

Criticality of Micro Transit to Urban Transit: Cabs, Autos and Taxis

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ABSTRACT:

The success of urban transit depends on users reaching the transit from their home or engagement with their bag and baggage: This is done by taxis, cabs, autos, rickshaws or For Hire Vehicles (FHV) or Micro-transit. Micro-transit needs cultivation, nurture and nourishment as much as mass transit.

Taxi service in many cities worldwide is accused of being rude, negation of trips and a poor working culture. India is no exception. The autos of Chennai, for example, have a firm place in the hearts of Madrasians and visitors.

If society expects good behaviour from cab drivers, regulators must design the system to reward good behaviour and discourage unwanted behaviour. The behaviour of a FHV service and the driver depends on the fare structure. Price influences behaviour-- UITP needs no reaffirmation on that—and regulation maintains it. Fare, capacity, labour and engineering of FHVs are usually regulated. The fare structure is usually a black box in most cities.

Fares must be structured with three aspects. First: A Revenue Model of FHV services that depends on the topography of the place: A fare designed for Mumbai will not work for Chennai or Ahmedabad. Second: A Contribution approach to fare pricing provides the granularity in revenue streams to provide 'motivation handles' to influence the behaviour: Cost based pricing cannot delineate short term response to demand. Third: A Fare Structure must be based on the four D's: Distance, Duration, Drop and Discern. The fare structure must be purposely and explicitly built with these factors in consultation with all the eight stake holders in micro-transit: drivers, passengers, fellow road users, owners, manufacturers, capital, regulators and the public. Such granularity is possible with modern fare meters.

This should be reinforced with an institutional framework such as a Taxi and Auto Commission. This body can monitor demand and usage statistics, integrate all the efforts in transit, facilitate with taxi stops and stands, clearing house for call FHV, penalties and subsidies where appropriate. Then can FHVs expected to exhibit desired behaviour and restrain unwanted behaviour.

BIOGRAPHY OF THE AUTHOR

Dr P Mahalingam is Coordinator of The Public Administration Help Tank (PAHT), a not-for-profit organisation. PAHT is creating a body of knowledge and a standardised service to the public, and a statistics data base of the service for regulators (Mahalingam and Supriya, 2002). The Government of Tamil Nadu, India declared to have based the recent fare revisions on this work. Professionally, Dr Mahalingam is Chairman of Door Sabha Nigam Limited (DSNL) and Telekonnectors Limited.

1 INTRODUCTION

Mass Transit is noble. To prevent being just an excellent prescription, people must be able to reach it efficiently. It could be a taxi or another feeder. The last mile (or first mile) link is Micro-Transit.

It follows that any Mass Transit initiative must address and integrate micro transit even beyond the introduction and conclusion. There are enough examples of unreachable mass transit stations, or long staircases from elevated railways that make a person come down one only to climb another to cross the road.

The most common of micro transit are taxis, and in India, autorickshaws. They are 'regulated' for one or more factors such as fare, capacity, quality of vehicles, driver, and traffic practice. Still, the service in many cities is known to refuse rides, demand higher fares, take circuitous routes, and be rude to passengers.

Taxis and taxi drivers have attracted attention since 1915. Researchers have generally emphasized financial and cost analyses to reach pricing decisions or how regulation can improve service. But the solution is still evades passengers and drivers, and Indian is not alone.

That "Price" modifies behaviour of people needs no reaffirmation to the UITP reader. The biggest price manipulators are governments nudging public behaviour with facilities, tariffs, subsidies and fines. On the other side, the "Sale" flyers in newspapers show that modern marketers successfully galvanise the behaviour of customers, sellers, local governments, the channel, manufacturers bankers and fellow merchants into a happy all-pervading feeling of win-win.

Scientists have found that people change their behavior rapidly if told directly which behaviors will be rewarded and which will be punished, than if left to discover it for themselves. They adapt their behavior based on the reward systems if followed by training.

The fare is the common factor for the many stake holders of the FHV service: To a driver the fare is income. To the passenger fare is cost. For owners and capital, the fare determines return on investment. Road users will be affected by the fare as driver income will influence who becomes a driver. Fares influence demand for FHVs, maintenance and upkeep for the industry. For society, this fare determines how precious road resources will be used.

This paper finds that FHV fares in India (and most around the world) do not reveal any behavioural basis or how the final figures were arrived at. The structures and granularity have been limited by the legacy of the mechanical taximeter. This attempt is to highlight this and propose a change method.

2.0 FHVS TODAY

FHV systems vary round the world: Usually a taximeter charges by distance. When the vehicle is stationary as when held up in traffic or a signal the meter changes to charging by time. A fixed amount is usually added when the meter is "engaged" at the beginning. Smaller towns have a "fixed fare to anywhere" method. Washington, DC in the USA has a fare based on zones. In Chennai (formerly Madras), India, the meter is an adornment and drivers will negotiate the fare based on the passengers' helplessness and innocence.

The cost of taxi service around the world is as wide as their reputations. London and Tokyo are usually mentioned as the best. A driver who turns down a fare or is willing to wait in airport queues for an hour or more is optimizing his response to the existing fare structure. In most Indian cities, the time fare is cut out or reduced to very low levels while making the per mile rate larger. Thus a single long airport trip would become more profitable to the alternative of several short city trips. Intuitively, all stake holders optimise at every point to get what benefits them. Table 1 shows the cost of a 5Km trip can explain some of the reputations.

Table 1: Fare for 5Km/30 min trip in Rupees (May, 2006)

	Detail	LON	TYO	NYC	PAR	SIN	HKG	MAA
1	Rate / Km	160	120	100	45	15	45	4.50
2	Rate / min	30	50	10	25	10	10	Nil
3	5Km/30 min Rs	1000	800	700	400	200	300	20*

* Drivers negotiate to Rs 50+ depending on time and traffic.

Some cities increase the charge above certain distance or duration, probably to force the trips closer to the heuristic or to compensate for opportunity loss to the operator. There are the novel surcharges in some cities as “pet surcharge” and ‘soiling charge’. Some charge for a third or fourth passenger.

If each factor can bring in an identified contribution to the driver he will adapt his behaviour to maximize income. If the fare has a number of variations for different services, a passenger will modify his behaviour to minimize expense or maximize comfort. So a fare structure must be granular enough with a number of inputs or “handles” to be able to evoke a wide variety of behavioural outputs.

3 THE REVENUE MODEL

A FHV provides a service. So the primary revenue factor is distance. The fixed costs of wage and investment have to be amortised by time. So the revenue model of a FHV is governed by trip distance and trip duration (Fig 1).

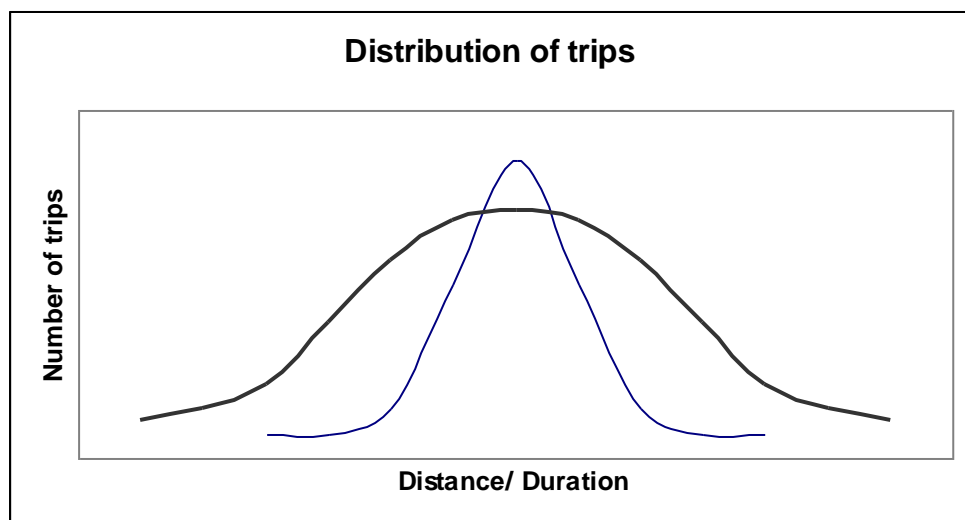


Fig 1: Distribution of trips: One wide and one narrow

Four combinations are possible with the two factors on the two axes. They are characteristics of four situations and corresponding fare basis (Fig 2):

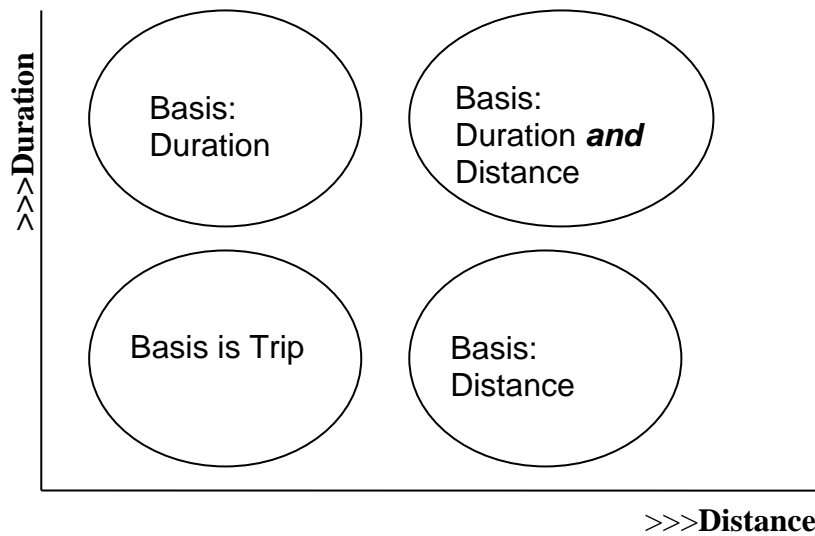


Fig 2: Selection of Revenue Model

3.1 Trips in small towns are short in distance and duration. Very small towns would come under this variety. The number of vehicles would be less. The total distance a FHV would run in a day might be in the order of say 20 Km. So the charging is by trip.

3.2 Medium sized cities have dense traffic. Trip lengths are small but the time to cover distance is large. A two Km trip across town would take half an hour. Hence the charging must be done on duration of the trip. FHV's here tend to run some 30 Km per day.

3.3 Trips in large cities are long in distances and durations. FHV's usually run 150 Km plus a day. Traffic speed is in the order of 20 Kmph. Hence the fare can have a combination of distance and duration.

3.4 The fourth is the typical intercity traffic. The trips are long distances. Duration cannot be differentiated. So the fare is by distance alone. This principle can be applied even to situations in cities where the population is in clusters: The run between the clusters can be by surcharge while the travel within the cluster can be by another model.

4.0 CONTRIBUTION METHOD TO INFLUENCE BEHAVIOUR

A restaurateur buys water. It is a cost to him. But water is served free to the customers. So the 'price' for the water is zero. The restaurateur can of course charge for the water and serve the food free. Cost is what a seller incurs to make a product or to provide the service. Price is what a buyer pays the seller to buy that product or service. Cost is a fact while price is a policy: Thus price can be lower than cost.

A manufacturer makes five sizes of television. Not all will make money or the same amount. What he looks for is called, in marketing parlance, 'contribution'. Contribution is a perspective from the market side of revenue. Price may even be negative as when running a promotion. Absorption costing is more useful in investment decisions.

For short time frames of consideration, this contribution approach offers more 'motivation handles' than absorption costing. Cost is fixed but contribution can be varied and with it behaviour. The contribution approach is able to delineate variable and fixed costs. Each factor can be made a handle for different expectations for different stake holders.

5.0 THE FARE MIX AND THE 4 DS

The revenue model of an enterprise is the plan of revenues, expenses and money flows. A fare mix is the combination of streams that produce the revenue. For the FHV business, two factors in the stream correspond to the cost factors in any enterprise: the output process or product and the duration of providing the output. The other two factors are derived from these primary factors and are the behaviour modifiers.

5.1 Distance

A FHV is meant to give distance utility. When the FHV provides this utility it incurs a direct cost of fuel. Hence distance is one chargeable factor.

5.2 Duration

Inherent to a live service is the time it takes to provide the service. Fixed cost is amortised over the time.

5.3 Drop

This is a derived factor. The Drop is made up of three factors which may be called the "Three Minor Ds":

5.3.1 Flag Drop

This is usually the minimum fare when the FHV is hired. The term is the drop or turning of the "flag" or dickory. It usually includes some travel.

5.3.2 Meter Drop

This is the least count of the meter. A high meter drop will negatively influence the perception of the passenger. For example, if the drop is Rs 10, then the passenger may display a "meter anxiety" as he nears the destination. His response may be to beat the meter by getting off before the next drop. On the other side a small drop like 10 paise will make the meter rotate faster and give a feeling of the meter running "faster than the cab"— for some it may induce meter anxiety throughout the trip!

5.3.3 Inclusion Drop

This is the travel that is included in the minimum fare or Flag Down charge. A large inclusion makes short trips expensive to the passenger and more remunerative to the driver. It thus contributes significantly to driver and passenger behaviour.

5.4 Discern

If fares influence behaviour, then surcharges and discounts are the sweeteners to nudge behaviour to expected fronts for immediate and direct effect. There are many models developed from the Pigouvian principle on price and cost of time to a user. The application of these theories with buyer and seller behaviour is the same: There is a price at which people will advance or postpone a purchase to a favourable time. This can be a surcharge on a standard rate or a discount from a higher rate. A surcharge gives a feeling of penalizing undesired behaviour while a discount gives a feeling of rewarding desired behaviour.

Thus the entire fare basis may be converted to a choice of surcharges or discounts – a bus stop charge can be a bus stop discount from minimum fare, A cleaning surcharge can be a clean cab discount, a peak time surcharge can be an off peak discount and so on.

Generally the immediate effect of surcharges is positive on the drivers and negative on passengers. The converse happens with discounts. Both shift traffic or compensate the inconvenience to other stake holders.

Discerns also help remove hidden subsidies between kinds of trips and make the actual users pay. Without an airport surcharge, the one way dead return cost from an airport will be loaded on the other trips. A well calculated surcharge loads costs equitably.

Surcharges can be fixed or usage sensitive. A simple across the board tweaking can compensate the driver for any situation. For example instead of Rs x per km, $x + \Delta x$ can increase total revenue over the day to cover the loss from a dead return. This is in effect a proportional Discern. Table 2 lists the types and examples of Discern.

Table 2: Discerns and Classification

Discerns to Even Traffic	
1	Peak Hour Surcharge/ Discount:
2	Inner City Surcharge/ Discount:
3	Long Trip Surcharge/ Discount:
Discerns of Convenience	
1	Reservation charge/ Discount
2	Negotiated Trip Charge/ Discount
3	Shared Service Surcharge/ Discount
4	Shed Run Surcharge/ Discount
5	Bus Stop Charge/ Discount
Discerns of Marginal Income	
1	Additional Passenger charge

2	Luggage Surcharge
3	Pet Surcharge
Discerns of Compensation	
1	Airport Surcharge
2	Theater Surcharge
3	Out of City Charge
4	Holiday charge
5	Night Fare or Surcharge
6	Soiling charge
7	Special Surcharge/ Discount
8	Fuel price adjustment

6.0 REGULATION AND ADMINISTRATION OF MICRO TRANSIT

In Indian cities the fare negotiations are done by the transport authority as and when required. Most cities have given up the trip sheet custom. That fare regulation requires constant review, monitoring of traffic and timely intervention has not been realised yet.

A number of strategies are required to maintain an efficient micro transit. It is a full time job of a body. Cities that have successful micro transit have an independent body to supervise and manage micro transit. This would be the first step for India.

7.0 MODEL CONSULTATION PAPER FROM PAHT

The Public Administration Help Tank (PAHT), a not-for-profit organisation has published a model consultation paper for use by all stake holders to arrive at a transparent fare policy.

PAHT is glad to assist in the formulation of a consultation paper specifically for a city for fare negotiations. Please write Info@PAHT.org
