

# Property tax on privatized roads

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## **ABSTRACT**

Roads cover a significant fraction of the land area in many municipalities. The public provision of roads means this land is exempt from the local property tax. Transferring roads from public to private ownership would not only remove maintenance costs from city budgets, but increase potential property tax revenue as well. This paper calculates the value of the land occupied by roads in sample cities and determines the potential revenue increase if they were subject to property tax. Further calculation computes the extent to which the property tax rate could be reduced if the land value of roads were added to the tax base. Property tax on privatized roads could generate meaningful revenue, but a corresponding reduction in rate for existing property would be small.

## 1 INTRODUCTION

2 Street maintenance is a significant part of many municipal budgets. Especially in older cities,  
3 much of the infrastructure is reaching an age where replacement or significant rehabilitation will  
4 soon be needed. At the same time, with recent economic conditions the fiscal health of many city  
5 governments is in question. Raising property taxes to cover increased street maintenance needs  
6 is likely not politically feasible in harder times, and may not be economically feasible given the  
7 recent spate of foreclosures. Several alternative instruments are available to finance transportation  
8 projects. Generally, these fall into the categories of user fees or value capture. User fees are  
9 charged to drivers, most directly in the form of tolls but also as vehicle registration fees. Value  
10 capture strategies, such as impact fees and land value taxes, are charged to land owners whose  
11 parcels derive value from the accessibility provided by the street network.

12 A third alternative is to lease or sell the transportation network to a private operator, who  
13 would manage and maintain the system and likely charge tolls to cover costs. Such arrangements  
14 are becoming more common, especially for large, capital-intensive projects for which it is difficult  
15 to obtain construction funding. The most obvious effect, aside from the appearance of tolls on  
16 facilities which were previously free, is the transfer of the burden of maintaining the system from  
17 public agencies to private entities. Another ramification, which is the focus of this paper, is that if  
18 roads were privately owned and operated, the owners could be charged property taxes. This would  
19 give governments more flexibility to fund other programs, or enable property taxes on residents  
20 and other businesses to be reduced.

## 21 PRIVATE OPERATION IN PRACTICE

22 Private operation of roads in the United States is rare, but discussion of privatization as a viable  
23 option has recently increased. Historically, privately-run toll roads were much more common, but  
24 today they are limited to a few corridors and major bridges. Two prominent examples are the Dulles  
25 Greenway in Virginia and State Route 91 in Orange County, California (1). The usual motivation  
26 for privatizing is that a for-profit business would have a greater incentive to minimize cost and  
27 operate efficiently than a government agency. Gómez-Ibáñez et al (2) concluded that taxpayers  
28 would come out ahead in such an arrangement, with operating companies contributing increased  
29 federal and state income taxes and using taxable financing for construction.

30 Privately-owned local roads do exist, such as those under the control of neighborhood associ-  
31 ations common in St. Louis, Missouri, but the economic ramifications of private construction and  
32 operation of major highways have received more attention in the literature. In particular, a build-  
33 operate-transfer business model has been considered, in which a private company would build the  
34 facility, operate and maintain it for a specified time period, and then turn it over to a public agency  
35 (3, 4). The results of a model created by Viton (5) concluded that the prospects of profitable oper-  
36 ation of a private intercity route are good, but the money-making opportunities with urban routes  
37 are more limited. The model only considered private routes operating in direct competition with  
38 public highways, and did not evaluate local roads or private monopolies. However, only recently  
39 has the electronic toll-collection technology advanced to the point that charging for minor streets  
40 has become a possibility.

41 A comprehensive discussion of road privatization is provided by Roth (6). The author notes  
42 the separation evident in the public sector between funding and responsibility for maintenance and  
43 safety. In contrast, a private operator would incur all liabilities in exchange for the ability to retain  
44 all profits. This single point of responsibility would likely result in lower costs, better response to

1 needs for improvement and more efficient investments. However, in the epilogue, Friedman and  
2 Boorstin (7) add that these improvements would be much more difficult to realize on intra-city  
3 networks than on longer-distance routes. The logistics of charging for use are more challenging,  
4 and the natural monopoly of a precise route plays a greater role when access to parcels takes  
5 precedence over traffic throughput.

6 Private operation of transportation facilities would be most successful in the presence of compe-  
7 tition. This is observed when a toll highway runs parallel to a public road, and users can determine  
8 whether they value the likely faster trip on the toll road enough to justify paying the toll. The effect  
9 would be even more pronounced if multiple toll facilities were to function as substitutes, compet-  
10 ing on price or quality of service. This is one reason that privatizing major highways may be more  
11 acceptable and more successful than privatizing an entire network of municipal roads. If all major  
12 highways were tolled and all local roads remained free, users unwilling to pay the toll would still  
13 have options. If all roads within a city were controlled by a single private operator, users would  
14 have no choice but to pay whatever the operator felt it could charge, and the operator's incentive to  
15 maximize network efficiency would disappear.

## 16 **REVENUE POSSIBILITIES FOR SAMPLE CITIES**

17 The purpose of this paper is to determine just how much revenue sample cities would be able  
18 to collect in property taxes on streets and roads within their limits. The data sets used in the  
19 analysis were obtained from MetroGIS, which compiles regional geographic information for the  
20 Twin Cities metropolitan area. Parcel information, major highway routes and land use maps were  
21 all used to calculate the area within each city devoted to streets and highways. Land value was  
22 estimated using a procedure developed in a previous project (8). The data created in that project  
23 included average land values for each census block in the metropolitan area. The methodology  
24 was derived from a hedonic pricing model developed by Iacono and Levinson (9). The average  
25 percentage of total property value in each block that is land value was estimated, and then applied  
26 to the estimated total property value in the parcel data set. Property tax rates were obtained from  
27 the respective county assessment offices online.

28 The land areas covered by roads and rights-of-way were calculated for each city for all types of  
29 streets and for major highways only. Beginning by importing a layer of census blocks with 100%  
30 coverage of the area into a geographic information system (GIS), other layers were subtracted  
31 until only the area of streets and roads remained. The parcel areas were subtracted first. Parcel  
32 boundary shapefiles are not consistent across the region; the maps for some counties leave space for  
33 road right-of-way, while others show the parcel boundaries as road centerlines. Only the counties  
34 in which rights-of-way were reflected in the parcel data (Anoka, Hennepin and Ramsey) could be  
35 included in the analysis.

36 The next subtraction removed areas of open water. Because the parcel and open water shape-  
37 files do not match exactly, some odd, narrow areas remained at the edges of lakes and rivers after  
38 this step. Many of these were removed by hand, but enough uncertainty remained in rural areas  
39 that the result was not reliable. In response to this issue, townships were removed from the analysis  
40 and only incorporated cities in the three counties named above were retained. After subtracting  
41 railroad rights-of-way and parks not included in either of the previous subtractions, the remaining  
42 areas were considered reasonable estimates of the area in each census block devoted to streets and  
43 roads.

44 The block-level estimates of land value per square meter were then applied to the areas of roads

1 in each block. The resulting values were then summed across each city, and multiplied by the mu-  
2 nicipal property tax rates. In Minnesota, the stated rates are assessed on the tax capacity of each  
3 parcel of land. The formula used to determine tax capacity varies by type of property, and in this  
4 case roads are assumed to fall into the category for commercial, industrial and utility establish-  
5 ments. The tax capacity formula for this category was obtained from the Minnesota Department  
6 of Revenue online and is shown in Equation 1.

$$\text{Tax capacity} = 1.50\% * \text{first } \$150,000 + 2.00\% * \text{remaining value} \quad (1)$$

7 In order to apply this formula to the calculation, the roads are assumed to operate as one  
8 business entity within each city. Therefore, in each city, the tax capacity of the road enterprise was  
9 calculated as 1.50% of the first \$150,000 in land value and 2.00% of the value above \$150,000.  
10 In most of the cities in the analysis, the value of roads and highways far exceeded that amount.  
11 Results of the calculations for sample cities are presented in Table 1. The selection allows for a  
12 varied mixture of large, central cities and inner and outer suburbs, as well as a wide range of tax  
13 rates and proportions of city area covered by roads.

14 A city evaluating the revenue potential of property taxes on privatized roads would need to  
15 consider the effects of pricing on driver behavior and locational and land use decisions, which in  
16 turn would affect the land value and profitability of the network as a business. The public would  
17 also have an interest in how this arrangement would compare to existing funding sources and free  
18 travel. A simulation of marginal-cost pricing for Austin, Texas found that the reduction in vehicle-  
19 miles traveled in the city would be minimal, but the reduction in congestion and travel time would  
20 create a welfare gain (10). However, the benefit would not be spread evenly across the city, and  
21 areas near downtown with more existing congestion would experience a loss due to higher tolls. To  
22 maintain overall economic efficiency, the revenue should be used for public benefit in some way.  
23 Reinvestment of the proceeds in transportation is not necessary, and they should not be returned to  
24 users based on how much they paid (11). The Austin simulation concluded that if the receipts were  
25 distributed evenly, any welfare losses would become gains for residents in all parts of the city.

26 Land use effects may be less pronounced and would take longer to appear. Employment and  
27 population could be expected to fall in dense central areas and become more evenly dispersed (10).  
28 Density in inner-ring suburbs is likely to increase, while the increased cost of travel would lead  
29 residents of outer areas to move closer (12). Workers would reconsider where they live in relation  
30 to their workplaces, but might be more likely to change jobs than residences (13). When travel is  
31 underpriced, land value does not rise with decreasing distance from the city center as quickly as it  
32 would if travel were priced at marginal cost (14). This can lead to excessive land at the center being  
33 devoted to road construction. A private operator taking over the road network might then prefer  
34 to convert some current road space to other land uses. The resulting changes in tax capacity and  
35 connectivity would affect the ultimate taxable value of the road enterprise and adjacent parcels.

## 36 **POTENTIAL PROPERTY TAX RELIEF**

37 One way to equitably distribute the extra revenue collected by adding the areas of roads and high-  
38 ways in the city to the property tax rolls would be to reduce the property tax rate for some or all  
39 types of property in the city. In fact, this may be the most politically popular use of the funds if  
40 they are not needed to cover increased construction or maintenance expenses. This section of the  
41 paper describes calculations of the rate reduction possible for residents and businesses if the land

**Table 1:** Revenue potential of property taxes on roads and highways by city.

City	Road area ( <i>km</i> <sup>2</sup> )	Highway area ( <i>km</i> <sup>2</sup> )	Land value, roads \$000	Land value, highways \$000	Revenue, roads \$000	Revenue, highways \$000
Anoka	2.890	0.422	\$184,101	\$12,163	\$1,365	\$91
Arden Hills	3.125	1.524	\$128,759	\$44,456	\$505	\$175
Bloomington	15.141	3.311	\$1,175,409	\$192,247	\$7,734	\$1,265
Brooklyn Center	4.967	1.694	\$282,885	\$58,768	\$2,507	\$522
Brooklyn Park	13.002	3.597	\$622,922	\$91,770	\$4,393	\$648
Champlin	3.624	0.371	\$212,714	\$12,378	\$1,385	\$81
Columbia Heights	2.198	0.191	\$218,489	\$14,957	\$1,883	\$130
Coon Rapids	10.103	2.568	\$579,136	\$96,649	\$3,560	\$595
Crystal	3.014	0.187	\$230,603	\$5,684	\$1,664	\$42
Deephaven	0.742	0.018	\$63,398	\$893	\$202	\$3
Eden Prairie	10.710	2.808	\$650,842	\$117,024	\$3,627	\$653
Edina	7.863	1.765	\$893,441	\$72,036	\$3,780	\$305
Falcon Heights	0.587	0.010	\$51,418	\$0	\$191	\$0
Fridley	5.287	1.308	\$347,352	\$79,062	\$2,110	\$481
Golden Valley	5.174	1.697	\$317,300	\$58,075	\$2,621	\$480
Hilltop	0.033	0.018	\$2,772	\$1,748	\$59	\$38
Hopkins	1.996	0.410	\$167,794	\$12,662	\$1,540	\$117
Lauderdale	0.293	0.085	\$23,401	\$3,586	\$114	\$18
Little Canada	2.166	1.053	\$69,856	\$16,369	\$294	\$69
Maple Grove	11.592	2.769	\$611,351	\$73,873	\$3,689	\$446
Maplewood	6.930	1.748	\$332,323	\$41,144	\$2,048	\$254
Medicine Lake	0.049	0.000	\$4,675	\$0	\$29	\$0
Minneapolis	37.639	5.932	\$5,420,222	\$181,874	\$61,450	\$2,063
Mnettonka	11.302	3.052	\$652,486	\$138,187	\$3,709	\$786
Mounds View	2.226	0.846	\$89,411	\$18,666	\$626	\$131
New Brighton	3.282	0.843	\$210,793	\$33,112	\$1,383	\$218
New Hope	2.396	0.292	\$180,975	\$14,983	\$1,525	\$127
North St. Paul	1.739	0.163	\$122,161	\$4,732	\$527	\$21
Osseo	0.576	0.201	\$36,067	\$4,607	\$261	\$34
Plymouth	12.706	2.785	\$802,441	\$143,316	\$3,737	\$668
Richfield	4.772	0.933	\$420,849	\$32,829	\$3,013	\$236
Robbinsdale	2.072	0.504	\$164,151	\$10,171	\$1,185	\$74
Roseville	6.785	1.957	\$435,975	\$97,983	\$2,039	\$459
Shoreview	3.903	0.544	\$231,757	\$10,089	\$1,091	\$48
Spring Lake Park	1.407	0.413	\$80,375	\$14,164	\$764	\$135
St. Anthony	1.029	0.008	\$86,230	\$0	\$788	\$0
St. Louis Park	5.981	1.417	\$617,262	\$93,508	\$4,289	\$650
St. Paul	31.920	5.341	\$3,464,988	\$165,268	\$21,065	\$1,005
Vadnais Heights	2.883	1.187	\$120,564	\$27,029	\$438	\$99
Wayzata	1.585	0.573	\$108,875	\$23,975	\$444	\$98
Woodland	0.104	0.000	\$8,675	\$0	\$13	\$0

1 value of roads is taxed.

2 The first step in this procedure was to determine the revenue collected from taxable property  
3 in each city. This was accomplished using a GIS and data layers of parcels, land uses and city  
4 limits. The land use categories were aggregated into single-family and multi-family residential,  
5 commercial and industrial, and institutional groups. Properties that did not fall into a residential  
6 or business group, such as churches, schools and parks, were assumed to be exempt from property  
7 tax. The parcel data include estimated market values for each property. These were totaled for  
8 each land use in each city.

9 The tax capacity formula for commercial property shown above was used once more, and the  
10 formula for residential property is given by Equations 2 and 3. The calculation shown for multi-  
11 family housing is used for properties with four or more units. This is assumed here to apply across  
12 the board for all properties within multi-unit land use zones. Total current revenue was calculated  
13 by applying the tax rate to the total tax capacity in each city. To determine the reduction possible  
14 with the addition of tax on roads and highways, their tax capacity was added to the totals, and the  
15 revenue total was divided by the result.

$$16 \quad Tax\ capacity_{SF} = 1.00\% * first\ \$500,000 + 1.25\% * remaining\ value \quad (2)$$

$$17 \quad Tax\ capacity_{MF} = 1.25\% * total\ value \quad (3)$$

18 The results of the calculations are shown in Figures 1 and 2. It can be seen that although the  
19 revenue potential of taxing roads is considerable, in most cities it would still represent a small  
20 proportion of tax capacity. Factors that would influence the distributions shown include the value  
21 of land and buildings in the city, the amount of developed versus undeveloped land, and the pro-  
22 portion of the land area reserved for roads. Cities with high land values and lower structure values  
23 would be able to reduce property tax further than those whose land values are lower and would  
24 not be supplemented as much by adding roads and highways. Sparsely developed cities with a few  
25 structures separated by undeveloped and untaxable land might see a greater potential for tax relief,  
since more roads are needed in relation to the existing tax base.

## 26 CONCLUSION

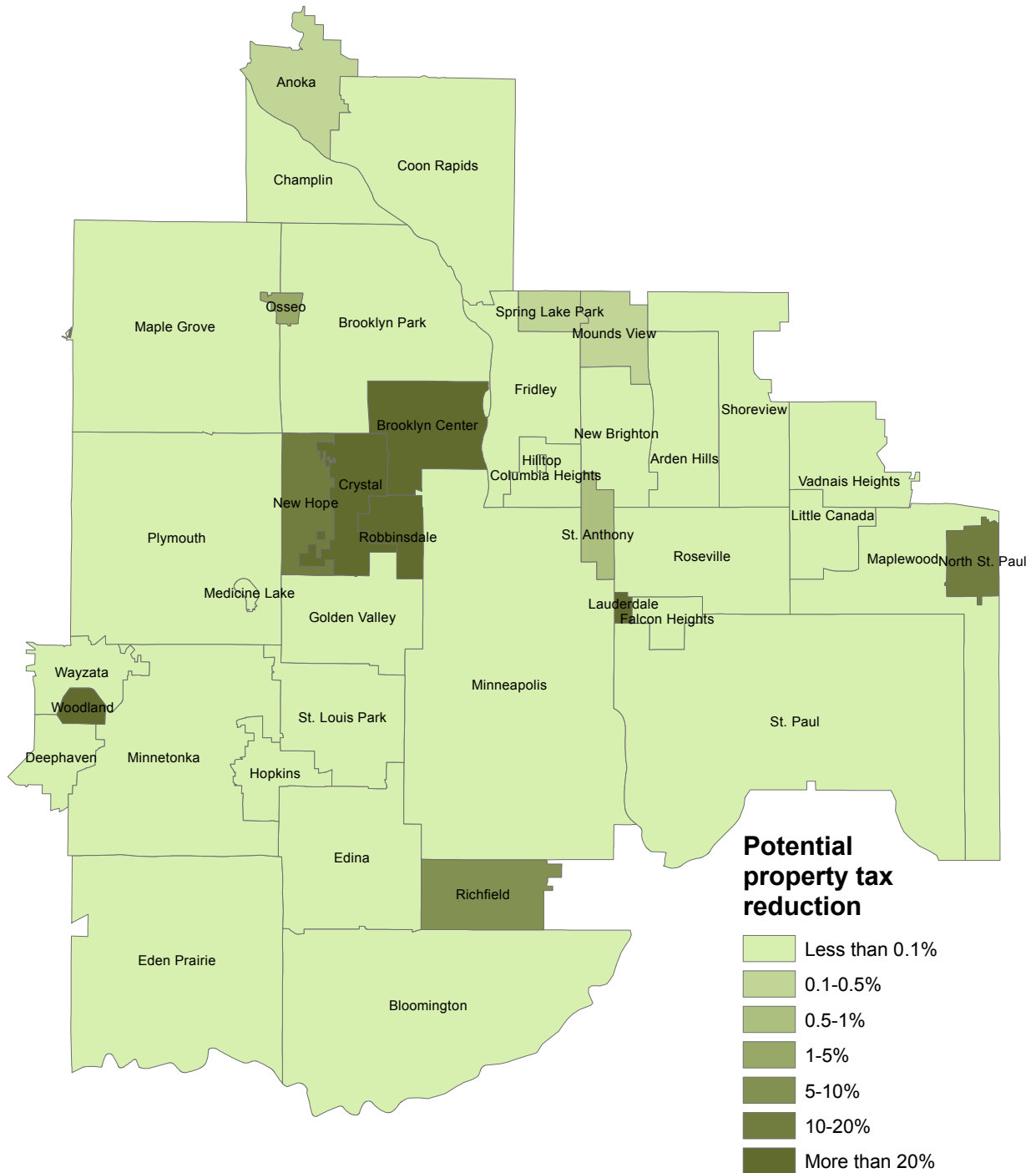
27 The results show that several municipalities in the Twin Cities area would be able to increase  
28 property tax revenue substantially if roads within the city limits were privatized and made taxable.  
29 Even if only major highways were included, which might be a more likely scenario, some cities  
30 along those corridors could increase annual property tax revenue by six-figure sums. Privatizing all  
31 local roads would also remove maintenance costs from city budgets, enabling funds to be directed  
32 toward the provision of other services or providing property tax relief. The negotiation would be  
33 more complicated for major routes, since maintenance is usually administrated by other agencies  
34 such as the state department of transportation.

35 This analysis does not include any consideration of the user fees that would be charged by a  
36 private road operator. Calculating the appropriate toll level and the resulting effects on road user  
37 welfare would become a large, complicated task in itself. This analysis simply attempts to deter-  
38 mine the potential effect on municipal government revenue of road privatization. The estimates for  
39 road value may be high, since the land value estimates used derive some increment from accessi-  
40 bility provided by the roads they abut, and removing this connectivity by converting road-covered  
41 land to some other use would have the effect of reducing land values citywide. However, roads

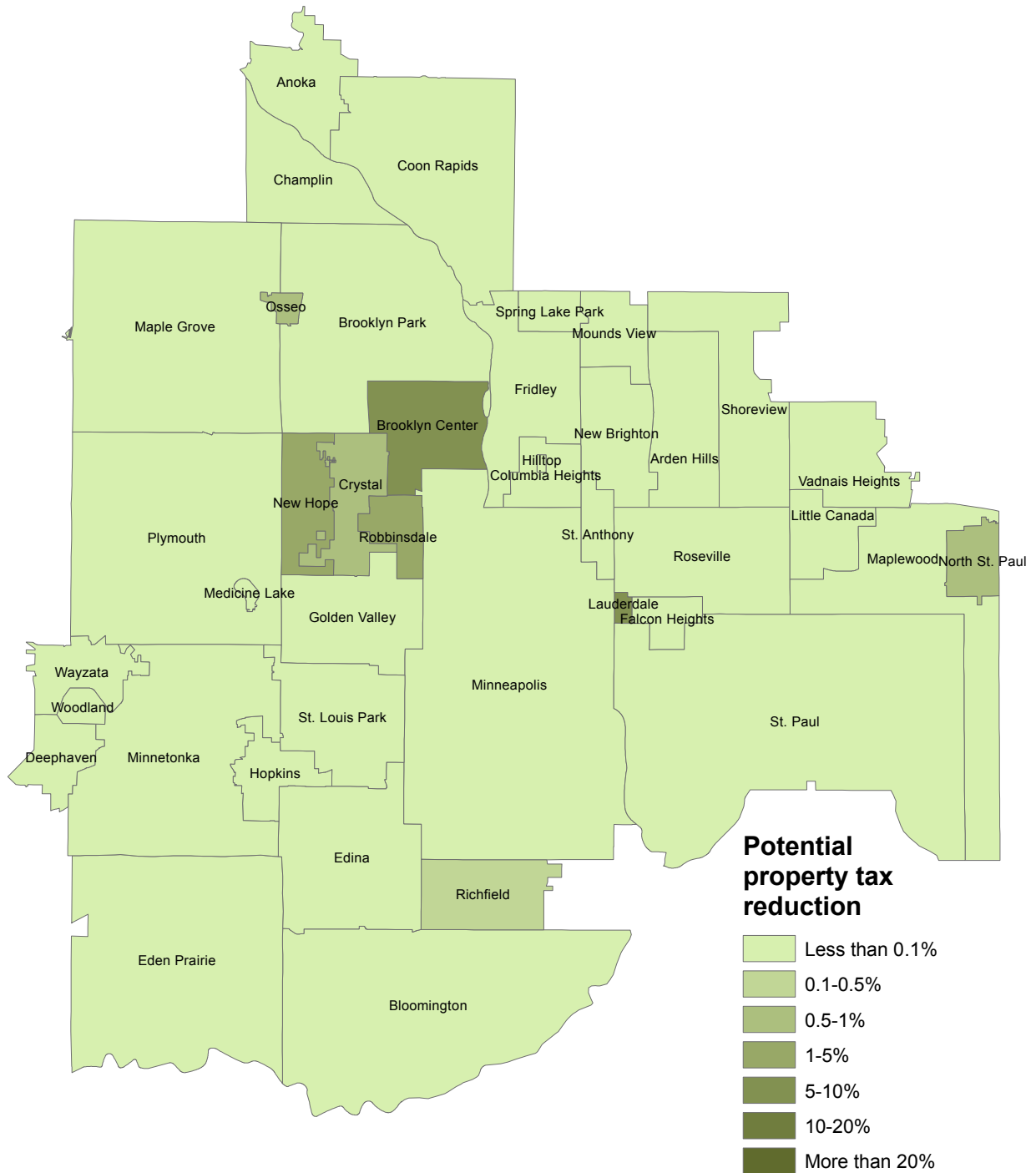
1 also have some structural value owing to the materials of which they are made, and service value  
2 created by the demand for activities made possible by transportation. Moreover, assuming that tolls  
3 are set such that private road operation is profitable, the business would have value representing  
4 the future revenue stream. When all of these factors are taken into account, it may be more likely  
5 that the taxable property values of the road enterprises in this analysis are in fact underestimated.

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**Figure 1:** Potential for property tax reduction if all local roads were assessed property tax.



**Figure 2:** Potential for property tax reduction if major highways were assessed property tax.