

3. Fare Analysis

KAT Fare Policy Review and Future Options

The structure of KAT's fare policy is important for generating and maintaining ridership and the overall perception of the agency within the community. Obviously fares must be collected on routes as a way to partially offset the cost of the operations. If the fare is too low then it will not recoup an acceptable percentage of the operating costs. In 2008, KAT recovered only nine percent of its operating expenses from fare collection, a much lower rate than most transit agencies nationwide. However, if fares are set too high, it could dissuade riders from using the service by making other forms of travel more cost effective.

During the course of this study, KAT made several changes to its fare policy. Many of these changes were implemented upon recommendations that arose from this transit development plan, including changes in fare structure and farebox technology. Due to the immediate need to cover the cost of rising fuel prices, regular cash fares for local and express routes were increased in January 2009. The cost of all monthly and UT semester passes, discounted fares, and transfers were also raised at this time. In addition to changes in fare pricing, multi-trip and multi-day passes were added as new components to the fare structure. A new farebox technology was adopted to allow for the use of magnetic fare cards and possible integration with KAT's future AVL system.

Early ridership numbers for 2009 indicate that the new fare structure has had little impact on the ridership gains KAT has made in recent years. While ridership is down from 2008 levels, when rising fuel prices attracted new transit riders nationwide, ridership remains higher than in 2007. Moreover, farebox recovery – or the percent of operating expenses covered by fares – has improved with the new fare structure.

The following section details KAT's existing fare policy (enacted in January 2009) and the fare policies of select peer agencies, many of which also implemented changes to their fare structures while this study was being completed. The economics of fare increases are briefly discussed, followed by the original recommendations about changes to fare structure and technology at the outset of this plan. While many of these recommendations are now obsolete due to recent changes in KAT's fare structure and farebox technology, they indicate how far the agency has come in improving its fare policy and point out ways that it might continue to improve as it moves forward.

KAT's Existing Fare Policy

Currently KAT charges \$1.50 per ride on all regular fixed-route bus service and \$2.00 for express routes. Discount fares of \$0.75 (\$1.00 express) per ride are available to disabled persons, seniors, and K-12 students. Children under five and seniors with a Medicare or Seniors FREEdom card ride for free.



KAT also offers a number of passes including a monthly pass (\$50.00 for adults, \$25 for disabled, K-12 students, and seniors) and a semester pass for UT students for \$50.00. Multi-day passes are available in for one day (\$4.00 for adults, \$2.00 for seniors, students, and the disabled) and seven day (\$15 for adults, \$7.50 for seniors, students, and the disabled).

Multi-trip passes are available only for express routes in 20-ride quantities. An adult 20-Ride pass costs \$35, while K-12 students, seniors, and disabled persons pay \$17.50

KAT also charges for transfers, with a regular adult paying \$0.50 per transfer and seniors, disabled persons, and K-12 students paying \$0.25 per transfer.

KAT also runs a paratransit service, LIFT, which charges \$3.00 per ride.

A summary of KAT's current fare policies can be found in Table 3-1.

Table 3-1
Fare Policy Review for KAT and Peer Agencies

Agency	Cash Fare	Discount Fares	Monthly Pass	Other Passes	Multi-Trip Fare	Paratransit	Transfers
KAT	\$1.50 \$2.00 Express	\$0.75/\$1.00 (Express)Senior \$0.75/\$1.00 (Express)Disabled \$0.75/\$1.00 (Express) Student Children (under 5), Free	\$50 Adult \$25 Senior \$25 Disabled \$25 Student	\$50.00 UT Semester Pass \$4.00 One-Day Pass, Adult \$2.00 One-Day Pass, Senior/Disabled/Student \$15.00 Seven-Day Pass, Adult \$7.50 Seven-Day Pass, Senior/Disabled/Student	\$35 Express Route 20-Ride Pass, Adult \$17.50 Express Route 20-Ride Pass, Senior/Disabled/Student	\$3.00 LIFT	\$0.50 Adult \$0.25 Seniors \$0.25 Disabled \$0.25 Students
TARC (Louisville)	\$1.50	\$1.50 Students (6-17) \$0.75 Seniors \$0.75 Disabled Children (5 and under), Free	\$42.00	\$3.00 One-Day Pass	\$12.50 TARC3 Five-Ride \$12.50 10-Ride \$7.50 10-Ride (Discount) \$30 Summer Youth Pass	\$2.50 TARC3	
Nashville MTA	\$1.60 Local \$2.10 Express	\$1.05 Students (4-19) \$0.80 Seniors/Disabled Children (4 and under), Free	\$78.00 Adult \$55.50 Youth	\$4.80 Adult All-Day Pass \$3.30 Youth All-Day Pass \$3.00 Disabled All-Day Pass \$22.00 Adult Seven-Day Pass \$14.75 Youth Seven-Day Pass	\$28.50 20-Ride Local \$38.00 20-Ride Express \$60.00 20-Ride (R&R Express) \$15.00 20-Ride Disabled \$32.00 10-Ride AccessRide	\$3.20 AccessRide	
CARTA (Chattanooga)	\$1.50	\$0.75 Student (K-12) \$0.75 Senior (65 and over) \$0.75 Disabled	\$50.00	\$4.00 One-Day Pass \$2.00 One-Day Pass Reduced Fare		\$2.50 Care-A-Van	
IndyGo	\$1.75	\$0.85 Seniors (65 & over) \$0.85 Students (18 & under) \$0.85 Disabled Children under 5, Free	\$60 Adult \$30 Senior \$30 Student \$30 Disabled	\$4.00 Day Pass, Adult \$2.00 Day Pass, Senior/Student/Disabled \$20.00 Seven-Day Pass, Adult \$10.00 Seven-Day Pass, Senior/Student/Disabled \$7.00 Green Line (Airport Express) \$3.00 ICE (Commuter Express Routes) \$30 Summer Youth Pass	\$17.50 10-Trip Pass, Adult \$8.50 10-Trip Pass, Senior/Student/Disabled	\$3.00 Flexible Services	
Greenlink (Greenville, SC)	\$1.25	\$1.00 Student (free school trips) \$0.60 Senior (65 & over) \$0.60 Disabled Children (under 6), Free			\$22.50 20-Ride Pass	\$2.50 GAP	\$0.50 Adult \$0.25 Student \$0.25 Senior \$0.25 Disabled

Peer Fare Policy Review

Several peer transit agencies were selected to compare fare policies with KAT's policy. The peer agencies were selected based on size of metropolitan area, size of transit services, and general geographic proximity to Knoxville. Peers selected included TARC in Louisville, KY, MTA in Nashville, TN, CARTA in Chattanooga, TN, IndyGo in Indianapolis, IN, and Greenlink in Greenville, SC.

Table 3-1 also summarizes the current fare structure and policies for each of the peer agencies.

The peer review revealed some interesting observations when compared to KAT's fare policy. The agency with the highest fares for a single ride (\$1.75) was IndyGo in Indianapolis. Greenlink in Greenville, SC was the peer agency with the lowest fare for a single ride (\$1.25), which was the cost of KAT's single ride fare prior to the January 2009 fare increase. The other three peers had a fares of \$1.50 and \$1.60. Greenlink and KAT were the only agencies reviewed that charged for transfers.

Prior to the January 2009 changes in fare structure, KAT did not offer a multi-day or multi-ride pass. The new fare structure, which includes a seven-day, one-day, and 20-ride express route pass, is more in line with its peer agencies. Four of the peer agencies reviewed offer some variety of a day pass, in either one-day or seven-day quantities, and a multi-ride pass, usually for ten or 20 rides.

Additionally, it was found that several of the peer agencies have agreements with local universities to offer free rides system wide to college students. In Indianapolis IUPUI students can ride for free by showing their student ID and a special pass that they obtain on campus. In Louisville students of the University of Louisville can ride for free by showing their student ID card. In Nashville, Vanderbilt University students, faculty and staff ride free. In the case of Nashville, Vanderbilt pays a lump sum amount for their students, faculty and staff, who use their IDs as fare cards.

Review of paratransit fares for each of the peer agencies revealed that KAT's LIFT program charges a fare in line with all other peer agencies, with fares ranging from \$2.50 and \$3.20 per ride.

Notably, several of the peer agencies reviewed also enacted fare changes during the course of this study. TARC and Nashville MTA enacted fare changes during the summer of 2008, while IndyGo raised fares in conjunction with KAT in January 2009. Fare increases may have been tied to the new fiscal year that occurs on July 1 for some agencies. However, changes more likely came about due to increases in costs, fuel and otherwise, that transit agencies are experiencing. Given the trends in fuel and other operating costs, transit agencies must increase fares in order to increase revenue and maintain the current relationship between farebox collection and overall costs. As the analysis showed, three peer agencies, in addition to KAT, have already done so.

Fare Economics

Fare elasticity is important to the overall discussion of transit fare policy when fare increases are being considered. In economic terms elasticity refers to the amount of change in demand for a good or service with a change in price. Goods with high elasticity are susceptible to high

fluctuations in demand when the price is changed, while goods with low elasticity typically will see minimal change in demand even with fluctuation in price.

Traditionally transit service has an accepted elasticity value of -0.3. This number means that a ten percent increase in the price would result in a three percent drop of riders. However, a look at the current environment suggests that an increase in fares at this time would not necessarily result in such a significant reduction in ridership. Estimates of price elasticity of demand assume that all other things will be equal, that the price of transit fare is rising in an environment in which the price of competing services (such as driving) and the prices of other consumer items stay the same. However, in the case of public transit, the price of motor fuel is making the cost of driving rise very rapidly—indeed, the perceived cost of driving has approximately doubled in the last four years. The price of fuel going forward is uncertain. In addition, the prices of other consumer products, including food and home utilities are also increasing. In this context, members of the public are seeking to reduce their costs by substituting lower-priced goods and services for higher priced ones. Transit, which is a lower-cost alternative to driving, is a beneficiary of this trend. The higher price of driving cancels out some of the convenience and time savings advantages of driving, and makes transit more competitive. Uncertainty in the market means the reduction in ridership that would result from a fare increase cannot be predicted with certainty. The only thing that can be said with certainty about fare elasticity is that it is lower now than it has been in the past.

Uncertainty in oil prices is a double edged sword for transit agencies. Increases in gasoline price means that more and more commuters are turning to transit as a low-cost way of getting to work and school. However, KAT and other transit agencies also must contend with the higher diesel fuel prices, which have increased operating costs.

Suggestions for Fare Structure and Policy

This section contains suggestions made to KAT prior to the recent changes in fare structure and farebox technology. Many of these suggestions were implemented as part of the January 2009 changes in KAT's fare policy.

Increase the Base Fare

As noted in the peer review section, KAT's base fixed route fare is lower than four of the five peer agencies reviewed. Two of the selected peer transit agencies have recently increased their fares, most likely due to rising fuel prices. A increase in the base fare price is necessary to provide additional revenue in the face of rising fuel costs. A fare increase, however, will help but not solve KAT's budgetary problems, particularly at the rate that operating costs continue to rise.

Increase the Price of a Monthly Pass

Along with the increase in base fare, KAT should consider increasing the price of a monthly pass. The peer agency review showed that all agencies had a higher price for a monthly pass (except for Greenlink which does not offer a monthly pass).

Typically a monthly pass replaces 44-46 regular fixed route fares for a typical commuter (the average month has 22 or 23 working days). So, if the price of a monthly pass is less than the price of 44-46 single fares, buyers of monthly passes are getting a discount. Currently the price of KAT's monthly pass is the equivalent of the price of 32 trips (\$40/\$1.25 per ride). This is a substantial discount off the base fare. The price of this fare instrument could be increased significantly, and would still offer a discount off the base fare.

Heavily discounted monthly passes and fare media have raised environmental justice concerns in some cities. Typically middle-class choice riders purchase monthly passes because the slight discount (as well as the convenience of using a fare card rather than handling cash) is worth the investment to them, and the overall price of the ticket is not high relative to their incomes (indeed, the current price of a monthly KAT pass is less than the price of a tank of gasoline in most vehicles). Working class and low income riders sometimes find it more difficult to accumulate the money required to purchase a monthly ticket or other multi-ride fare media, and thus cannot receive the volume discount, even though many lower-income people use transit far more frequently than twice each weekday. For this reason, some transit systems offer day passes and multi-ride tickets for as few as five rides, to provide lower income frequent users of the system a volume discount similar to those enjoyed by monthly pass holders.

Multi-trip Tickets and Weekly Passes

Another area where KAT could improve their fare structure is by offering multi-trip tickets and weekly passes. Currently KAT offers no multi-trip fare media, discounted or otherwise. Customers who do not pay to purchase a monthly pass must then pay a cash fare on a per-ride basis, which lengthens boarding time.



If a rider does not buy a pass at the beginning of the month, after six working days it becomes more economical to just pay the cash fare than to buy a monthly pass. A ten-ride ticket (which covers a five day work week) could be ideal for those who ride occasionally or who would not ride enough to make a monthly pass economical.

A ten-ride or five-ride ticket works best with the use of fareboxes with magnetic card readers. The magnetic card reader deducts a trip from the ticket on each ride. Using a magnetic card for a multi-trip ticket will also speed boarding.

Typically a small discount is given on multi-trip tickets to make them a better value than paying the cash fare. For instance, in Louisville a ten ride ticket is \$12.50, or \$1.25 a ride, which saves \$0.25 on the cash fare.

Coordinate with University of Tennessee to Offer Free Rides to Students and/or Faculty and Staff

As noted above, several of the peer agencies have arrangements with local universities that purchase the privilege of using the transit system—often at a significant discount on a per-trip basis—for their students, faculty and staff members. Given the importance of UT in the Knoxville Community, pursuing such an arrangement between KAT and UT has obvious benefits to both entities. College campuses are a great place for transit ridership because many students either cannot afford to operate a car, or to use a car for all of their trip purposes. Others, including faculty and staff, choose to live a car-free lifestyle or to use transit for some of their travel purposes out of environmental concerns, thrift or other factors. Many college campuses also face parking and housing shortages. They are reluctant to turn over large swaths of land to parking, partly because parking can destroy the vibrancy of a college campus, and partly because many college campuses are land locked.

KAT currently operates fare-free service on the UT campus, and students are able to purchase a semester pass at a significant discount to access KAT's off-campus services. KAT could pursue an agreement with UT to offer free service to all students on the entire system – and not just on campus – in exchange for a fee collected from all students at the time of registration. Offering free rides system wide could reduce parking demand because some students, faculty, and staff would choose to come to campus on a bus instead of by car. It would encourage some students to consider living off-campus, alleviating housing shortages. From KAT's perspective, it would offer a substantial source of funding while adding tens of thousands of potential new riders. Free rides on KAT would also open up some new areas of Knoxville to carless students.

Free Transfers

A review of the peer agencies revealed that four of the five did not charge for transfers between routes. The removal of paid transfers could be a possibility for the KAT system, but would require additional study of the benefits and costs of such a move.

This review should include an assessment of route structure, as some route formats lend themselves to transfer better than others. The review should also consider how much money is generated by the transfer fare and whether this is worth the administrative costs and service delays associated with collecting the transfer fare. The ability of KAT's current or future card reader technology to print and read transfers is also an issue to be addressed.

Trolley/Circulator Fares

Currently KAT operates four trolley lines that circulate passengers throughout downtown, the UT campus, and several close-in historic neighborhoods. These routes distribute passengers from longer-haul bus routes throughout the downtown, and provide circulation through the downtown and nearby neighborhoods. These routes currently operate free of charge to all passengers, but free service can also attract some passengers who have no destination and are just using the service to pass time.

One way to remove patrons who are not using the trolley for travel-related purposes would be to add a nominal fee to ride. KAT attempted to collect fares on trolleys in the past, but this resulted in a loss of about half of the ridership, indicating that the fare was set too high. This fare needs to be high enough to deter non-travel related boarding, but low enough that legitimate trolley users would not be deterred from taking the service. Finally, the amount should be a convenient one, such as a dime or a quarter, which does not require making complicated change.

Other Fare Structure Opportunities

There are other opportunities to change KAT's fare structure, specifically with preference to certain routes, fare zones, or policies.

One way to organize fare structure is with a Peak/Off-peak structure. In this structure there would be one price for riders during peak operations – say 7-9 AM and 4-6 PM, and then another fare during off-peak operations. The benefit of such a policy would be that KAT would benefit from higher fares when they have the most buses on the road, which would pay for the higher cost of peak operations. The drawback to this fare structure is that the higher peak fare could induce some riders back to their automobiles and may be considered unfair for working class transit riders who need transit to access jobs.

Another way to organize fares is by Local/Express fares. In this structure local routes that make all stops would have one fare while express routes that make fewer stops or travel on the freeway, and thus generally serve longer distance travelers with faster service, would pay a premium fare. As with a Peak/Off-peak structure, there are environmental justice issues with giving a benefit to riders willing to pay a higher fare.

A third way to structure fares is to enact a zonal system. In this arrangement fares would be linked to zones, which are typically set up along city, county, or topographical boundaries. For instance, riders within the City of Knoxville would pay one fare, while routes that originate outside the city's boundaries would pay a higher fare.

Another variation would be to make downtown a fare-free zone. In this case routes that run through downtown or near UT's campus would be free of charge for all riders, but a fare would be enforced once the routes leave the downtown area. This policy can eliminate short car trips in the downtown area while getting some downtown workers comfortable with the idea of taking transit. It also has the effect of turning all of the buses serving the downtown area into circulators for the downtown portion of their trips.

Technology Assessment

In the last decade new fare technology has focused on the use of either magnetic strip cards or smartcards for customers to pay fares. Both of these types of cards can store fare information, including how much value is on the card, when and where the customer boarded the vehicle, and whether the customer receives a discounted fare.



The employment of this new technology has done a number of things. It speeds up the boarding process by reducing the number of cash fares. It reduces the role of the operator in interpreting the validity of fare media, reducing potential conflict with passengers and further speeding up the boarding process. It increases convenience for passengers, giving them a wider range of fare media options and, in the case of declining balance or smart cards, gives them more opportunities to add value to their cards. It allows for the use of fare vending equipment. And it makes it easier for transit agencies to implement more complicated fare structures, such as zone or distance-based fares. Some of the ideas and concepts listed above – zonal fares or peak/off-peak fares – are much easier to utilize when patrons use magnetic strip or smart cards. The use of cards means the burden is off the driver to ensure the correct fare is assessed.

There are drawbacks to a card-based fare system, of course. As mentioned previously, many working class transit riders pay for fares on a day to day basis because they cannot afford to spend a large amount of money at one time on a multi-ride or monthly pass. The benefit of using magnetic strip cards would be lost to these riders. There are also issues with cards losing value or being lost or stolen. Smartcards can overcome this because their stored information is tied to a system database. Magnetic strip cards do not typically store rider information in a database, mostly because the cards are seen as disposable.

Another issue with using permanent or semi-permanent fare media is the means used to put money on the card and where vending machines are located. In larger cities these machines are typically found at larger transit stops (like train stations) and downtown transit centers, such as the planned transit center in downtown Knoxville and in busier commercial locations downtown and in neighborhoods. Deployment in other areas of the city, however, could be problematic due to the potential for theft or vandalism. One solution to this is to locate fare vending machines in supermarkets and corner stores to give access throughout the city, but this would require some negotiation with local businesses.



New technology should be embraced, because it can allow KAT to employ new and creative fare solutions. However, deployment of this technology should be considered thoughtfully, as it can also create many new problems.

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