

The Shuttle by United

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## Abstract

United Airlines designed the Shuttle by United to compete in the short-haul air service market. Up to mid-1994, United had been steadily losing market share in the short-haul markets to new carriers with lower costs. It seized an opportunity created by an employee buyout through an employee stock ownership plan (ESOP) to reestablish itself as a competitor in those markets. Using a combination of market research, employee teams, and process analysis, United reduced its costs by 30 percent, increased plane utilization, and cut turnaround time in half from its existing air service. Its efforts have resulted in higher customer satisfaction, improved market share, reduced costs, and increased profitability.

## The Shuttle by United

It is 9:30 am on October 1, 1994. "Three, two, one, ignition!" Rono Dutta, vice-president of shuttle development, is chanting this countdown with a group of Shuttle by United employees at Los Angeles International airport. As he presses a large button labeled "Launch," the San Francisco-bound passengers on flight 2018 holding zone 1 boarding passes start to board. Zone boarding is a concept initiated by the Shuttle by United to help the airline regain market share in the short-haul markets. In those markets, niche carriers, such as Southwest, America West, and other low-cost carriers, have steadily pushed out the more established, higher-cost airlines, such as American, Delta, and United. The niche carriers offer low fares, no-frills service, and frequent flights, a formula that has been fully endorsed by the marketplace.

When designing the shuttle, United targeted the west coast of the United States. United has a strong, well-established consumer franchise in the busy and demanding west coast market. For example, it operates 40 round trips per day between Los Angeles and San Francisco, the largest air travel market in the United States. In this crucial west coast market, United's share eroded from 50 percent in 1989 to 34 percent in 1994, mainly due to Southwest entering the fray in the late 1980s and increasing its market share from zero to 50 percent. As United announced its plans for the shuttle for the fall of 1994, both USAir and American Airlines announced major reductions in intrastate flights.

To compete successfully in the short-haul market, United needed to reduce its costs by 30 percent. When its employees bought out United Airlines Corporation

through an ESOP (employee stock ownership plan), it had an opportunity to make this happen. The lower pay scales and more flexible work rules resulting from the ESOP package, combined with increased aircraft utilization, helped United close its cost gap with its short-haul competitors.

### **The Employee Buyout**

As part of the employee buyout of United Airlines, employees traded nearly five billion dollars in wage, benefit, and work-rule concessions for a 55 percent stake in United. The buyout was sought and driven by the pilots and machinists unions. Flight attendants withdrew from the labor coalition in 1993. In exchange for the right to select three of the 12 directors on the United board, the employees put up \$4.9 billion in wage and benefit concessions over five years, ranging from 8.25 percent in givebacks for nonunion office workers and ticket agents to 14.7 percent for ground crews and 15.7 percent for pilots. The entire package will reduce United's labor costs by 14 percent.

United strategists sought to leverage this reduction in labor costs to develop a new product competitive with Southwest Airlines. The cost target for the new product was set at 7.4 cents per available seat mile (down from the pre-ESOP 10.5 cents). To achieve its 7.4 cents goal, United needed to decrease costs in two other areas: assets and distribution. It reduced asset costs through higher utilization of aircraft and facilities and reduced distribution expenses through greater reliance on direct ticketing (Table 1). At 7.4 cents, United would be at a 0.4 cent disadvantage to Southwest. It compensated for this disadvantage by obtaining additional revenue with its superior yield management tools and from its higher average revenue per passenger. The shuttle

routinely matched Southwest fares to the penny on the same routes. Even at fare parity, the shuttle would enjoy a higher average simply because of its first-class service and a greater proportion of connecting passengers.

### **The Competition: Southwest Airlines**

Southwest Airlines was the major competitor for United in the west coast market. Southwest has succeeded because of its well-focused strategy centered on high frequency point-to-point service of routes under 750 miles and a fleet built around a single aircraft type, the Boeing 737. Southwest leads the industry in on-time performance, baggage handling, and rate of consumer complaints and bills itself as the only holder of the "Triple Crown" in the industry. Its success is largely credited to a highly enthusiastic, motivated, and productive work force and high aircraft utilization, resulting in a low-cost structure. Southwest is a very different airline: it offers no meals, no first-class section, and no assigned seats. To avoid booking fees, it has repeatedly refused to join the computerized reservations systems sponsored by the big three carriers (American, Delta, and United). Thanks to a simpler product and simpler processes, it consistently achieves a 20-minute turnaround time (the period from when a plane arrives at the gate until it leaves the gate) and high aircraft utilization. Its open-seating policy encourages passengers to arrive at the gate early to get the best seats. Its boarding process is a prime example of a simpler process. Passengers are issued plastic boarding cards numbered from 1 to 126 (the number of seats on the airplane) on a first-come, first-served basis. These cards are issued only at the gate, which eliminates the need for expensive and extensive computer networks throughout the

airport. Passengers are boarded in groups of 30, and carry-on baggage rules are strictly enforced to speed up the boarding process. Carry-on bags not meeting the size requirements are tagged at the gate and brought down to the baggage compartment in the plane cargo bay by any available employee.

Once on board, passengers can sit in any available seat. Flight attendants assist passengers with seating and carry-on storage. In-flight service is limited to peanuts and drinks, which simplifies aircraft servicing and reduces costs.

The practice of cross-utilizing employees makes the Southwest workplace productive and has created a strong team atmosphere. Southwest's low-cost structure, combined with its high load factor and high customer satisfaction, has led to its enormous success and its status as the only profitable US airline in the early 1990s with a net margin of five percent or better.

### **Development of the Shuttle**

"It is our firm belief that if we do what is right for our customers and what is right for our employees, then shareholders' value will be maximized." This vision of the shuttle was translated into an implementation plan by 22 cross-functional employee teams. According to Rono Dutta, vice-president of shuttle development, their mandate was to set up the shuttle as a "customer-friendly and hassle-free" product, build "a fiercely loyal customer base," instill ownership and enthusiasm in its employees, and ultimately achieve profitability. Over a two-month period, these teams developed operating procedures (playbooks in shuttle parlance) from the ground up. These playbooks covered such areas as airport, flight, and in-flight operations. In addition, the

airline set up city teams to develop a public awareness campaign targeted at specific communities. These "city" teams typically consisted of a flight attendant, a pilot, a baggage handler, a reservations agent, and a sales account executive who lived in a particular metropolitan area. Involving a broad cross-section of front-line employees in designing a new product represented a radical departure from past United management practices.

### **Main Goals**

To compete with Southwest, United needed to make a profit at Southwest's price. United asked its employee teams to increase aircraft utilization, which implied reducing time on the ground. Turnaround time is affected by several factors: the deplaning rate (in passengers per minute), the enplaning rate (in passengers per minute), baggage handling time, and other servicing time. If the airline reduced ground time, it would require fewer gates and less ground equipment. If it could increase aircraft utilization, it would increase the revenue generated by each plane. Southwest flew its planes 11 hours per day. The Shuttle by United made matching that number its goal.

### **The Original Process**

Before designing the Shuttle by United, the teams analyzed the existing procedures of United and Southwest. They performed detailed time studies for deplanement, enplanement, baggage handling, and fueling services. These studies served as the basis for the design of the Shuttle by United.

On United's regular flights, passengers received assigned seats and, upon request, boarding passes, when they bought their tickets. Families with children, children traveling alone, and people needing extra assistance were preboarded, followed by first-class passengers and premier passengers (the top level of United's frequent flyer program). After this, the airline boarded by row numbers from the rear of the plane forward. Passengers in the back third of the plane boarded first, then passengers in the middle of the plane, and finally passengers in the front part of the coach section. United restricted carry-on baggage to two bags per person but did not strictly enforce size and number restrictions.

A flight attendant greeted passengers as they boarded the plane while other flight attendants set up the in-flight service in the galleys. The gate attendant or a flight attendant could restrict what a passenger carried on but had to call a baggage handler for assistance.

The United teams performed time studies on the components of ground time for both Southwest and United. It did both time studies on 737 aircraft using a single door jet bridge. Southwest and United Airlines had the same deplaning rate (17 passengers per minute), but the team observed that Southwest had an enplanement rate of 11 passengers per minute while United had an enplanement rate of only 8.5 passengers per minute.

When flights arrived at the gate, the plane door was opened so passengers could deplane. Southwest took a half minute to open the door and United one minute. Southwest had a gate agent who waited at the jetway door to meet the plane and open the door from the outside, whereas the United gate agent often had to be called in from

other duties. Once the door was open, passengers were deplaned (six minutes for both airlines), and the inflight crew did minor cabin cleaning. Departing passengers were then boarded: at an 80 percent load factor, observations showed that Southwest took 12.5 minutes to board passengers while United took 14.2 minutes. Finally, the crew asked passengers to settle into their seats and closed the door. This process took 2.5 minutes on both airlines. The entire boarding process on United took approximately 23.7 minutes compared to 21.5 minutes for Southwest Airlines.

Ramp service consists of baggage handling and fueling service. The team assumed a 128-seat plane with an 80-percent load factor, 0.9 bags per passenger, and 500 pounds of cargo (on and off). The baggage handling process was sequential and consisted of six steps: (1) open the doors and set up the belt loaders (3.0 minutes), (2) unload the bags (7.7 minutes), (3) unload the cargo (1.7 minutes), (4) load the bags (7.7 minutes), (5) load the cargo (1.7 minutes), and (6) remove the belt loaders and close the doors (3.0 minutes). The baggage-handling process took approximately 24.8 minutes. The fueling process occurred concurrently and was usually shorter than the baggage-handling procedure.

### **The Reengineered Process**

The current United enplaning process was too slow. Time studies showed that the open seating method Southwest used was faster than United's assigned seating approach. However, many passengers did not like scrambling for a seat. Even with Southwest's open seating, bottlenecks still occurred. Most passengers preferred aisle or window seats, which left only middle seats for late-boarding passengers. They either

climbed over the aisle passengers or displaced them and created a bottleneck in the aisle. In addition, bottlenecks occurred when passengers stowed their baggage in the overhead compartments. Southwest anticipated this problem, and its flight attendants actively assisted passengers with stowing their carry-on bags.

The United team experimented with open seating on 40 flights. The results showed that open seating reduced boarding time from an average of 14.2 minutes to 13.3 minutes, which was still higher than the Southwest time of 12.5 minutes, but customer comments were largely unfavorable. The employee team decided that it needed "a better mousetrap."

In team meetings about the boarding process, an industrial engineer who had worked for a trucking company noted that trucks were loaded from the outside in to minimize loading time. Couldn't the same concept be applied to an airplane? The initial reactions to her idea varied, but United decided to test the plan. Passengers holding window seats were to be boarded first, followed by those holding middle seats and finally followed by those holding aisle seats.

The boarding process, code-named WILMA (window-middle-aisle), uses zones to identify seating order. When passengers select their seats, zone numbers are automatically assigned and printed in large letters on their boarding passes. Zone 1 seats are window seats on the right side of the plane; Zone 2, window seats on the left side of the plane; Zone 3, middle seats on the right; Zone 4, middle seats on the left; Zone 5, aisle seats on the right; and Zone 6, aisle seats on the left. Zone 1 and 2 passengers are boarded first, followed by Zone 3 and 4 passengers, followed by Zone 5 and 6 passengers. Premier customers are not offered early boarding but instead

boarded when their zone is called. Early boarding is still provided for passengers needing special assistance.

Tests of the new boarding procedure resulted in an average enplanement rate of 11.5 passengers per minute on planes with a load factor of 80 percent. The boarding time was reduced by 2.5 minutes to 11.7 minutes (slightly lower than the Southwest boarding time of 12.5 minutes). United performed time studies on selected Southwest flights, on United Airlines advanced-seat-assignment flights, and on United Airlines WILMA flights. The results (Table 2) showed that the use of WILMA resulted in a 17.6 percent reduction in boarding time.

A problem that surfaced early on was the issue of passengers traveling together. What would happen if a family with small children all received different zone numbers? United modified the zone assignment algorithm to issue the same zone number to passengers traveling together.

Boarding passes with the zone number printed in large block letters are issued to all passengers. United modified its printers so they could print the shuttle boarding passes. In addition, during the launch period, it clearly displayed cards describing the Shuttle by United at ticket counters and gate areas.

Before the boarding process begins, the gate agent makes an announcement explaining how the plane will be boarded by zones and emphasizing the enforcement of the carry-on baggage policy. Passengers requiring extra time or assistance are preboarded. Passengers seated in Zones 1 and 2 are boarded first. If the gate attendant notices passengers boarding out of order, he or she politely asks them wait for their zones. Zones 3 and 4 are then boarded, followed by Zones 5 and 6.

The teams identified several factors that could disrupt the WILMA process. Reducing the standard deviation around the WILMA mean is critical to maintaining consistency. Potentially disruptive factors included advanced seat assignments, carry-on baggage, overhead bins, preflight beverage service, and provision of in-flight materials.

(1) In the original process, passengers could request boarding passes with their seat assignments when they bought their tickets. On the day of travel, passengers with advanced seat assignments tended to arrive at the last minute and board out of sequence, which defeated the WILMA scheme. The team decided on a best of both worlds approach: keep seat assignments, a feature demanded by frequent flyers, but issue them only at the airport when they checked in. This gives passengers an incentive to arrive early at the airport.

(2) Carry-on baggage was a problem. Most airlines restrict passengers to two carry-on bags of a certain size, but restrictions are unevenly enforced. Passengers with too much carry-on luggage or with over-sized carry-on luggage often have problems finding places to store it. While these passengers search for places to store their bags, the passengers behind them have to wait, and the boarding process is disrupted. These passengers can impede the deplaning process as they go against the flow to gather their belongings. The shuttle teams came up with several ways to handle this problem. Clearly marked boxes at the ticket counter, the gate, and the gate door illustrate the largest acceptable size of carry-on baggage. Ticket and gate agents offer to check any oversize and excess bags. To expedite this process, United relied on the newly created position of flight coordinator. The flight coordinator patrols the gate area before boarding

looking for oversize and excessive bags and coordinates loading these bags onto the plane with the baggage handlers.

(3) Overhead bins are to be opened before boarding and flight attendants are to keep the overhead bins open as long as possible. Passengers can then easily see whether a bin is full or not without having to open and close it.

(4) Traditionally, first-class passengers are boarded first and offered predeparture beverages. The beverages are difficult to deliver because flight attendants have to dodge in and out of other boarding passengers disrupting boarding process. United eliminated the predeparture beverage service on the shuttle.

(5) Traditionally, magazines are placed at the front of the first class cabin, and pillows and blankets are located throughout the plane. The teams observed that as passengers enplaned, they sometimes stopped to peruse the magazine rack or to pick up a pillow or blanket. To eliminate these distractions, United stores in-flight reading material on the shuttle out of sight in the overhead bins. Pillows and blankets are kept at a central location and distributed on request by the flight attendants.

In addition to WILMA, the team identified other time savers that helped ensure a consistent 20-minute turnaround:

The flight coordinator waits on the jetway for the airplane to arrive. Previously, the airplane sometimes had to wait for the agent.

Pilot and flight attendant crew changes are minimized and occur simultaneously. This reduces cases in which the pilots are onboard but the flight attendants are on their way from another flight (or vice versa). Because of contractual differences between pilots and flight attendants, building common schedules for these two groups increased

costs significantly. Yet, after a period of hesitation, the shuttle team decided to implement this concept because its favorable impact on on-time performance.

To reduce the time needed to provision the aircraft and the frequency of provisioning, United greatly simplified meal service. It now provides only beverages and light snacks (peanuts or cookies). In most cases, it can pack enough supplies on the aircraft at the beginning of the day to last six flight segments. This decision was supported by market research studies: on flights of less than 750 miles, passengers have repeatedly stated that on-time performance and low fares are more important to them than a meal.

Flight attendants no longer use beverage carts so aisles remain clear during flights; instead they take beverage orders and bring them to passengers on trays. Toward the end of the flight, attendants collect newspapers, used cups, and napkins from the passengers to reduce cabin-servicing time on the ground.

Airline ground personnel are divided into upstairs employees (gate and ticket agents) and downstairs employees (baggage handlers, cabin service employees, and mechanics). On the shuttle, the upstairs and downstairs employees work together as teams with common goals. For example, they are jointly responsible for on-time departure performance. To reinforce team spirit, all ground employees connected with the shuttle wear the common shuttle uniform. This uniform was designed by a cross-functional employee team and consists of a red, white, and blue shirt worn with dark pants or a dark skirt. A common uniform is a powerful symbol, especially at large airports where the downstairs employees are unionized but the upstairs ones are not. In

the shuttle operations, for example, it has become routine for mechanics or gate agents to help with loading last-minute bags.

United redesigned the baggage handling process so crews could handle both cargo bays concurrently: both cargo doors are opened at once and a team of employees works on each door. The concurrent process requires two additional employees. Both doors are opened and equipment set up in 2.0 minutes, bags are unloaded in 4.6 minutes, cargo is unloaded in 1.0 minute, bags are loaded in 4.6 minutes, cargo is loaded in 1.0 minute, and the doors are closed and equipment removed in 2.0 minutes, for a total of 15.2 minutes.

### **Shuttle Performance**

The Shuttle by United began operations on October 1, 1994 with 92 round-trip flights to eight west coast cities. By November 1, 1994, the shuttle expanded to 130 round-trip flights to 12 markets; by December 1, 1994, to 143 daily round-trip flights to 14 markets. By April 2, 1995, it had grown to 362 flights to 16 markets (Table 3).

Performance can be measured in a number of ways: turnaround time, passenger load factor, and on-time arrivals and departures. On-time arrival and departure performance is based on the difference between actual and scheduled arrival or departure times. The US Department of Transportation defines on-time arrival as within 14 minutes of scheduled arrival. United uses the 14-minute guideline, but also computes five-minute and zero-minute percentages.

Consumer research indicates that the key indicator of performance for the customer is arrival performance. Departure delays are irrelevant as long as the flight

arrives at the destination close to on-time. After the inclement winter of 1994 (which eroded the percentage of on-time arrivals and departures), in early 1995, the shuttle recovered to a level of 75 percent of arrivals within five minutes of schedule (Table 4). During the fall of 1994, average ground time was reduced from 37.5 minutes in October 1994 to 24.7 minutes in December 1994.

United conducts regular surveys of its customers to assess their satisfaction with its service. In general, customers were pleased with the shuttle service and both premier and regular passengers were more satisfied with the shuttle than with the main airline (Table 5).

In San Francisco immediately after the shuttle was launched, some passengers complained about the gates used for the shuttle. Before the shuttle, San Francisco- Los Angeles flights left from gates 68-75, but after the shuttle started, its flights used gates 76-79. Passengers had to walk further to get to these gates and some resented the extra time and effort. United argued that by using gates that were farther out, the taxi time of the shuttle planes was reduced by several minutes, and the minute or two increase in walking time was justified. After two to three months, this complaint subsided.

Management was particularly concerned with the reaction of the premier passengers. On nonshuttle flights, premier passengers are allowed to preboard the plane along with first-class passengers. On the shuttle, premier passengers must board by zone with everyone else but receive preferential seating. A survey of premier passengers resulted in 28 percent positive comments, 28 percent neutral, and 44 percent negative. The major complaint (about 30 percent) was that the shuttle did not

offer preassigned seats. Another 20 percent resented the loss of early boarding privileges. About 10 percent complained about the fare; 10 percent were annoyed by a change in frequent-flyer-mile computations (with the shuttle, passengers earned actual flight miles, instead of the former 500-mile minimum), 10 percent felt that first-class service fell short of first class, and another 20 percent complained about various other factors.

Among positive comments, passengers liked the on-time performance, the schedule, the potential for upgrade, the friendly employees, and earning miles in the Mileage Plus program. In an earlier survey of shuttle passengers, 94 percent of the respondents said they would fly United instead of Southwest if the schedule and fares were identical. On the other hand, the Southwest loyalists liked the Southwest gate location, its friendly staff, and its two- for-one companion fares.

United did not expect the shuttle to meet the goal of a 20-minute ground time for the first few months of operation. The flight schedule allowed an average of 40 minutes between flights during October. The employee-owners decided to first develop experience with the new procedures in a low- stress situation before attempting to achieve a 20-minute ground time. In November 1994, United tightened the flight schedule to allow an average of 35 minutes between flights. It reduced this to an average of 25 minutes between flights by early 1995.

### **Continuous Improvement**

In its first nine months, the shuttle has operated very successfully. The challenge is to avoid complacency and to improve the process continuously while staying focused

on the customer. Since its launch, all shuttle airports have had daily "huddles" to identify cross-functional problems and resolve them. In addition, airport and corporate support staff meet for corporate huddles bimonthly. United encourages its corporate staff members to spend a day at the shuttle to stay in touch with operating and market realities. Some of the issues addressed during the huddles are carry-on bags, seat assignments for connecting passengers, fare surcharges, duplicate seat assignments, accurate passenger counts, and the potential for ticketless travel.

The design of the original "yardstick" box for carry-ons was inadequate. Gate personnel routinely had arguments with customers about what size carry-ons were acceptable. United designed a new box illustrating the acceptable carry-on size and its introduction greatly improved the interpretation and enforcement of the carry-on policy for both gate personnel and passengers.

Moving oversized carry-ons from the gate to the plane was cumbersome and labor intensive. Employees carried the bags down the jetway stairs two to four at a time, which often caused delays. To solve this problem, the San Francisco team installed bag slides along the jetway stairs.

Connecting passengers are given seat assignments on the shuttle when they check in for their first flight. If connecting passengers are late and hold window or middle seats, the boarding process is disrupted. However, if most aisle seats are reserved for connecting passengers, other passengers might be unhappy with their seat assignments. On flights with a large number of connecting passengers, the shuttle team decided to set aside entire rows of seats for them and thus minimize disruption to the WILMA boarding.

Over half of the shuttle passengers travel on some sort of discount fare. Most of these fares do not allow passengers to change flights or travel dates unless they pay a surcharge. Passengers arriving early at the airport usually want to move up to an earlier flight. Because flights are very frequent in many shuttle markets, this situation has become a common situation resulting in some heated arguments at the gates. Adding and collecting the surcharge had become the most frequent cause of passenger complaints. To conform with the hassle-free vision of the shuttle, the team decided to remove the surcharge.

Partly because flights are so frequent and ground times so short, a few passengers would get confused between flights and end up boarding the wrong flight. The common manifestation of this problem was for another passenger to find a person in his seat. This severely disrupted the boarding process as the mistaken passenger went against the flow to exit the airplane. The solution to this problem is for the gate agent to check boarding cards at the gate door prior to allowing passengers to get on the airplane.

A second problem, which called for a similar solution, was to determine the number of empty seats on the aircraft at departure time so the shuttle could accommodate stand-by passengers. The primary causes of discrepancy between the computer check-in inventory of seats and the actual inventory were no-shows and passengers who missed their connections. To reconcile such potential discrepancies, someone usually boarded the aircraft to count empty seats, which often resulted in a delay. United decided to test a boarding-pass reader at the gate door. This device reads the magnetically encoded boarding pass and verifies that the passenger is

boarding the correct flight. It also checks off the passenger's seat as boarded so that the gate personnel have an accurate count of available seats. In the spirit of WILMA, the team named this device FRED (Fast Reconciliation Enplanement Device). United is currently testing FRED at the San Francisco Airport.

To encourage passengers to book directly with United or through self-service media, such as United Connections on CompuServe, the shuttle launched electronic ticketing with a \$10 promotional fare between Los Angeles and San Francisco on Thanksgiving Day. With electronic ticketing, passengers make their reservations ahead of time and pay by credit card. At the airport, they are issued boarding passes when they present their credit cards or some other form of identification, and the need for a printed ticket is eliminated.

### **Future Plans**

The buyout agreement placed certain constraints on the shuttle operation. The Shuttle by United is limited to 130 737-size planes for its first five years of operation. With the exceptions of Los Angeles and San Francisco, the shuttle is not allowed to fly between United hub cities. The maximum length of any shuttle flight is 750 miles. In addition, total flight hours on the shuttle are restricted to 20 to 25 percent of total United hours.

Since its launch on October 1, 1994, the shuttle has added several new cities including Las Vegas, Phoenix, Reno, and Portland. The shuttle has triggered vigorous reaction from its competitors, mainly in the form of protracted fare wars, which have shifted the battleground from operational excellence to financial strength.

The Shuttle by United is an excellent example of reengineering in action. By listening to its customers, benchmarking its competition, and involving its employees, United has demonstrated that it is a company that can translate its vision into action—a key to success in a highly competitive marketplace.

Table 1. Shuttle by United costs slightly exceed those of Southwest. Southwest outsources a higher percentage of maintenance work than United does. Thus, its aircraft maintenance cost is higher than United's, but its unit labor expense related to maintenance is lower (from UAL Corporation, Proxy Statement, June 10,1994).

Expense Category	Southwest	Current United	United Shuttle
Wages and Benefits	\$0,024	\$0,035	\$0,026
Fuel and Oil	\$0,011	\$0,011	\$0,011
Aircraft Ownership	\$0,007	\$0,008	\$0,007
Aircraft Maintenance	\$0,006	\$0,003	\$0,002
Commissions (excluding international)	\$0,005	\$0,010	\$0,006
Advertising	\$0,002	\$0,002	\$0,003
Food and Beverage	\$0,000	\$0,005	\$0,000
Other	\$0,017	\$0,031	\$0,019
Total	\$0.072	\$0.105	\$0.074

Table 2. This summary of boarding times on 15 flights shows the advantage of the WILMA system (window, middle, aisle). We assumed that all planes had 128 seats and had an 80- percent load factor. All times are in minutes.

Flight	Open Seating Time	United Advanced Seating Time	WILMA Time
1	10.0	12.9	11.3
2	16.7	12.6	13.3
3	14.8	18.0	13.3
4	11.8	14.7	12.4
5	11.6	13.9	13.3
6	15.0	13.8	9.6
7	13.8	14.0	13.3
8	10.2	12.7	8.8
9	12.3		10.9
10	11.7		10.5
11	12.3		
12	12.9		
13	10.1		
14	12.3		
15	12.6		
Average	12.5	14.2	11.7

Table 3. The total daily flights have increased over three months from 184 to 286 (from United Airlines: "Friendly Skies").

City Pair	October	November	December	One-way Miles
San Francisco/ Burbank	20	22	22	326
San Francisco/ Las Vegas	18	18	18	414
San Francisco/ Ontario	14	20	22	363
San Francisco/ San Diego	18	20	20	447
San Francisco/ Seattle	28	26	26	678
San Francisco/ Los Angeles	58	62	62	337
Los Angeles/ Sacramento	10	10	10	373
Los Angeles/ Oakland	18	18	20	337
Los Angeles/ Las Vegas		18	20	236
Oakland/ Burbank		14	14	325
Oakland/ Ontario		12	14	361
Oakland / Seattle		10	10	671
San Diego/ Sacramento		10	10	480
Los Angeles/ Phoenix			18	370
Total Flights	184	260	286	

Table 4. Shuttle by United performance statistics show decreases in all factors except daily departures.

Month	Passenger Load Factor	Average Daily Departures Completed	Arrivals On-Time :05	Arrivals On-Time :15	Departures On-Time :00	Average Ground Time
Oct-94	69.80%	180	92%	96%	85%	37.5 min
Nov-94	65.10%	246	79%	86%	63%	27.9 min
Dec-94	59.10%	283	73%	83%	54%	24.7 min
Goal			78%	88%	75%	

Table 5. 10/94 Customer satisfaction surveys show that customers were more satisfied with the shuttle than with the main airline (scale: 1-5).

Service	Shuttle Premier	Shuttle Other	Mainline Premier	Mainline
Overall	4.3	4.5	3.7	3.8
On-Time	4.7	4.6	3.6	3.8
Courtesy	4.6	4.6	3.8	3.9
Check-in Efficiency	4.4	4.5	—	—
Boarding Efficiency	4.4	4.6	—	—
Overall Flight Attendant Service	4.5	4.6	3.8	3.9
Flight Attendant Friendliness	4.6	4.6	3.9	3.9
Beverage Service	4.2	4.4	—	—
Aircraft Cleanliness	4.2	4.4	3.6	3.8