Technical Note MCL/01/2008 (Revised 2012)
CALCULATION OF THE NORMAL AVERAGE FARE

Basic Method

For operators providing Electronic Ticket Machine (ETM) data[1], the data capture module of our data extraction software (DCM) calculates the average adult fare on each route for each day.

This calculation is based on the sales of adult single tickets (counting as one journey) and adult return tickets (counting as two journeys). The result of this calculation is what we call the "on-bus average" (OBA) and is a dynamic variable, driven by the out-turn data coming into us from the operator. The operator is equally able to establish this value.

The "Normal Average Fare" (NAF) is the value used in reimbursement calculations, elasticity analysis, etc.. The aim is to calculate this using DfT's "Discount Factor" approach which reflects not only the discounts generally available from return tickets but also from day tickets and weekly tickets.

If the Discount Factor method is not appropriate as identified in DfT Guidance Table 5.1, which is exceptional, then the DfT "Basket of Fares Method" is used.

The NAF is calculated by applying a "Fares Discount Factor" (FDF) to the OBA and, hence, achievement of the overall fares basket calculation becomes a 2-stage process involving the ongoing measurement of the OBA and separate calculation and application of an FDF.

the FDF is normally calculated at the operator level and for a given period. For the preferred Discount Factor Method, the OBF, daily and weekly prices are input to the Calculator and the FDF is obtained directly

For the Basket of Fares Method, data on the sales of each type of ticket are provided by the operator. An average ticket value and an average number of journeys made per ticket are agreed with the operator, thus enabling the average fare per journey to be calculated.

We also agree a weighting value for each ticket type reflecting the relative likelihood of that type of ticket being bought by those that qualify for travel concessions if there was no scheme (eg a low weighting is given to ticket types aimed primarily at the commuter market).

These inputs are combined into a "fares basket" calculation using the DfT Calculator, however, an example showing the principle is shown below:

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[1] Which is most operators

FARES BASKET ANALYSIS					Period:	Example	Scheme:	Example	
Operator: Example									
Type of ticket (Full/Adult Fare Version)	A - Number Sold	B - Revenue Taken	C - Average Revenue per Ticket (B/A)	D - Assumed Trips per Ticket sold	Implied Revenue per Trip (£s)	% of total Trips with this Ticket Type	Adjustment to reflect Concessionary use	Adjusted % of total Trips with this Ticket Type	Adjusted Revenue per Ticket weighted by Trips
Single	3,557,273	£ 6,357,703	£ 1.7872	1.0	£ 1.7872	50.4%	1.000	66.2%	£ 1.1828
Return	235,054	£ 1,195,461	£ 5.0859	2.0	£ 2.5429	6.7%	1.000	8.7%	£ 0.2224
Daily pass	423,500	£ 1,554,245	£ 3.6700	2.5	£ 1.4680	15.0%	0.750	11.3%	£ 0.1652
Weekly pass	124,400	£ 1,596,052	£ 12.8300	12.2	£ 1.0516	21.5%	0.250	5.4%	£ 0.0565
Special	226,957	£ 680,871	£ 3.0000	2.0	£ 1.5000	6.4%	1.000	8.4%	£ 0.1267
<Other, pl specify>									
<Other, pl specify>									
Total						100%		100.00%	
								NAF from above	£ 1.7536
								OBA from above	£ 1.8755
								Implied Discount	6.50%

The standard "fares basket" calculation yields an overall NAF value. However, we need to extract the FDF value and to do this we calculate an equivalent value of the OBA from the single and return ticket data used in the "fares basket". The FDF is then the NAF value divided by the OBA value, both derived from the "fares basket".

The FDF value remains fixed until either the TCA or the operator observe the need for change (eg if the operator adopts a revised fares structure or introduces a new ticket product likely to be of interest to those that qualify for travel concessions). The "fares basket" calculation is shared and agreed with the operator and the operator can model, in advance, any changes that may arise from changes in fare structures, etc.

Overall Average Fare for an Operator

Overall averages are calculated for any given period using the route-by-route, day-by-day OBA data, the FDF value applicable for the operator and the number of concessionary journeys on each route, each day. For the operator and period in question we sum the gross revenue foregone for each route on each day (Total GRF) and sum the total journeys on each day in the period. The operator average fare is then GRF divided by journeys.

This is therefore an average weighted by the relative volume of concessionary travel on each route and differs from the average of each route fare and any average weighted by total adult patronage. For the purpose in question and subject to the following comments, this value is the most accurate representation of the value of concessionary journeys.

Other factors

The above method, and use of the Calculator, assumes that the journey length profile of concessionary journeys is the same as for adult fare payers on any given route. This may not be the case and survey-based research undertaken in 2006/07 suggested that in some cases concessionary journeys were, on average, shorter and some, longer than their adult equivalents. The impact on final elasticity and reimbursement calculations was, however, relatively small and, set against the quite substantial cost of ongoing research and the possible contention with operators, it was decided not to attempt any adjustments. MCL schemes do, however, make provision for "journey length factors" to be agreed with operators in exceptional cases.

Finally, a note of caution to those looking at and interpreting average fares data: the evidence that is amassing is showing substantial variation in average fares over the year, arising not from changes in fare levels but from seasonal changes in journey lengths (eg longer "days out" trips in the summer, shorter "subsistence" trips in the winter). When comparing average fares, one period with another, it is very important to bear this in mind.