Transportation Utility Fees: Possibilities for the City of Milwaukee

Prepared by:
Deven Carlson
Bill Duckwitz
Karen Kurowski
Lamont Smith

Prepared for:
Division of Budget and Management
Department of Administration
City of Milwaukee

Workshop in Public Affairs, Domestic Issues
Public Affairs 869
Spring 2007

Robert M. La Follette School of Public Affairs
University of Wisconsin-Madison

For additional copies:
Publications Office
La Follette School of Public Affairs
1225 Observatory Drive, Madison, WI 53706
www.lafollette.wisc.edu/publications/workshops.html

Table of Contents

List of Figures

List of Tables

Foreword

This report, which analyzes the possibility of implementing a Transportation Utility Fee (TUF) in the City of Milwaukee, is the product of collaboration between the Robert M. La Follette School of Public Affairs at the University of Wisconsin–Madison, the City of Milwaukee Budget and Management Division, Department of Administration. This gives graduate students at La Follette the opportunity to practice their policy analysis skills while contributing to the capacity of the City of Milwaukee to effectively provide public services.

The La Follette School offers a two-year graduate program leading to a master's degree in public affairs. Students study policy analysis and public management, and pursue a concentration in a public policy area of their choice. They spend the first year and a half taking courses that provide them with the tools needed to analyze public policies. The authors of this report are all enrolled in Public Affairs 869, Workshop in Public Affairs, Domestic Issues. Although acquiring a set of policy analysis skills is important, there is no substitute for doing policy analysis as a means of learning policy analysis. Public Affairs 869 provides graduate students that opportunity.

The students were assigned to one of several project teams. Two additional groups worked with the City of Milwaukee Budget and Management Division, while others worked with the Wisconsin Joint Legislative Council, and the Wisconsin departments of Revenue, Administration, and Health and Family Services. The topic of this report—analyzing alternatives for implementing a transportation utility fee—was chosen by Mark Nicolini, the budget director of the City of Milwaukee, in consultation with his staff.

In Milwaukee, much transportation infrastructure funding comes primarily from property taxes. The TUF is an innovative approach to pay for transportation infrastructure. It seeks to convert this revenue source into a user fee. A user fee would foster a more direct connection between use and payment, enabling the City to capture revenue from entities that are exempt from property taxes, effectively shifting the burden from residents to other entities. It would also provide a special revenue source for transportation infrastructure and create greater predictability in funding.

The research team undertook detailed financial analyses of four options: the status quo approach to funding transportation and three alternative TUFs. The first alternative is a relatively simple flat-fee model that charges a specific amount according to a property's characteristics; the second is a trip-generation approach that crafts a more sophisticated estimation of how much people use transportation infrastructure. The team ultimately recommends the third alternative, a hybrid approach between the flat-fee and trip-generation approaches that appears to provide greater equity for residential properties.

This report would not have been possible without the support and encouragement of Budget Director Mark Nicolini and Dennis Yaccarino, who served as the project coordinator for the Budget and Management Division and solicited ideas for policy analysis from the Budget Office staff and coordinated the efforts of staff in support of the project.

The report also benefited greatly from the active support of the staff of the La Follette School. Outreach director Terry Shelton, along with Kari Reynolds, Mary Mead, and Gregory Lynch, contributed logistic and practical support for the project. Karen Faster, La Follette publications director, edited the report and shouldered the task of producing the final bound document.

I am very grateful to Wilbur R. Voigt whose generous gift to the La Follette School supports the La Follette School public affairs workshop projects. With his support, we are able to finance the production of the final reports, plus other expenses associated with the projects.

By involving La Follette students in one of the tough issues faced by the City of Milwaukee, I hope the students not only have learned a great deal about doing policy analysis but have gained an appreciation of the complexities and challenges facing city government in Wisconsin and elsewhere. I also hope that this report will contribute to the work of Mayor Barrett and the Division of Budget and Management.

Donald Moynihan
May 1, 2007

Acknowledgments

The authors would like to thank everyone who contributed time and energy to helping us complete this project. We would especially like to thank Dennis Yaccarino of the Division of Budget and Management in the City of Milwaukee's Department of Administration for providing us with a wealth of information, data, and feedback on early drafts of this report. Furthermore, the quality of this report was improved dramatically thanks to Karen Faster's editing expertise. Finally, we are indebted to our professor, Dr. Donald Moynihan of the Robert M. La Follette School of Public Affairs, who provided invaluable guidance, encouragement, and feedback.

Executive Summary

The City of Milwaukee operates under a number of political and legal constraints regarding the financing of transportation infrastructure expenses. The largest local source of revenue, the property tax provides more than one-third of transportation infrastructure revenues. However, the property tax did not generate adequate revenue to cover transportation infrastructure costs in 2007 and is likely to be capped by state law. Further, funding transportation expenses with property taxes loads almost all of the costs of infrastructure maintenance on owners of taxable property, ignoring the fact that numerous tax-exempt properties within the City use the transportation infrastructure but do not pay commensurately in terms of use. Transportation utility fees (TUFs) are an alternative approach to financing transportation infrastructure. Under a TUF, property owners pay fees according to their use of the infrastructure. This makes the TUF charges more equitable than the property tax in terms of the relationship between payments made and benefits received. In addition, a TUF can draw additional funds into the City and reduce market distortions associated with the property tax. We examine several TUF models, with fees based on property characteristics, estimated annual trips, or a combination of the two. We then develop a set of evaluation criteria: equity, economic impact, budgetary impact, and feasibility. Finally, we evaluate the TUF options against the status quo. Ultimately, we recommend that the City of Milwaukee implement a TUF, using a model that bases fees on both property characteristics and estimated trips.

Under a TUF framework, the municipality treats access to the transportation infrastructure as a municipal utility service and assigns fees to properties based upon infrastructure usage. Many other municipalities have adopted this method of financing transportation infrastructure needs, and the option is becoming more popular across the nation. We identified 25 municipalities that had dealt with TUFs by 2007, most of them towns in Oregon.

There is no uniformity among the TUFs in existence. The most basic issue is choosing the fee basis. Ideally, the fee would be based upon a direct measurement of actual transportation infrastructure usage. Because usage cannot easily be measured directly, however, a proxy measure must be used to estimate actual usage, just as the use of the sewer system is estimated by measures of water usage. Available proxies for transportation infrastructure usage include lot area, building area, number of bedrooms for residential properties, and trip-generation rates, which are estimates of how frequently vehicles enter or exit particular property types in a given period of time.

Transportation engineers reason that different land uses (e.g., residential, manufacturing) are associated with different trip-generation rates. The number of trips estimated for a given property is the product of the trip-generation rate for that land use and the quantity of a given property characteristic (e.g., gross floor area for general office buildings). While any of the above proxies can be used to estimate transportation infrastructure usage, the legality of the TUF is contingent

on choosing a proxy that ensures a reasonable relation between the actual usage and the fee ultimately charged.

Using the available proxies, we developed three TUF alternatives. One is based on physical property characteristics alone, one is based upon trip-generation rates alone, and one incorporates both. The flat-fee model allocates costs to property land-use categories according to each category's proportion of lot area within the City and then distinguishes among individual properties within each category according to the proxy that we believe provides the best estimate of usage within that category (i.e., number of bedrooms for single-family residential homes, gross floor area for commercial establishments, and acreage for manufacturing businesses). The trip-generation model allocates transportation infrastructure costs to all properties according to the trip-generation rates developed by the Institute of Transportation Engineers. The hybrid model also allocates costs among land-use categories by trip-generation rates. However, the hybrid does not allocate costs to all individual properties solely by those rates. Non-residential properties are handled the same way as in the pure trip-generation model, but residential properties are assigned a fee proportional to the number of bedrooms for each parcel.

We evaluate these alternatives against the status quo according to how equitably they align costs with transportation usage and property-owner ability to pay; the economic impact would they have on residents and businesses within the City; how they would affect the City's budget; and whether they are politically, legally, and administratively feasible.

The status quo and flat-fee model would promote continued misalignment of costs and usage, and we consequently do not recommend either of these options. In contrast, the trip-generation and hybrid models appear to be highly equitable in terms of aligning transportation costs with transportation usage. The trip-generation and hybrid models would increase the financial burden on commercial properties, reflecting the considerable traffic volume these properties generate, but these alternatives could simultaneously ease the financial burden on City homeowners if TUF revenues offset property taxes. All of the TUF alternatives would increase revenue diversification compared to the status quo, would constitute a relatively stable source of transportation revenue, and appear feasible in all dimensions.

We favor the trip-generation and hybrid TUF alternatives. The trip-generation TUF is superior in administrative feasibility and perhaps in political feasibility just because it is simpler in concept. However, we prefer the hybrid model because its use of bedrooms as a proxy for usage likely provides superior equity among residential properties, more so than can be achieved using trip-generation data alone. We therefore recommend that the City of Milwaukee implement a TUF with charges based primarily upon trip-generation rates and refined for residential properties by number of bedrooms. In addition, we recommend that the City consider setting a cap on the maximum fee that may be charged, to ensure that no single property owner is subject to an unreasonably large fee and to minimize the likelihood of political opposition.

Introduction

Fiscal constraints prevent the City of Milwaukee from optimally funding the operation, maintenance, and improvement of the City's transportation infrastructure. A portion of this problem is attributable to the inflexibility and inequity of the transportation-funding system. To address this, the Budget and Management Division of the City of Milwaukee's Department of Administration asked us to examine the impacts of an alternative revenue option: a transportation utility fee (TUF). More specifically, we evaluate the distributive equity, economic impact, budgetary impact, and feasibility that would be associated with implementing a TUF in Milwaukee.

The City of Milwaukee funds transportation needs through a combination of property taxes, property tax-financed debt, special assessments, intergovernmental transportation aids, and miscellaneous revenues. Appendix A summarizes current transportation infrastructure funding for Milwaukee. Various restrictions on the above revenue sources, particularly the property tax, limit the City's ability to fund transportation infrastructure. For example, two years ago the state legislature enacted legislation artificially restricting the allowable growth in municipal property tax levies. Although expiring in early 2007, additional levy limits remain a notable possibility (Wisconsin State Legislature 2005). For more detail on Wisconsin laws pertaining to user fees, see Appendix B. In addition, tight fiscal conditions within the state have resulted in the stagnation of receipts from intergovernmental transportation aid to the City (City of Milwaukee, Wisconsin 2006a). A TUF would provide an additional revenue source with which the City could fund transportation infrastructure needs.

Reliance upon property taxes to fund maintenance of transportation infrastructure ensures that some property types will pay a disproportionate share of road maintenance costs relative to their road usage. Tax-exempt properties such as churches, hospitals, stadiums, and airports inarguably impose burdens upon the City's transportation infrastructure but provide very little revenue for its maintenance and improvement. Instead, taxable properties must bear a greater financial burden. For instance, we estimate that single-family residential properties, as a whole, pay nearly three times as much for transportation infrastructure maintenance and improvement as the cost of their usage (see our equity evaluation for more detail). A TUF would potentially reduce financing inequities by charging properties a fee that more closely reflects their usage of transportation infrastructure. We describe the basic differences between user fees, such as TUFs, and taxes in greater detail in Appendix C.

While a TUF offers several potential improvements over the current transportation funding system, such a fee may pose a number of challenges. First, a TUF must be designed in a manner that ensures its legality. To pass constitutional muster, a fee must have a reasonable connection with service usage. Because few municipalities in Wisconsin have even considered enacting a TUF, and none have

implemented one, the threshold a TUF must meet to be considered legal is not clear. Second, the controversy generated by the recent implementation of solid waste, snow and ice removal, and water fees in Milwaukee casts doubts over the political feasibility of enacting yet another fee. Third, it is unclear whether a TUF can be designed that is equitable within and across property types and income levels. That being said, evidence from across the country indicates that TUFs can, and have, been successfully implemented. Our background research identified more than 20 municipalities that administer TUFs. For more information on municipalities' TUFs, see Appendix D.

This report first describes transportation utility fees and documents their history in the United States. The report then outlines our evaluation criteria and specifies the policy alternatives we consider. Finally, the report evaluates each alternative by the specified criteria and presents the final policy recommendation.

Transportation Utility Fees

One alternative revenue source that has piqued the interest of municipal officials in recent years is the transportation utility fee. This fee goes by a variety of titles, including road user fees, street maintenance charges, street utility fees, and street lighting fees, amongst others. Regardless of title, such fees share three characteristics. First, all attempt to treat the transportation infrastructure as a public utility funded by usage fees, analogous to how municipalities often provide water, sewer, storm-sewer, and gas services. Second, municipal officials must spend TUF revenue only for transportation infrastructure services. In contrast, municipal officials may spend general revenue, obtained through the property tax, on a broad range of public services. Third, the relevant municipal department bills the fee as a utility charge, typically on a property owner's utility bill alongside sewer and water service charges. Appendix E provides further details on TUF structural alternatives.

As a revenue source, TUFs offer municipal governments a number of fiscal benefits. To begin with, fees are not bound by the same restrictions as taxes. For instance, state-imposed tax and expenditure limitations typically do not apply to fee revenues. As a result, local governments can flexibly finance fee-funded services as the costs of labor and materials fluctuate. In a similar manner, officials can set the fee at a level that covers the additional transportation infrastructure costs associated with urban growth. Appendix F provides a summary of transportation infrastructure expenditures in Milwaukee in 2007.

Local governments may compute the TUF on a variety of bases. The most popular of these is trip generation, which provides estimates for the number of vehicle arrivals and departures to and from a particular property based on typical travel patterns from similar properties across the nation. More specifically, trip-generation rates estimate the number of vehicular trips that a property produces according a relevant property characteristic. For instance, the Institute of Transportation Engineers (ITE) estimates that apartments, on average, induce nearly seven vehicular trips per dwelling unit, every weekday (2003). Appendix G

describes trip generation in further detail. Other than trip-generation rates, possible fee bases include lot area, building area, and number of parking stalls. Any of these can serve as a proxy for the amount of road usage likely to be generated from a given property.

Through the application of trip-generation rates or other proxies, TUFs allow municipalities to assign costs more accurately according to usage. The fees accomplish this by basing payments on trip-generation estimates or other traffic research. In other words, the municipality uses empirical data to approximate the amount of road usage that certain property types generate. Furthermore, TUFs can be designed to charge properties that are exempt from property taxes. For example, hospitals and stadiums generally do not have to pay property taxes. Such properties, however, generate considerable traffic activity, adding to the costs of road maintenance. TUFs can be designed to extract payments from public properties owned by higher levels of government. For a discussion of possible fee bases, see Appendix E.

A local government must be aware of legal issues when considering implementation of a TUF. One legal rule of thumb requires a TUF to show three things: (1) that it is associated with particularized benefit to the party being charged, that is not shared by other members of the community; (2) that payment of the fee is voluntary; and (3) that expenditures are earmarked only for expenditures that are reasonably related to transportation infrastructure costs (*Emerson College v. City of Boston* 1984). State law in Wisconsin mandates that usage of fee revenues resemble the purpose for which they were raised (Wisconsin State Legislature 2004). For the most part, municipalities establish a more convincing link between transportation infrastructure usage and user fee charges when they base their TUFs on the number of trips generated by the property. For more detail on relevant Wisconsin statutes, see Appendix B.

History of TUFs in the United States

TUFs are a relatively new revenue innovation. Early TUF adoption produced mixed legal results, and their ultimate legality remains in question in a number of states. Despite the difficulties that officials have had instituting them, however, greater constraints on taxes have spurred widespread interest in TUF activity. Appendix H provides a timeline of TUF activity in other municipalities.

In 1984, Fort Collins, Colorado, became the first municipality in the United States to implement a TUF. The fee was quickly challenged in court, and Fort Collins chose to voluntarily discontinue the TUF within three years. The next legislative action concerning TUFs occurred in 1985 and 1986 when La Grande, Oregon, and Pocatello, Idaho, authorized TUFs. Similar to the case in Fort Collins, some residents challenged the legality of Pocatello's TUF, and the City soon discontinued the fee voluntarily. Somewhat surprisingly, the TUF implemented by La Grande was never challenged in court. As a result, by 1987 Oregon was the only state with a municipality that charged a TUF to its residents (Ewing 1994).

Despite Fort Collins and Pocatello voluntarily discontinuing their TUF programs, litigation on the TUFs continued. The results of these legal challenges were mixed. The Idaho State Supreme Court ruled that the Pocatello TUF was unconstitutional in 1988, and since then no municipality in that state has implemented a TUF. Soon after the decision in Idaho, the Colorado State Supreme Court upheld the legality of the Fort Collins TUF (Ewing 1994). The contrasting outcomes result from differences in respective state laws and the specific provisions of the TUFs under scrutiny. Because Fort Collins voluntarily abandoned its TUF, the decision in Colorado had little immediate effect. This changed over time, however, as several municipalities in Colorado have since implemented or considered a TUF.

The 1990s were characterized by widespread national interest in TUFs. In 1990, Tualatin, Oregon, and Beaumont, Texas, each implemented a TUF (Ewing 1994). Neither has been challenged in court, and both municipalities continued to administer TUFs in 2007 (City of Tualatin, Oregon 2005; City of Beaumont, Texas 2007). In 1991, Palm Bay, Florida, instituted a TUF, but had to drop the fee after the policy was ruled unconstitutional because the fee charged was not related closely enough to usage (*Hanna v. City of Palm Bay* 1991). A year later, the communities of Medford, Oregon, and Austin, Texas, took advantage of the successful TUF implementations in their states and implemented fees of their own. The TUF in Medford is notable because it recovered not only operations and maintenance expenses, but also capital expenditures, thereby expanding the scope of recoverable expenditures (Ewing 1994). Appendix D details TUFs operated by various municipalities.

In 1992, experimentation with this revenue source expanded to the state of Washington when the community of Soap Lake implemented a TUF. The City of Port Orange, Florida, adopted a TUF in 1992 that was ruled unconstitutional after a protracted legal battle (*City of Port Orange v. State* 1994). In contrast, several Oregon communities, including Klamath Falls, implemented TUFs in the 1990s without legal challenge. Klamath Falls used the TUF revenue for street lighting, once again expanding the scope of TUFs. Despite this success of TUFs in Oregon, however, the Washington State Supreme Court rules TUFs unconstitutional in 1995. (*Covell v. City of Seattle* 1995).

By the early 2000s, the legality of TUFs was widely accepted in Oregon. TUF proposals fared much worse in Florida, where state courts have ruled every TUF statute unconstitutional, resulting in little advocacy for adoption of TUFs there. On the other hand, increased budgetary pressures and a favorable legal precedent have renewed interest in TUFs in Colorado, evidenced by Loveland's adoption of a TUF in 2001 and Fort Collins' 2005 development of a new user fee (City of Loveland, Colorado 2007).

Recently, Minnesota and Wisconsin have shown some interest in developing TUFs. In 2005, the Minnesota State Senate introduced a bill enabling TUF ordinances in its communities, and the City of Oconomowoc, Wisconsin, briefly considered a TUF. This interest has failed to translate to action as the Minnesota bill was allowed to expire, and the Oconomowoc Common Council ultimately abandoned its TUF due to political opposition (Rinard 2006). A more detailed timeline of TUF developments in the United States can be found in Appendix H.

Transportation Infrastructure in the City of Milwaukee

Milwaukee's transportation infrastructure encompasses many components, including roads, bridges, street lighting, and traffic signals. While these components of the transportation infrastructure represent a broad spectrum of transportation infrastructure, they all share the need for regular maintenance and repair. According to the 2007 Milwaukee Budget, the City will spend roughly $47.8 million for the operation, maintenance, capital improvement, and general administration of this infrastructure. The City funds these expenditures through a combination of intergovernmental aid ($25.8 million), property taxes ($17.8 million), and miscellaneous revenue ($4.3 million) (City of Milwaukee, Wisconsin 2006a; City of Milwaukee, Wisconsin 2006b; City of Milwaukee, Wisconsin 2006c).

In addition, the City finances some transportation infrastructure-related expenditures with special assessments. However, these tend to fund more neighborhood-specific projects through revenues collected from those neighborhoods, as opposed to the more general nature of the other revenue sources. Also, as special assessments distribute the financial burdens primarily to the benefiting neighborhoods, they are similar to user charges in how they function. Thus, we omit special assessment figures from our analysis.

The cost of Milwaukee Department of Public Works infrastructure service expenditures are expected grow $717,000, from $47.1 million in 2006 to $47.8 million in 2007 (City of Milwaukee, Wisconsin 2006a). For City administrators, restrictions on these revenue sources limit the City's ability to raise revenue to fund transportation infrastructure. The state legislature could reauthorize levy limits on property tax, and intergovernmental aid receipts have stagnated. Intergovernmental transportation aid to Milwaukee in 2006 was at roughly the same level as it was in 2004, despite significant growth in transportation infrastructure costs (City of Milwaukee, Wisconsin 2006b). Compounding the fiscal dilemma, the City of Milwaukee 2006-08 budget plan estimates a citywide structural imbalance of $166 million within three years (City of Milwaukee, Wisconsin 2006d).

These struggles prompted City officials to consider alternative sources of funding. As a budget strategy, Milwaukee seeks new non-property tax revenue streams, including user fees such as the new snow-removal and storm-sewer fees (City of Milwaukee, Wisconsin 2006d). Implementing a TUF would provide revenue the City could use to fund transportation needs, substantially increasing the flexibility of the transportation funding structure.

In addition to legal constraints, Milwaukee would have to resolve other issues during policy design and implementation. These including devising an equitable fee structure and determining the specific expenditures the City hopes to recover through the TUF. Overall, the goal of implementing a TUF in Milwaukee is to generate revenue specifically for infrastructure maintenance. To ensure legality, this revenue must be paid in proportion to infrastructure usage. In addition, it would be ideal if the fee introduced minimal economic distortion and captured revenue from tax-exempt properties.

Evaluation Criteria

In our analysis, we evaluate each alternative according to four broad criteria: equity, economic impact, budgetary impact, and feasibility.

Criterion One: Equity

In general, policy alternatives should distribute costs and benefits in a "fair" or equitable manner. One can define equity according to a number of standards, but analysts typically refine this broad concern into two specific principles: the benefit principle and the ability-to-pay principle (Mikesell 1991).

The Benefit Principle

The benefit principle holds that the most equitable methods of public finance require those individuals who benefit the most from a good or service to pay the most for that given good or service (Mikesell 1991). The benefit principle underpins the philosophical basis for user charges because only the people who choose to enjoy particular goods and services pay fees. Others are free to abstain from consuming a particular good or service and pay nothing (Allan 1995).

The current transportation-funding system may misalign the burden of transportation funding with the benefits of transportation infrastructure. In particular, we estimate that single-family households pay disproportionately more for transportation infrastructure than they use. Of course, user fees prove most appropriate when one can easily identify and charge people for specific uses of a good or service. By contrast, public goods complicate the benefit principle because excluding people from consuming them is difficult. Thus, assigning costs for them based upon usage is problematic (Mikesell 1991).

We perform our benefit-principle equity analysis by constructing a benefit-principle ratio for each land-use category under each of our policy alternatives. This metric indicates the ratio of each land-use category's proportional contribution to transportation infrastructure funding to its proportional transportation infrastructure usage. In other words, we investigate the degree to which each land-use category compensates the City for the benefits it derives from the transportation infrastructure. Below, in Figure 1, we detail the equation for our benefit-principle ratio.

Figure 1: Calculating the Benefit-Principle Ratio

$$\textbf{Benefit-Principle Ratio} = \frac{\textbf{Percentage of Total Transportation Infrastructure Payments}}{\textbf{Percentage of Total Transportation Infrastructure Usage}}$$

Source: Authors

A benefit-principle ratio value equal to 1 indicates that the land-use category, overall, pays for transportation infrastructure in a perfectly equitable manner. Ratio values exceeding a value of 1 indicate that land-use categories pay disproportionately more than they benefit. By contrast, ratio values less than 1 indicate that land-use categories pay disproportionately less than they benefit.

We derive our figures for proportional transportation usage by assigning annual trip estimates to each property within the City using trip-generation rates from the Institute of Transportation Engineers (ITE). As a result, the usefulness of our benefit-principle evaluation depends on the accuracy of the trip-generation rates and our application of them. We discuss the strengths and weaknesses of ITE trip-generation data further in Appendix G.

The Ability-to-Pay Principle

The second, and more common, standard of equity is the ability-to-pay principle (Allan 1995). Put simply, this principle requires that those individuals most capable of affording a particular public service should bear the highest burden for financing the service (Mikesell 1991).

We focus on a variant of ability-to-pay equity known as vertical equity. Vertical equity (hereinafter, simply ability to pay) describes how a tax or fee distributes its burden across groups, typically relative to each group's level of income or wealth. A revenue source is progressive if the financial burden of a particular service increases as a proportion of total wealth for wealthier groups, regressive if the burden increases as a proportion of wealth for poorer groups, or proportional if the burden remains constant across wealth groups. (Allan 1995).

For our analysis of equity under the ability-to-pay principle, we use assessed property value as a proxy for wealth. Assessed property value, at least in part, reflects the culmination of efforts to accumulate assets for the long-term. We limit our analysis of ability to pay to properties within the three residential land-use categories (i.e. single-family, duplex, and multi-family) as assigning levels of wealth to non-residential properties is less straightforward.

We begin our analysis by dividing each of the three residential categories into quintiles according to assessed value. We then determine the mean fee incidence for each quintile. We calculate the mean incidences by dividing each quintile's mean fee payment by that quintile's mean assessed property value.

Criterion Two: Economic Impact

Ideal revenue policies should influence economic behavior in the municipality in the least distortionary manner. Taxes and fees impose burdens that potentially distort behavior by altering the benefits that consumers and firms obtain through market transactions (Allan 1995). Adopting a TUF alternative would influence the City's economic health by (1) collecting revenue from sources previously contributing little, if any, funds toward transportation infrastructure costs and (2) redistributing the burden of transportation infrastructure costs among City properties.

For our analysis, we evaluate each of our alternatives according to the likelihood that it would draw new funds into the City, and how its particular distribution of financial burdens would affect individual economic decisions within the City.

Criterion Three: Budgetary Impact

Implementing a TUF in Milwaukee would provide City officials with an entirely new revenue stream and would undoubtedly have an effect on the City's fiscal situation. However, the precise effects of such a fee imposition are not clear and need to be evaluated systematically. As a result, budgetary impact serves as the third criterion by which we evaluate our alternatives. Within this criterion, we have specified two impact categories: (1) revenue adequacy and stability and (2) revenue diversification.

Not all TUF policy designs would create identical revenue streams. Some might produce revenues that fluctuate wildly from year to year while others might fill City coffers with a revenue stream that is stable, predictable, and consistently able to fund all services for which it was intended. According to Allan (1995), a well-designed revenue stream conforms to the latter description. Therefore, the first impact category under the budgetary impacts criterion is revenue adequacy and stability.

Analysts should strive to design a revenue system that balances all major taxes and incorporates user fees when possible (Allan 1995). In short, they should strive to create a portfolio of diversified revenue streams. Such a strategy helps limit a government's vulnerability to economic shifts or other exogenous events. As a result, the second impact category for the budgetary impacts criterion is revenue diversification. That is, we will evaluate the diversifying impact each TUF policy design would have on the City's revenue portfolio. We measure the diversifying impact of each alternative according to how it reduces disparities among revenue sources.

Criterion Four: Feasibility

A policy may rate highly on each evaluation criterion used in the analysis, but that means little if the policy cannot be implemented (Weimer and Vining 2004). A variety of factors may doom the adoption and implementation of a specific policy. For example, the government may lack the capacity to administer the policy and may find that adding capacity would be prohibitively costly. Or, perhaps, the policy could not generate enough support from the public or policymakers to pass the relevant legislative body. Finally, the policy may run afoul of applicable laws, whether city ordinances, state statutes, federal code, or even the state or federal constitutions. Given this, we have selected feasibility as the fourth criterion by which we evaluate each TUF alternative. Within this criterion we have identified three impact categories: (1) political feasibility, (2) legal feasibility, and (3) administrative feasibility.

The first, and arguably most important, step in implementing a policy is securing its passage through the relevant legislative body. To achieve passage, it is often necessary for the policy to gain support of the public and the relevant political actors. Drastic departures from the status quo are often more difficult to achieve than minor adjustments to current policy. In addition, certain policies may be more likely than others to provoke intense lobbying efforts from powerful interests that judge themselves to be negatively affected. Concerns such as these are captured by an impact category measuring likelihood of successful adoption.

In addition to addressing political feasibility, analysts must ensure that policy design falls within legal bounds at the local, state, and federal levels. As evidenced by TUFs in other cities, failure to conduct this check can result in a short-lived policy if it is challenged in court. As a result, our second impact category under the feasibility criterion is likelihood of legality. We compare the alternatives to relevant laws at the local, state, and federal levels, and we evaluate the likely legality of each.

Even if a policy is judged to be politically and legally feasible, the policy cannot be fully implemented unless the government possesses the capacity to administer it effectively. This requires the existence of an administrative agency, knowledgeable personnel, and adequate fiscal resources. Lacking just one of these qualities can result in an ineffective or failed policy. Thus, our third impact category under the feasibility criterion is likelihood of successful administration. When evaluating each alternative on this impact category, we judge whether the City of Milwaukee has the resources required to implement the policy.

Evaluating each TUF alternative along the three impact categories outlined above provides us with measures of the political, legal, and administrative feasibility of each policy. This, in turn, allows us to determine the overall feasibility of each alternative. Feasibility figures prominently when we make our final policy recommendations.

Policy Alternatives

This section describes each of the four policy alternatives evaluated in this analysis: the status quo, the flat-fee TUF, the trip-generation TUF, and the hybrid TUF. Each TUF alternative offers a slightly different structure. We describe the specific features of each in the following sections.

To facilitate meaningful comparisons across the four alternatives, we design each policy option to achieve an identical revenue target. Specifically, each alternative would generate $17.8 million in revenue annually, which represents the amount of property tax revenue the City expects to raise to fund transportation infrastructure during 2007. Instead, the revenue target could have been set to recover expenditures. We chose our target because property taxes are the source of the revenue that the City would most likely choose to replace with TUF revenue.

In addition to achieving identical revenue targets, we assume that the TUF alternatives would all be revenue neutral. That is, each TUF design would generate $17.8 million in annual revenue and the City of Milwaukee would reduce property taxes by an identical amount. This assumption allows proposed charges under the TUF alternatives to be meaningfully compared to payments made under the status quo.

Finally, we assume that implementation of a TUF would not affect the amount of intergovernmental aid or miscellaneous revenues collected by the City of Milwaukee. Furthermore, we assume that the City would refrain from replacing special assessment revenues with TUF revenues. Milwaukee raises special assessment revenue through neighborhood-specific property tax increases to target transportation infrastructure improvements specific to that neighborhood. Although special assessments do not connect service usage with payment as closely as traditional user charges, we assume that the City would continue to utilize special assessments outside of a TUF structure to promote greater alignment of transportation infrastructure costs with benefits.

Status Quo

At present, the City of Milwaukee does not charge a transportation utility fee. Rather, the City finances transportation expenditures through a combination of intergovernmental aid, property taxes, and miscellaneous revenue. While the current revenue streams provide enough money to cover current expenditures, it is not clear whether this funding stream will be adequate if the City hopes to maintain the quality of its transportation infrastructure.

Under the status quo, the burden of transportation expenditures that Milwaukee inhabitants most directly bear is from property taxes. Each year, the City sets an overall mill rate (dollars of tax liability per $1,000 of assessed property value) sufficient to defray net municipal expenditures. For 2007, Milwaukee property owners will face a municipal mill rate equal to 7.99 (City of Milwaukee, Wisconsin 2006e). A portion of property tax revenues collected in 2007,

and therefore a portion of the municipal mill rate, will fund the $17.8 million in transportation infrastructure expenditures. We acquire the transportation-specific mill rate, equal to 0.65,[1] by dividing transportation infrastructure expenditures by total assessed property value. Multiplying this mill rate by assessed property value, we determine each property's contribution to transportation infrastructure revenue. The land-use categories used by the City of Milwaukee and the total contributions of all properties in each are displayed in Table 1.

Table 1:
Distribution of Assessed Property Value and Property Tax Revenue for Transportation Infrastructure in 2007

Property Classification	Assessed Property Value		Total Transportation Infrastructure Revenue ($)	Median Payment ($)
	Percentage (%)	Total ($)		
Residential				
Single-Family	48	13,115,539,413	8,509,563	82
Duplex	17	4,683,995,900	3,039,048	81
Multi-Family	11	3,087,881,470	2,003,465	158
Mixed: Commercial – Residential	3	715,764,140	464,399	83
Commercial				
Wholesale/Retail Trade	4	961,535,555	623,859	176
Services, Finance, Insurance, and Real Estate	8	2,104,672,080	1,365,544	122
Mixed Commercial	4	1,109,619,800	719,938	272
Manufacturing, Construction, Warehousing	4	1,064,629,610	690,748	223
Transportation	1	304,107,741	197,310	35
Agriculture and Fishing	0	5,187,300	3,366	104
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	0	89,007,524	57,749	0
Public Parks, Quasi-Public Open Space	0	3,628,800	2,354	0
Other				
Vacant	0	115,643,100	75,031	3
Under Construction	0	78,215,418	50,747	18
Not Assigned	0	10,623,500	6,893	323
Total	100	27,450,051,351	17,810,014	

Source: City of Milwaukee, Wisconsin 2007

[1] In deriving our transportation mill rate estimate, we chose between two figures for total assessed property value: (1) the figure reported in the City Assessor's Office's 2006 *Assessment and Taxes* document (City of Milwaukee, Wisconsin 2006e) and (2) our calculation from the City's Master Property Record (City of Milwaukee, Wisconsin 2007). We chose the latter for consistency because we calculate all of our fee estimates from that same file. Further, our choice in total assessed value figures does not substantially affect our analysis because the difference between the two transportation mill rate estimates equals only 2 cents per $1,000 of assessed property value. Thus, our computation of the status quo tax liability would vary by only $2.00 for each $100,000 increment in assessed property value from that computed under the alternative mill rate.

Residential and commercial properties possess the largest portions of assessed property value and thus pay the largest portions of transportation infrastructure expenses. By contrast, the properties in the two public/quasi-public land-use categories pay relatively little under the current system because few of these entities are taxable properties.

Owners of vacant,[2] under-construction,[3] and non-assigned[4] (to a land-use category) properties pay for some transportation expenditures. Because these properties lack readily identifiable land uses to assign trip-generation or other proxy rates with and constitute less than 1 percent of assessable property, we exempt them from our evaluation of the status quo and alternatives.

Transportation Utility Fee Alternatives

Instead of continuing to fund transportation infrastructure expenditures solely through existing revenue streams, the City of Milwaukee could implement a transportation utility fee. The City could compute the fee in a variety of ways. We propose three bases for a TUF. These alternatives represent the range of options and reflect the best practices developed in other jurisdictions. In each case, we calculate charges to cover all funds needed for operations and maintenance.

Flat-Fee Basis

The flat-fee alternative bases its structure on a property's physical characteristics. We have classified each property in the City under one of the 12 land-use categories. The property categories we use mirror the land-use categories identified in City of Milwaukee's Master Property Record (MPROP) (City of Milwaukee 2007).

We design each TUF alternative to recover $17.8 million. Each of the 12 broad land-use categories identified in Table 1 is responsible for recovering a portion of this revenue. Under the flat-fee alternative, we divide the total revenue target among the land-use categories according to proportions of lot area within the City. For example, manufacturing properties occupy 7 percent of the City's land area, so this category, as a whole, would pay 7 percent of the $17.8 million. However, we make an exception to this general cost allocation by aggregating the three residential land-use categories into one residential category. This allows us to generate an equal unit cost for all residential properties and thus provides greater parity of fee burden for residential property owners in the City. We provide each land-use category's cumulative revenue responsibility in Table 2.

[2] The City of Milwaukee assigns a land-use category of 13 to these properties in its Master Property File Documentation (City of Milwaukee, Wisconsin 2005).
[3] The City of Milwaukee assigns a land-use category of zero to these properties in its Master Property File Documentation (City of Milwaukee, Wisconsin 2005).
[4] The land-use category value for these properties is missing in the City of Milwaukee's Master Property File Documentation (City of Milwaukee, Wisconsin 2005).

Table 2:
Distribution of Lot Area
and Dollar Burden under a Flat-Fee TUF

Property Classification	Percentage of Lot Area (%)	Total Revenue ($)
Residential	43	7,686,266
Single-Family	N/A	4,107,908*
Duplex	N/A	2,320,810*
Multi-Family	N/A	1,257,548*
Mixed: Commercial – Residential	1	246,644
Commercial		
Wholesale/Retail Trade	4	688,658
Services, Finance, Insurance, Real Estate	3	614,783
Mixed Commercial	3	448,922
Manufacturing, Construction, Warehousing	7	1,270,740
Transportation	2	321,217
Agriculture and Fishing	0	4,725
Public/Quasi-Public		
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	22	3,963,421
Public Parks, Quasi-Public Open Space	14	2,564,637
Total	100	17,810,014

Source: City of Milwaukee, Wisconsin 2007

Note: We exclude properties that are vacant, under construction, or not assigned to a land-use category from the calculations in Table 2.

* The breakdown of TUF revenue among residential properties is provided for informational purposes but is not directly proportional to the total lot area in the residential sub-categories. Subtotals for the sub-categories are not added to the revenue total because they are already included in the subtotal for all residential properties.

For each land-use category, we then selected a property characteristic tracked in the MPROP that we believe serves as a proxy for transportation infrastructure usage. We refer to these proxies as billable units. For example, residential properties are charged a set dollar amount for each bedroom. We chose bedrooms as the billable unit because we believe that residential properties with relatively more bedrooms are likely to house more people and, as a result, impose a greater burden on transportation infrastructure than properties with relatively fewer bedrooms. For the purposes of calculating fees, we assign one bedroom to residential properties listed in the MPROP as having no bedrooms, to reflect the presence of at least a single occupant. For commercial properties we designate gross floor area of buildings as the billable unit. Lot acreage serves as the billable unit for warehouse and industrial properties. The billable unit we have selected for each land-use category, as well as the mean, median, and maximum number of billable units in each land-use category, can be found in Table 3.

Table 3:
Distribution of Billable Units under a Flat-Fee TUF

Property Classification	Billable Unit	Billable Units per Property		
		Mean	Median	Maximum
Residential				
Single-Family	Bedrooms (#)	3.0	3	14
Duplex	Bedrooms (#)	4.6	4	65
Multi-Family	Bedrooms (#)	13.7	8	910
Mixed: Commercial – Residential	Gross Floor Area (1,000's Sq. Ft.)	5,041	3,318	193,780
Commercial				
Wholesale/Retail Trade	Gross Floor Area (1,000's Sq. Ft.)	10,313	3,520	966,572
Services, Finance, Insurance, Real Estate	Gross Floor Area (1,000's Sq. Ft.)	17,919	3,739	999,999
Mixed Commercial	Gross Floor Area (1,000's Sq. Ft.)	26,371	9,676	654,165
Manufacturing, Construction, Warehousing	Lot Acreage (Acres)	2.6	0.28	74.0
Transportation	Lot Acreage (Acres)	0.9	1	29.2
Agriculture and Fishing	Gross Floor Area (1,000's Sq. Ft.)	4,472	3,573	10,160
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	Lot Acreage (Acres)	3.2	0.4	1517.6
Public Parks, Quasi-Public Open Space	Lot Acreage (Acres)	1.7	0.1	153.6

Source: City of Milwaukee, Wisconsin 2007

Once we determine the proportion of total revenue each land-use category must recover and the billable units, we calculate the fee per billable unit within each land-use category. To complete this task, we calculate the total number of billable units within each land-use category. We then divide the dollar figure each land-use category must recover by the total number of billable units to determine the fee per billable unit. Because we aggregated all the three residential land-use categories, our model produces a single, per-bedroom fee of $14.20. The fee per billable unit, along with the mean, median, and maximum annual fee for each land-use category can be found in Table 4.

Table 4:
Distribution of Annual Fees under a Flat-Fee TUF

Property Classification	Fee per Billable Unit	Annual Fee per Property ($)		
		Mean	Median	Maximum
Residential				
Single-Family	$ 14.20	42	43	199
Duplex	$ 14.20	66	57	923
Multi-Family	$ 14.20	194	114	12,922
Mixed: Commercial – Residential	2 ¢	86	57	3,322
Commercial				
Wholesale/Retail Trade	4 ¢	405	138	37,991
Services, Finance, Insurance, Real Estate	2 ¢	349	73	19,472
Mixed Commercial	2 ¢	486	178	12,065
Manufacturing, Construction, Warehousing	$ 402.08	1,050	397	29,769
Transportation	$ 402.08	371	89	11,737
Agriculture and Fishing	5 ¢	236	189	537
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	$ 402.08	1,300	139	610,205
Public Parks, Quasi-Public Open Space	$ 402.08	676	42	61,749

Source: City of Milwaukee, Wisconsin 2007

Trip-Generation Basis

Another possible method for TUF computation utilizes trip-generation data. Using this method, the fee charged to a property is a function of the number of vehicle trips expected to enter or exit that property. Trip-generation rates have been calculated for several property types. To the extent that properties can be appropriately classified, this method allows for relatively strong predictions of the road usage associated with that property. Details on the trip-generation method are available in Appendix G.

The trip-generation alternative bases its fee structure on national trip-generation data. We use the detailed land-use categories from the tax assessor's database (City of Milwaukee, Wisconsin 2007) and typical trip-generation rates calculated by the Institute of Transportation Engineers. To determine the fee for each property, we first assign each property to an ITE trip-generation category. These assignments are based on the detailed land-use categories mentioned earlier. We then use the trip-generation data and the information contained in the tax assessor's database to determine the annual number of trips generated by each property. Dividing the annual number of trips generated by a property by the total number of trips generated in the City provides the proportion of the total TUF for which a property is responsible.

Table 5 presents descriptive statistics that are useful in assessing the trip-generation alternative. Specifically, it provides the number of properties in each land-use category and the percentage of total properties for each land-use category. Table 5 shows that residential properties make up approximately 89 percent of the properties in the City. The subcategories break down residential properties even further. Commercial properties account for less than 3 percent of all properties, while public and quasi-public properties make up approximately 5 percent of the total properties in the City.

Table 5:
Comparison of Property Distribution and Estimated Transportation Infrastructure Usage

Property Classification	Chargeable Properties		Estimated Annual Trips	
	Number	%	Number	%
Residential				
Single-Family	97,423	63	327,683,768	17
Duplex	35,234	23	147,936,993	7
Multi-Family	6,456	4	145,738,992	7
Mixed: Commercial – Residential	2,854	2	18,403,640	1
Commercial				
Wholesale/Retail Trade	1,699	1	496,343,587	25
Services, Finance, Insurance, and Real Estate	1,762	1	227,713,440	11
Mixed Commercial	923	1	358,290,487	18
Manufacturing, Construction, Warehousing	1,225	1	55,355,012	3
Transportation	875	1	50,052,409	3
Agriculture and Fishing	20	0	452,700	0
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	3,284	2	140,292,709	7
Public Parks, Quasi-Public Open Space	3,979	3	18,124,446	1
Total	155,734	100	1,986,388,183	100

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Note: We exclude properties that are vacant, under construction, or not assigned to a land-use category from the calculations in Table 5.

Table 5 also provides statistics on the estimated annual number of trips generated within each land-use category. According to the data, commercial properties generate a disproportionately large number of trips. While such properties account for less than 3 percent of total properties, they generate approximately 55 percent of trips. On the other hand, residential properties are estimated to generate about 31 percent of trips while making up nearly 89 percent of the 155,734 properties in the City of Milwaukee.

Table 6 outlines estimates of annual fees for each land-use category under a scenario in which the City would use a TUF to recover the portion of 2007 property tax revenue used to fund transportation infrastructure.

Table 6:
Comparison of Estimated Transportation Infrastructure Usage and Annual Dollar Burden under a Trip-Generation TUF

Property Classification	Percentage of Estimated Annual Trips* (%)	Total Annual Fees ($)
Residential		
Single-Family	17	2,938,022
Duplex	7	1,326,407
Multi-Family	7	1,306,700
Mixed: Commercial – Residential	1	165,008
Commercial		
Wholesale/Retail Trade	25	4,450,231
Services, Finance, Insurance, Real Estate	12	2,041,685
Mixed Commercial	18	3,212,443
Manufacturing, Construction, Warehousing	3	496,315
Transportation	3	448,771
Agriculture and Fishing	0	4,059
Public/Quasi-Public		
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	7	1,257,868
Public Parks, Quasi-Public Open Space	1	162,504
Totals	100	17,810,014

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

* By definition, the percentage of estimated annual trips is equal to the percentage of total revenue.

Given our revenue target of $17.8 million and application of ITE trip-generation rates to all Milwaukee properties, we determine that property owners would be charged 0.9 cents for each estimated trip. Table 7 shows the distribution of fees under a trip-generation TUF.

Table 7:
Distribution of Annual Fees under a Trip-Generation TUF

Property Classification	Fee per Trip	Annual Fee per Property ($)		
		Mean	Median	Maximum
Residential				
Single-Family	1 ¢	30	31	187
Duplex	1 ¢	38	37	483
Multi-Family	1 ¢	202	86	14,814
Mixed: Commercial – Residential	1 ¢	58	21	3,613
Commercial				
Wholesale/Retail Trade	1 ¢	2,621	940	130,647
Services, Finance, Insurance, Real Estate	1 ¢	1,159	234	147,235
Mixed Commercial	1 ¢	3,480	1,282	86,640
Manufacturing, Construction, Warehousing	1 ¢	405	181	9,889
Transportation	1 ¢	519	143	17,437
Agriculture and Fishing	1 ¢	203	118	802
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	1 ¢	391	19	271,800
Public Parks, Quasi-Public Open Space	1 ¢	303	44	7,352

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

The median single-family home would be charged $31 annually under the trip-generation alternative. The maximum that any single-family residential property would be charged is $187. The median retail and wholesale commercial property would be charged an annual fee of approximately $940. One such property, however, a department store, would incur a charge of approximately $131,000. Another notable statistic can be found under the maximum payment for public buildings. Under this alternative, the U.S. Post Office on West St. Paul Avenue would be charged an annual TUF of approximately $272,000.

Finally, Table 8 illustrates that there is often a sizable difference between the median and mean TUF charges in a property category. While each statistic has its advantages and disadvantages, in this case the median is probably a better indicator of central tendency because we have found the mean to be severely affected by outliers. More details on outliers can be found in Appendix I.

Table 8:
Distribution of Billable Units under a Trip-Generation TUF

Property Classification	Billable Unit	Billable Units per Property		
		Mean	Median	Maximum
Residential				
Single-Family	Trips (#)	3,364	3,470	20,820
Duplex	Trips (#)	4,196	4,140	53,823
Multi-Family	Trips (#)	22,573	9,537	1,652,251
Mixed: Commercial – Residential	Trips (#)	6,448	2,384	402,930
Commercial				
Wholesale/Retail Trade	Trips (#)	292,313	104,851	14,571,382
Services, Finance, Insurance, Real Estate	Trips (#)	129,308	26,101	16,421,392
Mixed Commercial	Trips (#)	388,180	142,930	9,663,090
Manufacturing, Construction, Warehousing	Trips (#)	45,224	15,882	1,102,919
Transportation	Trips (#)	57,933	16,002	1,944,749
Agriculture and Fishing	Trips (#)	22,636	13,122	89,459
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	Trips (#)	43,581	2,070	30,314,440
Public Parks, Quasi-Public Open Space	Trips (#)	33,753	4,867	819,969

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Hybrid of Flat-Fee and Trip-Generation Bases

The last policy option we evaluate is a TUF using a hybrid of flat fees and trip-generation rates. This alternative attempts to capture the benefits of both the flat-fee and trip-generation models, while avoiding their shortcomings. The main advantage of the trip-generation TUF is that it splits the burden of road maintenance and repair costs among property categories in proportion to usage. This model's main weakness is that it does not differentiate among residential properties. For instance, trip-generation figures estimate that households consisting of one dwelling unit with differing numbers of inhabitants consume transportation services equally. Further details on trip-generation methods are available in Appendix G. The flat-fee alternative, on the other hand, does fairly well in differentiating among residences because number of bedrooms is a reasonable proxy for the number of occupants at the property, and road usage is expected to be roughly proportional to the number of occupants. The flat-fee alternative is much weaker in splitting the burden among residential and other property types. Additionally, the variables used to differentiate among non-residential properties (gross floor area and acreage) appear to be less predictive of actual road usage than trip-generation rates.

Under the hybrid alternative, we allocate transportation costs to non-residential properties according to trip-generation rates, equivalent to the method in our trip-generation model. Similar to our flat-fee model, the hybrid model aggregates total

residential costs among the three land-use categories. This aggregate cost equals the total costs that the three residential categories (i.e., single-family, duplex, and multi-family) would pay under the trip-generation model. Again, we divide this total by the number of bedrooms to obtain a single residential unit cost of $14.29 per bedroom. Just as with the flat-fee TUF, residential properties listed in the MPROP as having no bedrooms are treated as having one bedroom for fee calculation purposes, to reflect the presence of at least a single occupant. The fraction of costs covered by a particular segment of the residential category thus is slightly different than its share of total trips. The number of bedrooms serves as a proxy for the number of people using the roads from that location, and thus for the relative amount of road usage associated with a particular property. Residential fees would therefore vary among properties significantly in this alternative. A single-bedroom condominium, for example, would pay half of the fee incurred for a two-bedroom townhouse and just one quarter of the fee owed by a four-bedroom house. Table 9 shows the distribution of billable units for the hybrid TUF.

Table 9:
Distribution of Billable Units under a Hybrid TUF

Property Classification	Billable Unit	Billable Units per Property		
		Mean	Median	Maximum
Residential				
Single-Family	Bedrooms (#)	2.9	3	14
Duplex	Bedrooms (#)	4.6	4	65
Multi-Family	Bedrooms (#)	13.7	8	910
Mixed: Commercial – Residential	Trips (#)	6,448	2,384	402,930
Commercial				
Wholesale/Retail Trade	Trips (#)	292,313	104,851	14,571,382
Services, Finance, Insurance, Real Estate	Trips (#)	129,308	26,101	16,421,392
Mixed Commercial	Trips (#)	388,180	142,930	9,663,090
Manufacturing, Construction, Warehousing	Trips (#)	45,224	15,882	1,102,919
Transportation	Trips (#)	57,933	16,002	1,944,749
Agriculture and Fishing	Trips (#)	22,636	13,122	89,459
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	Trips (#)	43,581	2,070	30,314,440
Public Parks, Quasi-Public Open Space	Trips (#)	33,753	4,867	819,969

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Table 10 presents the mean, median, and maximum fees that would be charged under a hybrid TUF using this rate. The median fees for single-family residences reflect the median value of three bedrooms for such properties. Duplexes and multi-family residences have higher median fees because they typically have more total bedrooms per property, despite having fewer bedrooms per unit. Likewise, single-family residences end up carrying the lion's share of the burden for residential properties because they are more numerous, despite having typically lower fees per property than other residential properties.

Table 10:
Distribution of Annual Fees under a Hybrid TUF

Property Classification	Fee per Unit	Annual Fee per Property ($)		
		Mean	Median	Maximum
Residential				
Single-Family	$ 10.29	31	31	144
Duplex	$ 10.29	48	41	669
Multi-Family	$ 10.29	141	82	9,366
Mixed: Commercial – Residential	1 ¢	58	21	3,613
Commercial				
Wholesale/Retail Trade	1 ¢	2,621	940	130,647
Services, Finance, Insurance, Real Estate	1 ¢	1,159	234	147,235
Mixed Commercial	1 ¢	3,480	1,282	86,640
Manufacturing, Construction, Warehousing	1 ¢	405	142	9,889
Transportation	1 ¢	519	181	17,437
Agriculture and Fishing	1 ¢	203	118	802
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	1 ¢	391	19	271,800
Public Parks, Quasi-Public Open Space	1 ¢	303	44	7,352

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Analysis

We analyze each alternative on each of the stated criteria, and then compare the policy options against each other.

Equity

We evaluate equity in two ways. First, we evaluate how equitable each policy is under the benefit principle by calculating how well each policy aligns fees with usage. Second, we evaluate how equitable each policy is according to ability to pay.

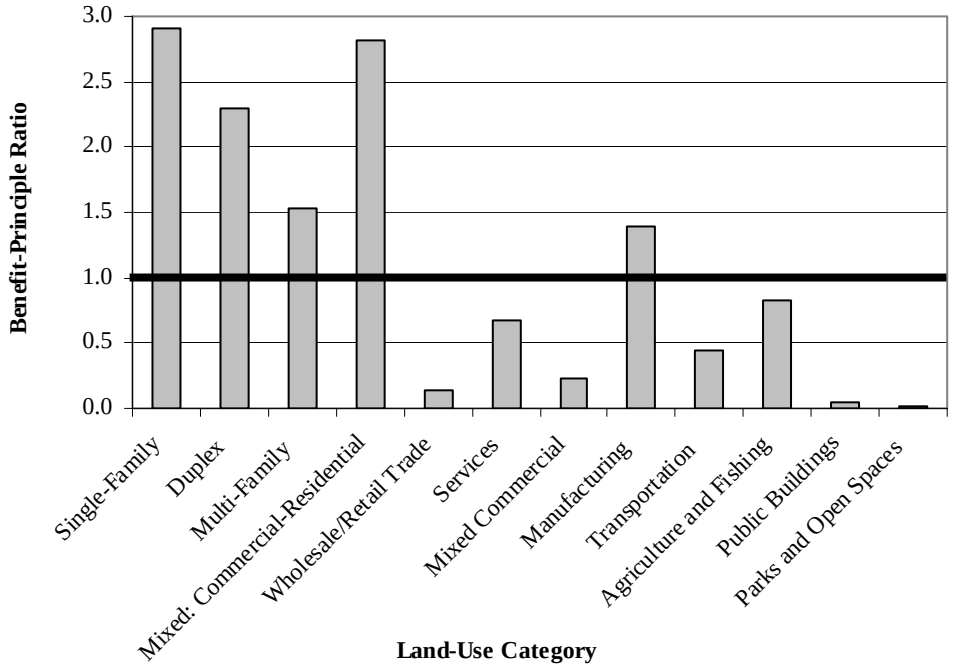
The Benefit Principle

We begin our equity analysis by calculating benefit-principle ratio for each land-use category. This metric describes the ratio of a given land-use category's proportion of transportation infrastructure funding to its transportation infrastructure usage. Under this criterion, the trip-generation model would offer perfect equity with each land-use category exhibiting a benefit-principle ratio equal to 1. The trip-generation model produces this result because we use the same trip-generation figures to estimate the proportion of transportation infrastructure usage for each land-use category and to distribute TUFs among land-use categories under the trip-generation alternative. Of course, the accuracy of our trip-generation estimates, and consequently our benefit-principle ratios, depends largely on the accuracy of the ITE's trip-generation rates. We discuss the strengths and weaknesses of this data further in Appendix G.

The other three alternatives all deviate from perfect benefit-principle equity, and we detail the results in the figures below. We denote perfect benefit-principle equity of 1 with a dark horizontal line. This line also represents the perfect benefit-principle equity exhibited by the trip-generation model. Land-use categories with values exceeding 1 pay disproportionately more for their relative usage, while land-use categories with benefit-principle ratio values below 1 pay disproportionately less.

Under the status quo, all three categories of residential property owners pay considerably more in proportion to their use of transportation infrastructure. As shown in Figure 2, owners of single-family residences, in the aggregate, pay nearly three times as much for transportation infrastructure than they use. Owners of mixed-use commercial-residential property pay a similarly disproportionate amount. Owners of properties in the manufacturing category pay almost 1.4 times as much as they use. The rest of the land-use categories pay disproportionately less for their transportation infrastructure usage. The two quasi-public categories pay nearly nothing for the trips they generate because few of the properties in those categories are taxable by the City.

Figure 2:
Ratio of Payments to Estimated Infrastructure Usage under the Status Quo

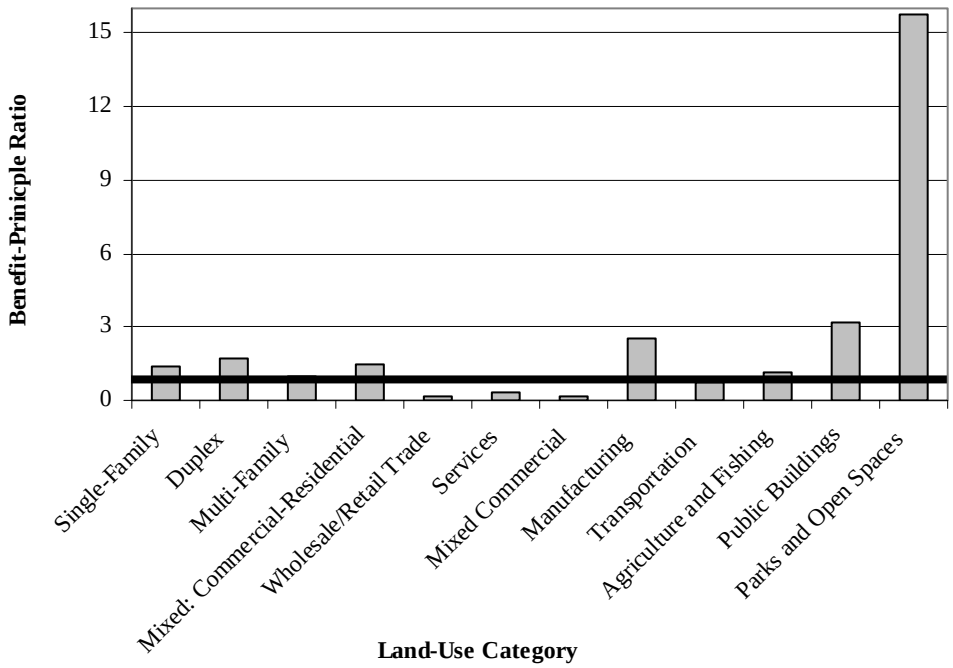


Trip-generation alternative denoted by dark horizontal bar: ▬

Source: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

The flat-fee TUF would impose mixed results according to benefit-principle equity. We display the equity results for this model in Figure 3, below. Some categories, including single-family, duplex, and mixed commercial-residential properties, would, on the whole, pay fees that were more closely related to their usage than under the status quo. Conversely, manufacturing, services, and mixed commercial properties would pay a fee that produces less equitable payments than under the status quo. Public buildings and public open spaces would go from paying nearly nothing to paying more than 3.1 and 15 times their relative usages, respectively. The large shift in payment responsibility relative to trip generation is a result of allocating transportation costs to land-use categories by proportion of overall lot area. These two public/quasi-public land-use categories constitute nearly 37 percent of all lot area in the City, so this model would allocate 37 percent of transportation infrastructure expenditures to those land-use categories. As these properties are mostly public, residents of the City and overlapping counties would pay these fees via their property tax levies.

Figure 3:
Ratio of Payments to Estimated Infrastructure Usage under a Flat-Fee TUF

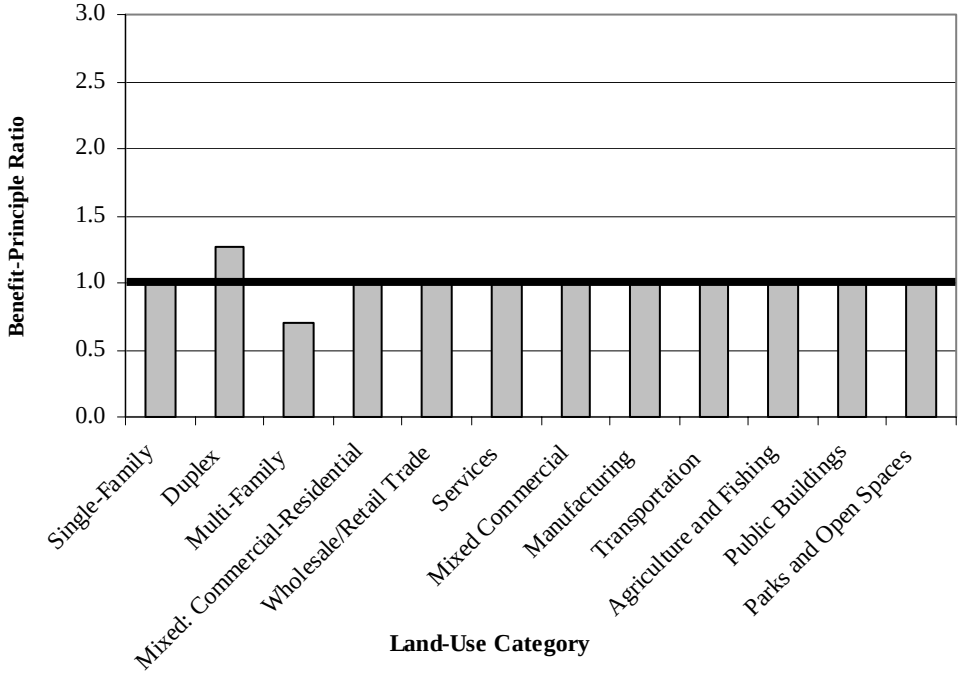


Trip-generation alternative denoted by dark horizontal bar: ▬

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

The hybrid model offers considerably greater benefit-principle equity than the status quo or flat-fee model. All non-residential properties pay perfectly equitable shares of transportation infrastructure expenditures because this model distributes those payments based on the trip-generation estimates used to calculate our benefit-principle ratio. The residential properties, charged a flat fee according to the number of bedrooms, pay in a much more proportionate manner, relative to the status quo and the flat-fee TUF. We display the hybrid model's impact on benefit-principle equity in Figure 4.

Figure 4:
Ratio of Payments to Estimated Infrastructure Usage under a Hybrid TUF



Trip-generation alternative denoted by dark horizontal bar: ▬

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Although the trip-generation model proves most equitable strictly according to our benefit-principle ratio calculations, the hybrid model may actually be more equitable because of its superior ability to reflect the number of trips taken. The trip-generation model assigns trip rates to residential properties (i.e., single-family, duplexes, and multi-family) according to the number of each property's dwelling units. The ITE has collected numerous studies exploring the relationship between dwelling units and trip generation, but number of dwelling units is still a blunt proxy for residential properties. Using this proxy, a house containing one resident is assumed to generate the same number of trips as a mansion with many residents. By contrast, the number of bedrooms, which hybrid model uses, likely serves as a more accurate proxy than trip-generation rates for distinguishing residential properties' relative use of the transportation infrastructure. Bedrooms provide a more accurate estimate for the number of people occupying a property and their use of the transportation network, and therefore would probably result in more accurate estimates of infrastructure usage.

The Ability-to-Pay Principle

We evaluate our alternatives according to the ability-to-pay principle of equity by examining the relative burden each alternative places on residential properties across varying levels of wealth. We focus on residential properties because they represent the vast majority of City properties, and residents' ability to pay is an especially important consideration with new fees. We use assessed property value as a proxy for wealth, and we break down the three residential land-use categories into quintiles based on assessed property value. We display the quintile ranges for single-family, duplex, and multi-family residential properties in Table 11.

Table 11:
Quintile Ranges of Property Value for Residential Properties

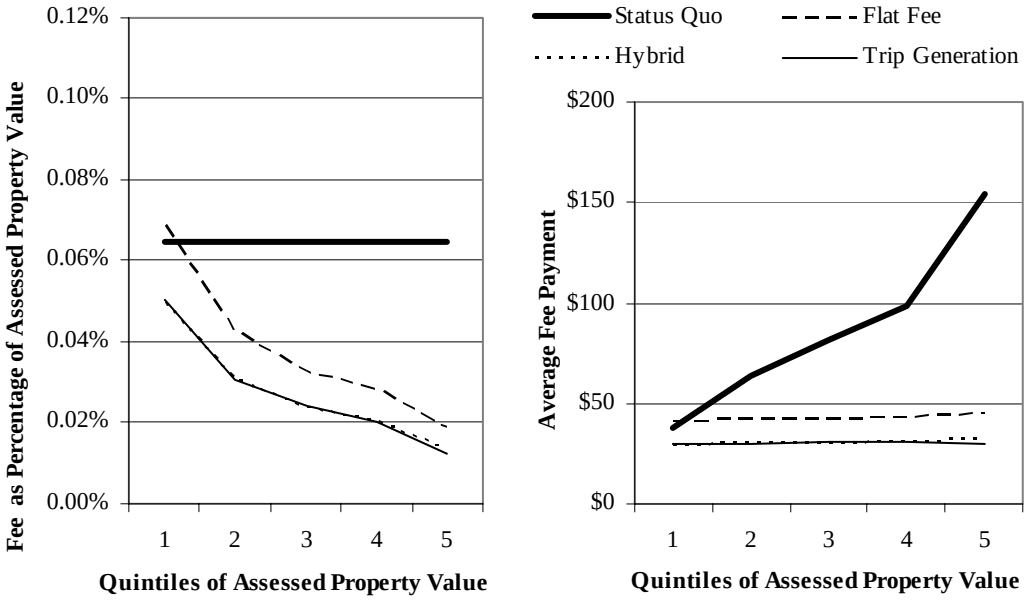
Residential Property Type	Quintiles According to Assessed Value				
	0-20%	**21-40%**	**41-60%**	**61-80%**	**81-100%**
Single-Family	<$81,799	$81,800 to 113,399	$113,400 to 139,099	$139,100 to 167,699	>$167,700
Duplex	<$74,499	$74,500 to 106,899	$106,900 to 141,699	$141, 700 to 179,499	>$179,500
Multi-Family	<$135,599	$135,600 to 202,299	$202, 300 to 285,299	$285,300 to 473,899	>$473,900

Source: City of Milwaukee, Wisconsin 2007

From these quintile ranges, we calculate the mean fee under each alternative and divide that figure by the mean assessed property value. This figure represents the burden relative to wealth. Progressive revenue sources produce greater relative burdens for higher quintile groups, and thus better account for greater household resources available to pay. By contrast, regressive revenue sources produce a less desirable outcome by imposing higher relative burdens on poorer households, consuming a greater portion of their overall wealth. Proportional revenue sources impose a constant burden relative to wealth across all wealth groups.

Under the ability-to-pay principle, all three TUF alternatives would perform fairly. We display the average fee payment (and tax payment under the status quo) for each quintile in the respective residential group in figures 5, 6, and 7. Wealthier single-family, duplex, and multi-family property owners would, on average, pay a smaller proportion of their total assessed property value than their poorer counterparts. This regressivity is evident in the downward sloping curves representing the average relative burden for each quintile group. It should be noted, however, that the burdens decrease across quintiles at a very small rate. Indeed, all variation in relative burden occurs within a range of 0.1 percent of average property wealth. We predict small variations in relative burden because the fees would constitute a very small percentage of assessed property value.

Figure 5:
Fee Burden as Mean Proportion of Wealth
and Mean Fee for Single-Family Properties by Wealth Group

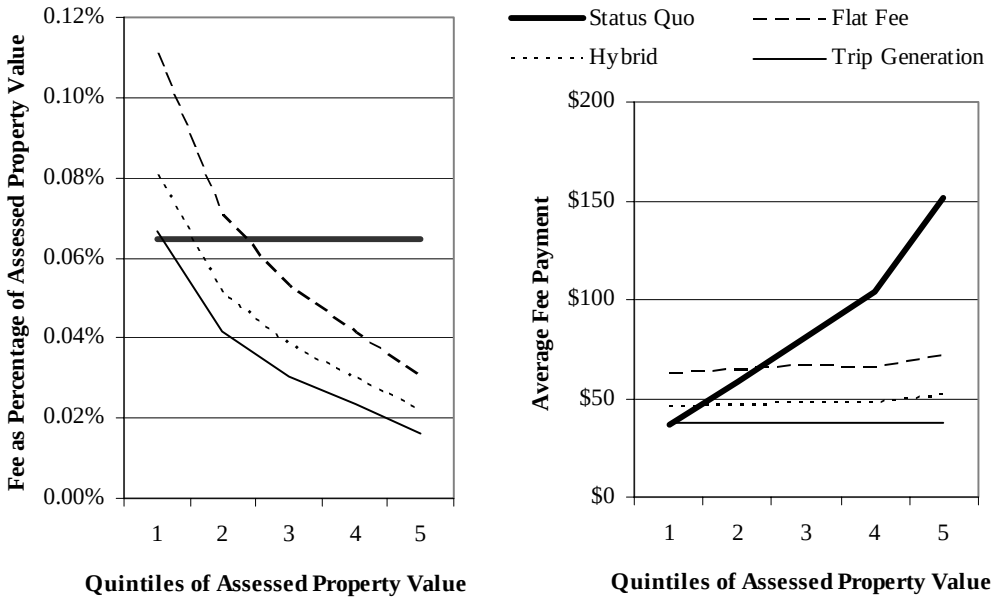


Source: City of Milwaukee, Wisconsin 2007

In contrast to the TUF alternatives, the status quo offers a purely proportional source of transportation infrastructure revenue. The property tax produces this result because the City collects these revenues as a percentage of assessed value. As a result, the status quo must impose a proportional burden.

Like many other user charges, TUFs impose a regressive burden because individuals pay them without regard to their wealth or ability to pay. Rather, property owners pay TUFs commensurate with their service usage. And while the average fee for single-family and duplex households would increase across quintiles, the greater property wealth far exceeds this fee increase. For instance, under the flat-fee alternative the average single-family household in the wealthiest quintile would only pay about $4 more per year than the average household in the poorest quintile, but the wealthier household would possess, on average, nearly $180,000 more assessed property value. This result reflects the fact that the mean number of bedrooms in each quintile is approximately the same and does not increase appreciably with property values.

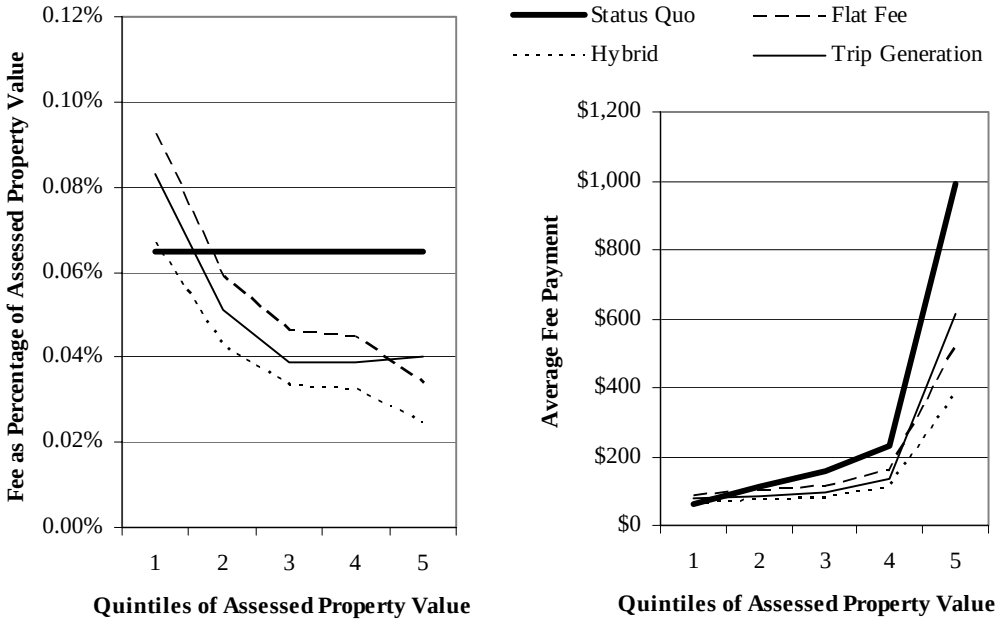
Figure 6:
Fee Burden as Mean Proportion of Wealth and Mean Fee for Duplex Properties by Wealth Group



Source: City of Milwaukee, Wisconsin 2007

As displayed in Figure 7, the average relative burden for multi-family properties begins to level off in the three wealthiest quintiles, exhibiting greater proportionality. Indeed, the trip-generation TUF would prove slightly progressive for the wealthiest quintile. Higher fees at these wealth levels produce greater ability-to-pay equity. More specifically, multi-family property owners pay much higher fees at these wealth levels than their single-family and duplex counterparts because they possess far more billable units. For instance, the average multi-family residence in the wealthiest quintile contains roughly 29 family units and 36 bedrooms. By contrast, the average single-family household in the wealthiest quintile contains, by definition, one family unit, as well as three bedrooms.

Figure 7:
Fee Burden as Mean Proportion of Wealth and Mean Fee for Multi-Family Properties by Wealth Group



Source: City of Milwaukee, Wisconsin 2007

It should be noted that despite the regressive nature of our TUF alternatives, they generally produce smaller relative burdens than the status quo for residential households, because a greater proportion of transportation infrastructure would be paid for by non-residential properties. Given our assumption of revenue neutrality, we estimate that, on average, single-family households will face a smaller burden under all TUF alternatives except for the poorest quintile under the flat-fee model. Duplex and multi-family property owners in the poorest quintile would typically pay more with a TUF than under the status quo but would face a smaller burden, on average, in the other four wealth groups.

Economic Impact

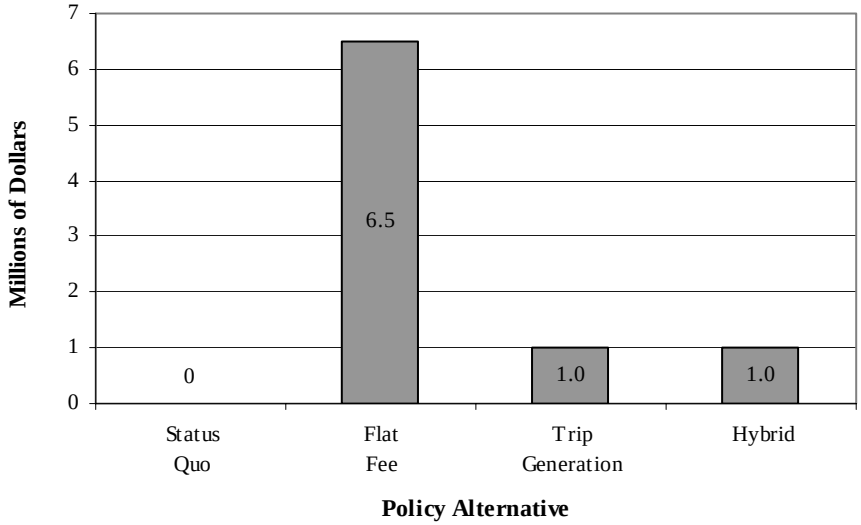
There would be two significant economic results if the City of Milwaukee chose to institute a TUF. First, City budget would accrue funds from sources that currently contribute relatively little toward road maintenance costs. Second, a TUF would redistribute the relative shares of transportation infrastructure costs among property categories, which may affect the economic behavior of individuals and commercial entities.

Importing Revenue

A TUF can elicit money from properties that are exempt from the property taxes that currently fund Milwaukee's transportation infrastructure expenditures. Such properties are typically classified as public or quasi-public. They include federal properties such as post offices; county properties, such as the courthouse; and

many private properties, such as churches. Approximately 5 percent of properties in the City are property-tax-exempt, but these properties represent more than a quarter of the City's total lot area. Under the status quo, however, these properties cumulatively pay less than 0.5 percent of the property taxes used for transportation infrastructure costs. To the extent that a TUF shifts the responsibility for transportation infrastructure costs from City residents and businesses to other governmental and private tax-exempt entities, it directly draws new funds into the City. Figure 8 compares the amount of revenue each alternative draws from tax-exempt properties.

Figure 8:
Total Revenue Drawn from Tax-Exempt Properties



Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

A TUF can also draw money into the City indirectly. Property taxes in 2007 will allot 87 percent of transportation infrastructure costs to residential properties and 13 percent to non-residential properties. Non-residential properties generate traffic from individuals residing outside of the City as a source of employment or as a site of commerce and industry. Non-residents do not pay property taxes and, therefore, do not directly contribute revenue to cover transportation infrastructure costs. As a TUF shifts a greater share of the transportation infrastructure financing burden to non-residential properties, those properties experience increased operational costs. As a result, owners of non-residential properties will likely pass on some of those cost increases to non-residents in the form of higher prices or lower wages. In other words, shifting an increased portion of the burden to non-residential properties will probably pass some of the costs of infrastructure usage by non-residents to non-residents.

All of the TUF alternatives we analyze would increase the amount of money paid by tax-exempt and non-residential properties. Table 12 shows the distribution of properties in Milwaukee by land-use category and the total amount of transportation infrastructure revenue that would come from each of those categories under each of our policy alternatives.

Table 12:
Comparison of Dollar Burdens
to Recover Transportation Infrastructure Revenue in 2007 ($17.8 Million)

Property Classification	Percentage of Properties (%)	Annual Fees (in $1,000's)						
		Status Quo	Flat-Fee		Trip-Generation		Hybrid	
			Total	Change	Total	Change	Total	Change
Residential								
Single-Family	63	8,510	4,108	(4,402)	2,938	(5,572)	2,977	(5,532)
Duplex	23	3,039	2,321	(718)	1,326	(1,713)	1,682	(1,357)
Multi-Family	4	2,003	1,258	(746)	1,307	(697)	911	(1,092)
Mixed: Commercial – Residential	2	464	247	(218)	165	(299)	165	(299)
Commercial								
Wholesale/Retail Trade	1	624	689	65	4,450	3,826	4,450	3,826
Services, Finance, Insurance, and Real Estate	1	1,366	615	(751)	2,042	676	2,042	676
Mixed Commercial	1	720	449	(271)	3,212	2,493	3,212	2,493
Manufacturing, Construction, and Warehousing	1	691	1,271	580	496	(194)	496	(194)
Transportation	1	197	321	124	449	251	449	251
Agriculture and Fishing	0	3	5	1	4	1	4	1
Public/Quasi-Public								
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	2	58	3,961	3,906	1,258	1,200	1,258	1,200
Public Parks, Quasi-Public Open Space	3	2	2,565	2,562	163	160	163	160

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Note: We exclude properties that are vacant, under construction, or not assigned to a land-use category from the calculations in Table 12.

Table 13 displays how the burden of transportation infrastructure costs would be split among the property categories under each of our policy alternatives. Any of the TUF alternatives we analyze would shift a significant fraction of those costs onto public and quasi-public properties that are largely exempt from property taxes. The alternatives that utilize trip-generation data (trip-generation and hybrid TUFs) would also shift a significant fraction of transportation infrastructure costs onto commercial properties, allowing for greater indirect capture of funds from non-residents of Milwaukee.

Table 13:
Comparison of Dollar Burden Distributions

Property Classification	Percentage of Properties (%)	Percentage of Dollar Burden (%)			
		Status Quo	Flat-Fee	Trip-Generation	Hybrid
Residential					
Single-Family	63	48	23	17	17
Duplex	23	17	13	7	9
Multi-Family	4	11	7	7	5
Mixed: Commercial – Residential	2	3	1	1	1
Commercial					
Wholesale/Retail Trade	1	4	4	25	25
Services, Finance, Insurance, and Real Estate	1	8	3	11	11
Mixed Commercial	1	4	3	18	18
Manufacturing, Construction, and Warehousing	1	4	7	3	3
Transportation	1	1	2	3	3
Agriculture and Fishing	0	0	0	0	0
Public/Quasi-Public					
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	2	0	22	7	7
Public Parks, Quasi-Public Open Space	3	0	14	1	1

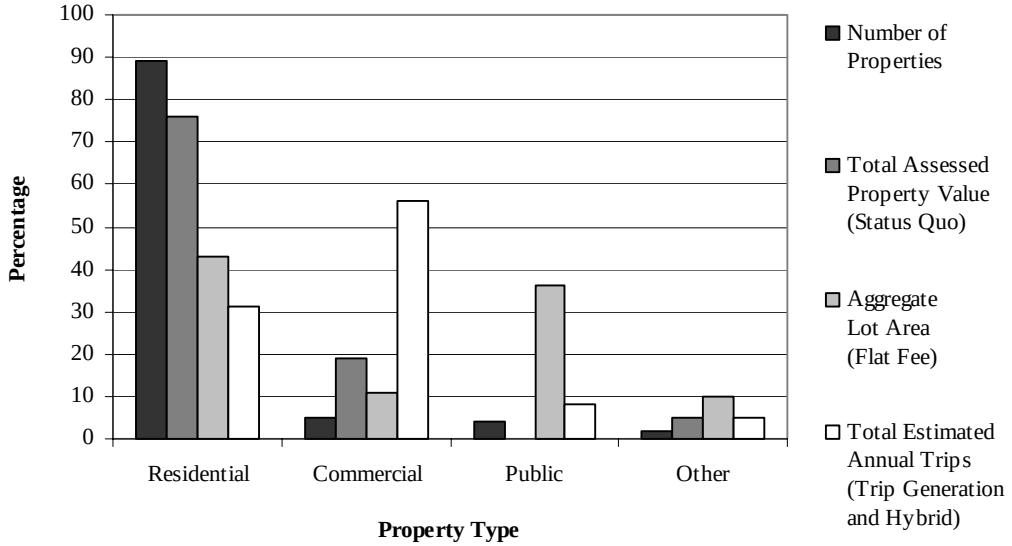
Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Note: We exclude properties that are vacant, under construction, or not assigned to a land-use category from the calculations in Table 13.

Market Distortions

Because the property tax system does not align cost with usage, it distorts economic behavior. In this case, those who pay a disproportionate share relative to their usage of the transportation infrastructure are discouraged from owning property, and those who receive an excess of benefits are enticed to own. Actual use of the infrastructure would not be directly affected because fee payment is not made at the time of use, and the fee does not reflect precise usage, but rather an estimation of likely usage. A TUF would produce less distortion of economic behavior because it provides better alignment between costs and use. Figure 9 shows how properties are distributed in the City of Milwaukee, and how each alternative would divide the financial burden of transportation infrastructure costs across them.

Figure 9:
Comparison of Dollar Burden Distributions by Property Type



Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Residential properties, which account for 89 percent of all properties in the City, pay a much greater share of transportation infrastructure costs via property taxes than is warranted by the infrastructure use associated with those properties. In addition to the inequity of the situation discussed earlier, the transportation infrastructure funding system likely distorts the market and discourages home ownership within the City. Under all of our TUF alternatives, total fees for residential properties would be less than the current total paid in property taxes toward transportation infrastructure costs. If implementation of a TUF is accompanied by a commensurate reduction in property taxes, then market distortion would be reduced, and owning residential property within Milwaukee's city limits would appear more desirable to individuals.

All of the TUF alternatives reduce the burden allocated to agricultural properties as well. The tax database only lists 20 properties in this category, though, and all would pay less than $1,000 under any option, so the effects from this property category are negligible.

While residential and agricultural properties would benefit under any TUF alternative, the effects on commercial and manufacturing properties vary according to the specific TUF options. The flat-fee TUF reduces the burden on most commercial properties because its fees are primarily based upon lot area, and commercial lot areas are typically smaller than those of manufacturing or public properties. So the flat-fee TUF would likely encourage commercial property ownership in the City, assuming that the fees paid offset property taxes. The trip-generation and hybrid models increase the liability for commercial properties because of their relatively high traffic volume. To the extent that a TUF increases costs to businesses, it discourages commercial property ownership. These properties represent less than 3 percent of all City properties, so relatively few property owners would be directly affected. Median fees for commercial properties would be in the vicinity of $1,000, which does not seem unduly burdensome for businesses. Though the maximum for certain commercial properties under a trip-generation or hybrid TUF is more than $100,000, the fees for only three properties in the category would equal more than the maximum paid in 2007 by a residential property via property taxes, which was $36,400. Therefore, a cap on fees could easily address any hardship involved with the TUF.

Manufacturing properties, as a group, would be most burdened by the flat-fee TUF because those properties are typically larger than residential or commercial properties. The trip-generation and hybrid TUFs reduce the amounts that manufacturing properties would pay because their fees are based on trip or traffic volume, which we estimate would be lower for manufacturing than for commercial properties. Even under the flat-fee TUF, however, the median paid by manufacturing properties is less than $400 annually. In terms of possible outliers, what is probably most significant for these properties is that the maximum fee paid by a single manufacturing property under any of the TUF alternatives is less than a quarter of the maximum paid via property taxes, despite the higher total paid by the category as a group.

Public properties include post offices, courthouses, churches, hospitals, and schools. The category as a whole would pay a much larger share of transportation infrastructure costs with a TUF, but most of those properties would not relocate even with a stiff fee because they are bound to the City by their nature or function. Market distortion would therefore be less than would be the case for commercial properties. Also, the median fee of less than $50 is low. Certain public properties, however, would face rather onerous burdens under a TUF. The airport, for example, would end up with a fee of at least $150,000 with the most favorable TUF, and more than $610,000 with a flat-fee TUF. However, only 13 public properties' TUFs would exceed the maximum 2007 residential transportation

infrastructure property tax of $36,400, and only three would exceed this maximum under the flat-fee alternative. A cap on fees could easily avoid any burdens that the City deems excessive.

Table 14 compares the median fees that would be paid by various classes of properties under the status quo and each of the TUF alternatives. It shows the median fees needed to recover annual tax levy revenues in 2007. Though median fees for some property classes under a TUF are higher than the median for the class under the status quo, the actual fee amounts do not appear unreasonable and seem unlikely to discourage commerce in the City. In addition to being more equitable, the lower fees for residences would encourage home ownership within the City.

Table 14:
Comparison of Median Annual Fees to Recover Transportation Infrastructure Revenue in 2007 ($17.8 Million)

Property Classification	Percentage of Properties (%)	Median Annual Fee per Property ($)			
		Status Quo	Flat-Fee	Trip-Generation	Hybrid
Residential					
Single-Family	63	82	43	31	31
Duplex	23	81	57	37	41
Multi-Family	4	158	114	86	82
Mixed: Commercial – Residential	2	83	57	21	21
Commercial					
Wholesale/Retail Trade	1	176	138	940	940
Services, Finance, Insurance, and Real Estate	1	122	73	234	234
Mixed Commercial	1	272	178	1,282	1,282
Manufacturing, Construction, Warehousing	1	223	397	142	142
Transportation	1	35	89	181	181
Agriculture and Fishing	0	104	189	118	118
Public/Quasi-Public					
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	2	0	139	19	19
Public Parks, Quasi-Public Open Space	3	0	42	44	44

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Note: We exclude properties that are vacant, under construction, or not assigned to a land-use category from the calculations in Table 14.

Table 15 shows the maximum fee each property category would pay under each policy alternative to recover an amount equal to the transportation infrastructure portion of the property tax levy in 2007.

Table 15:
Comparison of Maximum Annual Fees to Recover Transportation Infrastructure Revenue in 2007 ($17.8 Million)

Property Classification	Percentage of Properties (%)	Maximum Annual Fee per Property ($)			
		Status Quo	Flat-Fee	Trip-Generation	Hybrid
Residential					
Single-Family	63	11,821	199	187	144
Duplex	23	1,623	923	483	669
Multi-Family	4	36,334	12,922	14,814	9,366
Mixed: Commercial – Residential	2	16,310	3,322	3,613	3,613
Commercial					
Wholesale/Retail Trade	1	10,139	37,991	130,647	130,647
Services, Finance, Insurance, and Real Estate	1	113, 362	19,472	147,235	147,235
Mixed Commercial	1	63,504	12,065	86,640	86,640
Manufacturing, Construction, and Warehousing	1	13,734	29,769	9,889	9,889
Transportation	1	10,212	11,737	17,437	17,437
Agriculture and Fishing	0	750	537	802	802
Public/Quasi-Public					
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	2	12,755	610,205	271,800	271,800
Public Parks, Quasi-Public Open Space	3	1,557	61,749	7,352	7,352

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Note: We exclude properties that are vacant, under construction, or not assigned to a land-use category from the calculations in Table 15.

While the flat-fee TUF generates the most extreme fees, it draws in the most money from outside the City and reduces the fraction of burden carried by commercial properties. Thus, it may still be a desirable option. Table 16 shows the number of properties in each category for which a TUF would be less than the amount currently paid via property taxes.

Table 16:
Distribution of Properties for which TUF Charge Would Not Exceed Status Quo Charge

Property Classification	Total Properties		Properties with Fee Not Exceeding Status Quo Charge					
			Flat-Fee		Trip-Generation		Hybrid	
	Number	%	Number	%	Number	%	Number	%
Residential								
Single-Family	97,423	63	86,434	89	92,890	95	92,106	95
Duplex	35,234	23	23,016	65	31,621	90	28,639	81
Multi-Family	6,456	4	4,394	68	5,017	78	5,614	87
Mixed: Commercial – Residential	2,854	2	2,033	71	2,469	87	2,469	87
Commercial								
Wholesale/Retail Trade	1,699	1	840	49	226	13	226	13
Services, Finance, Insurance, and Real Estate	1,762	1	1,332	76	656	37	656	37
Mixed Commercial	923	1	639	69	69	7	69	7
Manufacturing, Construction, and Warehousing	1,225	1	311	25	828	68	828	68
Transportation	875	1	230	26	176	20	176	20
Agriculture and Fishing	20	0	6	30	7	35	7	35
Public/Quasi-Public								
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	3,284	2	176	5	1,559	47	1,559	47
Public Parks, Quasi-Public Open Space	3,979	3	7	0	4	0	4	0

Sources: City of Milwaukee, Wisconsin 2007; Institute of Transportation Engineers 2003

Note: We exclude properties that are vacant, under construction, or not assigned to a land-use category from the calculations in Table 16.

Budgetary Impact

We continue our analysis by assessing the budgetary impact that each alternative would have, given our assumption of revenue neutrality with respect to the status quo for each of the TUF alternatives.

Revenue Adequacy and Stability

Present trends and the likelihood of continuing political and legal constraints on property tax revenue suggest that the status quo will not provide sufficient revenue to optimally fund Milwaukee's transportation infrastructure. That said, because property values are unlikely to change dramatically over the short-term, the status quo provides a dependable and stable source of revenue.

Because City officials would have the discretion to specify the revenue target for a TUF, implementing any of the three TUF alternatives would have the potential to provide adequate revenue to optimally fund Milwaukee's transportation infrastructure needs. Of course, several optional features of TUFs, such as fee caps or exemptions for specific property types, could prevent the City from obtaining the revenue needed to optimally fund the City's transportation infrastructure. However, if such a situation arose, City officials would simply have to specify a higher revenue target for the TUF to alleviate the problem.

In addition to providing adequate revenue, the revenue stability of the three TUF alternatives likely would be comparable. The flat-fee alternative bases its fee structure on physical characteristics of the properties (i.e. lot area, number of bedrooms, and gross floor area). Such characteristics are very rarely subject to short-term changes. As a result, City officials could be very confident in the stability of this revenue stream.

The trip-generation alternative bases the fee structure not only on the physical characteristics of properties, but also on trip-generation data compiled by the ITE. The physical characteristics of properties largely remain stable from year-to-year. However, trip-generation data also remain largely unchanged. As a result, the revenue and fee structure of a trip-generation TUF alternative would not change substantially over time. The hybrid TUF alternative also uses the same data as the flat-fee and trip-generation alternatives. Because those alternatives have been assessed as having stable revenue sources, the hybrid TUF alternative likely will have comparable revenue stability.

All of the alternatives that we evaluate, including the status quo, provide sufficient flexibility to accommodate typical economic fluctuations. This can be attributed to two factors. First, City officials can specify any revenue target for the TUF alternatives. Second, the fee structures of each alternative are based on characteristics that are largely unaffected by exogenous economic conditions. Together, these factors insulate the revenue streams against economic downturns. In sum, all three TUF alternatives perform better than the status quo on the measure of revenue adequacy and stability. However, the three TUF alternatives are indistinguishable from one another on this impact category.

Contribution to Revenue Diversification

Municipal governments should strive to create a portfolio of diversified revenue streams (Allan 1995). Specifically, a municipality's revenue portfolio would balance all major taxes and incorporate user fees when possible. Because the status quo maintains the current combination of revenue sources, this alternative clearly performs the worst on the impact category measuring the contribution to revenue diversification.

The flat-fee, trip-generation, and hybrid TUF alternatives all perform better than the status quo on the measure of contribution to revenue diversification, but the three TUF alternatives do not differ significantly from each other on this measure. Each TUF alternative generates revenue as a user fee and differs only in the basis for the fee. As a result, each TUF alternative would contribute equally to the diversification of the Milwaukee's revenue portfolio. Under the status quo, transportation infrastructure is funded by property taxes, intergovernmental revenue, miscellaneous revenue, and special assessments. Implementation of any TUF alternative would add "user fees" to the City's transportation infrastructure revenue portfolio. While we assume that a TUF would be revenue neutral for the purposes of fairly comparing our alternatives, the City would retain the ability to raise additional revenue via property taxes rather than replacing it completely with the TUF.

Feasibility

We conclude our analysis by assessing the political, legal, and administrative feasibility of each alternative.

Political Feasibility

Milwaukee recently began charging residents user fees for a variety of services, including removal of snow, storm water, and solid waste. Milwaukee residents have not always greeted new fees with enthusiasm. They contend that they should pay for such services through their property taxes and may oppose the institution of yet another fee. In contrast, the status quo is largely uncontroversial. The confluence of these factors leads us to judge the status quo as the most politically feasible of the four alternatives examined in this analysis.

Among the alternatives, the flat-fee proposal appears to be the most politically feasible. Under this proposal, residential and commercial properties, which make up more than 90 percent of the properties in Milwaukee, would potentially pay less to fund transportation infrastructure than they do under the status quo. In 2007, the median single-family residential property paid just more than $80 in property taxes to fund transportation infrastructure in Milwaukee. Under the flat-fee TUF alternative, the median property would pay $43 per year (see Table 14). The situation for commercial properties is similar. On the other hand, the remaining property types (manufacturing, transportation, agriculture, and public properties) would experience, on average, a modest increase in their burden of funding the City's transportation infrastructure. On the whole, the fact that 90 percent of properties would potentially see a reduction in their transportation

infrastructure funding burden leads us to judge the flat-fee TUF alternative to be politically feasible. However, adopting this proposal would be more contentious than continuing the status quo.

While residential properties fare well under the flat-fee TUF alternative, they fare even better under the trip-generation and hybrid alternatives. The same cannot be said for commercial properties. On average, these properties would pay substantially more under the trip-generation or hybrid TUF alternatives than they do under the status quo. This represents a problem for the political feasibility of those alternatives. Business owners often have considerable political clout in communities and have the potential to prevent the implementation of the trip-generation and hybrid TUF alternatives because of their significant negative impacts on commercial properties, relative to the status quo. That said, we believe that with enough political will, any of the TUF alternatives could end up being adopted.

In sum, any alternative this report examines could be adopted, but one may require more political willpower on the part of City policymakers than another. We judge the political feasibility of the alternatives from most to least politically feasible as follows: status quo, flat-fee TUF, hybrid TUF, trip-generation TUF.

Legal Feasibility

Each of the current funding streams (i.e. intergovernmental aid, property taxes, special assessments, and miscellaneous revenue) is well-established and unquestionably legal under federal, state, and local law. As a result, we judge the status quo to be the most legally feasible of the four alternatives we considered.

TUF charges, like any other user fee, must be reasonably related to the amount of use of the service in question if they are to be considered legal. If a court judges the TUF charges to have little or no relation to use, then the fee is essentially a tax that local governments are not authorized to levy in Wisconsin. Given that standard, it is clear that the TUFs employing a trip-generation fee basis are likely to be judged legal if challenged in court. These alternatives distribute TUF charges for individual properties in Milwaukee based on unique property characteristics and trip-generation data collected from the ITE.

Of the two TUF alternatives that base their fee structure on trip generation, it is unclear which would most closely align charges with actual usage. Trip generation is based on well-documented research from the ITE but does not distinguish among residential properties. The hybrid model is a more intuitive approach and has not yet been subjected to empirical analysis. More precisely, the hybrid TUF alternative is identical to the trip-generation TUF on all non-residential land-use categories, but within the residential category, it bases a property's charge on the number of bedrooms. This metric is likely correlated with transportation infrastructure usage, but the correlation is perhaps not as certain as the correlation between trip generation and infrastructure usage. However, we judge that the

hybrid alternative will prove superior to the pure trip-generation basis in aligning charges with usage, and therefore in terms of legality.

The highly detailed ITE data do not guarantee that a TUF employing a trip-generation or hybrid fee basis will ultimately be judged legal in a court of law. TUFs based on trip-generation data have been ruled unconstitutional in some other states. Appendix J provides an example of a TUF ordinance from Hubbard, Oregon, that has survived all legal challenges (City of Hubbard 2001).

The TUF alternative that charges properties based on a flat-fee structure is the least likely of the four alternatives we consider to survive a legal challenge. We choose characteristics that would likely succeed in relating a property's charge to its usage, but it is unlikely that property characteristics can predict transportation infrastructure usage as effectively as trip-generation data. As a result, we deem it less likely that a flat-fee TUF would pass constitutional muster if challenged in court. In sum, we judge the legal feasibility of the alternatives from most to least feasible as follows: status quo, hybrid TUF, trip-generation TUF, flat-fee TUF.

Administrative Feasibility

As with political and legal feasibility, the status quo rates highest on the administrative feasibility measure. We attribute this rating to the fact that the Milwaukee City government administers the status quo in an effective manner.

Among the TUF alternatives, the flat-fee proposal appears to be the most administratively feasible option. City officials possess all the data in the MPROP file required to calculate all TUF charges using the flat-fee basis. The City would only need to make a couple of small investments to administer the flat-fee TUF alternative. More precisely, the City would likely need an employee to supervise the TUF administration and ensure that the MPROP file was routinely updated.

Successfully administering the trip-generation or hybrid TUF alternatives would require a larger investment from the City. In addition to maintaining the MPROP file, City officials would need to become intimately familiar with ITE trip-generation data. Every time the land-use category of a property changed, City officials would have to determine the proper trip-generation classification for that property. Further, administrators would need to keep abreast of the constantly evolving trip-generation estimates to ensure that TUF charges reflected the best estimates of usage. All things considered, because the hybrid TUF alternative requires both property characteristics and trip-generation data, administration of this alternative would be slightly more complicated than administration of the trip-generation TUF alternative. However, even for these relatively more complicated alternatives, newly generated revenues from the TUF would likely be far larger than any additional administrative costs. In sum, we judge the administrative feasibility of the alternatives from most to least feasible as follows: status quo, flat-fee TUF, trip-generation TUF, hybrid TUF.

Recommendations

We make a general policy recommendation and give our reasoning for it. We then give specific recommendations that would assist City officials if they decide to adopt our primary recommendation.

Policy Recommendation

We recommend that the City of Milwaukee adopt a TUF to finance transportation infrastructure needs. More specifically, we recommend that the City implement our hybrid TUF alternative, whose fee schedule is based upon trip-generation data from the Institute of Transportation Engineers, and augmented by data on individual properties kept by the tax assessor. The hybrid and pure trip-generation TUF models we analyzed would align costs with usage and import revenue from outside the City more effectively than the status quo or a flat-fee TUF. We expect that the hybrid TUF would do a somewhat better job than the trip-generation model of ensuring horizontal equity among residential properties. That expectation guides our recommendation.

While the hybrid and trip-generation alternatives both significantly increase the burdens on commercial businesses, they simultaneously reduce the burden on residents – which is currently disproportionately high. The trip-generation TUF is therefore preferable to the status quo and a flat-fee TUF and would be a good choice if simplicity of design was a concern.

All of the TUF alternatives would help diversify Milwaukee's revenue sources by replacing a portion of property taxes with a user charge. Also, the TUFs all improve revenue adequacy by allowing for revenue to pace increases in costs without regard to tax constraints. All options we examine appear to offer similar levels of revenue stability.

Table 17 summarizes the results of our analysis of the various TUF options against our stated criteria. Each alternative is rated on each criterion as poor, fair, good, or excellent. Entries in bold indicate the best rating achieved by any of the alternatives on a particular criterion.

Table 17:
Summary of Policy Alternatives Evaluated Against Policy Goals

Goals	Impact Category	Status Quo	TUF Alternatives		
			Flat Fee	Trip Generation	Hybrid
Equity	*Benefit Principle:* Aligns Cost with Usage	Poor	Fair	Good	**Excellent**
	Ability-to-Pay Principle: Aligns Costs with Affordability	**Good**	Fair	Fair	Fair
Economic Impact	Imports Revenue	Poor	**Excellent**	Good	Good
	Minimizes Economic Distortions	Poor	Fair	Good	**Excellent**
Budgetary Impact	Ensures Revenue Adequacy and Stability	Fair	**Good**	**Good**	**Good**
	Diversifies Revenue Sources	Poor	**Good**	**Good**	**Good**
Feasibility	Political	**Excellent**	Good	Fair	Fair
	Legal	**Excellent**	Fair	Good	Good
	Administrative	**Excellent**	Good	Fair	Fair

Source: Authors

Recommendations Relevant for Implementing a TUF

If the City pursues any of the TUF alternatives, it should include an effective appeals process. TUFs in other jurisdictions sometimes failed legal challenges because they did not adequately align costs, resulting in unfavorable legal rulings. An appeals process allows for adjustment of fees when a case can be made that the general rule was inadequate to align cost with use, thus giving the TUF the best chance of withstanding legal challenges.

We also recommend that the City of Milwaukee consider employing trip-generation rate adjustments to account for pass-by trips and varying trip lengths. Pass-by adjustments reduce trip rates for properties that generate excessive numbers of trips, simply because people frequently stop at these properties during their journey to their end destination. Pass-by properties include gas stations and supermarkets (Federal Highway Administration 1985). Furthermore, some properties induce trips of varying lengths and, therefore, of varying infrastructure burden. We provide examples of pass-by and trip-length adjustments in Appendix K. In addition, we also provide a brief profile of the pass-by properties in the City of Milwaukee in Appendix I.

In addition, the City should consider whether exemptions for certain property types would be appropriate. We exempted two of the 13 land-use categories (i.e., vacant properties and those under construction) from our models, but did not make exemptions for specific land uses (e.g., cemeteries). Appendix I discusses specific land uses that may warrant special consideration.

Finally, we suggest that if the City adopts any of the TUF alternatives, it also investigate the possibility of setting caps to limit the maximum possible fee. Each TUF rate structure has the possibility of producing unusually large fees in isolated cases, and appropriate caps would avoid the problems that such fees could cause for the small number of affected properties. A cap set equal to the maximum paid by a single residential property under the status quo, for example, would be applicable to about a dozen properties or fewer, but would still be very effective in avoiding onerous fees. Appendix I discusses properties with unusually large fees and possibilities for addressing their situations in greater depth.

References

Allan, Ian J. (1995). Evaluating Alternative Revenue Sources. In J. Rabin, W.B. Hildreth, and G.J. Miller (Eds.), *Budgeting: Formulation and Execution* (pp. 358-366). Athens, GA: Carl Vinson Institute of Government.

Beimborn, Edward, and Kennedy, Rob. (n.d.). *Inside the Black Box: Making Transportation Models Work for Livable Communities.* Retrieved March 6, 2007 from http://www.environmentaldefense.org/documents/1859_InsideBlackBox.pdf

Bezruki, Don, Lecoanet, Robin, Hammer, Christine, and Sakk, Lori. (2004). Best Practices: Local Government User Fees. Madison, WI: Wisconsin Legislative Audit Bureau. Retrieved February 27, 2007 from http://www.legis.state.wi.us/lab/reports/04-0UserFeesFull.pdf

Bloom v. City of Fort Collins. (1990). 784 P .2d 304 (Colo. 1990).

Brewster v. Pocatello. (1988). 768 P.2d 765 (Id. 1988).

Buttke, Carl H. (1984). *Using the ITE Trip Generation Report*. Prepared for Institute of Transportation Engineers. July, 1984. Washington, D.C: Institute of Transportation Engineers. Found in Federal Highway Administration (1985). *Development and Application of Trip Generation Rates – Final Report*. United States Department of Transportation. Washington, D.C.: Author. Retrieved February 26, 2007 from http://ntl.bts.gov/DOCS/382DNA.html

City of Beaumont, Texas. (2007). *Code of Ordinances.* Beaumont, TX: Author. Retrieved May 5, 2007 from http://www.municode.com/Resources/gateway.asp?pid=10140&sid=43

City of Grants Pass, Oregon. (2006). *Municipal Code.* Grants Pass, OR: Author. Retrieved February 28, 2007 from http://www.grantspassoregon.gov/Modules/ShowDocument.aspx?documentid=303

City of Hubbard, Oregon. (2001). Ordinance No. 244-2001, 2001.

City of Klamath Falls, Oregon. (2007). *Street Lighting Utiltiy Act.* Klamath Falls, OR: Author. Retrieved May 5, 2007 from http://www.orcities.org/portals/17/A-Z/transp029.pdf

City of Loveland, Colorado. (2007). *Loveland 2020 Transportation Plan.* Loveland, CO: Author. Retrieved February 28, 2007 from http://www.ci.loveland.co.us/publicworks/Loveland2020TransPlan.pdf

City of Milwaukee, Wisconsin. (n.d.). *Assessment Base and Classes of Property*. Milwaukee, WI: Author. Retrieved February 26, 2007 from http://www.city.milwaukee.gov/AssessmentBaseampCla723.htm.

City of Milwaukee, Wisconsin. (2007). *Master Property Record*. Milwaukee, WI: Author. Retrieved February 26, 2007 from http://isdweb1.ci.mil.wi.us/gis/mprop/mprop.zip.

City of Milwaukee, Wisconsin. (2006a). *2007 Detailed Budget: Department of Public Works: Infrastructure Services*. Milwaukee, WI: Author. Retrieved February 18, 2007 from http://www.ci.mil.wi.us/display/displayFile.aspx?docid=18557&filename=/User/crystali/2007budget/2007_bmd2s_pdfs/07dpwinfr_bmd2.pdf

City of Milwaukee, Wisconsin. (2006b). *2007 Detailed Budget: Department of Public Works: Revenues, Detailed Listing*. Milwaukee, WI: Author. Retrieved February 18, 2007 from http://www.ci.mil.wi.us/display/displayFile.aspx?docid=18557&filename=/User/crystali/2007budget/2007_bmd2s_pdfs/07sfgcp_bmd2.pdf

City of Milwaukee, Wisconsin. (2006c). *2007 Detailed Budget: Capital Improvements*. Milwaukee, WI: Author. Retrieved February 18, 2007 from http://www.ci.mil.wi.us/display/displayFile.aspx?docid=18557&filename=/User/crystali/2007budget/2007_bmd2s_pdfs/07capimp_bmd2.pdf

City of Milwaukee, Wisconsin. (2006d.). *2007 Plan and Budget Summary*. Milwaukee, WI: Author. Retrieved February 28, 2007 from http://www.ci.mil.wi.us/display/displayFile.aspx?docid=16655&filename=/User/crystali/2007budget/07adoptedbudgetbook.pdf

City of Milwaukee, Wisconsin. (2006e). *2006 Assessment and Taxes*. Milwaukee, WI: Author. Retrieved February 28, 2007 from http://www.city.milwaukee.gov/display/displayFile.aspx?docid=20246&filename=/User/dmalqu/2006_ASSMT_and_TAXES_BOOKLET.pdf.

City of Milwaukee, Wisconsin. (2005). *Master Property File Documentation*. Milwaukee, WI: Author. Retrieved February 26, 2007 from http://isdweb1.ci.mil.wi.us/gis/mprop/Documentation/mprop.doc

City of Port Orange v. State. (1994). Case No. 93-32203-CI-CI-32, slip op. at 20 (Fla. 7th Cir. Ct. Jan 6, 1994).

City of Talent, Oregon. (2000). Ordinance Number 678. *Talent Ordinances.* July 19, 2000. Talent, Oregon: Author. Retrieved April 23, 2007 from http://www.cityoftalent.org/vertical/Sites/%7BAA1CCE57-8F49-4306-B28A-3A526BAB71E9%7D/uploads/%7BE5BB59B5-CA7C-4616-9AF9-398BFC8DA7E3%7D.PDF

City of Tualatin, Oregon. (2005). *Tualatin Municipal Code.* Tualatin, OR: Author. Retrieved February 28, 2007 from http://www.ci.tualatin.or.us/city/Departments/Legal/images/TMC/Chapter3-4.pdf

Covell v. City of Seattle. (1995). 127 Wn.2d 874 (1995).

Emerson College v. City of Boston. (1984). 462 N.E.2d 1098 (Mass. 1984).

Ewing, Reid. (1994). Transportation Utility Fees. *Government Finance Review, 10,* 13-17.

Federal Aviation Administration, U.S. Department of Transportation. (2007). *Airport Data*. Washington, D.C.: Author. Retrieved March 18, 2007 from http://www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/menu/contacts.cfm?Region=&District=&State=WI&County=&City=MILWAUKEE&Use=&Certification=IS%20NULL%20OR%20CertificationTypeDate%20IS%20NOT%20NULL

Federal Highway Administration, U.S. Department of Transportation. (1985). *Development and Application of Trip Generation Rates – Final Report*. Washington, D.C.: Author. Retrieved February 26, 2007 from http://ntl.bts.gov/DOCS/382DNA.html

Florida v. City of Port Orange. (1994). 650 So. 2d 1 (Fla. 1994).

Hanna v. City of Palm Bay. (1991). 579 So.2d 320 (Fla. 5th D.C.A. 1991).

Institute of Transportation Engineers. (2003). *Trip Generation.* 7th Ed. Volumes 1-3. Washington, D.C.: Author.

Lowe, Sadie. (2001). "Transportation Utility Fee Ordinances: Policy Considerations and Examples from Oregon Cities," Oregon: The City Center @ LOC.

Mikesell, John L. (1991). *Fiscal Administration: Analysis and Applications for the Public Sector.* 3rd ed. Pacific Grove, CA: Brookes/Cole Publishing Co.

National Cable Television Association, Inc. v. United States. (1974), 415 U.S. 336, 341-343.

Rinard, Amy. (2006). Election 2006: Oconomowoc Mayor; Debate focuses on failed utility. *The Milwaukee Journal Sentinel*, Mar 17, 2006. Retrieved March 18, 2007 from http://findarticles.com/p/articles/mi_qn4196/is_20060317/ai_n16222573

Shoup, Donald. (2002). Roughly Right or Precisely Wrong. *Access, 20,* 20-25.

Shuming, Yan, and Alan J. Horowitz. (1991). Using a City Master Property File in Trip Generation Estimation. In *Institute of Transportation Engineers: Annual Meeting Compendium* (pp. 500-503). Retrieved March 2, 2007 from http://www.ite.org/membersonly/digital_library/AIA91F00.pdf

Sluggy's Lake Front Inn, Inc. v. Town of Delavan. (1985). (Ct. of Appeals, 1985), 125 Wis. 2d 199, 201; 372 N.W. 2d 174, 175. Quoted in Bezruki, et al. 2004. Retrieved February 27, 2007 from http://www.legis.state.wi.us/lab/reports/04-0UserFeesFull.pdf

State ex rel. Thomson v. Giessel. (1953). 265 Wis. 207, 213; 60 N.W. 2d 763, 766. Found in Bezruki, et al. 2004. Retrieved February 27, 2007 from http://www.legis.state.wi.us/lab/reports/04-0UserFeesFull.pdf

STATS Indiana IBRC. (2007). *States IN Profile – State Metrics. Wisconsin: Main. Income & Taxes. Local Revenues and Expenditures. Local Revenue in 2004.* Retrieved February 28, 2007 from http://www.stats.indiana.edu/sip/

Weimer, David L., and Aidan R. Vining. (2004). *Policy Analysis: Concepts and Practice*. 4th ed. Upper Saddle River, N.J.: Prentice Hall.

Wisconsin Blue-Ribbon Commission on State-Local Partnerships for the 21st Century. (2001). Report. Madison, WI: Author. Retrieved February 28, 2007 from http://www.lafollette.wisc.edu/reform/report011001.pdf

Wisconsin State Legislature. (2007a). *Wisconsin Statutes Database*. Chapter 66: General Municipality Law. Updated February 28, 2007, Madison, WI: Author. Retrieved April 22, 2007 from http://www.legis.state.wi.us/statutes/stat0066.pdf.

Wisconsin State Legislature. (2007b). *Wisconsin Statutes Database*. Chapter 196: Regulation of Public Utilities. Updated February 28, 2007, Madison, WI: Author. Retrieved April 22, 2007 from http://www.legis.state.wi.us/statutes/stat0196.pdf.

Wisconsin State Legislature. (2005). *2005 Wisconsin Act 25*. Madison, WI: Author. Retrieved February 4, 2007 from http://www.legis.state.wi.us/2003/data/acts/03Act134.pdf.

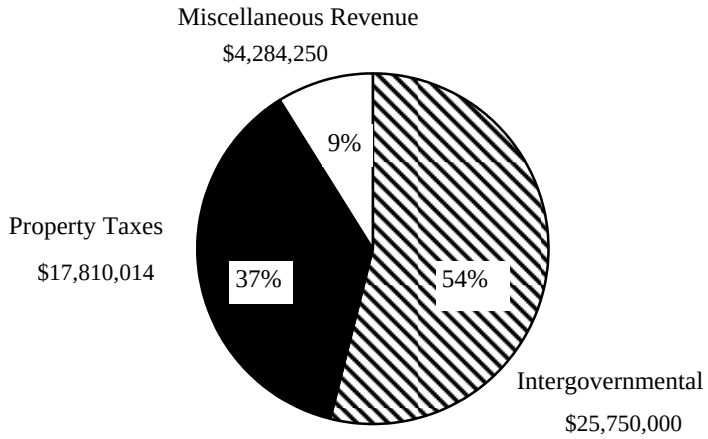
Wisconsin State Legislature. (2004). *2003 Wisconsin Act 134*. Madison, WI: Author. Retrieved February 27, 2007 from http://www.legis.state.wi.us/2003/data/acts/03Act134.pdf.

Zorn, Kurt C. (1991). User charges and Fees. In Peterson, John and Dennis Strachota. (Eds.) *Local Government Finance*. Chicago, IL: Government Finance Officers Association.

Appendix A: City of Milwaukee Transportation Infrastructure Revenues in 2007

According to the 2007 City of Milwaukee Budget, the City will spend $47,844,264 for road operation, maintenance, capital improvements, and related administrative overhead. Milwaukee funds these services through a combination of sources: intergovernmental aid, property taxes, and miscellaneous revenues. We display the relative proportion of these revenue sources in Figure A1. For a more specific breakdown of expenditures, see Appendix F.

Figure A1:
City of Milwaukee Transportation Infrastructure Revenues in 2007



Sources: City of Milwaukee, Wisconsin, 2006a; City of Milwaukee, Wisconsin, 2006b; City of Milwaukee, Wisconsin, 2006c.

Milwaukee obtains the majority of its transportation infrastructure revenue from state and federal aid payments. More than a third of funds allocated for transportation infrastructure needs come from municipal property taxes. Miscellaneous revenues make up nearly one-tenth of transportation infrastructure revenue.

In addition, the City funds related transportation improvements through municipal bonds (with debt service later financed through property taxes). Like many cities, Milwaukee pays for a portion of capital improvements by issuing municipal bonds. For 2007, the City plans to issue $6,589,600 in transportation-related debt (City of Milwaukee, Wisconsin 2006c). For simplicity, we omit City debt from our figures. Instead we include property tax revenue used to pay for the debt service (principal plus interest) of previously issued debt. Moreover, debt service more accurately reflects Milwaukee's ability to pay for capital improvements than the sum of debt issued in one year because debt service spreads the costs of debt over several years when the City actually repays the debt.

Also, the City finances some transportation improvements through special assessments. However, we omit special assessment figures from our above description because these revenues tend to fund neighborhood-specific transportation infrastructure improvements, using revenue primarily obtained from neighborhood property owners. By contrast, the revenues displayed above are collected in a more general manner and fund transportation infrastructure improvements, which more broadly benefit the City.

Appendix B: Summary of Relevant Wisconsin Statutes

Chapter 66 of the Wisconsin State Statutes provides general guidelines for implementation of user and impact fees. Statute 66.0628 provides that fees imposed bear a reasonable relationship to actual use of services. Statute 66.0617 discusses general standards for impact fees, which are required to 1) be reasonably related to need for service, 2) be proportionate to usage, 3) provide cost recovery estimates not in excess of actual costs, and 4) be reduced to compensate for other assessments. These standards may assist in evaluating the legal feasibility of TUF structures.

Several statutory requirements pertain to the establishment of fees and to public utility regulation. Certain formal processes are required, such as needs assessment, public hearing, and a fee appeals process. State statutes also contain provisions pertaining to the use of public utility revenue for debt service and trust fund investment. Table B1 provides a short synopsis of relevant statutes.

Table B1:
Select Statutory Provisions for Fees and Public Utilities

Chapter	Statute	Provision
66 General Municipal Law	66.0628(1)(2) General	"Fee imposed by political subdivision shall bear reasonable relationship to service for which fee is imposed."
	66.0617(2)(b) Fees reduced by amount of other cost imposed by city	"Subject to par. (c), this section does not prohibit or limit the authority of a municipality to finance public facilities by any other means authorized by law, except that the amount of an impact fee imposed by a municipality shall be reduced, under sub. (6) (d), to compensate for any other costs of public facilities imposed by the municipality on developers to provide or pay for capital costs."
	66.0617(3) Public hearing	"Public hearing; notice. Before enacting an ordinance that imposes impact fees, or amending an existing ordinance that imposes impact fees, a municipality shall hold a public hearing on the proposed ordinance or amendment."
	66.0617(4)(a) Needs assessment required for new fees	"Before enacting an ordinance that imposes impact fees or amending an ordinance that imposes impact fees by revising the amount of the fee or altering the public facilities for which impact fees may be imposed, a municipality shall prepare a needs assessment for the public facilities for which it is anticipated that impact fees may be imposed. The public facilities needs assessment shall include, but not be limited to, the following: 66.0617(4)(a)1 to 66.0617(4)(a)3, 66.0617(4)(b)."
	66.0621(4)(b)5. Utility revenue use for debt service	"The governing body of a municipality may include a provision in any ordinance or resolution authorizing the issuance of refunding bonds pledging all or part of the revenues of any public utility or utilities originally financed, extended or improved from the proceeds of any of the municipal obligations being refunded, and pledging all or part of the surplus income derived from the investment of a trust created in relation to the refunding."

Chapter	Statute	Provision
66 General Municipal Law	66.0621(4)(c) Depreciation fund for public utility	"The governing body of a municipality shall, in the ordinance or resolution authorizing the issuance of bonds, establish a system of funds and accounts and provide for sufficient revenues to operate and maintain the public utility and to provide fully for annual debt service requirements of bonds issued under this section. The governing body of a municipality may establish a fund or account for depreciation of assets of the public utility."
	66.0621(4)(d) Depreciation fund and debt service	"If a governing body of a municipality creates a depreciation fund under par. (c) it shall use the funds set aside to restore any deficiency in the special redemption fund specified in par. (e) for the payment of the principal and interest due on the bonds and for the creation and maintenance of any reserves established by the bond ordinance or resolution to secure these payments. If the special redemption fund is sufficient for these purposes, moneys in the depreciation fund may be expended for repairs, replacements, new constructions, extensions or additions of the public utility. Accumulations of the depreciation fund may be invested and the income from the investment shall be deposited in the depreciation fund."
196 Regulation of Public Utilities	196.03(1) Fee provides adequate services	"Subject to s. 196.63 a public utility shall furnish reasonably adequate service and facilities." "The charge made by any public utility for any heat, light, water, telecommunications service or power produced, transmitted, delivered or furnished or for any service rendered or to be rendered in connection therewith shall be reasonable and just."
	196.03(2) Fee determination	"For rate-making purposes the commission may consider 2 or more municipalities as a regional unit if the same public utility serves the municipalities and if the commission determines that the public interest so requires."

Sources: Wisconsin Legislature 2007a; Wisconsin Legislature 2007b

Appendix C: Comparison of User Fees versus Taxes

The property tax has lost the ability to be the primary source of local government revenue for several reasons. First, though federal aid to local governments increased throughout the 1970s and decreased reliance on property tax revenue to finance local government services, the federal government has since cut back on such aid. The reduction in federal aid has increased local reliance on property tax revenue. Second, property tax limits constrain the growth of local government revenue over time and, therefore, the ability to sustain local government services. Third, some cities suffer from diminishing tax bases as property owners migrate out of urban areas. Faced with the need for new revenue sources, many local governments seek to implement user fees that create revenue streams for specific government services (Zorn 1991).

TUFs represent a special case of user charges with their own general public finance principles. In general, user fees should (1) isolate individual benefits to individual service consumption, (2) remain avoidable by not using the service (regardless of whether the services is a public good), and (3) are voluntary. The closer that municipal user fees adhere to these general principles, the more these fees will constitute feasible and appropriate sources of local revenue (Zorn 1991).

Typically, government utilities, such as water and sewer, are excluded from the definition of user fees, since they are akin to private market prices for goods that are inherently public. However, as utility charges are directly linked to individual benefits received, utility charges are analogous to user fees and should be determined by each individual's consumption, and, when possible, municipalities should seek to recover the full costs of the services. (Zorn 1991).

Several public finance goals may be met by instituting user fees (Zorn 1991). Demand for services may be measured through the introduction of user fees. In the case of demand for transportation infrastructure, using trip-generation-based user fees, such as TUF, may allow financial planners to more precisely gauge road usage and reasonable frequency of infrastructure maintenance. Reduction of waste may occur if the calculation of revenue needed for infrastructure maintenance based on usage is more accurate than incremental budgeting practices.

Equity in price of goods and services may be achieved with a user fee if payment in exchange for services creates a closer link between use and user fee contribution. For example, transportation infrastructure maintenance funded through property taxes does not reflect that different property classes generate varying levels of infrastructure usage, regardless of assessed value. Finally, de facto subsidies may exist in the current funding structure that user fees may reduce. For example, tax-exempt properties, such as many not-for-profit organizations, may generate considerable infrastructure usage; however, they do not contribute to infrastructure maintenance through the property tax.

In the case of TUFs, several obstacles to implementation are readily visible. First, for an individual, user consumption of transportation infrastructure is difficult to quantify. Second, although very few individuals can claim to choose, conscientiously, not to use the transportation infrastructure, it is problematic to assume every individual or property uses the transportation infrastructure and therefore should be charged a user fee. Third, excluding any individual beneficiary from using transportation infrastructure is difficult, and, thus, enforcement is an issue. Table C1 summarizes considerations that are relevant when choosing between user fees and taxes.

Table C1:
Considerations for Choosing User Fee in Lieu of Property Tax

	Fee is Preferable	**Tax is Preferable**
Benefits	Benefits are direct to individual user	Benefits are external
	No loss of benefits from lower revenue generation	Loss of benefits as a result of lower user fee revenue, compared to existing funding structure
Demand	Elastic	Inelastic
	Users adjust behavior given pricing thereby eliminating excess usage	Limited impact on excess usage
Equity	Creates equity among beneficiary groups	Need for special provisions for certain beneficiary groups
Administrative Cost	Billing and enforcement cost is low	Billing and enforcement cost is high

Source: Zorn 1991

Appendix D: Comparison of Municipal TUFs

Table D1: Comparison of Municipal Transportation Utility Fees

State	City	Year Adopted	Outcome	Scope	Basis	Land-Use Categories	Exemptions	Discounts
CO	Fort Collins	1984	Discontinued 1987 Validated 1990	Road Maintenance	Front Footage Trip Generation	Residential (Single-Family, Multi-Family) Non-Residential	Undeveloped	Low-Income Elderly
CO	Loveland	2001	In Use	Street Rehabilitation	Flat Fee Per Unit Per Acreage	Residential Nonresidential (5 Categories)	None	None
FL	Orlando	Unknown	In Use	Storm Water Runoff	Trip Generation	Unknown	None	None
FL	Port Orange	1992	Invalidated 1994	Street Maintenance	Flat Fee	Unknown	None	None
ID	Pocatello	1986	Discontinued 1986 Invalidated 1989	Road Maintenance	Trip Generation	Residential (4 Categories) Nonresidential (79 Categories)	Undeveloped Vacant	Low-Income Elderly
MN	Senate Bill	N/A	Expired 2006	N/A	Trip Generation (Required)	N/A	None	None
OR	Ashland	1986	In Use	Road Maintenance Bikeways Pedestrian Improvement	Flat Fee Per Unit Per Parking Space	Residential (Single, Multi) Nonresidential (10 Categories)	Undeveloped Churches Nursing Homes	Low-Income Elderly
OR	Grants Pass	Unknown	In Use	Street Maintenance Safety Improvements	Flat Fee Trip Generation Gross Floor Area	Residential (4 Categories) Nonresidential (11 Categories)	Public	Vacant Autoless
OR	Hubbard	2001	In Use	Road Maintenance	$4.25 Per Month Per Unit Trip Generation	Residential Nonresidential (6 Categories)	Vacant Without Water Service	Low-Income Elderly

State	City	Year Adopted	Outcome	Scope	Basis	Land-Use Categories	Exemptions	Discounts
OR	Klamath Falls	1994	In Use	Street Lighting	$2.00 Per Month	One Category	Unlit Opt-Out	Autoless
OR	La Grande	1985	In Use	Road Maintenance Road Construction	$2.50 Per Month	One Category	W/Out Water Service	Low-Income Elderly
OR	Lake Oswego	2003	In Use	Street Maintenance	Flat Fee Trip Generation Gross Floor Area	Residential (Single, Multi) Nonresidential (3 Categories)	None	None
OR	Medford	1992	In Use	Road Maintenance	Trip Generation	Residential (Single, Multi, Senior) Nonresidential (16 Categories)	Undeveloped Without Water Service	None
OR	Northplains	2003	In Use	Unknown	Unknown	Unknown	None	None
OR	Nyssa	2001	In Use	Street Lighting	Flat Fee	One Category	Vacant	None
OR	Philomath	2003	In Use	Unknown	Unknown	Unknown	None	None
OR	Phoenix	1994	In Use	Unknown	Unknown	Unknown	None	None
OR	Portland	Unknown	In Use	Unknown	Unknown	Unknown	None	None
OR	Salem	Unknown	In Use	Streetscaping	Unknown	Unknown	None	None

State	City	Year Adopted	Outcome	Scope	Basis	Land-Use Categories	Exemptions	Discounts
OR	Tigard	2003	In Use	Street Maintenance	$2.18 Per Unit 78 cents Per Parking Space 78 cents Per Pump Station	Residential Non-Residential Gas Stations	None	None
OR	Tualatin	1990	In Use	Road Maintenance Street Lighting	Trip Generation	Residential (Single, Multi) Nonresidential (7 Categories)	Undeveloped Unoccupied Without Water Service Park-and-Ride Public Park Without Parking RR ROW	Vacant Without Water Services
OR	Wilsonville	1997	In Use	Road Maintenance	Flat Fee Per Unit Trip Generation Gross Floor Area % Trucks	Residential (Single, Multi) Nonresidential	Undeveloped	None
TX	Austin	1992	In Use	Road Maintenance	Trip Generation	Residential (8 Categories) Nonresidential (31 Categories)	Undeveloped Public Vacant Residence Autoless Elderly	Below Assigned Traffic Level
TX	Beaumont	1990	In Use	Road Maintenance	Flat Fee	Residential (Single, Multi) Nonresidential	Undeveloped Disabled Persons Public/Low-Income Rental	Elderly Single-Family
WA	Soap Lake	1992	Invalidated 1995	Road Maintenance Road Construction	Flat Fee Per Employees	Residential Nonresidential	Undeveloped Tax-Exempt Low-Income Elderly/Disabled	None

State	City	Year Adopted	Outcome	Scope	Basis	Land-Use Categories	Exemptions	Discounts
WI	Oconomowoc	2005	Abandoned 2005	Street Maintenance	$22.50 Per Unit Trip Generation Gross Floor Area: $11.75 To $472.25 Per 1,000 Sq.Ft.	Residential Nonresidential	None	None

Sources: *Bloom v. City of Fort Collins* 1990; *Brewster v. Pocatello* 1988; City of Grants Pass, Oregon 2006; City of Hubbard, Oregon 2001; City of Loveland, Colorado 2007; *City of Port Orange v. State* 1994; City of Talent, Oregon 2000; City of Tualatin, Oregon 2005; *Covell v. City of Seattle* 1995; Ewing 1994

Appendix E: TUF Structural Alternatives

Scope of Services

In designing an ideal TUF rate structure, municipal officials need to answer two questions: (1) what types of transportation costs may the City of Milwaukee legally fund through TUFs? and (2) what portion of these transportation infrastructure costs should the City of Milwaukee recover through TUFs?

Wisconsin state law constrains the breadth of services that local governments may fund with particular user fees, stating that fees, "shall bear a reasonable relationship to the service for which the fee is imposed," (Wisconsin State Legislature 2004). As municipalities deviate from this principle, fees increasingly resemble general taxation for government services. Because state law prohibits local governments from instituting new taxes without explicit state legislative approval (*State ex rel. Thomson* v. *Giessel* 1953), Milwaukee could not spend TUF revenues on services unrelated to the City's transportation infrastructure.

Nevertheless, Milwaukee possesses the discretion to fund a fairly comprehensive range of transportation infrastructure services. For instance, in a best practices guide to implementing user charges, the Wisconsin Legislative Audit Bureau recommends that local governments, at least initially, consider the effects of partially funding all direct and indirect costs related to the particular service. Direct costs tend to include employee compensation, supplies and materials, capital expenditures, debt service from capital expenditures, and capital depreciation. Costs not easily connected to service provision include the portion of administrative overhead devoted to the particular service (Bezruki, et al. 2004).

In practice, communities successfully include TUF funds to finance a broad range of transportation infrastructure services. For example, the City of Grants Pass, Oregon, reserves the discretion to use TUF revenues to fund the repairing, replacing, improving, cleaning, and coordinating of traffic controls and signage, of City streets (City of Grants Pass, Oregon 2006). Furthermore, the City of Fort Collins, Colorado, among other communities, devotes TUF revenue to pay for administrative overhead costs (Ewing 1994).

Based on these examples, the City of Milwaukee could fund the following services:

- all expenditures associated with the regular operation and maintenance of roads and bridges;
- capital expenditures on transportation infrastructure, otherwise financed through the municipal cash levy;
- debt service on municipal bonds used to fund capital improvements to transportation infrastructure;
- street lights, traffic controls, and signage;
- indirect costs related to providing transportation infrastructure services (e.g. administrative overhead).

As to which portion of transportation infrastructure costs the City could fund with a TUF, Milwaukee may recover all or a portion of its chosen transportation infrastructure costs through TUF revenues. Municipalities, including ones implementing TUF systems, may supplement user fee revenues with property tax or other revenues (Bezruki, et al. 2004). Moreover, some municipal governments may recover surplus fee revenue and spend that revenue in the following year on the same services (City of Tualatin, Oregon 2005; Lowe 2001). However, state court decisions constrain excessive fee collection. For instance, local governments are prohibited from imposing fees that, "unreasonably exceed the cost of administration" (*Sluggy's Lake Front Inn, Inc. v. Town of Delavan* 1985).

Legal questions aside, municipalities face tradeoffs when considering whether to fully or partially recover service costs through user fees. Reliance upon property taxes and intergovernmental revenues impairs the ability of local governments to finance essential government services. Rather, as Wisconsin Blue-Ribbon Commission on State-Local Partnerships for the 21st Century (also known as the Kettl Commission) notes, local governments should strive to diversify their revenue sources (2001). Thus, the more costs that Milwaukee recovers through TUFs, the more the City will diversify its revenue sources.

Milwaukee expects to collect 13.9 percent of its revenue through user fees in 2007, which is close to the cumulative, statewide proportion of 12.5 percent (City of Milwaukee, Wisconsin 2006d; STATS Indiana IBRC 2007). However, Wisconsin local governments collectively rank 38th in the nation in terms of proportion of revenues collected through fees (STATS Indiana IBRC 2007). In other words, the City of Milwaukee could fully recover transportation infrastructure costs without representing an unprecedented reliance upon user fees.

A greater reliance upon user fees should foster greater benefit-principle equity, allocating the costs of service provision according to usage. On the other hand, moving from property-value-based taxation, roughly taking into account one's ability to pay taxes, toward standard fees across different values of property could shift the financial burden of transportation infrastructure expenses onto less wealthy households (Zorn 1991).

Another concern about cost recovery pertains to the nature of the public service. In particular, some argue that municipalities should employ partial cost recovery when the service provision produces benefits that accrue to individuals external to the transaction (Zorn 1991). In the present case, the application of trip-generation rates uses a reasonable, yet imperfect method, charging fees based on figures for average road usage. After all, in contrast to tollbooths, trip-generation methods cannot measure precise transportation usage. Undoubtedly, some would pay more, and some would pay less in proportion to their actual road usage.

Recognizing the potential ability-to-pay inequity and likely imprecision involved in TUFs, Milwaukee could consider spreading some of its transportation costs around generally through the property tax levy.

Another approach to cost recovery, incremental pricing, directs the municipality to fully recover all direct costs through fees and all estimated indirect costs through the property tax. Proponents of incremental pricing argue that when administrative costs cover multiple programs (as is the case in Milwaukee's Department of Public Works), the municipality should only charge for direct costs (i.e., the incremental cost of providing the particular service). According to this doctrine, indirect costs represent general expenses necessary for providing overall public management, and residents should finance these expenses in a broad manner through the property tax levy (Zorn 1991).

Fee Computations and Discounts

The next basic consideration in the design of a TUF is the basis upon which fees are computed. The charge must be reasonably related to the use of the transportation infrastructure to qualify as a fee and not a tax. As the TUF is charged to specific properties, the key is to find a proxy for each property that estimates its use of the infrastructure. Various proxies that have been used include:

- number of units (housing, commercial, etc.);
- number of employees;
- number of parking spaces;
- number of gasoline-pumping stations;
- frontage feet;
- gross floor area;
- acreage; and
- trip-generation rate.

No single proxy has been found to predict perfectly transportation infrastructure usage for all property types. Nor has any single proxy proven to be the most accurate for all classes of properties. Frontage feet works fairly well for residences, for example, but is a poor indicator for businesses. Similarly, acreage is a poor indicator for residences and many commercial establishments, but is one of the better measures for manufacturing properties. The most widely applicable proxy is trip-generation rate, which is therefore a favorite with local officials. This method is more complex to administer, on the other hand, and is still an imperfect measure, so it has not been universally accepted as a standard. See Appendix G for further information on trip generation.

Regardless of how fees are generally computed for a TUF, certain classes of people or properties may deserve special consideration. Individuals may qualify for discounts because they receive fewer benefits of the service (Allan 1995), lack an ability to pay the fee (Mikesell 1991), or simply deserve compassion.

Examples of classes for which discounts have been established are:

- low-income persons;
- elderly persons;
- disabled persons;
- autoless households;
- vacant properties;
- properties lacking water service; and
- properties with atypically low traffic volume.

Several other issues deserve consideration when determining how to structure TUF payments. Municipal officials must decide the proportion of needed funds is to be raised by the TUF, whether any excess fees will be rolled over from one billing period to the next, and who will be responsible for setting the amount of the fee for each billing cycle. In various jurisdictions, the responsibility for setting the fee has been assigned to:

- the city council;
- the city engineer;
- a city administrator; or
- the city recorder.

The city council is a logical choice, since the members are elected, and thus are directly accountable to the citizenry for their decisions. However, allowing the council to decide may politicize the decision-making process and may cause dissension if members' opinions differ. Any of the other choices largely avoids the political and social issues by vesting the decision in a single authority. However, this may increase the likelihood of an arbitrary or poorly reasoned decision being made.

Land Categories and Exemptions

The total assessed value of the nearly 169,000 parcels of land in Milwaukee is more than $28 billion. Each parcel is classified under one of 13 land-use categories (City of Milwaukee, Wisconsin n.d.). The categories are:

- under construction;
- residential,
  - single-family,
  - duplex,
  - multi-family;
- mixed residential and commercial;
- commercial,
  - wholesale/retail trade,
  - services, finance, insurance, and real estate;
  - mixed commercial;
- manufacturing, construction, and warehousing;

- transportation;
- agriculture and fishing;
- public/quasi-public,
  - public buildings,
  - public open spaces; and
- vacant.

Within each land-use category and subcategory are dozens, sometimes hundreds, of more specific land-use codes that expand on the information in the land-use category and allow users to gain a detailed understanding of the use of each parcel of land. For example, there are codes for dentist offices, bowling alleys, police stations. The City provides a complete list of land-use codes in its master property database (City of Milwaukee, Wisconsin 2005). While our flat-fee alternative would apply fees to properties according to the broader, 12 land-use categories, our trip-generation alternative relies on the more specific and numerous land-use codes. Our hybrid alternative would rely on both sets of data.

Appendix F: City of Milwaukee Transportation Infrastructure Expenditures in 2007

According to the 2007 City of Milwaukee Budget, the City will spend $47,844,264 for direct and indirect transportation infrastructure costs. Direct costs include operation and maintenance of the City's transportation infrastructure, capital improvements, and debt service. Indirect costs include overhead and facility rent. Direct costs account for more than $41 million in 2007. Table F1 displays the precise expenditures for each category of both direct and indirect expenditures.

Table F1:
City of Milwaukee Estimated Transportation Infrastructure Expenditures in 2007

Direct Transportation Infrastructure Costs	Expenditures ($)
Operating and Maintenance	
Department of Public Works-Infrastructure-Administration	892,530
Department of Public Works-Infrastructure-Transportation	2,112,031
Department of Public Works-Infrastructure-Field Operations	900,420
Department of Public Works-Infrastructure-Field Operations Street & Bridges	10,165,900
Department of Public Works-Infrastructure-Field Operations Electrical Services	9,777,630
Estimated Wage Settlements	355,437
Total Department of Public Works Infrastructure	24,203,948
Department of Public Works Infrastructure-Revenue	4,284,250
Net Operating and Maintenance	**19,919,698**
Capital Improvements-Tax Levy Funded	
State & Federally Aided Street Projects	-
Locally Funded Street Projects	2,289,956
Street Lighting	3,750,000
Traffic Controls	700,000
Total Capital Improvements-Tax Levy	**6,739,956**
Debt Service-Tax Levy Funded (12/31/05)	
Streets (includes aided & local streets, traffic control & street lighting)	13,125,364
Bridges	1,997,810
Total Debt Service	**15,123,174**
Total Direct Transportation Infrastructure Expenditures	**46,067,078**
Indirect Transportation Infrastructure Expenditures	
Overhead	1,777,186
Total Indirect Transportation Infrastructure Expenditures	**1,777,186**
Total Transportation Infrastructure Expenditures	**47,844,264**

Sources: Dennis Yaccarino, personal communication, February 8, 2007; City of Milwaukee, Wisconsin 2006a; City of Milwaukee, Wisconsin 2006b; City of Milwaukee, Wisconsin 2006c

Appendix G: Trip Generation

Urban planners and transportation engineers use trip-generation estimates to forecast demand for transportation infrastructure. In a similar manner, analysts can use the same data to determine the sources of current infrastructure demand (Beimborn and Kennedy n.d.). Trip generation constitutes one method of allocating transportation infrastructure costs under a transportation utility fee (TUF) system. Accordingly, we use trip-generation data for both our trip-generation alternative and for the non-residential portion of our hybrid policy alternative. For our analysis, we rely on trip-generation estimates published by the Institute of Transportation Engineers (ITE) in its 2003 manual, *Trip Generation*.

Trip generation refers to the number of vehicle trips that certain land uses induce during a given period of time. The ITE defines a vehicle trip as "a single or one direction vehicle movement with either the origin or destination (exiting or entering) inside a study site," (2003, p. 11). Researchers develop trip-generation estimates by visiting designated sites and counting the number of trips made in and out of property parking lots or driveways. During typical studies, researchers select four to seven sites within each land-use category. For several decades, the ITE has requested and obtained hundreds of individual trip-generation studies in order to aggregate the data and publish increasingly more comprehensive trip-generation estimates for a myriad of land uses (Institute of Transportation Engineers 2003).

These trip-generation estimates apply to how occupants use specific parcels of land. See Appendix E for more detail on land-use categories. To develop accurate trip-generation estimates, researchers examine specific characteristics of land-use categories likely to correlate with trip-generation estimates. Researchers refer to these characteristics as independent variables. As the value of a relevant independent variable changes, the number of trips generated (the dependent variable) is supposed to change. For instance, transportation engineers typically believe that the more dwelling units that a residential property contains, the more trips that property will generate. Other common independent variables include gross floor area (GFA), which equals the sum, in square footage, of the area of all floors in the buildings of a given property, and acreage, which equals the property's entire lot size in acres (Institute of Transportation Engineers 2003).

Through analysis, researchers estimate a rate for the amount of trips each unit of relevant independents variables will encourage. As a result, planners and engineers can apply these trip-generation rates to properties exhibiting varying characteristics within a land-use category in order to properly tabulate and attribute the total number of trips (Institute of Transportation Engineers 2003; Shuming and Horowitz 1991).

For our analysis, we rely on property data in the City of Milwaukee's Master Property File (MPROP) to identify the most relevant independent variables that coincide with ITE trip-generation estimates. The MPROP offers dozens of land-use characteristics for the approximately 160,000 properties in Milwaukee. In fact, previous ITE studies purported to find relatively high correlations between the independent variables identified in the MPROP and local trip rates. In particular, the authors noted that the number of dwelling units exhibited a strong relationship with residential trip-generation rates. In a similar, manner, various square-footage and acreage variables also proved to be strong predictors of trip-generation rates among a number of manufacturing, commercial, and tax-exempt land uses (Shuming and Horowitz 1991).

Researchers employ a number of methods to devise trip rates from independent variables. The traditional method involves calculating an average trip rate per unit of an independent variable. In its simplest form, researchers divide all the trips produced from a land-use category by the total number of independent variable units. The ITE weights its averages to prevent outlying results from skewing its sample average. In addition, some researchers use regression analysis to develop coefficient estimates as trip-generation rates (Institute of Transportation Engineers 2003).

In general, using average trip-rate figures to estimate trip generation is relatively simple. One obtains a trip-generation estimate by multiplying the average trip rate by the value of that particular property's independent variable. A general formula for average trip rate calculation is shown in Figure G1.

Figure G1:
Calculating the Total Trips a Property Generates
Using the Average Trip Rate Method

Total Trips	**=**	**Value of Independent Variable**	**X**	**Average Trip Rate**

Source: Institute of Transportation Engineers 2003

While the average-trip rate method proves simple and intuitive, it also represents a relatively crude approach to trip estimation compared to regression analysis estimates. For instance, average-trip method assumes that trips increase in proportion to the independent variable at constant rate. By contrast, some regression models allow for the possibility that trips will increase or decrease at differing rates as the independent variable changes. In a similar manner, average trip rates imply that when the independent variable equals zero, that the particular property produces zero trips. Conversely, regression analysis offers a baseline level of trip rates, represented by the Y-intercept (the character b in Figure G2), and any other coefficient estimates from other variables, if included in the model. More importantly, regression analysis calculates an estimate that "best fits" the data. In other words, regression analysis minimizes the difference between the trip rate estimate

and the actual data observations in the collected data (Institute of Transportation Engineers 2003). General formulas for two common regression models, linear and logarithmic, are shown in Figure G2.

Figure G2:
Two Common Models Used to Calculate Trips Generated with Regression Analysis

Linear: Total Trips = A*(Independent Variable) + b

Logarithmic: Ln(Total Trips) = A*Ln(Independent Variable) + b

Source: Institute of Transportation Engineers 2003

In general, applying trip-generation rates to individual properties within a land-use category entails some risk that the estimates will not adequately reflect the true rate of trip generation. Some properties within a land-use category are bound to generate more or less than the ITE's average trip rates or coefficient estimates suggest. These estimates lose their predictive power as the value of the dependent variable (trips generated) varies more with the same value of the independent variable. The ITE acknowledges that some independent variables demonstrate considerable variation and attributes such instances to small sample sizes, differing economic and business conditions across samples, location, and other features unique to particular studies. Moreover, the ITE maintains that, whenever possible, analysts should supplement weak ITE data with local data (2003).

The ITE works to alleviate these problems by aggregating study data provided to them over several decades. Furthermore, the ITE *Trip Generation* manual provides measures for analysts to assess variation among independent variables. These measures include the standard deviation measure, and where applicable, the regression model's coefficient of determination (i.e., the R-squared figure, which displays the proportion of trips generated that can reasonably be attributed to the independent variable).

In some instances, the ITE excludes regression analysis estimates for particular land-use categories for one of the following reasons: (1) the sample size is less than four observations; (2) the R-squared is less than 0.50 (i.e., the independent variable accounts for less than 50 percent of the trips generated for that land-use category); and (3) trips fail to increase as the independent variable increase (Institute of Transportation Engineers 2003). This helps prevent analysts from misapplying poor-predicting coefficient estimates. However, corresponding average trip rates are likely to be just as inaccurate as an omitted coefficient estimate because they are based on the same highly variable data (Shoup 2002).

Another concern with trip estimation is that analysts attribute excessively high trip rates to "pass-by" properties, such as gas stations or supermarkets. Relatively

large numbers of motorists stop at these properties, but they do so while en route to their end destination, such as work or school. These motorists are already adding to the traffic and other burdens on transportation infrastructure, so their inclusion in trip-generation studies typically inflates the number of trips that these pass-by properties are truly responsible for (Federal Highway Administration 1985). We provide suggestions and figures for how to adjust trip-rates for pass-by properties in Appendix K.

Despite various shortcomings with statistical precision, the ITE *Trip Generation* manual appears to provide realistic trip-generation estimates. At the very least, these estimates reaffirm obvious relationships between land uses and trip generation (e.g., individual supermarkets generate far more trips in any given day than individual single-family residences) (Institute of Transportation Engineers 2003). As a result, the trip-generation estimates will more often than not assign trips in a reasonably accurate proportion.

While the ITE provides several regression trip-generation estimates relevant to our analysis, most trip-generation estimates were only available in the form of weighted averages. Rather than alternate between the two the methods across land-use categories, we chose to strictly use weighted averages for our trip-generation and hybrid alternatives. Using the more detailed, four-digit land-use codes in the MPROP file, we assigned trip-generation rates to categories of properties that appeared to foster similar land uses. We list our selected trip rates and their corresponding independent variables for our land-use categories in Table G1.

Table G1:
Trip-generation Categories and Rate Estimates

ITE Land-Use Code	Description	MPROP Land-Use Categories Assigned to ITE Code	Independent Variable Unit	Average Daily Trip Rate per Independent Variable		
				Weekday	Saturday	Sunday
10	Waterport/Terminal	4449-4499	Acres	11.93	11.93*	11.93*
21	Commercial Airport	4500-4581	Flights	104.73†	98.46†	119.61†
22	General Aviation Airport	4500-4581	Flights	1.97†	1.98†	1.87†
30	Truck Terminal	4000-4013, 4173-4214, 4230-4231, 4432, 4731-4783	Acres	81.90	17.28	10.79
90	Park-and-Ride with Bus Service	4111-4151, 4789, 7521-7525	Acres	372.32	74.46†	74.46†
110	General Light Industrial	2679-2791, 3089-3229, 3648-3694, 3824-3993	Gross Floor Area (1,000's Sq Ft)	6.97	1.32	0.68
120	General Heavy Industrial	4910-4953	Acres	6.75	6.75*	6.75*
130	Industrial Park	7711	Gross Floor Area (1,000's Sq Ft)	6.96	2.49	0.73

ITE Land-Use Code	Description	MPROP Land-Use Categories Assigned to ITE Code	Independent Variable Unit	Average Daily Trip Rate per Independent Variable		
				Weekday	Saturday	Sunday
140	Manufacturing	1442-2677, 2796-3083, 3241-3646, 3711-3823	Gross Floor Area (1,000's Sq Ft)	3.82	1.49	0.62
150	Warehousing	3999, 4221-4226	Gross Floor Area (1,000's Sq Ft)	4.96	1.22	0.79
210	Single-Family Detached Housing	8810	Dwelling Units	9.57	10.10	8.78
220	Apartment	8830-8850, 8888-8899	Dwelling Units	6.72	6.39	5.86
230	Residential Condominium/Townhouse	8811, 8820, 9911	Dwelling Units	5.86	5.67	4.84
310	Hotel	7000-7011, 7041	Rooms	8.17	8.19	5.95
320	Motel	7021-7022	Rooms	5.63[†]	5.63[*]	5.63[*]
412	County Park	7-9, 8860-8871	Acres	2.28	12.14	4.13
418	National Monument	8412	Acres	5.37	8.28	9.39
430	Golf Courses	7992	Acres	5.04	5.82	5.88
437	Bowling Alley	7933	Acres	90.38	97.60	81.49
444	Movie Theater with Matinee	7832-7833, 7922	Gross Floor Area (1,000's Sq Ft)	33.09[*†]	99.28[†]	81.90
481	Zoo	8422	Acres	114.88	114.88[*]	114.88[*]
492	Health/Fitness Club	7991, 7997	Gross Floor Area (1,000's Sq Ft)	32.93	20.87	26.73
493	Athletic Club	7941	Gross Floor Area (1,000's Sq Ft)	43.00	38.46	36.77
495	Recreational Community Center	7993, 7999, 8631-8641, 8690-8699	Gross Floor Area (1,000's Sq Ft)	22.88	9.10	13.60
530	High School	8211	Gross Floor Area (1,000's Sq Ft)	12.89	4.37	1.79
540	Junior/Community College	8221-8222, 8244-8299	Gross Floor Area (1,000's Sq Ft)	27.49	11.23	1.21
560	Church	8661	Gross Floor Area (1,000's Sq Ft)	9.11	10.37	36.63
565	Day Care Center	8350-8351	Gross Floor Area (1,000's Sq Ft)	79.26	6.21	5.83
566	Cemetery	6553, 7261	Acres	4.73	5.94	7.62
571	Prison	9223	Gross Floor Area (1,000's Sq Ft)	81.74[†]	6.54	6.54[*]
590	Library	8231	Gross Floor Area (1,000's Sq Ft)	54.00	46.55	25.49
610	Hospital	8060-8069	Gross Floor Area (1,000's Sq Ft)	17.57	11.73	10.34
620	Nursing Home	8050-8059, 8360/8362	Gross Floor Area (1,000's Sq Ft)	6.10	6.10[*]	6.10[*]
630	Clinic	8010-8049, 8093	Gross Floor Area (1,000's Sq Ft)	31.45	31.45[*]	31.45[*]

ITE Land-Use Code	Description	MPROP Land-Use Categories Assigned to ITE Code	Independent Variable Unit	Average Daily Trip Rate per Independent Variable		
				Weekday	Saturday	Sunday
710	General Office Building	4811-4899, 6211-6552, 7361-7400, 7819-7829, 8111, 8322-8331, 8390-8399, 8611-8621, 8710-8721, 8742-8748, 9222, 9850	Gross Floor Area (1,000's Sq Ft)	11.01	2.37†	0.98†
720	Medical-Dental Office Building	8090-8092, 8099	Gross Floor Area (1,000's Sq Ft)	36.13	8.96	1.55
730	Government Office Building	9111-9221, 9224-9721	Gross Floor Area (1,000's Sq Ft)	68.93	2.37	0.98
732	United States Post Office	4311	Gross Floor Area (1,000's Sq Ft)	108.19	49.69	28.81
760	Research and Development Center	8072, 8731, 8733-8734	Gross Floor Area (1,000's Sq Ft)	8.11	1.90	1.11
770	Business Park	8732	Gross Floor Area (1,000's Sq Ft)	12.76	2.56	1.29
812	Building Materials and Lumber Store	5211, 7349-7359	Gross Floor Area (1,000's Sq Ft)	45.16	51.60	24.50
814	Specialty Retail Center	5331, 5399, 5421-5499, 5714, 5735-5736, 5921-5941, 5943-5947, 5992-5999, 7211-7251, 7299-7336, 7841	Gross Floor Area (1,000's Sq Ft)	44.32	42.04	20.43
816	Hardware/Paint Store	5231, 5251, 7622-7699	Gross Floor Area (1,000's Sq Ft)	51.29	82.52	68.65
817	Nursery	180-782, 5261	Acres	96.21	144.04	115.81
818	Nursery	831-851, 5200	Acres	19.50	3.11	2.20
820	Shopping Center	5311	Gross Floor Area (1,000's Sq Ft)	42.94	49.97	25.24
841	New Car Sales	5510-5521, 5551-5571, 7513-7519	Gross Floor Area (1,000's Sq Ft)	33.34	21.03	10.48
849	Tire Superstore	5531	Gross Floor Area (1,000's Sq Ft)	20.36	19.03	19.03*
850	Supermarket	5411	Gross Floor Area (1,000's Sq Ft)	102.24	177.59	166.44
853	Convenience Market with Gasoline Pumps	5541	Gross Floor Area (1,000's Sq Ft)	845.60	1448.33	1182.08
860	Wholesale Market	5000-5199, 5961-5989	Gross Floor Area (1,000's Sq Ft)	6.73	1.59	2.30
862	Home Improvement Superstore	5720-5722	Gross Floor Area (1,000's Sq Ft)	29.80	45.67	20.93
863	Electronic Superstore	5731-5734, 5942	Gross Floor Area (1,000's Sq Ft)	45.04	45.04*	45.04*
869	Discount Home Furnishing Superstore	5700, 5713, 5719	Gross Floor Area (1,000's Sq Ft)	47.81	70.01	70.01*
870	Apparel Store	5600-5699	Gross Floor Area (1,000's Sq Ft)	66.40	66.40*	66.40*

ITE Land-Use Code	Description	MPROP Land-Use Categories Assigned to ITE Code	Independent Variable Unit	Average Daily Trip Rate per Independent Variable		
				Weekday	Saturday	Sunday
879	Arts and Crafts Store	7911	Gross Floor Area (1,000's Sq Ft)	56.55	56.55*	56.55*
881	Pharmacy/Drugstore	5912	Gross Floor Area (1,000's Sq Ft)	88.16	88.16*	88.16*
890	Furniture Store	5712	Gross Floor Area (1,000's Sq Ft)	5.06	4.94	4.64
911	Walk-in Bank	7291	Gross Floor Area (1,000's Sq Ft)	156.48	13.70	8.30
912	Drive-in Bank	6000-6159	Gross Floor Area (1,000's Sq Ft)	246.49	71.21	22.15
931	Quality Restaurant	5813	Gross Floor Area (1,000's Sq Ft)	72.16	94.36	72.16
932	High-Turnover (Sit-Down) Restaurant	5812	Gross Floor Area (1,000's Sq Ft)	127.15	158.37	131.84
942	Automobile Care Center	7530-7540	Gross Floor Area (1,000's Sq Ft)	15.86*	15.86	2.59
948	Automated Care Wash	7542, 7549-7600	Gross Floor Area (1,000's Sq Ft)	78.57†	95.31	95.31*

Sources: City of Milwaukee, Wisconsin 2005; Institute of Transportation Engineers 2003

* Due to lack of data on the trip rate for this day of the week, we use a different day's trip estimate for this figure.

†Due to a lack of relevant independent variables for this day, we developed our equation for an estimate. We describe our general methodology for the particular cases below.

Our analysis requires us to determine the total number of trips each property in the City generates annually. We multiply the value of each property's relevant independent variable by the assigned trip-generation rate for single weekdays, Saturdays, and Sundays. We multiply the weekday trip estimate by five to reflect the trips generated throughout the workweek and add this to the Saturday and Sunday figures to calculate weekly trips. We obtain our annual trip estimate for each property by multiplying this sum by the 52 weeks in a year.

As there were hundreds of detailed land-use categories listed in the MPROP, we found that the ITE frequently lacks trip-generation rates that (1) match independent variables detailed in the MPROP, (2) cover all days of the week, or (3) apply to particular MPROP land-use categories. In many instances, we grouped MPROP land-use categories under distinctly different, but reasonably related, ITE categories. In other situations, we extrapolated weekday trip rates as a proxy for Saturday and Sunday rates. For more than half a dozen land-use categories, the lack of ITE trip-generation data required us to construct more elaborate proxy estimates. We explain these more complicated calculations below.

The ITE lacks trip-generation estimates for government office buildings for Saturdays and Sundays. In response, we substituted weekend figures from general office buildings, assuming both buildings types operate with considerably fewer employees, and therefore fewer trips, on weekends.

The ITE also lacks adequate weekday data for movie theaters relevant to our available independent variables. Recognizing that fewer people attend the cinema on weekdays, we divide the Saturday figure by three and use that for a rough single-weekday estimate.

For motels, the most relevant independent variable the ITE supplies is the number of occupied rooms. The ITE also estimates that 78 percent of motel rooms remain occupied at any given time (2003). As result, we multiply 78 percent by the MPROP's figures for total rooms to obtain our estimated independent variable for each motel property.

Milwaukee's two airports, Timmerman and General Mitchell, also required additional calculations to derive trip-generation estimates. The ITE provides trip-generation estimates based on the number of commercial and general aviation flights. However, a number of properties surrounding the two airports possess the MPROP's land-use code (4581) for "airports, flying fields, etc." (City of Milwaukee, Wisconsin 2005). Thus, we had to develop a method of allocating the number of trips generated from the number of flights produced by the airports among the several properties. We chose to allocate trips according to the proportion of total lot area that each property occupied for all the code 4581 properties associated with each airport.

The trip generation manual gives rates for airports based upon numbers of commercial and general aviation flights (Institute of Transportation Engineers 2003). We obtained annual flight data for the two airports from the Federal Aviation Administration (FAA), which classified flights as commercial, air taxi, general aviation, or military. Based on airport configuration, we assume for the purpose of calculating vehicle trips from these properties that only General Mitchell airport provides commercial air travel to the City of Milwaukee, and that this commercial aviation includes the 70,791 explicitly commercial flights and 122,998 flights listed by the FAA as air taxis, based on typical aircraft capacities. General Mitchell also provides service to general aviation flights, which we assume includes 22,817 explicitly general aviation flights and 2,518 military flights, based upon typical aircraft capacity and use. We assume that Timmerman Airport only handles general aviation flights, based upon runway configuration and airport facilities. Its total flights as reported by the FAA consisted of 68,273 explicitly general aviation flights, 81 military flights, and 780 air taxi flights (2007), but we classify them all as general aviation for trip-generation calculation purposes.

The ITE lacks weekend data for park-and-ride bus properties. We assume that there would be considerably less demand for bus trips outside of the work week, and therefore fewer trips generated, so we developed a proxy measure for Saturdays and Sundays by dividing the single weekday estimate by five.

For prisons, we identified the ITE's estimate for weekday peak hour trip generation as the most relevant independent variable for our analysis. In response we

developed a rough estimate for weekday trip generation. Due to the relatively more complex nature of this calculation we display the equation in Figure G3, below. The prisons did have relevant Saturday estimates but lacked Sunday estimates. We simply extrapolated Saturday figures for Sunday.

Figure G3:
Deriving Weekly Trip-Generation Estimates for Prisons

$$\textbf{Weekly Prison Trip Generation} = 5 \times \left[\left[\frac{\text{Weekday-Peak Hour Estimates}}{4} \right] + \left[\frac{\text{Weekday-Peak Hour Estimates}}{4} \times 23 \text{ Hours} \right] \right] + \textbf{Saturday Estimate} + \textbf{Saturday Estimate (for Sunday)}$$

Source: Authors

Like prisons, the ITE only provided relevant peak hour estimates for automated carwashes. As a result, we employ a similar equation to obtain weekly trips for automated carwashes. We display this equation in Figure G4 below.

Figure G4:
Deriving Weekly Trip-Generation Estimates for Automated Car Washes

$$\textbf{Weekly Automated Carwash Trip Generation} = 5 \times \left[\left[\frac{\text{Weekday-Peak Hour Estimates}}{4} \right] + \left[\frac{\text{Weekday-Peak Hour Estimates}}{4} \times 23 \text{ Hours} \right] \right] + \textbf{Saturday Estimate} + \textbf{Sunday Estimate}$$

Source: Authors

Appendix H: Timeline of TUF Activity

Table H1:
History of Transportation Utility Fees in the United States

Year	Activity
1974	U.S. Supreme Court distinguishes fees from taxes under the principle: "benefit not shared by other members of society"
1984	Massachusetts Supreme Judiciary Court distinguishes fees from taxes under the principles: "particularized benefit, voluntary payment, earmarked expenditures reasonably related to costs"
	First U.S. TUF implemented in Fort Collins, Colorado
1985	Class action suit challenges legality of TUF in Fort Collins, Colorado
	"Street user fee" implemented in La Grande, Oregon
1986	TUFs implemented in Pocatello, Idaho, and Ashland, Oregon
1987	Use of TUFs voluntarily discontinued in Fort Collins, Colorado, and Pocatello, Idaho
1988	Idaho State Supreme Court holds that Pocatello TUF is a tax
1989	Colorado State Supreme Court upholds legality of Fort Collins TUF - first state to validate a TUF
1990	"Road utility fee" implemented in Tualatin, Oregon
	"Street use service fee" implemented in Beaumont, Texas
1991	Florida court strikes down citywide assessment for street maintenance in Palm Bay
1992	"Street utility charge" implemented in Soap Lake, Washington
	TUF implemented in Austin, Texas
	"Street utility fee" implemented in Medford, Oregon. Wholesalers refuse to pay. City amends land-use categories
	TUF implemented in Port Orange, Florida
1994	"Street lighting utility fee" implemented in Klamath Falls, Oregon
	TUF implemented in Phoenix, Oregon
	Florida 7th circuit court upholds legality of Port Orange TUF
	Florida State Supreme Court rules Port Orange TUF illegal
1995	Divided Washington State Supreme Court rules Seattle street utility charge was a property tax
1997	"Street maintenance fee" implemented in Wilsonville, Oregon
2001	"Street maintenance utility fee" implemented in Loveland, Colorado
	"Street maintenance fee" implemented in Hubbard, Oregon
	"Street lighting utility fee" implemented in Nyssa, Oregon
2003	"Street maintenance fee" implemented in Philomath, Oregon
	"Street maintenance utility fee" implemented in Northplains, Oregon
	"Street maintenance fees" implemented in Lake Oswego and Tigard, Oregon
2005	Minnesota Senate Bill 818 proposes legislation enabling TUFs; House considers a companion bill
	Oconomowoc, Wisconsin, tentatively approves TUF in October, but scraps it in November
2006	Maryland state attorney general holds a TUF to be a property tax
	Minnesota TUF legislation fails to be enacted
	Fort Collins, Colorado, renews interest in a TUF

Sources: *Bloom v. City of Fort Collins* 1990; *Brewster v. Pocatello* 1988; City of Grants Pass, Oregon 2006; City of Hubbard, Oregon 2001; City of Loveland, Colorado 2007; *City of Port Orange v. State* 1994; City of Talent, Oregon 2000; City of Tualatin, Oregon 2005; Covell v. City of Seattle 1995; *Emerson College v. City of Boston* 1984; Ewing 1994; *Florida v. City of Port Orange* 1994; *Hanna v. City of Palm Bay* 1991; *National Cable Television Association, Inc. v. United States* 1974; Rinard 2006; *Sluggy's Lake Front Inn, Inc. v. Town of Delavan* 1985

Appendix I: Special Properties

Outliers

Under each of the alternatives we considered, including the status quo, a very small number of properties ended up with fees markedly higher than all of the others. The outlying properties vary by the alternatives, as each model bases fees on different property characteristics. We consider any property with a fee greater than the maximum transportation-related property tax paid by a residential property in 2007, which was $36,400, to be an outlier. Table I1 shows the number of outliers expected in each land-use category under each of our alternatives. Note that the results for the trip-generation and hybrid TUFs are identical, because those two models differed only in the residential categories, in which there were no outliers. In the end, the only types of properties that fall into outlier status under any alternative are commercial or public properties.

Table I1:
Comparison of Outliers

Property Classification	Number of Properties Charged more than $36,400			
	Status Quo	Flat-Fee	Trip-Generation	Hybrid
Residential				
Single-Family	0	0	0	0
Duplex	0	0	0	0
Multi-Family	0	0	0	0
Mixed: Commercial – Residential	0	0	0	0
Commercial				
Wholesale/Retail Trade	1	1	3	3
Services, Finance, Insurance, and Real Estate	1	0	2	2
Mixed Commercial	0	0	6	6
Manufacturing, Construction, and Warehousing	0	0	0	0
Transportation	0	0	0	0
Agriculture and Fishing	0	0	0	0
Public/Quasi-Public				
Public Schools and Buildings, Churches, Cemeteries, Quasi-Public Buildings	0	13	3	3
Public Parks, Quasi-Public Open Space	0	6	0	0

Sources: City of Milwaukee, Wisconsin 2007; City of Milwaukee, Wisconsin 2005; Institute of Transportation Engineers 2003

Under the status quo, more than 95 percent of public properties are tax-exempt, paying no property tax. The only two properties to pay more than the highest residential charge under the status quo were both office buildings. They paid $64,000 and $113,000, respectively.

Under the flat-fee TUF, 20 properties would be classified as outliers. Only one commercial property would fall into the outlier category, a department store. That property would be charged $38,000. The remaining 19 properties are public properties, including one freight yard, four airport properties, four cemeteries, one sports club, one golf course, one hospital, six parks, and one national security property. Sixteen would pay less than twice the residential maximum in 2007. The remaining three properties are a cemetery, Timmerman Airport, and General Mitchell International Airport, and they would pay $78,000, $151,000, and $610,000, respectively.

Under the trip-generation and hybrid TUFs, there would be 14 outlier properties, 11 of which are commercial properties: one department store, one grocery store, one restaurant, two banks, and six mixed-use buildings. Six of those properties would pay less than twice the maximum residential fee in 2007, and three would pay less than three times that amount. Of the last two commercial properties, the department store would pay $131,000, and one of the banks would pay $147,000. The remaining three outliers are public properties. They are the Miller Park parking lot, General Mitchell International Airport and the U.S. Post Office. They would pay $38,000, $152,000, and $272,000, respectively.

The three TUF alternatives clearly generate a few isolated fees that are much higher than the maximum fees charged under the status quo. In some cases, the higher fees may be considered acceptable by the City because they reflect greater actual use of the transportation infrastructure and more equitable payment for that use. In other instances, the City may prefer to amend the TUF structure to avoid such charges. This could be done easily by setting caps on fees, by exempting certain land-use categories (e.g. public parks and open spaces), or by exempting certain land uses (e.g. cemeteries). The exact effects of any caps or exemptions would depend upon the amount forgiven and how it was distributed across other properties (e.g. across only the land-use category of the capped or exempted property, versus across all City properties). For simplicity's sake, we chose not to include any of these options in the design of our policy alternatives. There are so few properties in the outlier category that applying any of these refinements would ultimately make little difference in our analysis.

Houses of Worship

There are 712 properties in the City of Milwaukee's tax database identified by land-use code as churches, which we understand to include houses of worship of all faiths (City of Milwaukee, Wisconsin 2007). The City may wish to give special attention to these properties, either in deference to the social value these entities provide the City, or in recognition of possible political resistance to imposing financial burdens on religious institutions. Table I2 provides a summary of the fees imposed on house-of-worship properties under each fee basis. Not all of the properties identified as houses of worship were tax-exempt under the status quo. Table I2 gives summaries for all houses of worship, just those paying taxes, and for just those designated as tax-exempt.

Table I2:
Comparison of Annual Fees for Houses of Worship

Land Use	Number	Total Annual Fees ($)			
		Status Quo	Flat-Fee	Trip-Generation	Hybrid
All Houses of Worship	712				
Mean		14	408	40	40
Median		0	136	0	0
Maximum		1,686	9,224	1,832	1,832
Total		10,099	276,334	28,224	28,224
Taxable Houses of Worship	87				
Mean		14	331	324	324
Median		0	79	162	162
Maximum		1,686	9,224	1,832	1,832
Total		10,099	28,810	28,224	28,224
Tax-Exempt Houses of Worship	625				
Mean		0	420	0	0
Median		0	145	0	0
Maximum		0	5,384	0	0
Total		0	247,524	0	0

Sources: City of Milwaukee, Wisconsin 2007; City of Milwaukee, Wisconsin 2005; Institute of Transportation Engineers 2003

The flat-fee TUF generates a great deal more revenue from houses of worship than under the status quo. The mean fee of $408 and median fee of $136 appear reasonable, although the maximum charge would be nearly the same size as the cumulative contribution to transportation infrastructure for houses of worship in 2007 under the status quo. Despite the relatively modest median fee, the flat-fee revenue total for houses of worship of more than $276,000 is sizable, because it draws funds from a large number of properties, including those designated as tax-exempt.

The trip-generation and hybrid TUF models, whose results are identical here, impose slightly higher fees than the status quo and therefore increase total revenue from $10,000 to $28,000. However, their average fee is only $40 and the maximum for all houses of worship is very similar to the status quo. Additionally, these models do not increase the burden on tax-exempt houses of worship at all, because the building area for those properties, of which their fee is a multiple, is listed as zero in the master property database (City of Milwaukee, Wisconsin 2007). The building areas for those properties may actually be zero, if the owners have not yet built upon them, or those values may not have been listed accurately, as they would not have been relevant for tax-exempt properties under the status quo. The house of worship fees under the trip-generation and hybrid TUFs could therefore end up being different if the City entered amended building-area values to the database. This would also increase the total revenue for this land use under

the trip-generation and hybrid TUF models. Assuming that tax-exempt houses of worship had trip-generation figures similar to those of the taxable houses of worship, we estimate that the maximum of fees from all houses of worship for the trip-generation and hybrid TUFs would be less than $5,000 and the total would be in the vicinity of $230,000.

Cemeteries

There are 33 properties in the City of Milwaukee's tax database identified by land-use code as cemeteries (City of Milwaukee, Wisconsin 2007). The City may wish to give special consideration to these properties. Table I3 provides a summary of the fees imposed on cemeteries under each fee basis. All cemetery properties were tax-exempt under the status quo.

Table I3:
Comparison of Annual Fees for Cemeteries

Land Use	Number	Total Annual Fees ($)			
		Status Quo	Flat-Fee	Trip-Generation	Hybrid
Cemeteries	33				
Mean		0	13,794	595	595
Median		0	4,891	211	211
Maximum		0	78,377	3,382	3,382
Total		0	441,421	19,046	19,046

Sources: City of Milwaukee, Wisconsin 2007; City of Milwaukee, Wisconsin 2005; Institute of Transportation Engineers 2003

The flat-fee TUF raises the fee total for cemeteries from $0 to more than $441,000. Average fees tend to run high because of the large typically large lot area associated with these properties. The fees on four of these properties under a flat-fee TUF were high enough to qualify as outliers. If this TUF model were adopted, it would be worthwhile for the City to consider exempting cemeteries.

By contrast, the fees for cemeteries under the trip-generation and hybrid TUFs are more modest. These TUFs would raise a total of more than $19,000 from cemetery properties.

Hospitals

There are 13 properties in the City of Milwaukee's tax database identified by land-use codes as hospitals (City of Milwaukee, Wisconsin 2007), which may warrant special consideration. Table I4 provides a summary of the fees imposed on these properties under each fee basis. Not all of the hospital properties are tax-exempt under the status quo. Table I4 gives separate summaries for those hospitals designated as taxable, tax-exempt, and for all hospitals.

Table I4:
Comparison of Annual Fees for Hospitals

Land Use	Number	Total Annual Fees ($)			
		Status Quo	Flat-Fee	Trip-Generation	Hybrid
All Hospitals	13				
Mean		1,459	4,987	1,383	1,383
Median		370	1,340	225	225
Maximum		6,358	49,139	4,940	4,940
Total		18,968	59,844	17,982	17,982
Taxable Hospitals	8				
Mean		2,371	854	2,248	2,248
Median		1,685	815	2,146	2,146
Maximum		6,538	1,877	4,940	4,940
Total		18,968	6,832	17,982	17,982
Tax-Exempt Hospitals	5				
Mean		0	13,253	0	0
Median		0	1,911	0	0
Maximum		0	49,139	0	0
Total		0	53,011	0	0

Sources: City of Milwaukee, Wisconsin 2007; City of Milwaukee, Wisconsin 2005; Institute of Transportation Engineers 2003

The flat-fee TUF raises the fee total for hospitals from $19,000 to $60,000. The majority of this money comes from a single tax-exempt property that is charged more than $49,000. There was one property for which the lot area was missing, and so we were unable to include it in our analysis. The remaining hospital properties would all pay less than $1,900 under the flat-fee TUF.

The total revenue from all hospitals for the trip-generation and hybrids TUFs of $18,000 is less than the status quo total of $19,000. The mean, median, and maximum fees for individual hospital properties are all reduced in these two TUF models. The fees for the tax-exempt hospitals in these models remain at zero because the building area for those properties, on which we base their fee, is listed as zero in the master property database (City of Milwaukee, Wisconsin 2007). This effectively exempts them from fees in the trip-generation and hybrid models, and depresses the reported mean and median fees. Their fees would end up significantly different if the City chose to add their buildings' areas to the database, which would also increase the revenue total for hospitals. If tax-exempt hospitals were similar to the taxable hospitals in terms of trips, then we estimate the mean and median fees for tax-exempt hospitals would be around $2,200, the maximum around $5,000, and the total raised by about $11,000 to roughly $29,000.

Pass-By Properties

The trip-generation estimates for several land uses likely overestimate actual transportation infrastructure usage generated by pass-by properties. The general characteristics of pass-by properties and various possibilities for trip-generation calculations involving those properties are discussed in Appendix K. A summary of properties in Milwaukee that would likely be classified as pass-by properties and their accompanying trip-generation rates is given in Table I5.

Table I5:
Pass-by Properties in the City of Milwaukee

Description	Number	Independent Variable	Average Daily Trip Rate per Independent Variable Unit		
			Weekday	Saturday	Sunday
Convenience Market with Gasoline Pumps	285	Gross Floor Area (1,000's Sq Ft)	845.60	1,448.33	1,182.08
Park-and-Ride with Bus Service	996	Acres	372.32	74.46	74.46
Drive-in Bank	99	Gross Floor Area (1,000's Sq Ft)	246.49	71.21	22.15
Walk-in Bank	2	Gross Floor Area (1,000's Sq Ft)	156.48	13.70	8.30
High-Turnover (Sit-Down) Restaurant	347	Gross Floor Area (1,000's Sq Ft)	127.15	158.37	131.84
United States Post Office	14	Gross Floor Area (1,000's Sq Ft)	108.19	49.69	28.81
Supermarket	86	Gross Floor Area (1,000's Sq Ft)	102.24	177.59	166.44

Sources: City of Milwaukee, Wisconsin 2007; City of Milwaukee, Wisconsin 2005; Institute of Transportation Engineers 2003

Many of the properties that we designate as outliers have land-use codes that identify them as pass-by properties. If adjustments were made to the trip totals for these properties using the methods described in Appendix K, then the fees for those properties would be reduced. In some cases, the reduction would be sufficient to remove the property from the outlier category. But regardless of the effects on individual properties, pass-by adjustments could alter the distribution of fees across the land-use categories. In particular, any pass-by adjustment would tend to increase the financial burden on residential and manufacturing properties, because the pass-by properties all fall within the land-use categories for commercial (wholesale/retail and services), transportation, or public building properties (City of Milwaukee, Wisconsin 2007).

Appendix J: Example TUF Ordinance

Many TUF ordinances exist nationwide. Below we reproduce an example of a municipal ordinance establishing a flat-fee TUF alternative from the City of Hubbard, Oregon (2001).

ORDINANCE NO. 244-2001
AN ORDINANCE ADOPTING A TRANSPORTATION UTILITY FEE FOR THE CITY OF HUBBARD.

WHEREAS, the City Council of the City of Hubbard finds it necessary to adopt a Transportation Utility fee in order to provide funds for the maintenance of local streets under the jurisdiction of the City of Hubbard, and

WHEREAS, the Council declares the necessity of providing maintenance and upkeep of the City's local streets and related facilities within the right-of-way as a Comprehensive Transportation Utility with such maintenance to include, patching, crack sealing, seal coating, over-laying and other activities as are necessary in order that local streets may be properly maintained to safeguard the health, safety and welfare of the city and its inhabitants.

THE CITY OF HUBBARD ORDAINS AS FOLLOWS:

Section 1. The City of Hubbard Transportation Utility Fee be established as set forth in the attached document marked “Exhibit A” attached hereto and by this reference incorporated herein and entitled “Transportation Utility Fee.”

The foregoing ordinance was passed by City Council of the City of Hubbard this 17th day of May 8, 2001:

Chapter 13.45
TRANSPORTATION UTILITY FEE
Sections:

13.45.010 Declaration of purpose.

There is hereby created a transportation utility for the purpose of providing funds for the maintenance of local streets under the jurisdiction of the city of Hubbard. The council hereby finds, determines and declares the necessity of providing maintenance and upkeep of the city's local streets and related facilities within the right-of-way as a Comprehensive Transportation Utility with such maintenance to include, without limitation, the following activities: Patching, crack sealing, seal coating, over-laying and other activities as are necessary in order that local streets may be properly maintained to safeguard the health, safety and welfare of the city and its inhabitants.

13.45.020 Establishment of transportation utility fee.

The city council may establish by resolution a transportation utility fee to be paid by the owners or occupants of property within the corporate limits of the city. Such fee shall be established in such amounts which will provide sufficient funds to properly maintain local streets throughout the city. Fees charged to individual structures and uses shall be based upon a flat fee for residential classifications and
based upon the average number of vehicle trip generated for non-residential classifications. The city council may from time to time by resolution, change the fees based upon revised estimates of the cost of properly maintaining local streets, revised categories of developed use, revised traffic generation factors, and other relevant factors.

13.45.030 Transportation utility fee - Dedicated.

All fees collected pursuant to this chapter shall be paid into the Street Fund. Such revenues shall be used for the purposes of the operation, administration, and maintenance of the local transportation network of the city. It shall not be necessary that the operations, administration, and maintenance expenditures from the Street Fund specifically relate to any particular property from which the fees for said purposes were collected.

13.45.040 City to maintain local streets - Exceptions.

The city shall maintain all accepted local streets within city-owned land, city rights-of-way, and city easements and maintain other accepted local streets within or adjacent to the city. Such local streets specifically exclude private streets and streets not yet accepted by the city for maintenance.

13.45.050 Billing and collection of fee.

(1) The transportation utility fee shall be billed collected with and as part of the water and sewer bill for those properties utilizing city water and/or sewer, and billed and collected separately for those properties not utilizing city water or sewer. In cases where a developed property is subject to water and/or sewer utility charges, the transportation utility fee bill shall be directed to the same person as the bill for water and/ or sewer charges. If a tenant in possession of any premises pays such fee, such payment arrangement shall not relieve the owner from such obligation and lien. All such bills shall be billed and collected pursuant to HMC 13.15.150.
(2) The Finance Director shall deposit all such fees so collected into the Street Fund to be separately kept and used for the purposes provided herein. Partial payments on utility bills shall be allocated first to the transportation utility fee, second to the sewer service charges and third to the charges for water service.

13.45.060 Enforcement.

(1) Any charge due hereunder which is not paid when due may be recovered in an action at law by the city. In addition to any other remedies or penalties provided by this or any other ordinance of the city, failure of any user of city utilities within the city to pay said charges promptly when due shall subject such user to discontinuance of any utility services provided by the city. The city Finance Director is hereby empowered and directed to enforce this provision against such delinquent users.
(2) The Public Works Superintendent shall be responsible for determining fee amounts in accordance with usage, developing street maintenance and improvement programs, performing traffic counts, and establishing standards for the operation and maintenance of streets and related facilities to the end that the transportation system shall be maintained and that the city's investment therein kept available for the benefit of the public. The employees of the city shall, at all reasonable times, have access to any premises served by the city for inspection, repair, or the enforcement of the provisions of this chapter.

13.45.070 Administrative review -Appeals.

(1) Any user or occupant who disputes the amount of the fee, or disputes any determination made by or on behalf of the city pursuant to and by the authority of this chapter may petition the city council for a hearing on a revision or modification of such fee or determination. Such petitions may be filed only

once in connection with any fee or determination, except upon a showing of changed circumstances sufficient to justify the filing of such additional petition.
(2) Such petitions shall be in writing, filed with the City Recorder, and the facts and figures shall be submitted in writing or orally at a hearing scheduled by the city council. The petitioner shall have the burden of proof
(3) Within forty-five (45) days of filing of the petition, the city council shall make findings of fact based on all relevant information, shall make a determination based upon such findings and, if appropriate, modify such fee or determination accordingly. Such determination by the city council shall be considered a final order.

13.45.080 Notice of decision.

Every decision or determination of the city council shall be in writing, and notice thereof shall be mailed to or served upon the petitioner within a reasonable time from the date of such action. Service by certified mail, return receipt requested, shall be conclusive evidence of service for the purpose of this chapter.

13.45.090 Disposition of fees and charges.

The fees paid and collected by virtue of this chapter shall not be used for general or other governmental propriety purposes of the city, except to pay for an equitable share of the city's accounting, management and other governing costs, incident to operation of the street maintenance program. Otherwise the fees and charges shall be used solely to pay for the cost of operation, administration, maintenance, repair, improvement, renewal, replacement and reconstruction of city streets and related facilities.

13.45.100 Waiver of fees in case of vacancy.

When any premises within the city become vacant, totally unoccupied, or unused, and water service is discontinued and all outstanding water, sewer and transportation utility charges have been paid; and with approval, by the Finance Director, the transportation utility fee shall thereafter not be billed and shall not be a charge against the property.

13.45.110 Exemptions.

The city council may, by resolution, exempt any class of user when they determine that the public interest deems it necessary or that the contribution to street use by said class to be insignificant.

13.45.120 Discount for the elderly.

Discounts applying to low income elderly persons for city water and sewer fees shall also apply to transportation utility fees.

13.45.130 Violation - Penalty.

In addition to any other remedy provided in this chapter, violation of this ordinance is punishable by a fine not to exceed $500. Each day after an account subject to transportation utility fees remains delinquent in payment of such fees constitutes a separate violation.

13.45.140 Severability.

(1) In the event any section, subsection, paragraph, sentence or phrase of this ordinance is determined by a court of competent jurisdiction to be invalid or unenforceable, the validity of the remainder of the ordinance shall continue to be effective. If a court of competent jurisdiction determines that this ordinance imposes a tax or charge, which is therefore unlawful as to certain but not all affected properties, then as to those certain properties, an exception or exceptions from the imposition of the transportation utility fee shall be created and the remainder of the ordinance and the fees imposed thereunder shall continue
to apply to the remaining properties without interruption.
(2) Nothing contained herein shall be construed as limiting the city's authority
to levy special assessments in connection with public improvements pursuant
to applicable law.

13.45.150 Effective date.

This ordinance sha1l begin June 15,2001.

A RESOLUTION ESTABLISHING THE TRANSPORTATION UTILITY FEE REQUIRED BY SECTION 13.45 OF THE HUBBARD MUNICIPAL CODE.

WHEREAS, the City Council of the City of Hubbard finds it necessary to create a transportation utility for the purpose of providing funds for the maintenance of local streets under the jurisdiction of the City of Hubbard; and

WHEREAS, the City Council has adopted a Transportation Utility Fee under section 13.45 of the Hubbard Municipal Code.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF HUBBARD, THAT:

Section 1: The City of Hubbard Transportation Utility Fee is set forth in the attached document marked "Exhibit A" attached hereto and by this reference incorporated herein and entitled "Transportation Utility Fee."

INTRODUCED AND ADOPTED this 12th day of June 2001.

Exhibit "A"
Transportation Utility Fees

1. Residential:
   - A. Single Family $4.25 Per month
   - B. Multiple Family $4.25 Per month per dwelling unit
   - C. Mobile Home Park $4.25 Per month per dwelling unit

2. Non-residential:
   - A. Churches/Private Clubs $4.25 Per month
   - B. Commercial - Low (0 - 2.5 vt) $1.00 Per month per 1,000 sq. ft.
     Ex: Offices, Barber/Beauty Shops, Furniture Sales
   - C. Commercial - Medium (2.5 - 19 vt) $2.50 Per month per 1,000 sq. ft.
     Ex: Retail Sales, Cleaners/Laundromats, Auto Repair Shops, Banks without drive-up window, Restaurants/Taverns/Lounges
   - D. Commercial - High (19+ vt) $4.00 Per month per 1,000 sq. ft.
     Ex: Service Stations, Convenience Stores with gas pumps, Banks with drive-up window, Restaurants with drive-up window
   - E. Warehouse/Storage
     (0 to 20,000 sq. ft.) $0.40 Per month per 1,000 sq. ft.
     (>20,000 sq. ft.) $0.24 Per month per l,000 sq. ft.
   - F. Manufacturing/Industrial/Wholesale
     (0 to 20,000 sq. ft.) $0.56 Per month per 1,000 sq. ft.
     (>20,000 sq. ft.) $0.40 Per month per 1,000 sq. ft.

3. The minimum monthly fee for any commercial account is $4.25 per business.

Note: Area calculations are applied to the square footage of structures used for commercial purposes.

vt = vehicle trips per 1,000 square feet based on the ITE Manual.

Appendix K: Trip-Generation Rate Adjustments

Pass-By Trips

Trip-generation data provide a reasonable fee basis for a TUF, but the estimates derived from these data are not perfect. In particular, trip-generation rate estimates ignore the possibility that not all properties function as end destinations and that trips vary in length.

Motorists visit some properties only as they happen to pass by them on their way to their ultimate destinations. Individuals may stop and purchase gasoline at a service station or other goods from a convenience store on their way to work. Similar "pass-by" properties include banks and supermarkets. An individual may leave home and consume transportation infrastructure services with the main purpose of going to work, but then stop at the convenience store on the way. The decision to stop at the convenience store does not appreciably contribute to greater usage of the transportation infrastructure than would have occurred anyway without that particular stop. However, trip-generation studies incorporate all vehicles entering and exiting all properties into their estimates, thus inflating the true burden these properties place on the transportation infrastructure (Federal Highway Administration 1985). We provide a list of land uses specifically for the City of Milwaukee that would likely be designated as pass-by properties and their accompanying trip-generation rates in Appendix I.

To account for the inaccuracy of trip-generation estimates associated with pass-by properties, transportation analysts have developed adjustments, which can be used to reduce trip-generation rates for those properties, to more realistically estimate trip-generation totals. In Table K1, we provide examples of reduction rates, collected by the Institute of Transportation Engineers, for notable pass-by property categories. For example, analysts could account for the pass-by nature of service stations by decreasing overall trips by 58 percent (Buttke 1984)

Table K1:
Pass-By Factors to Reduce Overall Number of Trips

Land Use	Pass-By Traffic Rate Reduction (%)
Shopping Centers	25
Fast-Food Restaurants	55
Service Stations	58
Convenience Mart	45

Source: Buttke 1984

Trip Length

Recognizing that different land uses will generate trips of varying average lengths, thereby placing burdens on the transportation infrastructure not directly proportional to numbers of trips, analysts have devised factors to adjust the number of trips for typical trip length. In Table K2, we provide an example of how the City of Talent, Oregon, adjusts the trip-generation rates for its TUF. The City of Talent assumes, for instance, that individuals will embark on shorter-than-average trips when en route to the local schools, so they multiply school trip rates by 0.67 to reduce the number of total trips by one-third for that property land use (City of Talent, Oregon 2000).

Table K2:
Multipliers Applied to Trip-Generation Estimates Correcting for Length of Trip

Land Use	Trip-Length Multiplier
Commercial	0.67
Church, Institutions, Schools	0.70
Business Parks and Offices	0.85
Residential (except senior housing)	1.08
Industry	1.08
Medical Clinic, Office	1.23
Lodging, R.V. Parks	1.33

Source: City of Talent, Oregon 2000

Similar calculations could be used to refine the trip-generation or hybrid TUF models we evaluated, using the land-use codes already recorded in the tax database. This could increase the accuracy of the estimated proportions of transportation infrastructure usage upon which our fee calculations are based, and consequently improve the equity of the TUF under the benefit principle. Such refinements would complicate the fee calculations, however, making the results less transparent and possibly reducing political feasibility.