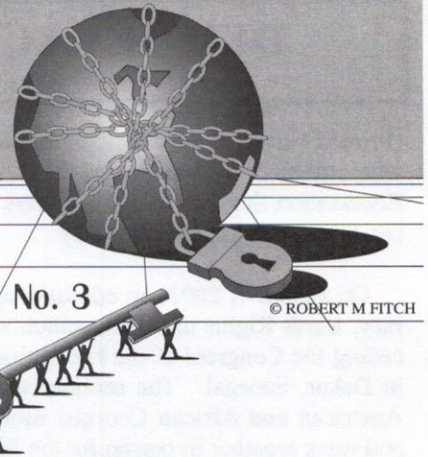


# GROUND SWELL

A BI-MONTHLY PUBLICATION OF  
COMMON GROUND-USA



© ROBERT M FITCH

MAY-JUNE 2002 / \$3.00

VOLUME 15, No. 3

## MODELING LAND RENT AND TRANSPORTATION COSTS

by H. William Batt, Ph.D., Albany, NY

(The following presentation was given at The Third Annual Global Conference on Environmental Taxation, April 12-13, 2002, Woodstock, VT)

### Introduction

From the standpoint of an economic geographer, and for some land economists, land rent is simply capitalized transportation cost. Land rent is the surplus generated by social activity on or in the vicinity of locational sites which accrues to titleholders of those parcels. Whether or not it is recaptured by public policy, rent is a natural factor deriving from the intensive use of natural capital. More intensive use of high value landsites leads to site configurations that are less dependent upon transportation services. People can access them easily even by walking. One must remember that transportation is not an end in itself but rather a means. This is something often forgotten even by urban planners, the distinction between accessibility and mobility. As explained well in a recent text, *The Geography of Urban Transportation*:

"Accessibility refers to the number of opportunities, also called activity sites, available within a certain distance or travel time. Mobility refers to the ability to move between different activity sites (e.g., from home to a grocery store)."

The result is that we do an awful lot of traveling to get what and where we want. We have paid enormously for mobility even at the expense of access. Subsidizing motor vehicle transportation makes the problem worse! Author Kirkpatrick Sale recognized this when he argued that:

"Cities are meant to stop traffic. That is their point. That is why they are there. That is why traders put outposts there, merchants put shops there, hostellers erect inns there. That is why factories locate there, why warehouses, assembly plants, and distribution centers are established there. That is why people settle and cultural institutions grow there. No one wants to operate in a place that people are just passing through; everyone wants to settle where people will stop, and rest, and look around, and talk, and buy, and share.

### Site Rent and Transportation Costs

Higher density development has all the economies of scale, savings in cost, reduction in externalities, dividends in community and political enhancement, and benefits to urban areas that we all say that we want. The greater the proximity to points of desirable accessibility, the lower are typically the transportation costs. Conversely, sites remote from the urban centers of greatest locational value will have higher transportation costs. When the fixed costs of transportation infrastructure and parcel site improvements are accounted for (which tend to be relatively the same regardless of location), one is left with the marginal costs of operations.

This relationship has been demonstrated more empirically in a recent study by the Urban Land Institute. The author concluded that, for Portland Oregon: "each additional mile [traveled] translated into slightly more than \$5,000 in housing costs; closer-in locations command a premium, those farther out save money. A ten-mile difference, all other things being equal, would amount to about \$56,000 in new home value."

For a household in which one worker drives downtown (or at least to a more central location) to work, that ten-mile difference may amount to 4,600 miles annually, assuming 230 days of commuting and a round-trip of 20 miles each day. Moreover, if non-work trips to the central area and elsewhere doubled that amount, the tradeoff would be about 9,000 miles annually, which could mean a higher/lower driving cost of \$3,000 annually, not counting the time saved/spent.

That's the savings for living closer to the urban center by ten miles. If the urban resident has to rely upon a car nonetheless, subtracting some \$3,000 annual travel expenses will still leave him paying again that much, and likely more, to own a car. James Kunstler put the true costs along with other experts at about \$6,100 annually seven years ago. The American Automobile Association calculated that a car driven 15,000 miles in 2001 cost 51 cents per mile or \$7,650. Even that figure reflects only direct costs to the driver, not those passed to society. One study calculated that the total costs of motor vehicle transportation to our society equal approximately a fourth of our Gross Domestic Product (GDP). Road user fees in 1991 totaled only about \$33 billion whereas the true costs to society were ten times that; (continued on page 11)



## **MODELING LAND RENT AND TRANSPORTATION COSTS** (from page 1)

put another way, drivers paid only 10% of the true costs of their motor vehicle use.

The latter figures include externalities like pollution and the costs of highway crashes. Hortatory public pleas for people to tune up their engines so they pollute less, inflate their tires properly, and drive more safely are not likely to change the reality that people are forgetful and fallible. Regardless, pollution-free cars are not available; people must drive to participate in this society. The consequences of SO<sub>2</sub>, CO<sub>2</sub>, and ozone are no longer a matter of debate; they are scientific fact. Despite frequent headlines about replacing the internal combustion engine, all the realistic substitutes also ultimately rely upon fossil fuel power; solar powered cars are far in the future, if at all, and also fail to deal with any transition. And every person driving his or her own car multiplies the probabilities of accidents. Those crashes alone, nothing else, represents a figure equal to 8 percent of the American GDP.

In human terms nationally, this is about 43,000 deaths and 2 million hospitalizations annually. When people step into a car they are seldom mindful of such odds. However, if the direct pecuniary costs of driving increase in any substantial way, such as for an increase in motor fuel as many experts forecast, there will surely be a significant changes in the tradeoffs involved in housing/transportation choices. Making costs visible and linked to private personal behavior is one way to ensure that transportation pays its own way.

Public opinion polls are practically unanimous in their demonstration of the kind of environment most Americans say they would like to live in. Sociological studies have documented graphically how alienating the car-dependent environment really is. There is an inverse correlation between the ability of a street to move and to park cars and trucks, and the amount of social interaction between neighbors on that street.

One study two decades ago compared three similar residential streets, with different levels of traffic volumes, in San Francisco. Residents on the different streets were asked to indicate on the base maps of their streets where friends and acquaintances lived. Those living on streets with the least traffic volume had three times as many friends and twice as many acquaintances as those living on the streets with heavy traffic volumes. More recently Harvard Professor Robert Putnam has made similar findings in his book "Bowling Alone". It is also no accident that on measures of livability, those locations regarded as most attractive are also the ones that are most bicycle-friendly.

Driving is no longer regarded as fun, not on today's typically congested highways. There was a time when most people drove cars for pleasure; today people resent their having to drive so much and often see driving as a burden. A number of recent books and their popularity reflect resentment over our forced dependency on motor vehicle transportation. Jane Holtz Kay's "Asphalt Nation", Clay McShane's "Down the Asphalt Path", Wolfgang Zuckerman's "End of the Road", and Katie

Alford's "Divorce Your Car" are only a few such examples. But despite their vague discomfort people typically lack the perspicacity to incorporate these non-pecuniary costs into their decisions about locational choice.

### **Correcting Distortions by Pricing**

Recovering the economic rent from urban parcels helps people to appreciate the true costs of the transportation versus location trade-off. It brings the carrying costs of site choices back to the present time and makes them comparable with travel choices. Collecting site rent becomes an operating cost. The other corrective policy is to raise transportation costs to a level commensurate with their full value as private goods. Transportation user fees, in the form of motor fuel taxes, green taxes, congestion fees, and recovery costs for the administration of drivers' licenses and registration fees could easily provide the needed price corrections to bring into balance marginal transportation costs and land rent collection. Doing so would equilibrate choices between people living and working in high rent urban centers and those in peripheral low rent (but higher travel cost) locales.

A tax on land value (or alternatively the tax on land rent) coupled with the proper design of transportation fees can equilibrate the competitive advantage of markets in urban areas relative to suburbs, thereby reducing, and perhaps even reversing, the centrifugal forces of sprawl development. The land tax cannot alone redress the problem, especially so long as such inordinate social subsidies are granted to private motor vehicle transportation services. Nor can transportation fees, raised to a level fully commensurate with the social and private costs they incur, alone ensure that the price of locations will be matched. But to the extent that both are assessed, they reach far toward correcting this disequilibrium. One could even argue that all site rent should be recaptured by society and that all transportation costs that are identifiable as consumption of private goods should be priced accordingly. Some advocates even suggest that doing so will not only foster economic efficient behavior but also provide a citizen's dividend consistent with economic justice.

Arriving at the appropriate revenue formulas is the challenge. Recapturing land rent is likely best achieved by setting the rates at a level that will stabilize the market price of land-sites in the face of speculative pressures. Because the collection of rents fosters economic activity in the regions of highest value, it may just be that market prices will remain stable even with very high levies. The downward pressure on market prices exerted by a tax is countered by the increased incentive to improve parcel sites with the highest value. Georgist economists like Dr. Mason Gaffney and Dr. Jerome Heavey argue that ultimately all tax revenues come from rents in any case; that it is only a question of how much they are shifted through to other sectors (continued on page 12)



# **MODELING LAND RENT AND TRANSPORTATION COSTS**

(from page 11)

of the economy before they are collected. Professor Gaffney explains this by noting that:

"After-tax interest rates are determined in world markets and the local supply of capital funds is highly elastic. So, local taxes on capital do not stick to capital. Even national taxes on capital typically fail to stick, because capital is a citizen of the world. Local labor supplies are also pretty elastic, although not so totally. Local taxes on labor, therefore, do not stick to labor, either. Payroll taxes drive people out of localities that impose them, for example. Ditto for sales taxes. Customers move, or shift their purchases, to where taxes are lower, or zero. Sellers shift, too, to the extent they bear the tax. What else is left? Just land, and land cannot emigrate or immigrate from the local jurisdiction."

This means that taxing away land rent more relieves it from circulating through labor and capital, allowing those factors to be more productive in turn. Significantly, perhaps most importantly, the collection of land rent, on account of its inelasticity, incurs no deadweight loss like tax levies on labor and capital. The economy thus functions more efficiently - i.e. with less drag and friction.

With respect to charges upon transportation services and externalities, there are several components to a proper pricing design. The first step to proper pricing is to identify the proportion of transportation services that ought rightly to be seen as private goods as opposed to public goods. Although this is a daunting task, the frequent figure used is 80 percent - 20 percent proportion.

The public good proportion of road use reflects the amount of reliance by services provided by the government and associated agencies like mail service, national defense, public safety (ambulance, police and fire departments), and so on. The private use of the roads constitutes the overwhelming amount of its use. This means that as a rule 80 percent of the highway use charges should be paid by individual drivers, directly or indirectly. It is easy to distinguish five elements of transportation service cost: capital investment, maintenance costs, regulation costs, environmental externalities and congestion costs. Each of these calls for a different treatment with respect to revenue design.

As noted earlier, capital investments affect the market value of locational sites by conveying rent to those in any way benefitting from the service. That rent accruing to proximate sites can be easily recaptured to pay off the debt service of project construction. Typically rent collection is ignored, however, left instead in the hands of titleholders whose sites are serviced by the infrastructure investment. This drives speculation in land, with all the negative effects it brings both economically and politically.

In fact the rent created by capital investment in transportation can be enormous. One nine-mile stretch of interstate highway in Albany, New York, costing \$125 million to construct

has yielded \$3.8 billion in increased land values within just two miles of its corridor in the 40 years of its existence. This is a thirty-fold return in a timespan typically used for bond repayment! The Washington Metro created increments in land value along much of the 101-mile system under of construction in 1980 that easily exceeded \$3.5 billion, compared with the \$2.7 billion of federal funds invested in Metro up until that time. No doubt the return is far greater today. The component of transportation costs constituting capital expenditure can and should be recaptured through the collection of land rent since it accounts for the creation of that value particular to proximate locational sites.

Maintenance costs on the other hand are best paid for from user fees, and can range from excise taxes on motor fuel, tires, heavy truck charges and others still. Such pricing has received considerable attention in recent years, even though it has been difficult to implement for political reasons. Heavy trucks, for example, pay special mileage charges, which should ideally be based upon axle-weight and distance, commensurate with the wear and tear on the roads that they cause.

High-tech innovations using transponders for electronic road pricing according to time and place of vehicle travel are being explored and implemented in Hong Kong, Singapore, New Zealand and on modest scales elsewhere. The virtue of a tax on motor fuel, at least for automobiles, is that charges are roughly commensurate with miles driven if rates are set at the proper levels. But electronic road pricing can be far more precise if concerns about personal privacy can be overcome by computers that calculate user charges based solely upon point calculations. Bringing prices into line with marginal costs is the most efficient and equitable way to pay for highway transportation services, and one can expect to witness significant advances in this realm before too many years pass.

Separate from maintenance operations are the costs involved in the regulation and supervision of drivers and motor vehicles themselves. License and registration fees should ideally be designed only to recover the costs involved in their administration. To be sure, such administration may reach to operations beyond license plate bureaucracies to safety inspections, certain judicial functions, and so on. But charging for road use through such measures is not only inefficient but inequitable.

Charging for pollution externalities of motor vehicle travel invites more complex issues. One approach widely explored involves reliance upon what are known as Pigou taxes, after noted British economist Arthur Pigou. It attempts to recover the costs of externalities in the natural environment and even involving health damages. Yet Pigou taxes are more often talked about than actually implemented. Related to such designs are those growing out of the theories of Ronald Coase, designed not necessarily to recover the full social costs of negative externalities but rather to foster the most efficient economic choice (continued on page 14)



# **MODELING LAND RENT AND TRANSPORTATION COSTS**

(from page 12)

among options, even if some parties are disadvantaged. Taxes recovering such costs are most easily collected at the production stage - at the wellhead or the refinery for oil, and from the manufacturer for tires and other materials.

Still a third approach is that represented by the Georgist tradition, which would recover the costs of specified pollution externalities by accepting them to the extent that the environment is capable of absorbing them, and charging polluters for the use of the environment as a sink for such wastes. This approach is particularly attractive as a way to charge for the release of noxious gases in motor vehicle exhaust.

The last dimension of motor vehicle transportation charges can be designed to reflect the costs of congestion. To some extent, those costs are already borne by drivers since they pay in the value of their time for that lost by slowed traffic. But not everyone's time has the same value, and proper pricing of road use reflective of time and place is an attractive solution to maintaining the efficient flow of highway service. Here again, electronic road pricing can help with efficiency.

These pricing approaches taken together offer the prospect of both recovering costs in their varied forms as well as fostering efficient transportation services. There are grave misconception in how much fiscal policies distort social and economic behavior. And the fiscal policies that foster the greatest distortions of all are those involving road costs and the failure to collect economic rent. Rather than resort to traditional command-and-control approaches which are frequently just as cumbersome and distorting as current unthinking fiscal measures, now is an opportune time to consider models which will help us to get things right.

## **Costs of Conventional Taxes and Subsidies**

The conventional property tax, one taxing both land values and improvement values, is analogous to a train with an engine at each end. The tax on land value fosters improvement on the parcels with the highest market and social value, while the tax on structures discourages that very same thing. No wonder it is that economic activity is stymied most in the urban centers and manifests itself in areas where the least imposition of all has taken hold. As scholar Jessica Matthews once put it:

"In a now familiar sequence, developers reach for the cheapest land, out in the cow pastures. Government is left to fill in behind with brand new infrastructure: roads, sewerage systems and schools, paid for in part by those whose existing roads and schools are left to decline. Property values rise in a ring that marches steadily outward from the city and fall in older suburbs inside the moving edge."

Because residential development can't meet the public bills, local governments compete for commercial investment with tax discounts that deplete their revenues still further. Property taxes then rise, providing an incentive for new development. Years of such leap-frogging construction devours land at an astonishing pace.

Developing land use and transportation patterns that assume walkability or transit service rather than individual and private motor vehicles is the very definition of livability. Experts agree that the minimum density necessary to make public transit services economically viable is 10 to 12 households per acre, although in cities developed in the post-automobile era, lamentably, one sees very little prospect of altering automobile dependency. One study found that "the range of costs induced by spread-out development, . . . [i.e.] houses built in sprawling developments, may cost 40 to 400 percent more to serve than if they were located close to major facilities, were clustered in continuous areas, and incorporate a variety of housing types." But by bringing prices into line with costs, both on the transportation services side and on the site-rent side, it is possible to foster those personal choice calculations that are consistent with sustainable urban environments. <<

(Dr. William Batt is Executive Director of the Central Research Group, Albany, NY, and is Secretary of the Board of Directors of The Center for the Study of Economics, Philadelphia, PA.

(For a related GroundSwell article, "Bill Batt Addressed TOES \* on Transportation", see the July-Aug. 1997 issue. \* The Other Economic Summit.)