



Gathering Place

Cliff Slater

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Oahu rail transit will be an environmental loser

One of the primary reasons given for building a rail transit line is that on average rail uses less energy than a regular automobile. Rail uses 2,750 British Thermal Units per passenger mile (BPM) and automobiles 3,445 BPM.ⁱ While this difference holds true for the U.S. as a whole, it is unlikely to be the case for a new rail transit line in cities like ours.

What transit agencies mean by *average* is *weighted average* — the BPM of large rail passenger carries more weight than small carriers. New York carries 57 percent of all U.S. rail transit trips and is an energy-efficient rail system at 2,200 BPM.ⁱⁱ Accordingly, on a weighted average basis it swamps the dismal performance of other rail lines, many of which are energy inefficient relative to the automobile.

If we do a simple un-weighted average, while still including New York, the average nearly doubles to 4,400 BPM from the weighted average of 2,750 BPM, such is the impact of New York on the weighted average.

Essentially, we must examine the details (the devil is always in the details), to find that among light rail cities, the energy usage ranges wildly from an efficient San Diego at 1,900 BPM to a grossly inefficient Baltimore at 8,400 BPM.

Heavy rail has the same kind of spread from New York's 2,200 BPM to Miami's 6,600 BPM with both heavy and light rail averaging 4,400 BPM on an un-weighted basis.

Judging whether a new rail system, such as that for Honolulu, is likely to be an efficient energy user relative to the automobile depends on the kind of average occupancy it is likely to achieve.

The U.S. Dept. Energy recognizes this and says, "Because of the inherent differences in the nature of services, routes available, and many additional factors, the energy intensity of transit rail systems can vary substantially among systems."ⁱⁱⁱ

The efficient systems, such as New York, have a great deal of traffic going in both directions in their core areas in the off-peak while the energy-inefficient

systems, such as Miami, tend to be those that are highly directional during the peak hours — full going from suburbs into town in the morning and empty going back out, with the opposite being true in the afternoon.

Rail transit cannot just discontinue service during the off-peak hours as our suburban express buses do, and so a certain amount of passengers during the off-peak is critical for energy efficiency. In New York, London and Hong Kong the relative difference between peak-hour passengers and off-peak passengers is much less than those rail lines with a heavily suburban orientation.

What also needs to be taken into account is that BPMs are calculated on the miles traveled by the vehicle, not as the crow flies. The route traveled by passengers on transit vehicles tend to be more circuitous and thus longer, especially where transfers are involved, than the door-to-door travel by automobile. For this reason, automobile BPMs must be adjusted down for the difference in trip mileage between autos and rail transit if we are to compare them accurately.

In short, the City must do a great deal of work during their current environmental impact process to persuade us that the projected Honolulu rail line will be as energy efficient as our automobiles. At the moment, it appears they have their work cut out.

Cliff Slater's footnoted op/eds can be found at www.cliffslater.com. He is grateful to Randal O'Toole, Senior Fellow at the Cato Institute, for developing the detailed data of energy use by passenger mile and to UH Prof. Panos Prevedouros for refinement of the data.

Endnotes:

ⁱ http://cta.ornl.gov/data/tedb26/Edition26_Chapter02.pdf Tables 2.12 & 2.13

ⁱⁱ http://www.honolulutraffic.com/BTU_per_PM.xls

ⁱⁱⁱ http://www1.eere.energy.gov/vehiclesandfuels/facts/favorites/fcvt_fotw221.html