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Freeways: Speed vs. Throughput

There's an old joke in computer science circles: never underestimate the bandwidth of a truck full of tapes. That is, if you want to move a large amount of data from one point to another, but you don't care how long it takes to get there, the most efficient way to do it is to put the data on a removable media (magnetic tape in the old days, hard drives or DVD-R's today) and drive them across the country. The freeway system becomes a high-throughput, albeit high-latency, data network.

Exactly the same point applies when you're comparing a freeway to a grid of city streets. A couple of commenters replied to [Sunday's post](#) by claiming that freeways are essential for moving people and goods into the city center. This argument confuses speed with throughput.

For throughput purposes, what you care about most is the number of lanes connecting any two points. And for a city grid, this number is huge. Central Philadelphia's surface streets have around a dozen lanes in each direction. This is enough lanes that city streets tend not to be major bottlenecks during rush hour. You're more likely to find congestion on the freeways themselves, or at the points where the freeways intersect with the street grid.

So urban grids provide plenty of throughput. What they don't provide is speed. At non-rush-hour times, freeways shave 10 or 20 minutes off the time it takes to get from an outer suburb into the city center. But from an economic perspective, it's not clear how important this is. First, as already noted, those time savings come at the expense of users of other modes of travel who suffer from a less-compact (and therefore less walkable and bikeable) urban core. And second, these time savings almost disappear completely during rush hour, when freeways don't move much faster than city streets.

Finally, while we're talking about throughput, it's important to remember that a subway line offers [dramatically higher throughput](#)—between 5 and 15 times, depending on your assumptions—than a freeway lane. It would be essentially impossible to have a city the size of New York rely primarily on freeways to get people in and out of downtown.

Freeways are a great way to move people around the suburbs, and to move people from one metropolitan area to another. But they're a poor way to move people into, around, or through the urban core. And it was a huge mistake to destroy thousands of homes and businesses in cities like St. Louis and Minneapolis to make room for urban freeways.