Transit Drives Dump the Pump, John Holtzclaw, June 16, 2011

Today is Dump the Pump Day. So, why should we?? To start, we use about 13 million barrels of oil every day just for transportation – almost 9 million of those just in our cars and trucks. What would happen if we had more transit and more of us used it? We urge walking, biking and public transit to cut carbon pollution. Walking and biking are obvious. In fact, I'd contend that biking is the most efficient land transportation, three times more efficient than walking. Of course, you have to bike three times as far for the same amount of exercise, oops, physical activity.

But what about public transit; how do you measure its effectiveness? Some buses run packed, and some empty. What's the average? How much driving (Vehicle Miles Traveled or VMT) does a mile on transit cut? Fortunately, the Federal Transit Administration requires transit agencies to report passenger-miles (p-m), vehicle miles and fuel used. When we compare average carbon pollution per passenger-mile, buses usually emit less carbon pollution than cars, see CNT's Travel Matters - http://www.travelmatters.org/calculator/individual/methodology, and the US Bureau of Transportation Statistics - http://www.bts.gov/publications/national_transportation_statistics/#chapter_4.

 Electrified vehicles emit about half as much carbon pollution as gas-powered cars, with rail cutting carbon pollution more than trolley buses. Systems running on "clean" electricity do even better! These are pollution reductions from replacing one mile driven alone in a car with one mile ridden on transit.

These kinds of one-for-one pollution reductions may result from transit to suburban areas. But is that the end of the story? Might passenger-miles on public transit-- whether by bus, streetcar, or rail-- be more efficient than miles driven in a car? Shouldn't we be comparing trips rather than passenger miles?

We drive to a desired destination: work, shop, eat, bank, visit… If you only have to go half as far to work, you save passenger miles. Most transit service is provided to dense, mixed-use neighborhoods with a wealth of nearby destinations, shortening trips – think NYC, Boston, DC, Chicago, San Francisco, etc. Many of those trips are walked or biked, and even the ones driven are shorter.

Transit efficiency not only benefits from this convenience, transit is absolutely necessary for these neighborhoods to survive. Can you imagine Manhattan without its subway or buses? Gridlock, from the Battery to Ft Tryon!

I took a close look at transit and its benefits a few years back and my conclusions are still solid and worth considering as we celebrate transit today. I found that a passenger-mile on transit in cities, along with walking and biking, can provide trips that would require 9 miles of driving by suburbanites. Let's call this a transit leverage of 9. The study is reported at http://www.sierraclub.org/sprawl/articles/reducedriving.asp.

From Table 2, two conclusions jump out: 1) older transit systems give higher transit leverage. They have had more time to stimulate higher density and development around the stations from housing to businesses to fun places to hang out. 2) greater differences in density, mixed-use and transit between two areas give even greater transit leverage.

Early research compared whole metropolitan areas (center cities plus suburban sprawl) with rail systems to those without, giving a transit leverage of 4. Similarly, other data show a transit leverage of 2.9 by comparing US metropolitan areas with and without rail systems, and 3.6 if Canadian, Australian and European metropolitan areas are included. My own research shows that comparing the central city (San Francisco) with its suburbs (Danville and San Ramon) gives a transit leverage of 8 or 9 for all transit - buses and rail.

The residents of San Ramon drive 2.2 times more than San Franciscans (10,591 to 4779 annual VMT/capita, Table 1) but have a transit leverage of 9, which exceeds the VMT ratio by about 4 times. Applying that same factor (4) to the North Beach area of San Francisco, with an annual 2759 VMT/capita implies a transit leverage of around 16! Manhattan, with an annual 1145 VMT/cap (http://www.sierraclub.org/sprawl/articles/campusprogress2006.pdf) implies a transit leverage of 37! Wow! More studies are needed to confirm these transit leverages. And if you want to get all of the details and studies I looked at in my own research click here! [link to http://www.sierraclub.org/sprawl/articles/reducedriving.asp, same as 3 para above]

OK, what do these numbers mean? They suggest that San Francisco's short trips and transit reduce carbon pollution from buses by more than a factor of 9 compared to the car trips necessary in San Ramon. In North Beach by a factor of more than 16, and Manhattan by a factor of more than 37. Double those transit leverages for electrified rail transit. American Public Transit Association, hold your head up high!

Let me repeat this: Buses out to sprawling areas reduce carbon pollution modestly; rail or electrification cuts it even more. Buses and rail serving denser, mixed use central cities cut emissions by 8 (San Francisco) and up to 37 times (Manhattan) compared to living and driving in sprawl. This results from convenient, dense, mixed use communities where trips are short, and many walked, biked or on transit.

And finally, social leverage? We chat with fellow passengers on the bus or train, often meeting visitors to the city. Try that while driving to work! I would call this social leverage. You can also flirt when walking or biking and you can enjoy your smart phone, text like mad or read your kindle on transit – someone else is doing the driving!!

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21st Century Transportation Campaign – http://www.sierraclub.org/transportation/

Building Healthy Communities – http://www.SierraClub.org/sprawl

Healthy Growth Calculator– http://www.sierraclub.org/sprawl/density/