

Carsharing – Start Up Issues and New Operational Models

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Abstract

This paper discusses some of the decisions to be made in when starting a new carsharing service. These include selection of business type; pricing issues; identification of target membership markets; vehicle selection, financing & insurance; reservation/scheduling systems & in-vehicle telematics (on-board computer); parking, staffing, marketing, partnerships. A brief review of carsharing benefits and demographics is included.

A simplified spreadsheet model to compare various pricing and expense scenarios is presented, along with a cost-effective concept for a small market (under 50 vehicles) service, such as a university campus. Finally, a discussion is presented of the possibilities of franchising and outsourcing certain functions; as well as several innovative service models, including exclusive use vehicles, van shuttles, open-ended, and one-way reservations.

This paper will be a useful overview of the industry for entrepreneurs considering starting a carsharing service, as well as public agencies wanting to partner with a carsharing service, both in North America or in developing nations of the world.

Carsharing – Start Up Issues and New Operation Models

By David Brook, Carsharing Consultant, Portland, Oregon

INTRODUCTION

Carsharing offers a solution of one of the most intractable problems of modern urban life – how to have the convenience and flexibility of a private car without owning one. By pricing the service on a per-use basis it sends a more accurate price signal to consumers about the cost of each car trip, consequently “leveling the playing field” with other modes of transportation. Carsharing could also play a major role in meeting future mobility in developing nations by reducing the need and desire for individual vehicle ownership.

Carsharing started in the United States in March 1998, with the launch of CarSharing Portland Inc. in Portland, Oregon. Earlier in North America, Benoit Robert launched in Quebec City in 1994 and Tracey Axelsson started the Cooperative Auto Network (CAN) in Vancouver, British Columbia in 1997. Since then several other carsharing organizations (CSOs) have been formed in North America, more recently in Chicago and Philadelphia. Two for-profit companies, Flexcar based in Seattle and Zipcar based in Boston, accounting for approximately 90% of the vehicles in service in the US, or 80% if Canadian CSOs are included.

These services are based on a European model, which started simultaneously but independently in 1987 in Berlin and Lucerne, Switzerland, and focus on individual members, and charging for usage both by time (hourly or half-hourly) and distance (mile or kilometer). Vehicles are geographically distributed in reserved parking spaces, typically off-street, through neighborhoods, putting one or more vehicles within easy walking or bicycling distance of the primary users, individual household members. Gasoline and insurance coverage is included in these rates.

Suffice it to say, as exciting and potentially transforming carsharing may be, it is still a highly speculative business venture. In order to succeed, carsharing companies need all they help they can get to grow fast and keep expenses down.

Four years ago I wrote a short paper attempting to lay out the issues facing start up carsharing organizations (“So You Want To Start a Carsharing Service?”). At that time, reasonable estimates for many of the costs needed for a start up business were still uncertain. Based on 4 years of experience, working both small CSO and the major national carsharing service (Flexcar), this paper provides an updated look at the carsharing world, useful for startups as well as government agencies and others wishing to encourage the growth of carsharing.

Benefits

The attraction of many to carsharing is the potential to offset the need for private ownership of a one, or possibly all vehicles, in a household. Based on European research suggesting 50% reduction in private car use, it was hoped that even a fraction of these amounts, and consequent energy and greenhouse gases (CO₂) reductions, might occur in the US, as well. Other anticipated benefits include reduction in parking congestion in dense urban neighborhoods, support of “car-free” or “car-lite” lifestyle, encouraging the use of “environmentally-friendly” modes of transportation, walking, public transit bus/rail and bicycling.

To date, only two detailed research projects have been undertaken in North America, in Portland, Oregon and San Francisco (and none, to this author’s knowledge, from Canada). Because these studies focused on CSOs in their immediate start up period, they likely include a high percentage of “early adopter” members, many of whom didn’t own a vehicle before joining, and thus the results may not be representative of membership in more mature CSO.

Although slight reductions in vehicle miles traveled (VMT) have been observed, they were not statistically-significant. Members did report significant changes in transit usage, as well as walking and bicycling after joining a carsharing organization. Perhaps most importantly at this stage, these projects have revealed a great deal of useful information about member demographics and usage behavior.

Demographics

The demographics of individual members appear to be remarkably consistent across all carsharing organizations (CSOs) in the United States. Members' average age is in the mid 30's, with incomes near the median for the areas. Generally evenly divided are gender (male and female), married and unmarried and renters vs. homeowners. Perhaps the most distinctive characteristics of carsharing members is the high level of education, with more than 2/3rds of members being four-year college graduates or holding advanced degrees — substantially greater than the norm in the neighborhoods where the service is being provided. To date, this author is not aware of any CSO that has demonstrated a marketing or service model that effectively serves low-income neighborhoods and households.

Reported usage is also quite consistent among members in the United States, with a typical trip being about 3-4 hours and 20-25 miles. Frequency of use varies widely, with 2-3 trips per month typical of organizations that charge a monthly membership fee and a much lower average for those that don't charge any "overhead" fee for membership. Distance from a members' home or place of work to the nearest vehicle is also a factor in how frequently a member tends to use a vehicle. Research suggests that many members' use of vehicles decreases slightly the longer the person is a member, perhaps because they get better at switching trips to other modes, perhaps because of the constant price signal from unit pricing

Business Type – coop, non-profit or for-profit

The issue of whether to establish the business as a cooperative, non-profit, or for-profit company can be one of the most contentious in start up situations. This paper will not go into the various arguments for each type of organization, which often speaks to the personal and political beliefs and motivations of an organization's founders. There is nothing inherent in any business form which would prevent it from providing excellent service to members and achieve any size desired. However, this author believes that there a likelihood that non-profits and cooperative may not have the incentive to expand as much as a for-profit enterprise; while a for-profit may not be the best model to achieve narrowly-stated environmental objectives.

The ultimate issue that any startup CSO needs to address is where the capital will come from to expand the business until the service reaches breakeven and revenues equal expenses. Each business type has unique sources of funding that it may be able to exploit, such as direct investment, foundation or government grants. However, the current popularity of "public-private partnerships" between government agencies and private companies, where little or no money changes hands but many in-kind services, such as publicity and free parking spaces may be provided, may minimize some of the unique advantages of cooperative and non-profit organizations.

One capital-raising strategy this author would caution any start up against is charging and using a portion of the money for operations, typically to acquire vehicles. First, a security deposit is yet another barrier to joining for people who may already be uncertain about the value of carsharing. The function of a security deposit in insuring members respect the vehicles and pay accounts on time can easily be addressed in other ways, such as automatic payment by credit or debit card or performing a credit check at the same time as the insurance screening. Spending a portion of member security deposits on operations also results in these amounts becoming a liability of the corporate accounts, quickly making the company look very risky, indeed. If capitalization from members is desired, it would be preferable to classify it as a "membership share", for which the company makes no guarantees about, except, perhaps, agreeing to transfer a departing member's share to the next new member.

Pricing

Pricing is one of the major distinctions between car rental and carsharing. Carsharing typically prices its services on an hourly (or half-hourly) basis, and includes a distance (mile or KM) charge as well. This is believed to send a more accurate price signal to consumers about the true cost of driving. Determining usage pricing is a difficult balancing act between revenue from hours and distance charges, as well as allocating administrative costs between regular and infrequent users. No pricing system will be fair to all users - higher hourly rates tend to minimize short distance, long duration trips, for example.

In an attempt to simplify pricing, in 2000, Flexcar implemented unique hourly-only pricing structure, with each hour including 10 free miles. It was hoped that this simplified pricing structure, with only one variable (time), would attract a wider market, though it is not clear whether anything short of providing unlimited mileage really removes the distance component from members' consideration.

As a convenience to members, most carsharing services provide a free overnight period (such as midnight to 7 am), with only a charge for distance charged during the period. This provides a good point for marketing and costs the service very little since vehicles are mostly parked at night. Although not intended to be as inexpensive as rental car rates, most carsharing services also offer some sort of discounted Daily Rate, usually in the form of a “maximum hours per day charge” to balancing the convenience to members, and, presumably, to increase vehicle utilization.

When a reservation is made other members cannot access the vehicle during that period. If reservations are cancelled within a specified period before the trip start time, usually between 8 and 12 hours, CSOs charge a cancellation fee or the entire hourly fee for reserved time (less any time picked up at the last minute by another member). How long to set the free cancellation period is also debated. The only statistical analysis on this topic that this author is aware of suggested that in a mature carsharing system, with many members and a dense network of vehicles, that revenues from last-minute trips might be sufficient to offset lost revenues from cancellation period as short as two hours before trip start time.

Other pricing factors include security deposits (discussed above) and monthly or annual membership fees. Membership fees seek to allocate the administrative cost of maintaining a member equitably among high and low users. When CarSharing Portland implemented a membership fee in 2000 about 30% of the members quit, but revenues changed very little, since most were not active members and treated carsharing primarily as “mobility insurance”. Finally, penalties and credits can be excellent motivators to encourage members to treat the service, and other members responsibly, primarily by returning vehicles on time and not stranding subsequent drivers.

Insurance & Membership

Membership is another major distinction that differentiates carsharing and car rental. It is both a plus and minus: a plus in that it can promote loyalty to the CSO, but a minus in that there is typically a several day delay before a new member is approved and able to drive vehicles.

The insurance carrier typically requires a driving history check (Motor Vehicle Report) from the state or Provincial driver’s license agency, which may cost \$15-\$20 per driver and adds several days delay before new members are able to drive vehicles. Drivers with several major infractions within the past few years are typically not accepted.

Obtaining the full insurance coverage to make carsharing insurance, similar to the levels that a household would choose to carry on a privately-owned vehicle, continues to be one of the major challenges facing any CSO today. Although the loss-history of carsharing in the US and Canada appears to be remarkably low, the total number of vehicles covered and annual premiums for the entire industry are still too small to attract serious competition. Typical rates are about \$250 per vehicle, per month for \$300,000 combined liability, comprehensive and collision coverage. Rates may be substantially higher in some parts of the country.

Marketing to Individuals

Most carsharing companies focus on two distinct market segments: individual (or personal) membership and business membership. Individuals typically use vehicles near their home or work for personal trips. They may use carsharing as an alternative to owning a second vehicle or as the only vehicle in their household.

Marketing an unfamiliar “product” like carsharing to individuals is probably the most challenging aspect of starting a carsharing service and easily deserves careful study for this topic alone. Even providing a simple description of how the service works for advertising and promotional use is difficult. Phrases such as “time share for cars” or “hourly car rental” often confuse as much as explain. (It’s worth remembering that the English-language term “carsharing” was coined in German-speaking countries, allowing it develop its own meaning.) The term “carsharing” itself is sometimes confused with “ridesharing” or “carpooling”. CarSharing Portland’s original, but somewhat unwieldy, slogan described the service well, “Convenient access to a car without the hassles of ownership”, as does Autosshare’s slogan, “Smart alternative to owning a car”™.

Member surveys repeatedly indicate that very few people actually sell a vehicle and join a carsharing organization when they first hear about carsharing. In most cases, it appears that people continue their existing transportation patterns, whether they own a vehicle or rely on public transportation, walking or bicycle, until some event in their lives prompts them to consider alternatives. This “trigger event” may be a change of jobs, marital status, moving to

a new home (particularly if it's in a new city), etc. For car owners it may be the prospect of major out of pocket costs to repair an older vehicle, failure to pass a required smog test or a major accident. For this reason, there may be a sort of "natural limit" to how many people in an area will consider carsharing in any given time.

For most members, convenient location of the vehicles is the major criteria for joining and using the service. For most people 1/4 mile, about a 5 minute walk, is an ideal distance. It is, of course, preferable that members have easy access to several vehicles, to provide options when the nearest vehicle is already scheduled. In major cities with frequent transit service, light rail or subway, members may be comfortable taking transit several stops in order to access a vehicle.

Marketing to Businesses

Businesses may be interested in carsharing for several reasons:

- To replace an existing fleet, or to substitute for underutilized vehicle in their fleet
- To at least partially replace existing car rentals
- To replace an existing subsidized employee parking
- To replace reimbursement for employees driving their own vehicles on company business
- To complement existing incentives to take transit, bike or walk to work, by giving access to a car for personal trips in the middle of the day.

In most cases the business joins so their employees can drive. In most cases individual employees driving records must be screened just like other members, an expense and drawback, especially for larger companies with many occasional drivers. Employees are also eligible to establish individual accounts in order to be able to use vehicles for personal trips, as well.

Marketing carsharing to businesses has some similarities to marketing to individuals, as well as significant differences. Depending on the size of the business, some managers may have a very good idea of the cost of their fleet, partners cars, subsidized parking, employee reimbursements. Consequently, a fair comparison between carsharing and existing expenditures can be developed. In many smaller companies, however, no one may have direct responsibility to monitor and manage transportation costs, which makes a sales presentation more difficult. Government fleets are another type of "business" account, but many have a comparatively low cost structure, since they keep vehicles for more years than private fleets, make them hard to compete with.

Business carsharing markets will be most effectively tapped with dedicated sales staff, equipped with customized sales information relating to businesses. Some tailoring of rate plans and billing systems may be helpful to provide better service to business customers.

General Marketing

Surveys regularly indicate that word of mouth from members to their friends and business colleagues are a small but consistent source of new members for any CSO. A high level of customer service is essential to insure that members are saying good things about the service. Member referral bonuses may be helpful but the majority of referrals seem to be made without expectation of payment.

The geographic nature of carsharing suggests a neighborhood-based marketing strategy, with general awareness marketing and news stories, coupled with target marketing near vehicle locations. Developing partnerships with local businesses, such as coffee shops and apartment building managers, and attending neighborhood fairs and events, can provide effective, low-cost neighborhood marketing.

Partnerships with local government agencies, particularly transit agencies and municipal transportation offices, can be a cornerstone of any CSO's marketing strategy. Transit agencies are particularly valuable since they already have an established base of riders who are familiar with not using a car for many trips. These agencies can become valuable "channels" to create awareness and market the service, which can be far more valuable than any direct cash grant. However, not all agencies will immediately understand carsharing nor will they necessarily embrace a

startup service as warmly as other cities have. Cultivating relationships in these agencies may take some time before the right “champion” within the agency can be found.

Ongoing awareness of the service through frequent press, TV and radio coverage is also essential so that potential members will consider the service when they are “shopping” for transportation in the future. Trade outs for advertising in local newspapers, particularly free weekly “lifestyle” newspapers and public radio stations can help provide general awareness and good name recognition. Non-profit and advocacy groups, such as environmental groups, bicycle and pedestrian advocacy groups, and anti-sprawl land-use watchdog groups, are also worthwhile channels to cultivate.

Business Planning

The Business Plan is where things have to be decided: What vehicles will be offered and how much will they cost? Where are the target markets? How will you market the service, and ultimately; How quickly will the service reach breakeven?

To compare various pricing and growth options a simplified spreadsheet model has been developed to enable startups to quickly consider pricing and staffing options worth a more detailed analysis. The user can input any set of assumptions (second column) and the starting number of vehicles and members on launch date and easily see the impact on expenses and revenues for the first 2 years. An example of one set of assumptions to get to breakeven are shown below in Figure 1. Copies of this spreadsheet in Excel format are available from the author.

The costs in this model are driven by vehicle utilization (hours day of usage) but might as easily have been based on members and an average trip. For simplicity sake, revenues are displayed the same month as usage, new members and new vehicles are added (whereas several months ramp up is common with all these factors. Member application fees are not included since discounting of these fees is likely to equal actual processing costs. The Cash flow line reflects the total investment needed to finance the operation to that point.

Scenario: Sample Assumption	Launch date	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 5	Quarter 6	Quarter 7	Quarter 8
New members added 40 per month		0	120	120	120	120	120	120	120
New vehicles added 2 per month		10	6	6	6	6	6	6	6
Total members (calculated)		0	120	240	360	480	600	720	840
Total vehicles (calculated)		10	16	22	28	34	40	46	52
Member to vehicle ratio (calculated)		0	7.5	10.9	12.9	14.1	15.0	15.7	16.2
Vehicle utilization 5.5 hours/day		1650	2640	3630	4620	5610	6600	7590	8580
5 miles/hour		8250	13200	18150	23100	28050	33000	37950	42900
Revenue - hours \$ 5.00 per hour		\$ 8,250	\$ 13,200	\$ 18,150	\$ 23,100	\$ 28,050	\$ 33,000	\$ 37,950	\$ 42,900
- mileage charge \$ 0.25 per mile		\$ 2,063	\$ 3,300	\$ 4,538	\$ 5,775	\$ 7,013	\$ 8,250	\$ 9,488	\$ 10,725
Membership fee \$ 5.00 per month		\$ -	\$ 600	\$ 1,200	\$ 1,800	\$ 2,400	\$ 3,000	\$ 3,600	\$ 4,200
Total revenues per month		\$ 10,313	\$ 17,100	\$ 23,888	\$ 30,675	\$ 37,463	\$ 44,250	\$ 51,038	\$ 57,825
Expenses									
Vehicle cost \$ 300 per month		\$ 3,000	\$ 4,800	\$ 6,600	\$ 8,400	\$ 10,200	\$ 12,000	\$ 13,800	\$ 15,600
Vehicle insurance \$ 250		\$ 2,500	\$ 4,000	\$ 5,500	\$ 7,000	\$ 8,500	\$ 10,000	\$ 11,500	\$ 13,000
Maintenance cost \$ 20		\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040
Repair cost \$ 20		\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040
Cleaning cost \$ 50		\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040
Parking \$ 75		\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040
New vehicle/location set \$ 1,500 per vehicle		\$ 15,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000
Average MPG of vehicle 25 mpg									
Fuel (cost per gallon) \$ 1.50 per gallon		\$ 495	\$ 792	\$ 1,089	\$ 1,386	\$ 1,683	\$ 1,980	\$ 2,277	\$ 2,574
Variable costs \$ 2,215 per month		\$ 21,795	\$ 19,872	\$ 23,949	\$ 28,026	\$ 32,103	\$ 36,180	\$ 40,257	\$ 44,334
Staff - General Manager \$ 40,000 per year		\$ 3,333	\$ 3,333	\$ 3,333	\$ 3,333	\$ 3,333	\$ 3,333	\$ 3,333	\$ 3,333
Staff - Customer Service \$ 25,000 (gross)		\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083
Staff - Marketing \$ 35,000		\$ 2,917	\$ 2,917	\$ 2,917	\$ 2,917	\$ 2,917	\$ 2,917	\$ 2,917	\$ 2,917
Staff - Fleet Mgr. \$ 25,000		\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083
Staff costs \$ 10,417 per month		\$ 10,417	\$ 10,417	\$ 10,417	\$ 10,417	\$ 10,417	\$ 10,417	\$ 10,417	\$ 10,417
Reservation/billing system \$ 100 per month		\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100
Marketing/advertising \$ 2,000		\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000
Office rent \$ 750		\$ 750	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750
Phones/internet \$ 250		\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250
Supplies, mailing \$ 500		\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
Office costs \$ 3,500 per month		\$ 3,600	\$ 3,600	\$ 3,600	\$ 3,600	\$ 3,600	\$ 3,600	\$ 3,600	\$ 3,600
Total Expenses \$ 16,132 per month		\$ 35,812	\$ 33,889	\$ 37,966	\$ 42,043	\$ 46,120	\$ 50,197	\$ 54,274	\$ 58,351
Net profit/loss per month		\$ (25,499)	\$ (16,789)	\$ (14,078)	\$ (11,368)	\$ (8,657)	\$ (5,947)	\$ (3,236)	\$ (526)
Cash flow (investment needed)		\$ (25,499)	\$ (42,288)	\$ (56,366)	\$ (67,734)	\$ (76,391)	\$ (82,338)	\$ (85,574)	\$ (86,099)

Figure 1 Sample Proforma Spreadsheet Model

As an example, using the operating assumptions shown on spreadsheets (40 new members and 2 new vehicles per month @ 5.5 hours per day vehicle utilization), a start up CSO could theoretically break in 24 months ("Net profit/loss" line) under the following scenarios:

- \$5.00 per hour + 25¢ per mile & \$5 monthly membership fee (optimistically requiring an \$100,000 investment)
- \$4.00 per hour + 40¢ per mile & \$5 monthly membership fee (optimistically requiring an \$88,000 investment)
- \$6.50 per hour with 5 miles per hour included & no monthly fee (optimistically requiring an \$85,000 investment)

The model also shows some surprising results – the cost savings from eliminating the Fleet Manager position (or similar costs) for the first 2 years advances breakeven only a few months; while using a hybrid vehicle to improve the gas mileage of vehicles from 25 mpg to 40 mpg but increasing the vehicle lease/finance cost actually delays breakeven.

OPERATIONS

Once the company is launched, maintaining smooth operations (or at least smooth-appearing operations) is the ongoing challenge. In addition to marketing and sales, discussed above, the following items are needed to keep the cars on the road and members happy.

Vehicle Locations & Parking

Carsharing depends on creating a network of closely-spaced vehicles providing easy access to the greatest number of people. At the present stage in the development of carsharing, this tends to be close-in urban neighborhoods and downtown districts, particularly those with a mix of business and residential. Some suburban areas, particularly mixed-use developments at light rail stations, are other potentially promising carsharing locations, as discussed in the final section of this paper.

Parking for carsharing vehicles is typically in designated, reserved off-street parking spaces. For startups, one vehicle per location is typical with the option to add more vehicles as demand grows. Parking should be in easy to find, well-lit areas. Spaces near sidewalks are particularly desirable since the vehicle will be visible at least some of the time and it may be possible to install a promotional sign and brochure holder. To provide the greatest convenience, vehicles should be about 1/4 to 1/2 miles apart. As the membership and usage grows, CSOs must determine whether to create new vehicle locations, which places more vehicles closer to more members, or to add additional vehicles at existing locations to meet growing demand. Vehicles placed within or adjacent to the existing network will serve the greatest number members. Outlying or isolated neighborhoods, unless well-served by transit, should not be established with a single vehicle since members have no options when that vehicle is in use.

Finding and leasing parking spaces in urban areas turns out to be a more difficult and time-consuming job than most CSOs anticipate. Except in downtown areas, where surface parking lots are professionally managed (but expensive), many business owners are reluctant to lease parking to non-building tenants, either because of limited availability or fear of potential liability problems. At a cost of \$50+ per month, and sometime many multiples more, parking becomes a major operating expense.

Providing designated, reserved on-street parking spaces can be one of the important ways a local government can support the growth of carsharing. Typically, such spaces are established under the same regulation that enables a city to designate parking for other “classes of vehicles”, such as taxicabs, movie or hotel zones. (If there were several carsharing organizations in the same city, any of them could legally use any space designated carsharing vehicles. In reality, competing services could easily establish a “gentleman’s agreement” about the use of such spaces.)

On-street spaces tend to attract more unauthorized usage than off-street spaces unless they are very clearly marked. A blocked parking space, whether on or off-street, causes serious inconvenience to the member attempting to return a vehicle, requiring an emergency call necessitating staff intervention to attempt to get the offending vehicle towed and the carsharing vehicle back in its space. As with many driver and schedule problems, one member’s inconvenience may cascade onto the subsequent drivers, who may be unable to find the vehicle at the start of their trip.

Vehicles – Selection, Lease vs. Own, Maintenance

Determining the “standard sedan” for the carsharing fleet is another topic of great interest during the start up phase. Since most carsharing users see carsharing vehicles as functional means of transportation, they will be satisfied with a wide range of vehicles, as long as they are reliable and clean, but certainly brand and cachet should be considered. It is probably desirable to standardize on a few vehicle models, so that members, many of whom may be infrequent drivers, will be more familiar with controls and handling of the vehicle.

During the vehicle selection process, attention should be paid to fuel efficiency, emission category (SULEV preferred) and accident safety ratings, all of which will be issues for some members. Since many carsharing members have environmental orientation, providing gas-electric hybrid vehicles is good marketing. Whether the entire fleet needs to be hybrid is a judgement call. Unfortunately, at today’s gasoline prices, the savings in fuel do not offset the increased cost of the hybrid.

A few specialty vehicles provide members with convenient access to infrequently needed vehicles, such as pickup trucks, minivans and even SUVs and convertibles. A single pickup truck with a bed liner, placed in a central location, can probably serve several hundred members quite well. Minivans may be attractive to certain business customers and will be appreciated by all members when family comes to visit.

Vehicles may be purchased or leased. Many CSOs lease vehicles, since it enables to business to acquire more vehicles with less cash. One of the common mistakes made in vehicle selection is to select an inexpensive vehicle,

rather than comparing at the actual monthly lease cost, which are heavily influenced by the estimated residual value of the vehicle at the end of the lease. A Honda Civic, for example, can probably be leased for less than a smaller, less desirable vehicle. Vehicle leases for CSOs will be commercial leases, which are more expensive than the promotional leases offered by dealers to individuals and most individual leases prohibit “commercial” use of the vehicle. In addition, leases typically have an annual distance cap before per a per mile/KM charge is levied. In most cases, can shift a higher mileage vehicle to a less popular location to avoid these surcharge.

Vehicles may also be purchased, new or used, usually with bank financing. Late model used vehicles may be an attractive alternative, if the reliability of the vehicle is considered and major maintenance, such as new tires and timing belts, are factored in.

Regular cleaning and maintenance is easily done by scheduling the vehicle for a few hours or longer. Developing relationships with a centrally-located dealership, full service tire and garage, as well as with a body shop, to turn-around repairs quickly is essential to keeping the cars in service and generating revenue. Even a small carsharing fleet makes any CSO a very attractive customer to local businesses. Mobile detailing and mobile oil-change companies are another possibility, as well as trading out usage to members keep vehicles clean.

Incidental body damage is one of the “hidden” costs of doing business. It is important to keep cars looking good, since it sends an indirect message to the members about their responsibility in maintaining the vehicles, as well as being mobile advertising for the service. No matter how much emphasis is placed on member responsibility for reporting damage, more of it will not be reported than the CSO would like and in some cases, the nicks, dents and dings are part of normal wear and tear.

Reservation Systems

Scheduling of vehicle use is the heart of what makes carsharing work. All CSOs now offer web-based and some form of telephone scheduling. The telephone scheduling may be operator-assisted, sometimes with a transaction charge per call, or free touch-tone or voice recognition scheduling. Since CSOs charge for usage by the number of hours a vehicle is reserved data from the reservation system is essential for preparing the usage statements and billing and may include a full-featured billing system or export this data to generate billing through the company accounting system.

Scheduling systems may link to the in-vehicle electronics for additional security and verification before allowing member access to a vehicle. Until recently, sophisticated reservation systems and in-vehicle electronics were proprietary to individual CSOs. Now CSOs can choose from equipment from the European developer Invers, EngineGreen in the Bay Area, as well as the possibility of contracting with Zipcar or Flexcar. In addition, Chi-Tec Software from Germany has developed scheduling/billing software that interfaces with existing in-vehicle electronics to provide another choice.

An essential part of a reservation system is the ability to produce a variety of usage describing member and location statistics needed for effective management the growth of the fleet. Such information will make it easy to identify when a location becomes sufficiently popular availability is seriously reduced and adding a new vehicle is worth considering. Seasonal variations will also be evident for this data.

In-Vehicle Electronics/On-Board Computer

In-vehicle electronic systems typically enable the member to unlock a vehicle using a personal key fob or proximity card. These systems may or may not communicate with central reservation computer to verify the member’s reservation for the vehicle and time. Such systems typically cost between \$500 - \$1,500 per vehicle installed and can be removed when a vehicle is taken out of service and installed in subsequent vehicles, if it is not technologically out of date at the time. In addition, there may be a \$30-\$50 per month wireless communication charge as the computer communicates trip data to the central computer.

Some on-board systems also provide cell phone communication to the CSOs emergency operator. Systems may also allow vehicle tracking through global positioning satellite (GPS). Typically, such systems do not continuously report the vehicle’s location but can be queried in the event the vehicle is overdue, parked in a wrong location or possibly stolen.

Staffing & Customer Service

Keeping cars on the road and getting “butts in the seat” is the essential goal of any carsharing organization. How that is done can range from highly professional corporate structure to a largely volunteer and member-driven organization. The major staffing functions are:

- General Manager providing overall direction
- Customer Service handling new member orientation and responding to billing issues and emergencies
- Fleet manager handling all aspects of vehicles and parking spaces
- Marketing and Sales
- Finance

In smaller operations marketing/sales and finance may be handled by the General Manager, with everyone pitching in on many tasks. In larger organizations technology and billing may also be handled separately.

Carsharing is a 24 hour a day operation, and to be perceived as a viable alternative to owning a car, the CSO must be able to handle emergency calls promptly and efficiently. Rotating on-call duties among staff carrying cell phones is most common, with bigger CSO contracting with call centers to screen routine problems, handing them off to local on-call staff when someone on the ground is needed to solve the problem.

Marketing is the key factor to success of a carsharing organization. As noted in the Marketing section above, CSOs are now devoting a substantial part of their marketing effort, some with designated sales staff to signing up business members enabling employees to use carsharing vehicles for company trips.

In startup CSOs, Fleet Management is often a shared responsibility until the fleet grows to 30+ vehicles and can justify the attention of a designated staff member. Fleet management includes taking delivery of the vehicles, applying decals and installing any on-board electronics before putting the vehicle in service. Obtaining and tracking fleet gas card use, as well as acquiring and preparing parking spaces for carsharing use are other responsibilities of the fleet manager. Developing a system to track vehicle usage, as well as maintenance and repair costs is crucial to the fleet manager's job. Disposing of vehicles at the end of service, either by returning them to the leasing company in good condition or selling them via auto auction or at retail for CSOs that purchase vehicles.

The key factor in customer service is communicating, from the start, the level of service CSO will provide and meeting and exceeding those expectations.

NEW OPERATIONAL MODELS

This section will examine some new ideas for carsharing that may be useful for both startups and older organizations.

Outsourcing & Franchising

Since carsharing depends on a high level of technology (on-board computers, web/phone reservation system, etc.), developing integrated technology packages for smaller carsharing operations, becomes cost prohibitive. The large carsharing companies recognize that is a great deal of interest in many cities where they might not provide service for many years, many have developed “franchise” or will contract to provide specific services. By franchising, or outsourcing certain functions, a startup can concentrate on what it knows best – the local market – while leaving the capital-intensive technology and “back office” staffing to larger organizations better equipped to handle these specialized tasks.

Outsource options include new vehicle leasing (with or without insurance and member screening), reservations system, in-vehicle electronics, and billing.

Franchises enable local operators to take advantage of the expertise and brand recognition already developed by a national company. In return, franchisees pay a fee, depending on the services received, and must meet specific operational and customer-service standards.

Small Operations

The two national carsharing companies in the US, Flexcar and Zipcar, have focused on the larger cities, and, to date, have been reluctant to provide service in smaller cities, even when interest may be quite high but the overall size of the market is relatively small.

Using the spreadsheet model (described above), a smaller community/university carsharing service has been shown theoretically be able to breakeven in about a year with only \$45,000 investment. In order to do this the carsharing operation would have to reduce costs, which might be done in several ways:

- Use volunteer or student labor for some administrative tasks, fleet management and some marketing
- Receive office, phones, internet and supplies gratis (campus mail and email would be free as well)
- Free parking from campus or local government
-
- Reduced cost for vehicles (from motor pool)

This simplified analysis is only intended to be indicative of the possibilities that might be considered.

Scenario: University	Assumption	Launch date	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 5	Quarter 6	Quarter 7	Q8
New members added	40 per month	0	120	120	120	120	120	120	120	120
New vehicles added	2 per month	10	6	6	6	6	6	6	6	6
Total members	(calculated)	0	120	240	360	480	600	720	840	840
Total vehicles	(calculated)	10	16	22	28	34	40	46	52	52
Member to vehicle ratio	(calculated)	0	7.5	10.9	12.9	14.1	15.0	15.7	16.2	16.2
Vehicle utilization	5.5 hours/day 5 miles/hour	1650	2640	3630	4620	5610	6600	7590	8580	8580
Revenue - hours	\$ 5.00 per hour	\$ 8,250	\$ 13,200	\$ 18,150	\$ 23,100	\$ 28,050	\$ 33,000	\$ 37,950	\$ 42,900	\$ 42,900
- mileage charge	\$ 0.25 per mile	\$ 2,063	\$ 3,300	\$ 4,538	\$ 5,775	\$ 7,013	\$ 8,250	\$ 9,488	\$ 10,725	\$ 10,725
Membership fee	\$ 5.00 per month	\$ -	\$ 600	\$ 1,200	\$ 1,800	\$ 2,400	\$ 3,000	\$ 3,600	\$ 4,200	\$ 4,200
Total revenues	per month	\$ 10,313	\$ 17,100	\$ 23,888	\$ 30,675	\$ 37,463	\$ 44,250	\$ 51,038	\$ 57,825	\$ 57,825
Expenses										
Vehicle cost	\$ 250 per month	\$ 2,500	\$ 4,000	\$ 5,500	\$ 7,000	\$ 8,500	\$ 10,000	\$ 11,500	\$ 13,000	\$ 13,000
Vehicle insurance	\$ 250	\$ 2,500	\$ 4,000	\$ 5,500	\$ 7,000	\$ 8,500	\$ 10,000	\$ 11,500	\$ 13,000	\$ 13,000
Maintenance cost	\$ 20	\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040	\$ 1,040
Repair cost	\$ 20	\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040	\$ 1,040
Cleaning cost	\$ -	\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040	\$ 1,040
Parking	\$ -	\$ 200	\$ 320	\$ 440	\$ 560	\$ 680	\$ 800	\$ 920	\$ 1,040	\$ 1,040
New vehicle/location setup	\$ 1,500 per vehicle	\$ 15,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000
Average MPG of vehicles	25 mpg									
Fuel (cost per gallon)	\$ 1.50 per gallon	\$ 495	\$ 792	\$ 1,089	\$ 1,386	\$ 1,683	\$ 1,980	\$ 2,277	\$ 2,574	\$ 2,574
Variable costs	\$ 2,040 per month	\$ 21,295	\$ 19,072	\$ 22,849	\$ 26,626	\$ 30,403	\$ 34,180	\$ 37,957	\$ 41,734	\$ 41,734
Staff - General Manager	\$ 30,000 per year	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500
Staff - Customer Service	\$ 15,000 (gross)	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250
Staff - Marketing	\$ 25,000	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083	\$ 2,083
Staff - Fleet Mgr.	\$ 10,000	\$ 833	\$ 833	\$ 833	\$ 833	\$ 833	\$ 833	\$ 833	\$ 833	\$ 833
Staff costs	\$ 6,667 per month	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667
Reservation/billing system	\$ 100 per month	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100
Marketing/advertising	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000
Office rent	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Phones/internet	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Supplies, mailing	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200
Office costs	\$ 2,200 per month	\$ 2,300	\$ 2,300	\$ 2,300	\$ 2,300	\$ 2,300	\$ 2,300	\$ 2,300	\$ 2,300	\$ 2,300
Total Expenses	\$ 10,907 per month	\$ 30,262	\$ 28,039	\$ 31,816	\$ 35,593	\$ 39,370	\$ 43,147	\$ 46,924	\$ 50,701	\$ 50,701
Net profit/loss	per month	\$ (19,949)	\$ (10,939)	\$ (7,928)	\$ (4,918)	\$ (1,907)	\$ 1,103	\$ 4,114	\$ 7,124	\$ 7,124
Cash flow (investment needed)		\$ (19,949)	\$ (30,888)	\$ (38,816)	\$ (43,734)	\$ (45,641)	\$ (44,538)	\$ (40,424)	\$ (33,299)	\$ (33,299)

Figure 2. Sample Small Market Model Calculation

New Shared-Vehicle Service Models

Conceptually, two different types of “shared vehicle” services serve opposite ends of the commute: carsharing has traditionally focused on neighborhood service to provide vehicles near where people live, while “stations cars”, has focused on transporting commuters from suburban rail stations to nearby offices. The operational requirements of both these services are quite similar – provide members with easy access to shared vehicles parked in designated

locations. The goal of both of these services is to provide convenient access to vehicles so that short trips can be cost effectively by taken using a shared vehicle.

The CarLink research projects in California explored the possibility of both “homeside” and “workside” members, but the pricing was not sustainable once the research grants ended. Hertz car rental also rents cars on a “fractional” (weekdays and evening/weekend) basis to businesses and individuals commuting by BART at several stations in the San Francisco Bay Area.

Because of the partnerships that some CSOs, especially Flexcar, developed with transit agencies and their orientation toward business memberships, almost from the start the distinction between carsharing and stations cars began to be blurred. By creatively, packaging services to different users, the carsharing company can generate sufficient revenue from several different users. Some new service models (actually “products” might be a better name) include:

- Exclusive and Semi-Exclusive Use Vehicles –Some businesses are interested in is exclusive access to a vehicle during part, or all, of the day for their employees. This reduces the concern that a vehicle might not be available. And it may be less expensive than owning a vehicle, which would otherwise be parked on evenings and weekends. Employees could also schedule and use other vehicles in the carsharing fleet, such as picking up a vehicle near one’s home to attend an early morning meeting.
- Weekday Van Shuttle – During weekdays the car or minivan parked at a transit station is picked up by a company employee and makes several round trips in the morning and afternoon to carry employees from the station to the worksite. During the middle of the day, the vehicle is parked at the worksite and is available for employees to use for company business. The CSO thus has the opportunity to earn revenue by providing a fleet vehicle to the business, from individual members on evenings and weekends and possibly a subsidy from the transit agency for the shuttle operation.
- Open Ended Return – one of the major complaints that new members have with carsharing is the requirement to specify a return time. CSOs have been concerned that offering “open ended” reservations, while attractive to the customer, could result in very low utilization since the vehicle would not be available until it was returned. A research project in Berlin during 2001 involving 25 vehicles was undertaken by Bodo Schwieger, then with Daimler Chrysler, and the results showed overall vehicle utilization actually increased under this plan by 37%.
- One Way Rental – Another part of the same research project in Berlin involved designating 8 stations that members could drop off vehicles at (normal reservation and open ended) without having specify which station. Again, the results were encouraging: during the study period 17% of the reservations were one-way trips, and there were sufficient trips originating from all stations that a staff person was needed to shuttle vehicles to equalize the stations only every 10th trip.

These service models can provide a useful supplement the basic carsharing services.

CONCLUSION

Carsharing has come a long way in North America since the first services started almost 10 years ago. It is hoped that the observations and suggestions, along with the simplified spreadsheet model presented in this paper, will be of value to future start up carsharing organizations.

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Readers are invited to contact the author to discuss these ideas.

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