My thanks to Referee # 1 for comments. Responses follow below.

The referee's second paragraph invokes the argument of practical utility. That is, it is acceptable to knowingly use an incorrect form of transit time distribution provided the outcome is still useful, presumably as measured by fits to data. However, that argument is predicated on the assumption that transit time distributions f(t) with f(0)=0 are consistently less useful. While specific instances might be cited where f(0) = 0 fares less well than L-shaped forms, this by no means constitutes a proof of the assumption. Distributions are flexible entities and, for example, it will always be possible to find a finite mixture of f(0) = 0 distributions which result in data matching as good or better than any L-shaped distribution.

Given an absence of a practical utility argument, the question then arises as to why we should knowingly employ transit time distributions of incorrect form. That is, why would we use L-shaped transit time distributions which have no mode when all transit time distributions must have at least one mode? The referee takes the view that this is a minor and irrelevant point. On the contrary, we know little enough about the forms of transit time distributions and it would seem only sensible to make as much use as we can of our knowledge that f(0) = 0, and not simply ignore it.

With respect to the two specific points which the reviewer wished addressed:

(i) The definition of L-shaped distributions was $f'(t) < 0$ and not $f(0) > 0$. L-shaped forms are always obtained from $f'(t) < 0$ for all $t \geq 0$.

(ii) There was never any intention in the paper to imply that only L-shaped probability density functions have been used through the history of transit time modelling. This point can be noted while using the additional references mentioned by the referee. The use of f(0) = 0 probability density functions to represent transit time distributions extends at least back to Turner and Barnes (1998), cited by Kirchner et al (2000) as an example of utilising the gamma distribution with shape parameter > 1. However, L-shaped distributions also continue to be used. Previous use of f(0) = 0 distributions is therefore of no consequence to the message of the paper – that L-shaped distributions do not properly reflect the form of transit time distributions and the call is made for their use to be discontinued.

Further responses follow to specific points mentioned briefly by the referee.

It is beyond the scope of this brief technical note to extend to advocating the merits of any specific alternative transit time distribution. The lognormal distribution is mentioned as an empirical possibility. So too is the inverse Gaussian distribution (which is the transit time distribution for Brownian motion with drift). Mention might also be made of the CTRW model noted by the referee.

With respect to whether the paper will generate interest is not for me to say. Perhaps the referee is right in contending that the paper would raise little interest. However, my feeling is that there is potential for hydrological interest. Specifically, given that f(0) = 0 it follows that all transit time distributions have a lag time to first mode. This lag time (which could be made dimensionless by scaling to the median) might be so close to zero that it is irrelevant. On the other hand, there might be possibility of some degree of displacement of the first mode from time zero. This would raise questions concerning the physical processes creating the lag. Similarly, the possibility of multiple modes and their physical associations might be raised from some data sets. Such issues could not be contemplated in the context of L-shaped distributions. So to that extent the paper has scope for opening the way to better hydrological questions.

Turner, J. V., Barnes, C. J. *Modeling of Isotope and Hydrogeochemical Responses in Catchment Hydrology* IN: Isotope Tracers in Catchment Hydrology (eds Kendall, C., McDonnell, J. J.) 723-760 (Elsevier, Amsterdam, 1998).

Kirchner, J.W., Feng, X.H., Neal, C. (2000) Fractal stream chemistry and its implications for contaminant transport in catchments, Nature, 403, 524–527.