$0.00	\$58.50
Net Cost / Revenue Mile	\$5.79	\$6.76	\$0.00	\$5.95
Passenger Boardings	1,995	1,137	0	567,000
Passengers / Revenue Hour	31.5	31.5	0.0	31.5
Passengers / Revenue Mile	3.2	1.8	0.0	3.2
Net Cost / Passenger	\$1.80	\$2.11	\$0.00	\$1.86
Fare Recovery	24.1%	21.3%	0.0%	23.8%

Downtown Circulator

Routes D1 and D2 are downtown circulators. The primary purpose of the D Routes is to connect major BCt and TriRail passenger facilities and the I-95 Park & Ride lot with downtown employment and to provide for internal circulation within the downtown area. This function is currently provided by line-haul BCt bus service within the downtown area, by the TMAX Circulator Service, and by the TriRail Shuttle.

Target Markets

Downtown Fort Lauderdale represents both the largest overall employment center in Broward County and the county's largest transit market. The purposes of the downtown circulator routes are:

- To connect major transit facilities (Central Terminal, TriRail) with downtown employment and educational facilities
- To provide internal circulation in the downtown area
- To provide an alternative to the automobile for intra-downtown trips
- To provide service to non-work destinations such as tourist attractions, shopping, museums, etc.

According to TriRail, approximately 600 commuters use the Fort Lauderdale TriRail Station on the average weekday. On an average weekday, 7,900 BCt patrons alight at the Central Terminal. This represents 8,500 existing transit "arrivals" in downtown Fort Lauderdale. If a circulator service carried 20 percent of these arrivals twice per day (once each way) it would carry 3,400 daily trips.

According to Broward County, there are more than 76,000 employees working within the study area. Of these, approximately a third (23,000) work in the core area of downtown Fort Lauderdale. If transit could provide AM and PM commute trips to 20 percent of downtown employees and 10 percent of other employees within the study area, it would carry almost 20,000 daily trips.

Service Concept

Two circulator routes are proposed, one for the northern portion of the downtown area and one for the southern portion. Both serve the Fort Lauderdale TriRail Station and the Central Terminal. Routes were designed to maximize potential service to major employment concentrations. **Figure 4** shows the location of employment in Fort Lauderdale.

Route D1 serves the northern portion of the study area. The service area includes downtown Fort Lauderdale, Las Olas Blvd., Fort Lauderdale Beach, and the Galleria Mall area. This route would provide connector service between downtown and the Las Olas District. On weekends, it also would provide a connection between TriRail and the beach.

Route D2 serves the southern portion of the study area. The service area includes downtown Fort Lauderdale, the Broward General Medical Center, and the convention center. On weekends, it would be extended via 17th Street and Highway A1A to connect the TriRail Station with the Fort Lauderdale Beach south of Las Olas Blvd.

Frequencies would be high, generally 10 minutes, during working hours (roughly 7am to 6pm). Evening and weekend service is at lower frequencies and will primarily serve to connect transit facilities with recreational

facilities (i.e. Fort Lauderdale Beach) and shopping.

Routes D1 and D2 are shown in **Figure 5**.

Figure 4
Fort Lauderdale employment

Figure 5
Route D1 & D2

Service statistics for Route D are presented in **Tables 4** and **5**.

Table 4
Route D1 Service Statistics

Statistic	Weekday	Saturday	Sunday	Annual
Peak Vehicles	9	4	3	2
Base Vehicles	9	4	3	2
Vehicle Hours	129.1	60.0	41.5	38,000
Vehicle Miles	1,326.5	658.5	417.6	393,000
Revenue Hours	113.9	49.5	31.4	33,000
Revenue Miles	1,053.1	539.7	342.3	314,000
Revenue Hours / Vehicle Hours	0.88	0.83	0.76	0.87
Operating Cost	\$7,900	\$3,700	\$2,500	\$2,331,000
Fare Revenue	\$2,083	\$904	\$573	\$607,000
Net Operating Cost	\$5,800	\$2,800	\$1,900	\$1,724,000
Net Cost / Revenue Hour	\$50.92	\$56.60	\$60.57	\$52.24
Net Cost / Revenue Mile	\$5.51	\$5.19	\$5.55	\$5.49
Passenger Boardings	3,592	1,559	988	1,046,000
Passengers / Revenue Hour	31.5	31.5	31.5	31.7
Passengers / Revenue Mile	3.4	1.5	1.8	3.3
Net Cost / Passenger	\$1.61	\$1.80	\$1.92	\$1.65
Fare Recovery	26.4%	24.4%	22.9%	26.0%

**Table 5
Route D2 Service Statistics**

Statistic	Weekday	Saturday	Sunday	Annual
Peak Vehicles	8	5	3	2
Base Vehicles	8	5	3	2
Vehicle Hours	115.8	71.7	58.1	36,000
Vehicle Miles	1,129.6	781.4	686.1	363,000
Revenue Hours	97.0	58.7	51.6	30,000
Revenue Miles	896.8	640.5	562.4	290,000
Revenue Hours / Vehicle Hours	0.84	0.82	0.89	0.83
Operating Cost	\$7,100	\$4,400	\$3,600	\$2,219,000
Fare Revenue	\$1,774	\$1,074	\$943	\$555,000
Net Operating Cost	\$5,300	\$3,300	\$2,700	\$1,664,000
Net Cost / Revenue Hour	\$54.64	\$56.21	\$52.38	\$55.47
Net Cost / Revenue Mile	\$5.91	\$5.15	\$4.80	\$5.74
Passenger Boardings	3,059	1,851	1,626	957,000
Passengers / Revenue Hour	31.5	31.5	31.5	31.9
Passengers / Revenue Mile	3.4	2.1	2.5	3.3
Net Cost / Passenger	\$1.73	\$1.78	\$1.66	\$1.74
Fare Recovery	25.0%	24.4%	26.2%	25.0%

Internal Airport Circulation

Internal airport circulation was identified at the outset of this study as a goal for the EV-Circulator System. Specifically, the circulator was to connect the passenger terminals with a centralized off-site car rental facility. At this time, the need for such a service is uncertain. In the short-term, individual rental car companies will continue to provide their own shuttle services to their own decentralized remote parking locations. In the long term, airport document suggest that a fixed-guideway tram system will connect the terminals with a remote rental car facility. Therefore, it is in the medium term – between the time that the centralized facility is built and the time that the tramway can be completed – that the circulator system may

be needed within the airport. More information on this service will be included in future Technical Memoranda as it becomes available.

Combined Annual Statistics

Combined annual statistics for Routes A-D are presented in **Table 6**.

Peak Vehicles (incl. 20% Spare)	36
Vehicle Hours	131,000
Vehicle Miles	1,449,000
Revenue Hours	108,000
Revenue Miles	1,189,000
Revenue Hours / Vehicle Hours	0.83
Operating Cost	\$8,029,000
Fare Revenue	\$1,982,000
Net Operating Cost	\$6,047,000
Net Cost / Revenue Hour	\$55.79
Net Cost / Revenue Mile	\$5.09
Passenger Boardings	3,417,000
Passengers / Revenue Hour	31.52
Passengers / Revenue Mile	2.87
Net Cost / Passenger	\$1.77
Fare Recovery	24.7%