



## **RETRIEVING TRANSIT'S BENEFITS**

### **And Other Advantages of Funding Transit from Land Value**

As Northeastern Illinois continues 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 80,000 jobs during the next 6 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.

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This major rewrite of Research Note No. 5 reflects recent research findings.

Appendix I explains changes made since the October, 2007 version.

Thanks to Wyn Achenbaum, Adam Kerman, A. Kristopans,  
Nic Tideman, William Wendt, for comments on earlier drafts.

## **Transit is having a funding crisis (again).**

Transit in the Chicago area is in crisis. Recently, CTA, Pace, and Metra asserted a need for at least an additional \$226 million in 2007, to simply maintain the existing level of service. There are further needs for capital (expansion and rehabilitation) expenditures, and 2008 will require increased 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 foreseeable future.<sup>1</sup>

## **Not only passengers 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 80,000 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 the Washington, DC, metropolitan area.<sup>2</sup> That study estimated that, for a 1 percentage point increase in the sales tax rate, employment growth would drop by 2.08 percentage points.

We can use a modification of this value for the RTA area, and use Illinois Department of Employment Security projections to estimate the impact of sales tax increases. A proposal has been circulated<sup>3</sup> to raise these tax rates by 1/4% in Cook County, and 1/2% in the other RTA counties. Table 1 shows the estimated impacts.

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<sup>1</sup>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](http://www.savechicagolandtransit.com/papers/bythenumbers.asp) . More detailed but less current information is at [rtachicago.org/infocenter/publicdoc.asp](http://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.

<sup>2</sup>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.

<sup>3</sup>*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.

<b>Table 1:</b>				
<b>ESTIMATED IMPACT OF PROPOSED SALES TAX INCREASE ON 2008-2014 JOB GROWTH IN RTA AREA</b>				
County	2008 Employment	2014 Employment		
		No new taxes on production or exchange	Sales tax increased	Jobs not gained due to tax
Cook	2,563	2,722	2,681	<b>41</b>
Dupage	612	662	642	<b>20</b>
Kane	201	211	204	<b>6</b>
Lake	329	353	343	<b>10</b>
McHenry	94	98	95	<b>3</b>
Will	160	167	162	<b>5</b>
<b>RTA Area</b>	<b>3,959</b>	<b>4,212</b>	<b>4,126</b>	<b>86</b>
Employment figures are in thousands and pertain to nongovernmental, nonfarm wages and salary jobs only. Totals may not add due to rounding.				
Appendix Table A-1 provides sources and calculations				

For several reasons, Table 1, which estimates a loss of about 86,000 jobs, is only a very gross approximation of what the impact of a sales tax increase might be. The point is that, all other things being equal, increased sales tax rates seem likely to reduce employment growth.

### 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.<sup>4</sup> Here are some findings:

- 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.
- In Helsinki, Finland, property located within walking distance of railway or metro stations increased 7.5% over other locations.
- Apartment rents in the Washington area decrease by about 2½% for every 1/10-mile distance from a Metro station.

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<sup>4</sup>Smith, Jeffrey J. And Thomas A. Gihring, *Financing Transit Systems Through Value Capture: An Annotated Bibliography*. at [www.vtpi.org/smith.pdf](http://www.vtpi.org/smith.pdf)

- 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.
- 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 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.<sup>5</sup>
- In a report to the RTA, Gruen Gruen + Associates found that houses near rail transit stations were worth up to 25% 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 1/2 mile from the station.<sup>6</sup>

Findings of the Gruen report can be applied to estimate, in a rough way, the land value resulting from a typical rail station. The following conservative assumptions are used:

- The houses are all statistically "average," so the study's estimated values 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.

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<sup>5</sup>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.

<sup>6</sup>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.

- 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 Table 2. There are a total of 144 CTA and 243 Metra rail stations.<sup>7</sup> 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
		<b>TOTAL</b>	<b>\$61,577,444</b>

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, in 1996 dollars. To account for the declining purchasing power of the dollar,<sup>8</sup> add 32%, for a total of about \$33 billion. This amount is the capitalized value of the greater land rent due to the transit system.

Assuming an interest rate of just 4%, **our rail transit system generates land value worth over \$1.3 billion each year, none of which is collected to fund transit service.**

**But even this \$1.3 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.
- 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.

<sup>7</sup> [www.rtachicago.org/support/didyouknow.asp](http://www.rtachicago.org/support/didyouknow.asp)

<sup>8</sup>Based on Consumer Price Index (CPI-U, Chicago region) annual average in 1996 and latest available (November ‘07).

## **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. A real estate tax based on the value of land excluding improvements is a land value tax.

## **Estimating the value of land.**

A good way to understand the idea 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, with the neighborhood otherwise unchanged. 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<sup>9</sup>.

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.

## **How much transit funding is needed?**

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<sup>10</sup>.
- (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.<sup>11</sup>

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<sup>9</sup>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.

<sup>10</sup>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.

<sup>11</sup>Thanks to Adam Kerman of the Transit Riders' Authority for suggesting this option.

Table 3 shows the effective tax rates, and the cost to a homeowner whose land is worth \$100,000.

<b>Table 3: Some Options for Funding RTA Subsidies thru a Land Tax</b>				
<b>Option</b>	<b>Amount Required (\$billions)</b>	<b>Estimated Tax Base (\$billions)</b>	<b>Required Tax Rate (per \$100 land value)</b>	<b>Annual Burden on owner of a \$100,000 lot</b>
<b>(1) Avoid Sales Tax Increase</b>	<b>0.4</b>	<b>1000</b>	<b>4¢</b>	<b>\$40</b>
<b>(2) Also eliminate existing RTA Sales Tax</b>	<b>1.17</b>	<b>1000</b>	<b>11.7¢</b>	<b>\$117</b>
<b>(3) Pay <u>all</u> transit operating subsidies and capital costs</b>	<b>2.0</b>	<b>1000</b>	<b>20¢</b>	<b>\$200</b>
<b>(4) Also provide free transit passes for homeowners, or everyone</b>	<b>2.9</b>	<b>1000</b>	<b>29¢</b>	<b>\$290</b>
Based on assumptions and estimates described in text and reference sources.				

Thus, for \$40/year, on the average, typical homeowners could avoid the sales tax increase. For \$290/year – less than \$1/day– we could abolish transit taxes and fares altogether.

### **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<sup>12</sup>.

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<sup>12</sup>For example, *Red-Light Taxes and Green-Light Taxes*, a talk by Mason Gaffney at Mansfield College, Oxford, 14 May 1998, at [www.wealthandwant.com/docs/Gaffney\\_RLT&GLT.html](http://www.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](http://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.<sup>13</sup> 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<sup>14</sup>, 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<sup>15</sup>, 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.**

A land value tax is likely to increase employment. By increasing the cost of holding underused land, it tends to promote development and jobs in those areas where development is lacking, thus reducing pressure to build on inappropriate sites.<sup>16</sup>

### **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.<sup>17</sup>

### **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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<sup>13</sup>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](http://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.

<sup>14</sup>Chicago Public Library: *Facts About Chicago* (Geography:2000 Section) at [chipublib.org/004chicago/chifacts.html](http://chipublib.org/004chicago/chifacts.html)

<sup>15</sup>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.

<sup>16</sup>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](http://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](http://masongaffney.org/publications/E37Ground_Rent_Urban_Decay_&_Revival.CV.pdf).

<sup>17</sup>See, for example, Winston Churchill's *The People's Rights*, at [www.cooperativeindividualism.org/churchill\\_peoples\\_rights.html](http://www.cooperativeindividualism.org/churchill_peoples_rights.html)

## APPENDIX I: History of this Research Note

*Henry George School Research Note No. 5* was published in December, 2004, to highlight the potential of land value taxation as a source for transit funding.

During the summer of 2007, additional information came to light:

- Estimates of the total value of land in the RTA area
- Estimates of the relationship between sales tax rates and job growth

It was thought advisable to expand *Research Note No. 5* to incorporate this information. The result, *Research Note 5a*, was originally published in October, 2007. It also incorporated other revisions and updates.

Subsequently, at least three critical comments were received concerning estimates of job loss due to sales tax increases. One comment suggested that the calculations were incorrectly done. Another expressed concern that forecasting jobs over such a long period (the estimates covered the period thru 2030) was a questionable venture. A third argued that the estimates should exclude government employment, as had the original Washington area study.

Responding to these concerns, the calculations were corrected. Rather than using 30-year forecasts based on 2000 employment, they now use 10-year projections based on 2004 employment. And all employment figures pertain to nonagricultural, nongovernmental wage and salary employment. The net result is that, rather than an estimate of 31,764 jobs lost over 25 years, the estimated impact now amounts to 85,697 jobs lost in six years.

This corrected *Research Note 5a*, which also changes an interest rate assumption and fixes some copyediting errors, is dated January, 2008. After the revisions were essentially complete, on January 17, 2008, it was reported that the Illinois Legislature and Governor had approved a plan to fund RTA thru increased sales taxes.

## APPENDIX II:

### Estimating the Employment Impact of a Sales Tax Rate Increase

There is one study which sought to estimate the impact of a retail sales tax on employment within the taxing jurisdiction. This study<sup>18</sup> was done in the Washington, DC, metropolitan area, analyzing the District of Columbia, seven surrounding counties and an independent city, and investigated the effects on population and employment growth of several different kinds of taxes. Data covered the period 1969-94. The study estimated that “a 1 percentage point increase in the sales tax rate reduces the annual growth in employment by 2.08 percentage points.” Of course this estimate is applicable to the place and time studied.

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<sup>18</sup>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.

We can use the above study to estimate the effect of sales taxes on employment within the RTA area, but need to allow for the differences. Some of these differences are:

1. The RTA area is larger than any of the individual jurisdictions in the Washington study. This would probably make the impact of a sales tax increase less in the RTA area, because it would be more difficult for the average person to travel to an area free of the tax.
2. Grocery purchases are subject to the RTA tax, but are tax-exempt in some of the Washington jurisdictions. This would probably make the impact of a sales tax greater in the RTA area, because it increases the actual cost to consumers.
3. Sales tax rates are probably higher in the RTA area today than in the Washington jurisdictions at the time of the study. The effect of this difference is not clear.

These factors might balance so that the relationship between sales tax rates and employment growth in the RTA area in the early 21<sup>st</sup> century is about the same as in the Washington area during 1969-94. However, this Note adopts a more conservative approach, assuming that the sensitivity of employment to sales tax rates is just half that estimated in the Washington study.

The calculations are shown in Table A-1, below.

<b>Table A-1: Estimating the impact of sales tax increase on employment growth</b>								
	<b>County</b>	<b>Cook</b>	<b>Dupage</b>	<b>Kane</b>	<b>Lake</b>	<b>McHenry</b>	<b>Will</b>	<b>RTA Area</b>
A	Emp 2004	2,462,434	580,166	194,000	313,648	92,277	155,921	<b>3,798,446</b>
B	Annual Growth Rate	1.01%	1.33%	0.83%	1.20%	0.57%	0.68%	
C	Emp 2008	2,563,434	611,652	200,521	328,976	94,399	160,206	<b>3,959,188</b>
D	Proposed ST Rate increase	0.25%	0.50%	0.50%	0.50%	0.50%	0.50%	
E	Effect on emp growth rate	-0.52%	-1.04%	-1.04%	-1.04%	-1.04%	-1.04%	
F	Assume only half the effect	-0.26%	-0.52%	-0.52%	-0.52%	-0.52%	-0.52%	
G	New annual growth rate	0.75%	0.81%	0.31%	0.68%	0.05%	0.16%	
H	Implied 2014 employment	2,680,973	641,987	204,280	342,629	94,683	161,750	<b>4,126,301</b>
I	Base case (no tax increase) 2014 employment	2,721,565	662,262	210,671	353,024	97,657	166,819	<b>4,211,998</b>
J	Jobs not gained	40,592	20,275	6,391	10,395	2,974	5,069	<b>85,697</b>

Explanation of rows:  
A= Nonfarm nongovernmental wages & salary employment, from Illinois Dept. Of Employment Security (IDES) [http://lmi.ides.state.il.us/projections/county\\_proj.htm](http://lmi.ides.state.il.us/projections/county_proj.htm)  
B= Annual growth rate (calculated by HGS from IDES 10-year forecast)  
C= Estimated 2008 employment assuming growth at rate in row "B"  
D= Proposed sales tax rate increase, which is 0.25% in Cook County and 0.5% in the other five counties  
E= Increase in row "D" multiplied by 2.08  
F= Half of the amount in "E", to allow for possible lesser effect of tax increase on jobs  
G= Post-tax annual growth rate, row "G" subtracted from row "B"  
H = Employment in 2014 based on growth from 2008 (row "C") at the rate in row "G".  
I = Original forecast of 2014 nonfarm nongovernmental wage & salary employment by IDES, at [http://lmi.ides.state.il.us/projections/county\\_proj.htm](http://lmi.ides.state.il.us/projections/county_proj.htm)  
J = Estimated number of jobs lost due to sales tax increase (Row "H" subtracted from Row "I")