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RETRIEVING TRANSIT'S BENEFITS

And Other Advantages of Funding Transit from Land Value

As Northeastern Illinois enters into another round of the transit funding crisis, a further sales tax increase has been proposed to help balance the budget. Such an increase seems likely to cost over 30,000 jobs during the next 25 years. The alternative of a land value tax could retrieve some of transit's benefits, reflected in land prices, and apply them to transit's costs. Such a tax could even be used to replace existing taxes and fares.

Prepared by: Chuck Metalitz, Director of the School

This major rewrite of Research Note No. 5 reflects recent research findings as well as updated information on the continuing transit crisis

The Henry George School of Social Science, Chicago, Illinois (28 E. Jackson #1004, Chicago IL 60604; 312/362-9302; www.hgchicago.org), is a not-for-profit adult school of political economy.

Transit is having a funding crisis (again).

Transit in the Chicago area is in crisis. Currently CTA, Pace, and Metra assert a need for at least an additional $226 million in 2007, to simply maintain the existing level of service. There are needs for capital (expansion and rehabilitation) expenditures, and 2008 will require further subsidies. Furthermore, CTA's pension and retiree healthcare funds are completely inadequate. While there are suspicions that transit may have been mismanaged and could reduce costs without reducing service to the public, it's clear that some public funds will be required for the forseeable future[1].

Not only travelers benefit from transit service.

Because we can all easily see that transit is important to its riders, we may think that they are the main beneficiaries of transit service. True, if CTA shuts down tomorrow, most riders will be mightily inconvenienced, and many will lose earnings because they cannot get to work. Pretty quickly the pain will spread to other travelers, as transit-dependents buy cars or get rides from others. Some employers will have to relocate, or raise wages, in order to retain staff.

Since transit has benefits to those who do not pay fares, it seems appropriate to subsidize it from a broad-based tax.

A sales tax increase could cost more than 30,000 jobs.

The largest piece of area transit subsidies for many years has been from a retail sales tax, at a rate of ¼% or 1% . In recent months a proposal was considered to boost this tax to provide the desired additional funding. Why not continue to fund transit in this way?

One reason not to fund transit from a sales tax is that such a tax costs jobs. We do not know how many jobs, but can get some idea from a statistical study that examined Washington, DC.[2] That study estimated that, for a 1 percentage point increase in the sales tax rate, employment growth would drop by 2.08 percentage points.

One can assume that the same values apply to the RTA area, and use NIPC employment forecasts to estimate the impact of sales tax increases. A proposal has been circulated[3] to raise these taxes by 1/4% in Cook County, and 1/2% in the other RTA counties. Table 1 shows the impacts.

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[1]The amount of transit funding needed is a complex issue, beyond the scope of this paper. Some information appears at www.savechicagolandtransit.com/papers/bythenumbers.asp . More detailed but less current information is at *rtachicago.org/infocenter/publicdoc.asp* . Even if the amount needed could be reduced by more intelligent management, the fact remains that some funding is required, and how it is obtained will have an impact on the community.

[2]Mark, Stephen T., Therese J. McGuire, and Leslie E. Papke; ***The Influence of Taxes on Employment and Population Growth: Evidence from the Washington, D.C. Metropolitan Area*****;** National Tax Journal; March 2000; Vol 53 #1, page 105.

[3]***Mass Transit Funding and Reform: Senate Bill 572, House Amendment #3,*** taken from RTA web site. Part of the increase outside Cook County might not be used for transit, but the impact on jobs would not be affected by how the proceeds are used.

Table 1: ESTIMATED IMPACT OF PROPOSED SALES TAX ON JOB GROWTH IN RTA AREA								
Area	Employment (no tax boost)				proposed tax boost	With Tax Boost		
	NIPC 2000	estimated 2005	NIPC 2030	pct growth	(percentage) points)	pct growth	2030 emp	jobs lost
RTA Area	**4,297,686**		**5,535,236**				**3,289,926**	**31,764**
County								
Cook	2,818,334	2,899,446	3,305,003	13.99%	0.25	13.47%	3,289,926	15,077
DuPage	649,989	680,057	830,394	22.11%	0.5	21.07%	823,321	7,073
Kane	206,107	230,457	352,208	52.83%	0.5	51.79%	349,811	2,397
Lake	352,582	371,070	463,509	24.91%	0.5	23.87%	459,650	3,859
McHenry	105,118	115,694	168,573	45.71%	0.5	44.67%	167,370	1,203
Will	165,556	207,222	415,549	100.53%	0.5	99.49%	413,394	2,155
Column	A	B	C	D	E	F	G	H

Column A is NIPC's base year (2000) employment estimate, and Column C shows their forecast for the year 2030[4]. An estimate for 2005, column B, is derived by simple linear interpolation. Column D shows the percentage increase, from 2005 to 2030. In column E, the proposed percentage point increase in sales tax is shown. Multiply this by 2.08, and subtract from column D, to get a reduced growth forecast in columns F (percentage growth) and G (absolute amount of employment). Subtracting column G from column C shows the absolute number of jobs which might be lost due to the sales tax increase, in Column H, a total of 31,764.

For several reasons, Table 1 provides only a very gross approximation of what the impact might be. It is based on an analysis for a different area, with sales tax at a different level, which considered only private-sector jobs[5]. And of course the relationship between taxes and jobs comes from a statistical analysis, not an actual experiment. Still, the reasons to think it is too low seem no less than the reasons to think it is too high.

Transit adds value to land...

There have been dozens of studies showing that public transportation increases the value of land. A review of 96 reports on the subject was compiled by Jeff Smith and Tom Gihring[6]. Here are some findings:

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[4]Columns A and C are from www.chicagoareaplanning.org/data/forecast/2030_revised/

[5]In the Washington, DC, area, where so many jobs are federal, it might be reasonable to exclude government jobs from the analysis. However, in the RTA area, most government jobs provide service to the local economy, and are likely to increase or decrease depending on the total employment and population in the region.

[6]Smith, Jeffrey J. And Thomas A. Gihring, ***Financing Transit Systems Through Value Capture: An Annotated Bibliography***. at *www.vtpi.org/smith.pdf*

- Atlanta and Washington real estate developments around transit stations command a premium of $3 to $4 per square foot.
- Dallas, TX real estate near light rail lines is worth 25% more than similar real estate elsewhere.
- In Toronto, Canada, assessed values near subway stations increased 45%(downtown) to 107% (suburbs) compared to 25% elsewhere.
- In Newcastle, U. K, house prices are 20% higher near rail stations.
- In Helsinki, Finland, property located within walking distance of railway or metro stations increased 7.5% over other locations.
- Washington's Metro, which cost $9.5 billion to construct, generated $10-$15 billion in increased land value.
- Homes near Portland, OR's light rail stations are typically worth 10% more than elsewhere, despite being at higher density.
- Apartment rents in the Washington area decrease by about 2½% for every 1/10-mile distance from a Metro station.
- In London, the Jubilee rapid transit extension cost £3.5 billion, and raised the annual rental value of land around it by £1.3 billion.
- In Santa Clara County, CA, commercial parcels are valued about 23% higher if near a light-rail stop.
- When site values around Houston were falling, the drop was less near bus stops than elsewhere.
- Around the Pleasant Hill rapid transit station in California, average home prices decline $1578 for every 100 feet distance from the station. In Queens, N Y, the decline was $2300 per hundred feet.
- Land for office use, within 1/4 mile of BART stations, is valued at $74/square foot, compared to $30/square foot for land more than 1/2 mile away.

..even in the RTA area..

How much does transit increase real estate values in Chicago? At least two studies have been done:

- John McDonald and Clifford Osuji found that residential land values within 1/2-mile of CTA's Orange Line increased 17.4% due to anticipation of the line, three years before service actually began.[7]
- In a report to the RTA, Gruen Gruen + Associates found that houses near rail transit stations were worth up to 20% more (if within 500' of the station) than otherwise identical houses more than a mile from the stations. The differential depends on distance from the station, and is only around 8% for houses ½ mile from the station.[8]

Findings of the Gruen report can be applied to estimate, in a rough way, the land value resulting from a

[7] McDonald, John F., and Clifford I. Osuji; ***The effect of anticipated transportation improvement on residential land values***, in Regional Science and Urban Economics 25 (1995) 261-268.

[8] Gruen Gruen + Associates; ***The Effect of CTA and Metra Stations on Residential Property Values: A Report to the Regional Transportation Authority***. June, 1997. Since the houses are identical except for location, the difference is due to location (or land) value.

typical rail station. The following conservative assumptions are used:

- The houses are all statistically "average," so the values above apply.
- There are no houses less than 500 feet from the station.
- For any 500-foot-wide concentric ring, the value of the outer circle applies. For instance, all houses between 3000 and 3500 feet away from the station are assumed to be 3500 feet distant.
- The entire area is developed as single-family houses, at a gross density of four per acre. This implies a lot size of about 7,000 square feet, plus generous allowance for streets and other public areas.

The station, or more precisely the transit service that the station represents, is worth more than $61.5 million. The calculations are shown in the Table 2. There are a total of 144 CTA and 243 Metra rail stations.[9] Since some of the Metra stations have very limited service, and because some station areas overlap, we can consider this the equivalent of about 300 full-service rail transit stations. If all these stations were surrounded by single-family housing as described above, the implied value of the transit system would be about $18.5 billion.

Table 2:
VALUE OF A RAIL TRANSIT STATION TO HOME-OWNERS IN A HYPOTHETICAL TYPICAL AREA

radius in feet	houses at 4 per acre	increment over $201,370	increment times houses
500	0	$51,948	0
1000	216	$40,680	$8,786,880
1500	361	$31,073	$11,217,353
2000	505	$22,966	$11,597,830
2500	649	$16,227	$10,531,323
3000	793	$10,748	$8,523,164
3500	938	$6,444	$6,044,472
4000	1082	$3,248	$3,514,336
4500	1226	$1,111	$1,362,086
5000	1370	$0	$0
		TOTAL	$61,577,444

based on data from Gruen + Gruen, implicitly 1996 dollars

Since much of the surrounding land is in uses more intense than single-family, the actual value is probably far greater, perhaps $25 billion. This amount is the capitalized value of the greater land rent due to the transit system. Assuming an interest rate of just 5%, the annual land rent is about $1.25 billion.

The above is based on 1996 data. To account for the declining purchasing power of the dollar[10], add 31%, meaning that **our rail transit system generates land value worth about $1.6 billion each year, none of which is collected to fund transit service**.

But even this $1.6 billion estimate is understated, for at least four reasons.

- It does not consider bus service. Landlords expect, and get, a higher rent for apartments with "Express bus at door." Or even just "convenient to transportation."
- It doesn't consider effects more than one mile from the station. Full parking lots at Metra and CTA stations show that many people travel more than a mile to get to the rail station, and this affects home values.

[9] www.rtachicago.org/support/didyouknow.asp

[10] Based on Consumer Price Index (CPI-U, Chicagoregion) annual average in 1996 and latest available (August '07).

- It doesn't recognize the benefits to those who don't live near public transit and never use it. Imagine the worsening of traffic congestion if transit service ceased.
- It doesn't specifically treat the land values of the central business district, which could not exist in anything like its current form without a large public transport system.

Transit could retrieve its benefits with a land value tax.

Since the benefit of transit service is reflected in real estate value, the logical funding source to support transit is the real estate tax. In fact, a number of transit systems in the U. S. are funded in part from this source. Although the real estate tax has the effect of making construction more costly, that difficulty can be avoided by exempting all improvements from the tax base.

To evaluate the effects of a land value tax, consider four options for the amount to be raised:

(1)$400 million/year. This is the amount RTA proposes to raise from the increased sales tax (not counting additional amounts from other taxes).

(2)$1.17 billion/year. This also allows the elimination of the existing RTA sales tax, expected to yield $769,807,000 in 2008.

(3) $2 billion/year. This should cover all operating subsidies ($1.206 billion) and allow $794 million/year for capital expenses and debt service[11].

(4) $2.9 billion. This would remove the need for farebox revenue. Either fares could be made free, or transit passes could be distributed to homeowners, who could sell them into the secondary market.[12]

Land in the RTA area is worth over a trillion dollars.

The effective land tax rate required to yield any of the above amounts obviously depends on the value of the land subject to the tax. A good way to understand the ideat of land value in an urban context is to think of it as the value that a real estate parcel would have if, instead of being occupied by a building or other improvement, it was simply vacant land. David Barker applied this concept by looking at actual sales of vacant land, then constructing a value surface. That is, if a vacant lot at a particular location was sold, in an arms-length transaction, for $25/square foot, it's reasonable to suppose that land in that vicinity is generally worth about that much, per square foot. Taking several precautions to exclude exceptional parcels, he applied that concept to the entire eight-county Chicago MSA, estimating that the total land value is about $2.188 trillion. Deducting an allowance for streets, he provides an estimate of $1.872 trillion[13].

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[11]RTA's budget book indicates (page 111) a total of $3.181 billion budget for capital and debt service over five years ending 2011, which is $636.2 million/year. Because the transit service boards insist that they need more capital money than is budgeted, I have added $157.8 million. There is no reason in principle that a larger capital fund could not be created, with proportionate increase in tax rate.

[12]Thanks to Adam Kerman for suggesting this option.

[13]Barker, David; ***Urban Land Rents in the United States***. In Ingram, Gregory K. And Yu-Hung Hong, editors, Land Policies and their Outcomes (pp 157-180). Cambridge; Lincoln Institute of Land Policy, 2007.

Actual total land value available for taxation in the RTA area is almost certainly less than this amount. Kendall and DeKalb counties are not (currently) within the RTA. Also, some non-street land probably would not be subject to taxation, such as public parks and schools, and some exemptions might be made for low-income owner-occupants. A reasonable lower bound estimate of taxable land value might be $1 trillion, which is still a considerable sum.

Assuming $1 trillion land value, we can readily calculate the effective tax rate that would be necessary to raise the desired sums.

Table 3: Some Options for Funding RTA Subsidies thru a Land Tax

Option	Amount Required ($billions)	Estimated Tax Base ($billions)	Required Tax Rate (per $100 land value)	Annual Burden on owner of a $100,000 lot
(1)Avoid Sales Tax Increase	0.4	1000	4¢	$40
(2)Also eliminate existing RTA Sales Tax	1.17	1000	11.7¢	$117
(3)Pay all transit operating subsidies and capital costs	2.0	1000	20¢	$200
(4)Also provide free transit passes for homeowners, or everyone	2.9	1000	29¢	$290

Based on assumptions and estimates described in text and reference sources.

More reasons to choose a land value tax.

In addition to avoiding the job loss described above, there are at least four reasons why a tax on land values is a better way to support transit than a tax on retail sales.

A land value tax encourages transit-supportive development.

Compared to current patterns of development, transit-supportive development would be more compact, relatively more dense near transit stations, and with less free or inexpensive parking. This is encouraged by a tax on land value, which provides incentive for intensive use of valuable sites, and discourages surface parking on parcels suited for higher-intensity use. Fuller descriptions of this process are available[14].

[14]For example, ***Red-Light Taxes and Green-Light Taxes***, a talk by Mason Gaffney at Mansfield College, Oxford, 14 May 1998, at *wealthandwant.com/docs/Gaffney_RLT&GLT.html* ; also ***Land Value Taxation: The Overlooked But Vital Eco-Tax*** by Karl Williams, at *www.cooperativeindividualism.org/williams_lvt_overlooked_ecotax.html* .

Retail sales tax is regressive; land value tax is not.

A land value tax cannot be passed on to renters.[15] The reason is that the cost of land (or more precisely, the land rent) is determined by supply and demand. The amount of land in, for example, the City of Chicago, is 228.443 square miles[16], and this amount will not be changed by the amount of tax applied to it.

About 62% of the households below poverty level in the RTA area are renters[17], who won't be affected by a land value tax. And although no statistical agency compiles comprehensive data on land ownership in the United States, it is evident that nearly all of the land value in the RTA area is controlled by relatively affluent people. Further research into the ownership and value of land in the region would allow us to address this issue more directly.

A retail sales tax, which applies to groceries as well as less essential products, is an especially heavy burden on low income people.

A land value tax has economic development benefits beyond its support of transit.

By making it more costly to hold underused land, it tends to promote development and jobs in those areas where development is lacking, thus reducing pressure to build on inappropriate sites.[18]

Because transit raises land values, a land value tax is the fair way to fund it.

Much has been written describing the inherent justice of land value taxation, paying for public services by a tax on the increased value which those services create.[19]

In conclusion

It has been shown (and not just in this paper!) that a land value tax is the efficient and equitable way to fund public transportation. Further research on the economic impacts of various taxes which might be proposed as alternatives, and on the ownership of land, could help to make this clearer.

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[15]See any standard modern economics textbook, or Bryan Kavanaugh's ***Why a landlord can not just pass on the cost of LVT to the renter*** at *www.earthrights.net/docs/landlord.html* . While it is true that land may be "created" by, for example, filling in a water body, a land value tax should not apply to the portion of value resulting from the fill.

[16]Chicago Public Library: ***Facts About Chicago*** (Geography:2000 Section) at *chipublib.org/004chicago/chifacts.html*

[17]U.S. Census Bureau, ***Current Housing Reports***, **Series H170/03-22, American Housing Survey for the Chicago Metropolitan Area: 2003**. Because this report is subject to sampling error and includes (without breakout) two counties not in the RTA area, a precise estimate isn't available.

[18]See, for example, Nicolaus Tideman's ***Development and Derelict Land***, at *www.urbantools.org/policy-papers/blight-and-development/the-role-of-taxes-in-promoting-development-on-derelict-land* , also Mason Gaffney's ***The Role of Ground Rent in Urban Decay and Revival*** at *masongaffney.org/publications/E37Ground_Rent_Urban_Decay_&_Revival.CV.pdf* .

[19]See, for example, Winston Churchill's ***The People's Rights***, at *www.cooperativeindividualism.org/churchill_peoples_rights.html*