

Chicago's Green Dividend

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Chicago has placed an increasing emphasis on pursuing green policies in recent years. Because city residents use less land and travel less, their environmental footprint is smaller than for those who live in less dense locales (Glaeser 2007). Even so, there are still some skeptics who view transit, density and conservation as a kind of virtuous self-denial, well-meaning, but silly and uneconomic. Critics see the seeds of economic ruin: planning, policies and regulations that restrict use or access to resources impede growth and lower household income.

Both the skeptics and the critics are wrong. Being green means not simply that cities are contributing to the environment. In addition, city residents earn a “green dividend” because they save a bundle on cars and gas. This means local residents have more money to spend on other things they value, which in turn stimulates the local economy.

Cities are green because they enable greater efficiency, offering more things that are close at hand and more different choices of how to travel to any given place.

Compared to other large metropolitan areas in the US, Chicagoland residents travel about 10% fewer miles every day. According to the US Department of Transportation the average resident of the metropolitan area traveled 22.2 miles per day in 2005. The median for the 33 most populous metro areas in the country is 24.3 miles per day. (And pity the Houstonians—they average 40 miles per day.) Vehicle miles traveled is a highly aggregated measure of travel of total miles divided by population. Consequently, it reflects the combined effects of shorter trips and the use of alternative modes.

24.3 Median commute miles per day for
33 most populous US metro areas

22.2 Average daily miles for
Chicago area commute

5.8 B Miles saved compared
to median

Transportation
costs saved
compared to
median **\$2.3B**

Two miles per day may not seem like much, but do the math

Two miles per day may not seem like much, but do the math. The Chicago metro area has roughly 7.7 million residents. If Chicago residents traveled as much as the typical US metro resident, that would produce 16 million more vehicle miles per day or about 5.8 billion more miles per year. A conservative estimate of the cost of driving is about 40 cents per mile (at \$3.00 a gallon, 15 cents of this is just the cost of fuel, figured at a fleet average of 20 miles per gallon, a generous number for city driving). All told, the out-of-pocket savings work out to \$2.3 billion per year. This amount is equal to about two-thirds of one percent of all personal income earned in the region in 2005, roughly the same as the direct personal income earned by the region's printing industries.

This is a good minimum estimate of the aggregate economic benefits—the green dividend—that Chicago area residents enjoy as a result of compact land use patterns and alternatives to single occupancy vehicle travel.

But the benefits don't stop there. Since they don't spend that money on transportation, they have more money to spend on other things. Because so much of what they spend on transportation immediately leaves the state—Illinois makes only a fraction of the cars driven in Chicago and even less of their fuel—money not spend on transportation gets spent on sectors of the economy that have a much larger local multiplier effect. According to IRS data, about 73 percent of the retail price of gas (back when it was under \$2.00 a gallon, by the way) and 86 percent of the retail price of cars is the “cost of goods sold,” which immediately leaves the local economy. The \$2.3 billion Chicagoans don't spend on car travel translates into \$2 billion that is not leaving the local region. Because this money gets re-spent in other sectors of the economy, it stimulates local businesses, rather than rewarding Exxon or Toyota.

Households that spend more on transportation spend less on housing, and vice versa



So where does the money saved on traveling fewer miles get spent? We don't know exactly, but we have some clues. National data show that there is an inverse relationship between household spending on transportation and housing: households that spend more on transportation spend less on housing, and vice versa. Shorter distances traveled means Chicago residents have more money to spend on housing and on other goods and services.

Not traveling has another important economic benefit—saving time. And time, as the saying goes, is money. The Texas Transportation Institute estimates that the average value of personal travel time in the United States was worth \$14.60 in 2005¹. So every hour saved is roughly \$15 in additional income. Based on an average travel speed of 27 miles per hour, Chicago residents traveling 5.8 billion fewer miles per year spend 200 million hours less traveling. At \$15 per hour, the economic value of the time saved is \$3.2 billion per year.

There's strong evidence that time spent commuting, particularly commuting alone, has a large negative effect on self-reported levels of happiness. One study found a 23 minute commute had the same effect on happiness as a 19 percent reduction in income (Stutzer and Frey 2004). A second concluded that public policies like congestion taxes or carpool subsidies that reduce time spent commuting alone could actually make people happier (Kahneman and Krueger 2006). So shorter commutes make people happier as well as better off financially.

There are, of course, huge environmental benefits. To gauge their magnitude, we use the assumption that vehicle emissions are proportional to total miles traveled. This is a reasonable assumption for greenhouse gases like carbon dioxide and a bit fuzzier for hydrocarbons, where emissions are also accentuated by starting and stopping an engine: avoiding a single short trip will reduce much more pollution than shaving that same distance off a longer one.

1 Texas Transportation Institute, Table 2. Components of the Congestion Problem, 2005 Urban Area Totals, http://mobility.tamu.edu/ums/congestion_data/tables/national/table_2.pdf

Again, with a metropolitan population of roughly 7.7 million driving 2.1 miles per day less than the average American, Chicago area residents travel 16 million miles less per day. At a fleet average of 20 miles per gallon, that means Chicago area residents burn 800,000 gallons less per day. At 19.4 pounds of carbon emitted per gallon burned, the lower level of emissions saves about 7,700 tons of greenhouse gases per day, or about 2.8 million tons per year.² The long term price of carbon is estimated at about \$20 to \$50 per ton,³ making the value of annual carbon savings from Chicago's greater efficiency worth between \$56 and \$140 million annually.

Chicago's transit system plays a key role in creating this green dividend enabling residents to drive fewer vehicle miles. Transit supports higher levels of residential density and higher density neighborhoods have more jobs, shopping opportunities, and civic and recreational activities and personal services close at hand, enabling shorter trips.

Across cities, the presence of a well-used transit system is correlated with fewer vehicle miles of travel. Cities with more heavily utilized transit systems have, on average, fewer vehicle miles of travel per person than cities with less heavily utilized transit systems.



Chicago ranks eighth among the nation's 50 largest metropolitan areas in percentage of the non-poor population that reports regular transit use

While in most places there is a strong negative relationship between income and transit use, Chicago ranks eighth among the nation's 50 largest metropolitan areas in the percentage of the non-poor population that reports regular transit use. About 26% of non-poor Chicago area residents used transit, compared to 45% in New York, 10.5% in Atlanta, 8.7% in Houston and 6.7% in Dallas (Cortright 2006). Denser neighborhoods and greater accessibility to jobs and shopping activity are strongly correlated with less driving by individual households. A careful study of the travel patterns showed people living in the most urbanized neighborhoods tend to travel only a third as many miles as those in the least urbanized neighborhoods (Lawton 1999).

A variety of other data points make it clear that Chicago is greener than other places. Data on gasoline consumption—available only at the state level—show Illinois consumes about 12 percent less motor fuel per capita than does the rest of the United States.⁴ The Department of Labor's Consumer Expenditure Survey shows that Chicago residents spend relatively less of their household budgets on vehicles, gasoline and repairs than the typical US metropolitan resident; residents spend about 2.2%

2 19.4 pounds of carbon per gallon of gas is the EPA estimate; see <http://www.epa.gov/otaq/climate/420f05004.htm>

3 International Panel on Climate Change, quoted in, "A Special Report on Business and Climate Change, The Economist, June 2, 2007, page 30.

4 Energy Information Agency, Motor Gasoline Prices and Expenditures Ranked by State, 2004. http://www.eia.doe.gov/emeu/states/sep_sum/plain_html/.

less of their total household budgets on cars, fuel and repairs than other Americans, about 14.8% compared to 17.0% nationally (Bureau of Labor Statistics 2005).

Green policies, like a choice of different neighborhood types and the availability of good transit, also have other economic benefits. Over the past decade, talented young workers seem to be increasingly attracted to dense urban neighborhoods with good transit. Young adults in metropolitan Chicago (those aged 25 to 34) have the highest relative preference for living in close-in neighborhoods (within 3 miles of the center of the city) of any large US metropolitan area. Nearly 70 percent of the young adults living in Chicago's close in neighborhoods have completed a four-year degree, the nation's highest concentrations of college-educated 25 to 34 year-olds outside of Manhattan (Cortright and Coletta 2004). Not only do they proportionately choose close-in neighborhoods, but unlike 25 to 34 year-olds in most metropolitan areas, those with college degrees in Chicago are more likely to use the transit system than their less well-educated counterparts.

Chicago's green dividend is the combined product of closely interrelated land use and transportation decisions. Particularly in the city of Chicago, investments in transit infrastructure have enabled and encouraged density. And far from being individual—or social—self-denial, these choices have produced a tangible green dividend for the region -- more than \$2 billion in savings on out-of-pocket spending for transportation, as well as savings in time, worth another \$3 billion. The time and money saved by less driving produces more demand for other local goods and services, and so, in fact, stimulates the local economy. And there is increasing evidence that shorter commutes actually make people happier. It's time to replace the cliché of green policy as un-economic sacrifice, and instead recognize that for Chicago, being green pays handsome economic dividends, and of course, contributes to a cleaner environment.

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