STORMWATER UTILITY FEASIBILITY STUDY

City of Jefferson, Wisconsin

September 2007

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1. STORMWATER MANAGEMENT PROGRAMS

1.1 Introduction

In recent years the emphasis in water quality management has shifted from point sources, such as municipal and industrial wastewater treatment plant discharges, to non-point sources, that is, pollution which is carried into streams by stormwater runoff. There has also been an increase in concern about the effects of new developments on groundwater recharge and on increased downstream flooding. These newly heightened sensitivities have been added to age-old concerns of efficient removal of stormwater runoff from the vicinity of homes, schools and businesses so that back-ups of runoff do not threaten life of property.

The result of these heightened concerns has been increasing regulation of stormwater runoff, a trend away from piped conveyances to open channel conveyances and more frequent installation of stormwater management facilities, such as ponds, sediment traps and infiltration structures. The increased investment required to deal with stormwater and the cost of maintenance needed to keep the new facilities functional have stressed the ability of governments to pay for stormwater management. This stress has impelled investigations into new methods of stormwater management revenue collection that will not only provide the needed funds, but that will assure all parties responsible for stormwater generation will pay their fair share of the costs.

This report was commissioned by the Jefferson City Council to evaluate the possibility of creating a City stormwater utility to meet its stormwater management revenue needs. This report was partially funded by the Department of Natural Resources through an Urban Nonpoint Source and Stormwater Grant.

1.2 Stormwater Management Activities and Trends

Historically, stormwater management consisted of draining the runoff to a permanent water body as quickly and as cheaply as possible, preferably through underground pipe systems where it would be the least inconvenience to the public. Because underground pipe systems would be prohibitively expensive if they were to be designed to handle large storms, the usual practice was to limit the design capacity to that required to handle a storm which would occur about once every five years in residential areas, or once every ten years in commercial areas. Design was totally "event-based", that is, facilities were designed to handle the rate of runoff occurring in the peak 15 to 60 minutes of a single storm. The runoff from larger storms was intended to be carried in streets until it reached a point at which overflow could occur into a permanent watercourse. Little attention was paid to ground moisture or the effects of a series of storms, and no attention was paid to removal of pollutants which might be washed from the pavement or ground surfaces, except possibly for the coarsest grit.

Although stormwater collection and conveyance for small areas is still handled in the same way today, there is a new-found respect for the role of wetlands and other natural runoff holding areas in slowing the rate of discharge so that streams and rivers can handle the runoff without flooding. There is also an increasing concern about the effects of the pollutants from farming activities, car exhausts, unvegetated construction sites and other disruptions of the natural landscape resulting from increasing development and the activities of modern human life.

The trend has become to attempt to replicate nature's beneficial stormwater management processes by the use of engineered facilities. Detention ponds are constructed to mimic wetlands and natural holding areas in slowing the rate of runoff. Sediment traps and sediment forebays are constructed to keep soil particles and other sediment from reaching watercourses. Infiltration trenches, infiltration beds and rain gardens are constructed to compensate for the reduction in areas where rainfall and snow melt can soak into the ground and replenish the groundwater system. It is possible that the future will bring treatment facilities to treat storm sewer discharges to remove harmful pollutants. Stormwater treatment is being done now in small industrial and commercial areas to control oil and grease in runoff from parking and vehicle storage areas. Filtration facilities are being considered for some stormwater discharges.

To-date the City of Jefferson has not had an erosion control and stormwater management ordinance. Developments have included ponds only as required for downstream rate control and as required by Department of Natural Resources regulations. Most such facilities are privately owned. In the future it is anticipated that the City will oversee installation of more stormwater management facilities, some of which will be maintained by City staff. In such cases the City will need funds to perform the necessary operation and maintenance. The City also will need funds to replace and upgrade its storm sewer system, and possibly to retrofit some storm sewer discharges to mitigate the water quality effects of those discharges.

In larger communities new Federal and State regulations are being implemented that require each municipality to monitor its stormwater discharges, to create computer models of its stormwater discharges and to reduce the pollutants in its stormwater discharges. It is probable that the City of Jefferson will be subject to such regulations in the future. Creation of a stormwater utility can provide the mechanism for the City to fund the anticipated expenditures.

1.3 Jefferson Stormwater Management Organization

The hands-on operation and maintenance of City-owned stormwater management facilities is the responsibility of the City Public Works Department under the direction of the City Engineer. The City Administrator and office staff provide support services. The City plans to administer its own Erosion Control

and Stormwater Management Ordinance. Review of erosion control and stormwater management plans for large developments is usually contracted out to the City's consulting engineering firm, with the review costs being recovered from the applicants. Smaller erosion control and stormwater management plans are handled directly by the City Engineer. The City Engineer also performs most of the erosion control and stormwater management inspection.

1.4 Costs of City's Stormwater Management Program

The City is already expending significant funds on stormwater-related activities. Appendix 1 is a tabular summary of existing City accounts which have a stormwater-related function. This appendix shows an estimate of the percent of the 2007 City expenditures which are related to stormwater management and a projected 2008 budget for stormwater management.

Typical municipal activities which are stormwater management-related are:

- Enforcement of an Erosion Control and Stormwater Management Ordinance
- Mow grass in stormwater channels and detention ponds
- Maintain, and replace as necessary, municipally owned infiltration facilities
- Clean storm inlets and storm sewers of accumulated sediment
- Replace and repair storm inlets and storm sewers
- Provide utility locations (Digger's Hotline) of municipally owned stormwater pipelines
- Sweep streets to remove debris and sediment
- Leaf collection to prevent leaves from being washed into stormwater conveyances

Support staff is needed to administer such programs. Equipment is needed to perform the maintenance and construction activities.

The City of Jefferson is an older community. In Jefferson, as in many older communities, existing storm sewers are often undersized. However, to replace existing storm sewers is an expensive proposition. Therefore, there are stormwater management needs going unmet due to budgetary limitations.

1.5 Necessary Characteristics of Stormwater Financing

Whatever method of stormwater financing is chosen by the City, it should have the following characteristics:

- Adequacy – The funds provided must be adequate for the needs.

- Stability, Reliability – The funding must be reliable and, to as great of extent as possible, not be in competition for revenue with other government services.
- Equitability – The funds necessary to execute the City's stormwater management programs should be collected in proportion to the creation of the need for the expense.

1.6 Public Education and Information

No stormwater management program or financing program will be successful unless the public is convinced of the need for the program and unless the details of the program are made as clear as possible. If a stormwater utility is adopted, the ordinance adoption should be preceded by a series of public hearings, meetings and discussions.

Continuing education on such items as the need to avoid dumping materials into street inlets and the effects on water bodies of lawn fertilizers will help protect the receiving waters. Over time such education programs may help citizens to modify their practices and may help the City to avoid end-of-pipe treatment requirements.

2. FINANCING ALTERNATIVES

2.1 Property Taxes

The property tax (ad valorem tax) is the most commonly used revenue source for constructing, operating and maintaining stormwater facilities and for administering stormwater management programs. This is the method the City has used to-date. Stormwater funding is part of the annual City general fund budgeting process. The use of property taxes has the effect of spreading stormwater management funding over the entire tax base of the community.

Under this system, tax exempt entities, such as schools and churches, do not pay for management of the stormwater they generate. Some students and some church members live outside the City limits. Consequently, the school district taxpayers or church members who live outside the City pay nothing for handling the stormwater generated on school or church property within the City.

Property taxes are deductible on State and Federal income tax returns, that is, payment for stormwater management by the property tax method can result in a credit against personal income taxes for individual homeowners if those homeowners itemize on their income tax returns.

2.2 Special Assessments

Chapters 62 and 66 of Wisconsin statutes allow direct assessment of municipal costs to parties responsible for those costs. Such assessments are commonly used for construction of new public works where the benefit to individual properties can be clearly and fairly established. Generally, assessments are used for discrete construction events, not to support ongoing operation and maintenance programs.

The establishment of "benefit" represents the biggest challenge for use of special assessments for stormwater facilities. Who is "benefiting", the property where the stormwater originates or the property where the stormwater collects? The rate of stormwater runoff varies by the amount of impervious surface area, the permeability of the soil, the slope of the ground surface, the length of the path by which the stormwater concentrates, and even by the time of year and amount of recent rainfall. The variables involved make exact calculation of benefit quite difficult, and, often, impractical.

2.3 Impact Fees

Wisconsin statutes allow the use of "impact fees" on land as it develops. Such fees are either collected at the time a development is approved or at the time a building permit is issued. Such fees are sometimes used where a new development, either singularly, or in combination with other new developments, will cause the construction of new regional facilities or the reconstruction of existing regional facilities. Wisconsin statues limit the application of these fees to

facilities where the need for construction can be related directly to the development. Any collected fees must be expended within a limited time period. The legal limitations on impact fees make them impractical for financing continuing stormwater management programs.

2.4 Developer Trust Funds

Because existing property owners inside a community sometimes object to the long-term costs involved with new stormwater ponds and other stormwater facilities necessitated by new development, some communities are considering requiring developers to establish permanent trust funds, the interest from which can be used to offset the future operation and maintenance costs for the stormwater management facilities in that development. This approach is usually practical only when the development is being annexed to the municipality, and the initial deposit to the trust fund can be negotiated as an annexation fee.

2.5 User Charges (Stormwater Utility)

The lack of fairness and equity inherent in the property tax method of funding the costs of stormwater management has resulted in a trend toward creation of a user charge-type system for funding stormwater management programs. Usually, in this system a separate "stormwater utility" is created.

A utility user fee is typically charged against all developed parcels within a municipality. Where land is in a natural vegetated state, over an annual period, most rain either soaks into the ground, evaporates, or is used by plants. Where development has occurred, rooftops, driveways and parking lots prevent the rainfall from being retained on-site. Instead, most of the rainfall runs off into storm sewers, streets, ditches or streams. A need for continuing maintenance of drainage systems and stormwater management systems is created by the development. Therefore, a fee is levied to each developed parcel based upon how much relative runoff is contributed by that particular parcel.

A stormwater utility may be:

1. A fund or restricted account designated for stormwater management within the existing governmental unit, sharing personnel and equipment with other governmental services,
2. An independent department with its own personnel and equipment.

Because of the relatively small size of the City of Jefferson, the type of utility being considered in this feasibility study is the first type, i.e. a separate stormwater account, with maintenance and equipment being provided by the existing Public Works maintenance staff.

3. USER CHARGE OPTIONS

3.1 Impervious Surface Area Approach and Rationale

3.1.1. Relationship of Impervious Surfaces to Runoff

Stormwater runoff rates and quantities are usually calculated using one of two methodologies. Storm sewer design is often accomplished using the "Rational Method". This method assumes that the runoff rate, Q, is the product of the area being drained, A, the average rainfall intensity, i, and a runoff coefficient, C. The runoff coefficient accounts for the integrated effects of rainfall interception, infiltration, depression storage and temporary storage. The primary determinant of the runoff coefficient is the imperviousness of the surfaces being drained.

The second methodology commonly used is known as the TR 55 methodology, after Technical Release No. 55 from the original federal Soil Conservation Service (now Natural Resources Conservation Service).

The general runoff equation is:

$$Q = \frac{(P - I_a)^2}{P - I_a + S}$$

where Q = actual runoff, P = potential maximum runoff, I_a = the initial abstraction (losses before runoff begins) and S = potential maximum watershed retention after runoff begins. The term I_a is generally considered to be equal to 20% of the potential maximum runoff. This makes the runoff equation assume the following form:

$$Q = \frac{P - 0.2S}{P + 0.8S}$$

The term S can be expressed in terms of a runoff "curve number", CN, as:

$$S = (1000/CN) - 10$$

The runoff curve number, CN, is a function of soil type and the percentage of the area which is impervious. For a "typical" two-inch rainfall (normally considered a one-year frequency event), in twenty-four hours, the runoff equation becomes:

$$Q = \frac{(16 - (1600/CN) + (40{,}000/CN^2))}{(800/CN) - 6}$$

With either of these methods, the single, primary determinant of the amount of a rainfall which runs off is the amount of impervious surface area.

3.1.2. Equivalent Runoff Unit (ERU) Approach

To avoid having to calculate the actual runoff from each individual parcel of land, the usual approach is to determine a standard runoff unit and to compare all land parcels in a community in terms of that standard runoff unit. This is the equivalent runoff unit (ERU) approach.

Because single family residential parcels are by far the most frequent type of land use, the common practice is to compare all other land uses to the average single family residence. Therefore, the ERU is sometimes called the equivalent residential unit.

3.1.3. Impervious Surface Approach to the Equivalent Runoff Unit

The simplest approach to determining an equivalent runoff unit is to determine the impervious surface area on a sampling of single family residential parcels using map measurements if aerial maps are available, or using infield surveying measurements if they are not. This average single family impervious surface area is then termed the equivalent runoff unit, or one ERU. Then, by the same methods, each commercial, industrial or institutional parcel can be measured and the total impervious surface area on each such parcel can be divided by the measured impervious surface area on the average single family residential parcel to determine the number of ERU's.

The total ERU's in a community are then added together. The annual stormwater management budget is then divided by the total ERU's to determine a cost per ERU.

This approach assumes all soils in the community are relatively similar in nature, or that property owners should not be penalized if the soil on their properties are less permeable than soils in other areas. It also ignores the differences in land slope and time of concentration. (Time of concentration is the time it takes for a drop of runoff to run from the farthest point in the watershed to the point of analysis. The longer the time of concentration, the lower the peak runoff rate.)

3.2 Alternative Approaches and Variations

3.2.1 Runoff Calculation

Some stormwater utilities assign a typical runoff curve number to each land use and use a standard rainfall, perhaps a two-inch, twenty-four hour rainfall to compute relative runoff for different land uses using the following equation:

$$Q = \frac{(16 - (1600/CN) + (40{,}000/CN^2))}{(800/CN) - 6}$$

For example, a single family residential use might be assigned a CN = 72, a duplex land use might be assigned a CN = 75, a multi-family land use might be assigned a CN = 85, an industrial land use might be assigned a CN = 88, an institutional land use might be assigned CN = 90, and a commercial land use might be assigned a CN = 92. The runoff per acre is then determined for each of the land uses. It is then necessary to determine the total acreages of each land use in the community. The acreage in each land use is multiplied by runoff from one acre of that land use at the assumed CN and is then divided by the runoff per acre at CN = 72 for single family residential use. The results for each land use are added to determine the total equivalent single family residential acreage. The stormwater utility budget is then divided by the total equivalent single family residential land use acreage to determine a single family residential land use charge per acre.

The difficulty with this approach is that the basis for the stormwater utility charge is acres. It assumes that every acre of a particular land use has the same imperviousness, and this is seldom the case. Consequently, appeals to the charges are common on the basis of intensity of development. Appeals continue until all parcels are adjusted to an equitable rate. Generally, this approach is simplified by assuming every developed parcel will get at least the single family residential charge.

3.2.2. Intensity of Development Factor

Some utilities include an "intensity of development" factor in the stormwater utility charge calculation. This factor recognizes the fact that a property which has a greater percentage of impervious surface area will tend to generate more runoff than the same amount of impervious surface area on a larger, less developed property where the runoff from the impervious fraction may have a greater chance of soaking into the ground before it reaches a public conveyance. (This may not actually be true if the impervious area is immediately adjacent to a street.) This weighting of the percent imperviousness also tends to promote the use of green space, buffer strips and on-site stormwater management practices. The designation of the intensity of development factor must necessarily, to some degree, be arbitrary. The following table shows the City of Fitchburg, Wisconsin, intensity of development system.

Table 3-1
Fitchburg Intensity of Development System

Multi-Family Residential and Non-Residential Percentage of Impervious Area	Intensity of Development Factor
0 – 9.9%	0.6
10 – 54.9%	1.0
55 – 69.9%	1.7
70 – 89.9%	2.9
Greater than 90%	4.8

The use of this factor introduces the need for another measurement, that being the total parcel area, and the need for another computation. (In the case of the City of Jefferson, the total parcel area is generally available from the County land records system or can be easily measured by the same methods as the impervious surface area is measured.)

3.2.3. Charging for Vacant Parcels

Some stormwater utilities charge for undeveloped, vegetated parcels on the basis that such parcels will generate some runoff which the municipal stormwater system must handle, and should, therefore, pay at least a basic charge. Other stormwater utilities totally exempt such parcels from any charge because they are considered insignificant in terms of causing runoff expenses. (An overwhelming percentage of the runoff from storms up to 1 inch of rainfall in 24 hours is generated by impervious surface areas. For larger storms, areas that are not impervious generate runoff at a rate increasingly close to the rate from impervious areas.) If such parcels are to be charged, measurements must then be taken of the size of the parcel to ensure the charge is proportional to the runoff generated, and the municipality's parks and conservancy areas must be added to the equation.

4. USER CHARGE DETERMINATION AND COST COMPARISIONS

4.1 Basic Assumptions

The basic assumptions used in this feasibility study are as follows:

- The stormwater user charges will be based upon impervious surface area only, without an intensity of development factor.
- Vacant, vegetated parcels will receive no charge.
- City streets and sidewalks, which are shared by all property owners, will not be measured or charged.
- City-owned parcels will be measured and the General Fund will be charged
- The equivalent runoff unit (ERU) will be based upon the average impervious surface area measured from a representative sampling of a combination of the single family residences and duplex-type units. Approximately 10% of such units will be measured. The upper and lower $^{1}/_{10}^{th}$ of that 10% will be discarded, and the middle $^{8}/_{10}^{ths}$ of the measured 10% will be used to determine an ERU.

These assumptions will keep the user charge determination as simple and as easily explainable to the layman, as possible, and will minimize administrative cost.

4.2 Definition of Equivalent Runoff Unit

Measurements have been performed on 271 single family residential and duplex properties using available aerial photography. A figure depicting the measurement of the impervious surface area on a typical single family residential parcel is shown on the next page.

The map measurements made are presented in both map and tabular form in Appendix 2. A chart depicting the distribution of impervious area ranges determined in the measurements for single family and duplex-type residential parcels is shown on the second following page.

Using these measurements, it has been computed that the average single family residential/duplex parcel has approximately 3,220 square feet of horizontally projected impervious surface area. Therefore, 3,220 square feet of impervious surface is the City of Jefferson equivalent runoff unit (ERU).

The City of Jefferson records indicate there are 2089 single family residential units and 109 duplex type units within the City. Therefore, there are 2208 ERUs in this land use category.

4.3 Multi-Family Residential Units

There are one hundred seven multi-family residential parcels in the City of Jefferson, a multi-family residential parcel being one that has three or more

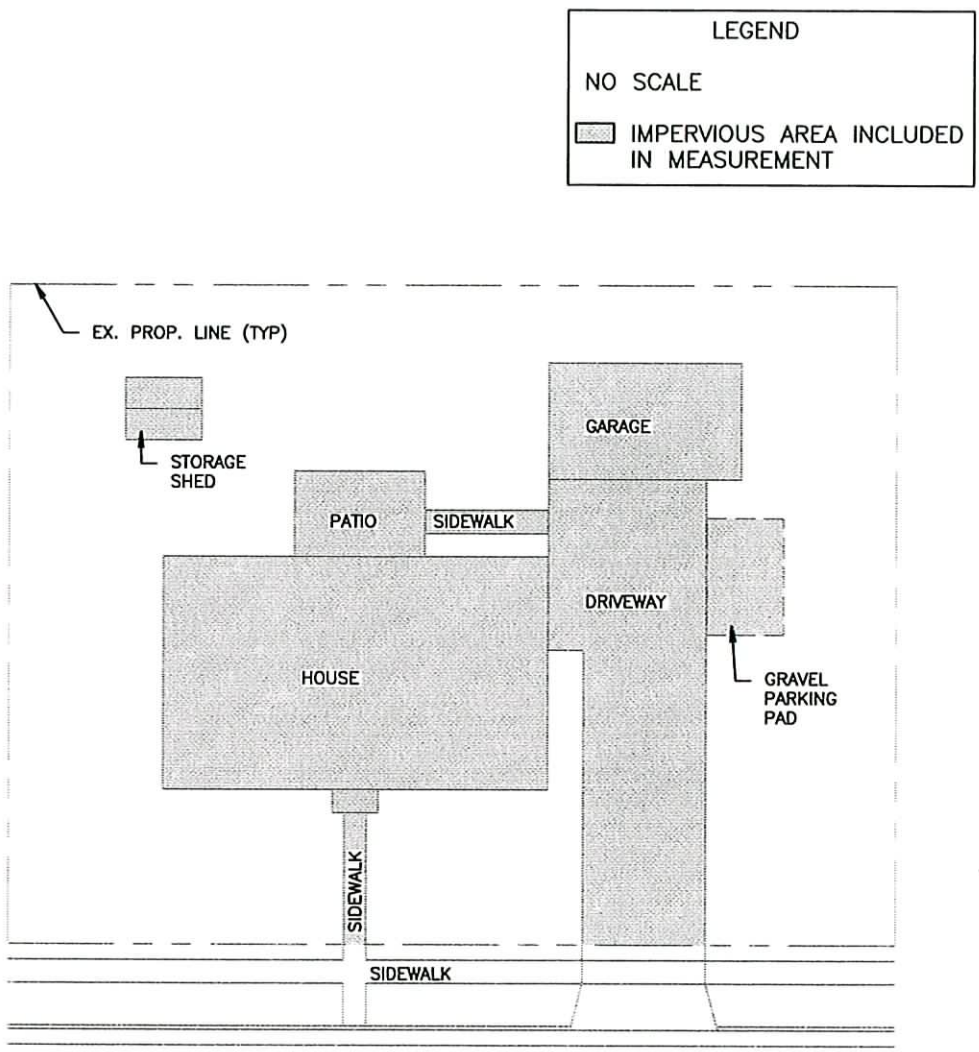
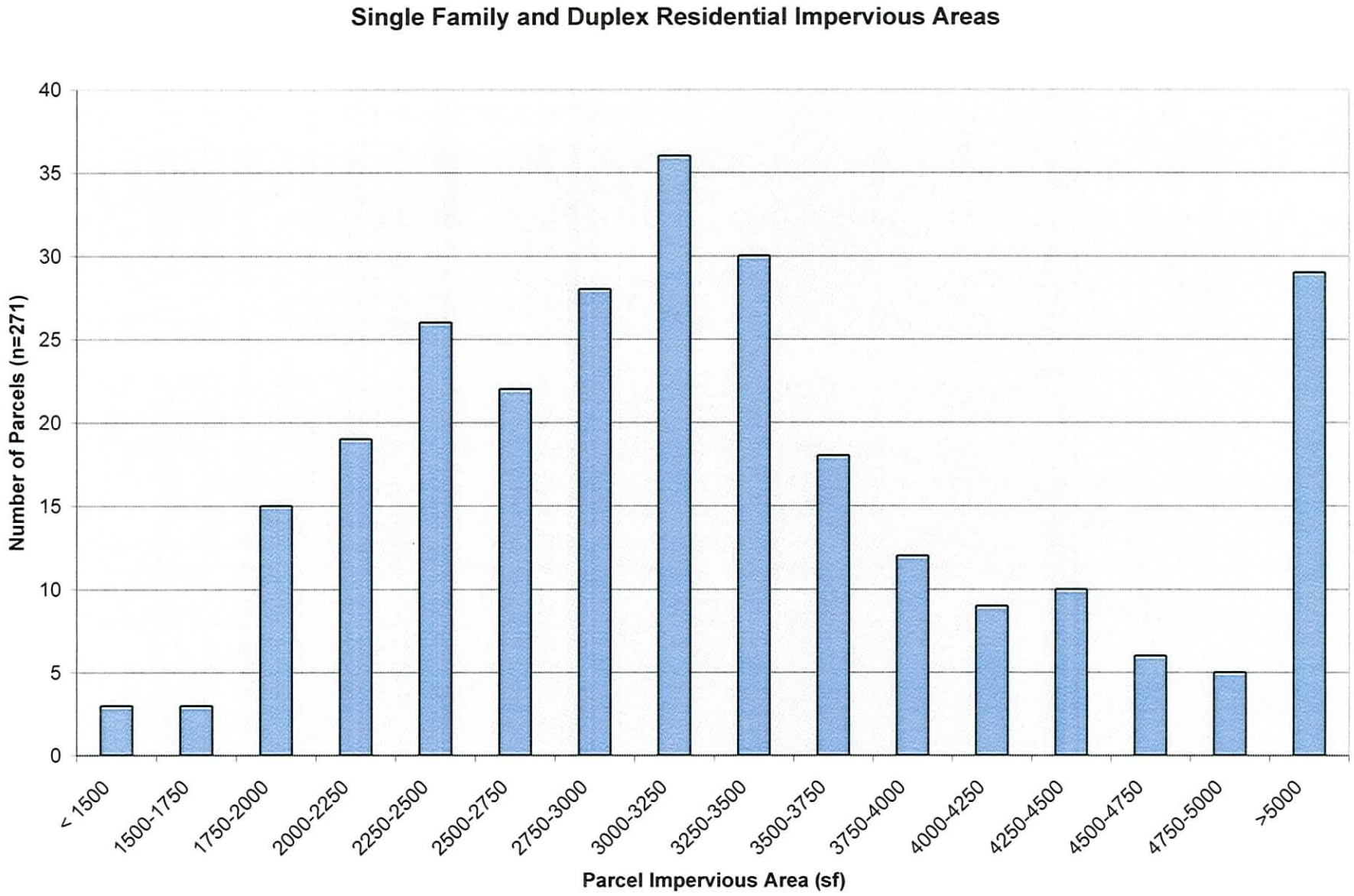

LEGEND
NO SCALE
IMPERVIOUS AREA INCLUDED IN MEASUREMENT
EX. PROP. LINE (TYP)
STORAGE SHED
GARAGE
PATIO
SIDEWALK
DRIVEWAY
HOUSE
GRAVEL PARKING PAD
SIDEWALK
SIDEWALK

FIGURE 4–1


Single Family and Duplex Residential Impervious Areas
Number of Parcels (n=271)
40
35
30
25
20
15
10
5
0
< 1500
1500-1750
1750-2000
2000-2250
2250-2500
2500-2750
2750-3000
3000-3250
3250-3500
3500-3750
3750-4000
4000-4250
4250-4500
4500-4750
4750-5000
>5000
Parcel Impervious Area (sf)

dwelling units on it. A condominium association is counted as one parcel, although there may be many individual parcels within the association. The mobile home park is also counted as one parcel. The results of the impervious surface measurements on the multi-family units are given in Appendix 2. These multi-family residential parcels total to 465 equivalent runoff units.

4.4 Non-Residential (Commercial/Industrial and Institutional) Land Uses

There are two hundred seventy-one non-residential developed parcels in the City of Jefferson. (Some of these may actually consist of more than one tax parcel.) There are 60 institutional entities, such as schools and churches. There are 176 commercial entities. And there are 33 industrial entities. There are also two agricultural business parcels with significant impervious areas. The impervious surface area on each of these was measured from the County's aerial maps. The results are shown in Appendix 2. A figure depicting the impervious surface areas on a typical commercial site is shown on the following page. The ERUs for the institutional parcels totaled 1449, for the commercial parcels 1232, for the industrial parcels 1810, and for the agricultural business parcels 97. These land uses total to 4588 equivalent runoff units.

4.5 ERU Charge Determination

The City's projected stormwater-related budgeted expenses for 2008 are shown in Appendix 1. (Stormwater expense is not currently segregated in the City accounts, although if a utility is adopted this should be done.) Where the expense in an account covers many services, for example clerical labor costs, an assumption is made of the percent of those costs which are stormwater-related. The total annual budget so determined was $273,876.

The sum of the ERU's in the categories described earlier in this section can be summarized as follows:

Land Use Category	ERU's
Single Family and Duplex Residential	2208
Multi-Family Residential	465
Commercial	1232
Industrial	1810
Others (Agricultural Business)	97
Institutional	1449
	7261

The ERU charge then can be determined as follows:

$$\frac{\$273,876}{7261 \text{ ERUs}} = \$37.72 \text{ / ERU per year}$$

Because there are likely to be some credits granted it is reasonable to set the ERU charge slightly higher than the calculated charge. An ERU charge of $40.00 per year is assumed. Therefore, the quarterly charge per ERU would be $10.00. The monthly charge per ERU would be $3.33.

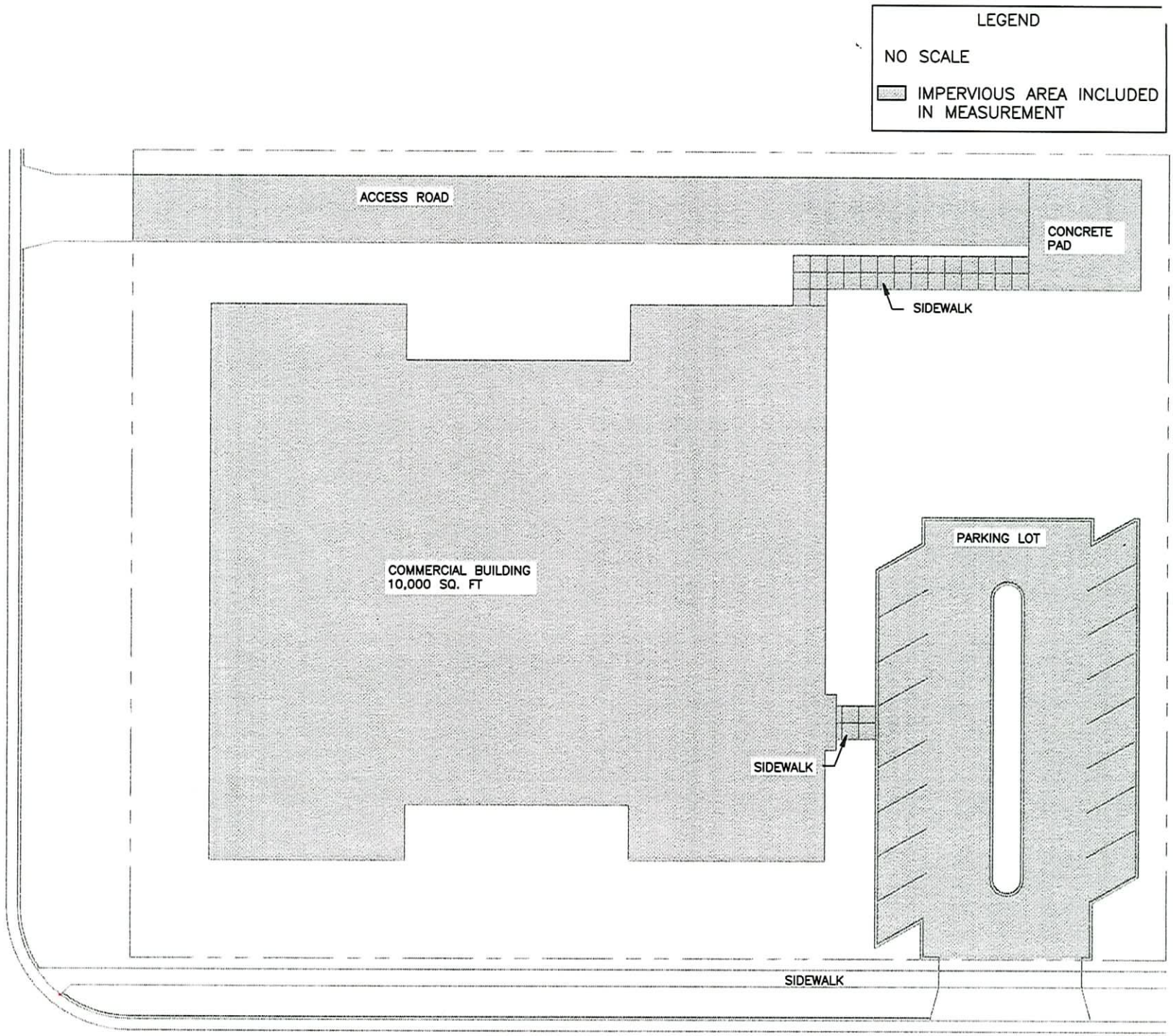

LEGEND
NO SCALE
IMPERVIOUS AREA INCLUDED IN MEASUREMENT
ACCESS ROAD
CONCRETE PAD
SIDEWALK
COMMERCIAL BUILDING
10,000 SQ. FT
PARKING LOT
SIDEWALK
SIDEWALK

FIGURE 4–2

On the following page a listing of stormwater utilities in Wisconsin taken from the American Public Works Association website is reproduced. This listing shows the magnitude of the ERU charge used by other municipal stormwater utilities. The $40.00 discussed in this study is in the lower third of the range of ERU charge rates shown in this listing.

4.6 Cost Distribution: Property Tax Basis versus Stormwater Utility Basis

The Appendix 2 spreadsheets show the cost per parcel for the City's stormwater-related expenses if those costs were collected by property taxes versus the charges for the same parcels on the calculated stormwater utility basis. (As noted in the previous section, the actual utility charge being considered is $40.00 per year, a little above the calculated charge.) The spreadsheet calculations for the collection of stormwater costs by property taxes are based upon a total assessed value in the City of $503,111,000. To collect the $273,876 annual budget set forth in Appendix 1 would require a stormwater-related tax levy rate of 0.0005444.

In general, with a stormwater utility, costs are shifted from residential properties to non-residential properties. The average single family residential parcel among those used to determine an ERU would pay $93.59 per year for stormwater-related City expenses at the assumed budget level. On the utility ERU basis, for the same budget that parcel would pay $37.72 per year. (Again, the actual utility charge being considered is $40.00 per year, a little above the calculated charge.) Of course, because property taxes are deductible on income tax returns, a 10% to 35% credit would be realized by residential property owners if the property tax basis is used, provided they itemize on their individual income tax returns.

For non-residential properties, the situation is reversed. Most (although not all) such properties would pay more under a stormwater utility basis. Because both property taxes and utility fees are deductible as ordinary business expenses, there is little tax advantage with one system or the other.

A table and a chart depicting the revenue shift are shown on the second and third following pages. A precise comparison is difficult because there are some mixed residential/commercial units (which are placed in the commercial category), and the land use classification upon which the ERU determination is based may not match the Department of Revenue classifications, from which the assessed value figures are taken, on a parcel to parcel basis. Moreover, industrial property assessments are set by the state and some are not available on the County database used in Appendix 2. Also, there are some new properties shown in the table in Appendix 2 that are yet to be given an up-to-date assessment that reflects the developed condition. Nevertheless, the table and the chart provide an accurate impression of the revenue shift that would take place with the adoption of a stormwater utility.

Fox Wolf Watershed Alliance

Stormwater User Charge System Information

Representative Wisconsin Communities

Information collected by APWA-WI and FWWA as summary of Wisconsin stormwater user charges. All data shown is subject to change - contact individual communities to confirm accuracy - please forward updates!

Name of Community or Stormwater District	Recent Population	Created/ Started in:	ERU Size (sf)	Annual $$ / ERU (or 1-fam home)	Credit Policy? Y/ N	Credit Policy? Max Amount	Comments/ Web site addresses
Allouez (Village)	15,443	2006	3,663				www.villageofallouez.com
Appleton (City)	70,293	1995	2,368	$ 108.88	Yes	77%	www.appleton.org
Baraboo (City)	10,771	2005	2,379	$ 46.87			www.cityofbaraboo.com
Barron (City)	3,250	2005	10,850	$ 24.00	Yes	75%	www.barronwi.us
Bellevue (Village)	14,386	2002	3,221	$ 48.00	Yes	100%	www.bellevue-wi.com
Beloit (City)	35,803	2006	3,347	$ 24.00			http://beloit.govoffice3.com/
Brown Deer (Village)	11,895	2004	3,257	$ 91.80	No		www.browndeerwi.org
Butler (Village)	1,885	1999	3,032	$ 66.00			
Chetek (City)	2,180	2005		$ 27.00	Yes		www.chetek.net
Chippewa Falls (City)	13,374	2005		$ 36.00			www.ci.chippewa-falls.wi.us
Cudahy (City)	18,430	2001	2,700	$ 48.00	Yes	$2/ ERU	www.ci.cudahy.wi.us
De Forest (Village)	7,400	2005		$ 54.00			
Delafield (City)	7,820	2004		$ 29.00			
De Pere (City)	20,560	2003		$ 40.00			
Eau Claire (City)	62,576	1997	3,000	$ 47.00	Yes	100%	www.ci.eau-claire.wi.us
Elm Grove (Village)	6,250	2004	6,235	$ 65.50			www.elmgrovewi.org
Fitchburg (City)	22,100	2002	3,700	$ 52.20	Yes		www.city.fitchburg.wi.us
Garner's Creek		1998	3,623	$ 96.00	Yes	85%	Combined Locks, Buchanan, Harrison
Glendale (City)	13,400	1996	2,609	$ 42.00	No	‡	www.glendale-wi.org
Grand Chute (Town)	20,200	1997	3,283	$ 48.00	Yes	85%	www.grandchute.net
Grantsburg (Village)	1,397	2004		$ 18.00	Yes	75%	www.grantsburgwi.com
Green Bay (City)	102,350	2004	3,000	$ 55.20	Yes	67%	www.ci.green-bay.wi.us
Greendale (Village)	14,410	2006		$ 72.00			www.greendale.com
Greenville (Town)	8,008	1999	4,510	$ 60.00	Yes	85%	www.townofgreenville.com
Harrison (Town of)	5,800	1998		$ 96.00			www.townofharrison.org
Howard (Village)	15,774	2005	3,301	$ 44.00			www.villageofhoward.com
Janesville (City)	61,604	2003	3,200	$ 27.36	Yes	65%	www.ci.janesville.wi.us
Kenosha (City)	96,845	2007	2,477	$ 60.00	Yes		www.kenosha.org
Lake Delton (Village)	2,975	1993	1,685	$ 18.00	Yes	100%	www.lakedelton.org
Little Chute (Village)	10,830	1998	2,752	$ 96.00	No		www.littlechutewi.org
Madison (City)	220,332	2001	Ind'l Msmt	$ 45.02	Yes	50%	www.ci.madison.wi.us
Marshfield (City)	19,220	2004		$ 66.00			
McFarland (Village)	6,416	2007					www.mcfarland.wi.us
Milwaukee (City)	597,000	2006	1,610	$ 82.20	Yes	60%	www.mpw.net
Monona (City)	8,000	2004	NA *	$ 60.00	Yes	65%	www.monona.wi.us
Monroe (City)	10,600	2006	2,728	$ 60.00			www.cityofmonroe.org
Neenah (City)	24,600	2003	3,138	$ 56.00			www.ci.neenah.wi.us
New Berlin (City)	38,719	2001	4,000	$ 60.00	No		www.newberlin.org
New Richmond (City)	7,726	2004	12,632	$ 28.68	Yes	75%	www.ci.new-richmond.wi.us
N. Fond du Lac (Village)	4,557	2007	3,123	$ 56.00	Yes		www.nfdl.org
Oshkosh (City)	65,000	2003	2,817	$ 48.88	Yes	40%	www.ci.oshkosh.wi.us
Pleasant Prairie (Village)	18,000			$ 15.00			
Poynette (Village)	2,563	2006	3,550	$ 50.00			http://www.poynette-wi.gov/
Racine (City)	81,855	2004	2,844	$ 72.00	Yes	40%	www.cityofracine.org
River Falls (City)	13,019	1998	NA *	$ 23.52	Yes	100%	www.rfcity.org
Sheboygan (City)	50,800	2001	2,215	$ 36.00	Yes		www.ci.sheboygan.wi.us
Shorewood Hills (Village)	1,732	2007	2,941				www.shorewood-hills.org
Slinger (Village)	3,901	2007	4,300		Yes		www.slinger-wi.usa.org
St. Francis (City)	9,373	2001	2,500	$ 48.00			www.ci.stfrancis.wi.gov
Sun Prairie (City)	24,464	2003	3,468	$ 60.00	Yes	65%	www.cityofsunprairie.com
Superior (City)	27,370	2007	1,907	$ 70.80	Yes	TBD	www.ci.superior.wi.us
Sussex (Village)	9,687	2005		$ 60.00			http://www.village.sussex.wi.us/
Washburn (City)	2,300	2005		$ 48.00			www.cityofwashburn.org
Watertown (City)	22,824	2005		$ 16.00			http://www.ci.watertown.wi.us/
Waupun (City)	10,720	2005	3,204	$ 77.50			www.cityofwaupun.org
Wauwatosa (City)	45,602	1999	2,174	$ 42.00	Yes	100%	www.wauwatosa.net
West Allis (City)	61,250	1997	1,827	$ 59.40	Yes	56%	www.ci.west-allis.wi.us
Weston (Village)	12,736	2004	3,338	$ 47.78	Yes	68%	www.westonwisconsin.org

Send updates to jmazanec@sehinc.com; 2007 update information courtesy of Shelly Billingsley/ City of Kenosha, Janet Sosnosky/ City of Manitowoc; City of Superior and T Ochsner/ SEH. Past contributions by J Bachhuber/ Earth Tech and M Dailey, City of Madison.

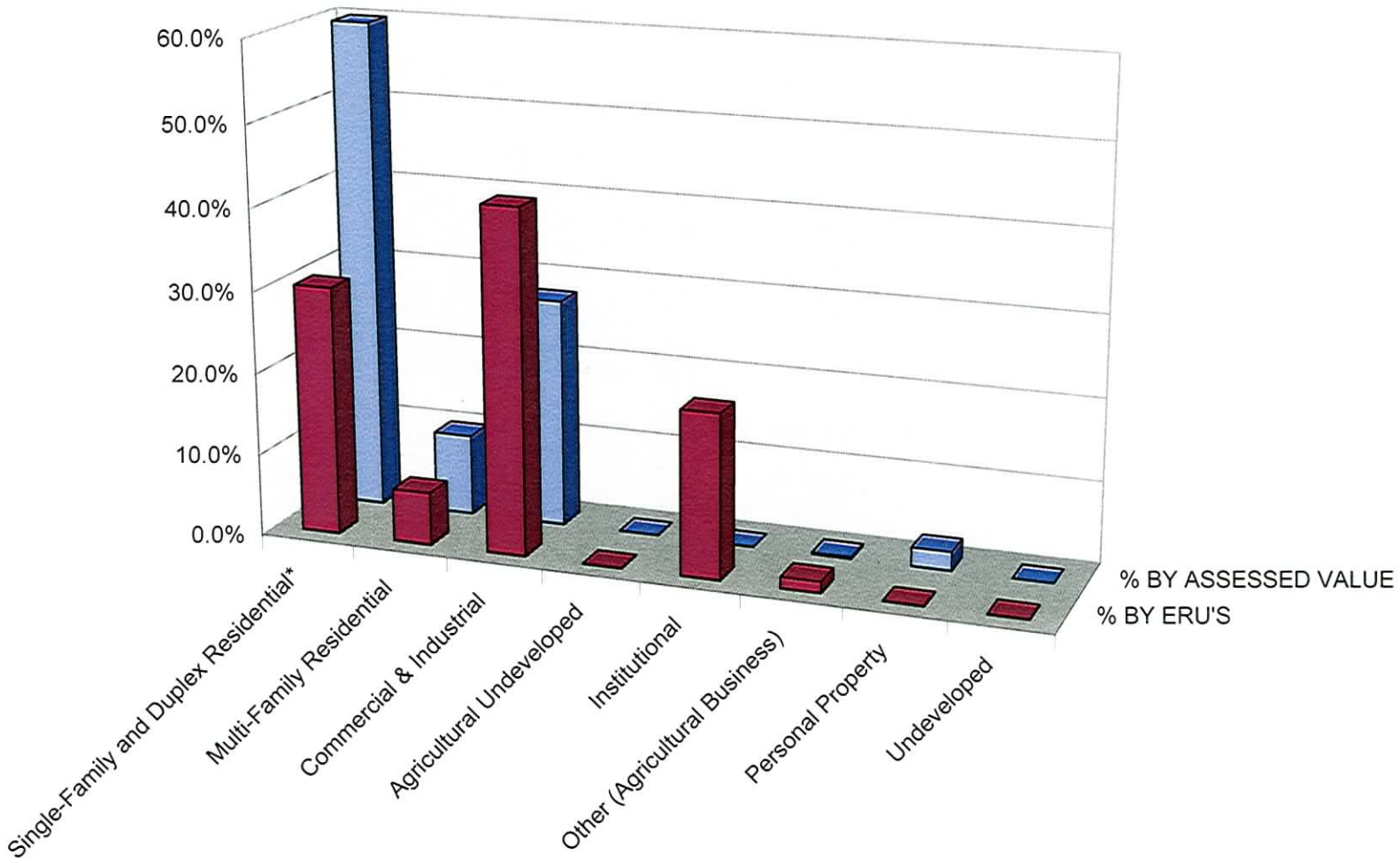
COMPARISON OF REVENUE GENERATED BY PROPERTY TAX METHOD VERSUS STORMWATER UTILITY IMPERVIOUS SURFACE AREA METHOD

LAND USE CLASSIFICATION	ASSESSED VALUE	% BY ASSESSED VALUE	ERUS	% BY ERUS
Single-Family and Duplex Residential*	$300,996,800	59.8%	2208	30.4%
Multi-Family Residential**	$49,452,600	9.8%	465	6.4%
Commercial & Industrial	$140,020,600	27.8%	3042	41.9%
Agricultural Undeveloped	$163,800	0.0%	0	0.0%
Institutional	$0	0.0%	1449	20.0%
Other (Agricultural Business)	$973,100	0.2%	97	1.3%
Personal Property	$11,484,600	2.3%	0	0.0%
Undeveloped	$19,500	0.0%	0	0.0%
TOTAL	$503,111,000	100.0%	7261	100.0%

* Includes zero lot-line and condominium two family structures

** Some parcels included in ERU calculation not yet assessed

Revenue Comparison



5. CREDIT SYSTEM

In Wisconsin, utilities are regulated by the Public Service Commission. PSC policies and legal precedent indicate that a recommended component of a stormwater utility ordinance is a "credit" system. The basic principle underlying a stormwater utility is that those who cause the greatest stormwater-related costs should pay the greatest amount. Conversely, credit can be given where a direct savings to the municipality's stormwater management program can be demonstrated. Consequently, credits may be offered for practices that reduce the impact of stormwater runoff or that provide an ongoing public benefit related to stormwater management.

A credit program should include several important features:

- No credit should be granted for simply meeting the City's or the State's erosion control and stormwater management regulations. Therefore, most detention ponds will not be an acceptable basis for a credit.
- The applicant should own and operate the facility or practice for which credit is requested.
- No credit should be granted just because the direction of flow from a rooftop or other impervious surface is toward the interior of a property. Small depressions in lawn areas will fill and storm runoff will eventually leave the property.
- The property owner must be responsible for the measurements and calculations, and for supplying other evidence which demonstrate justification for the credit.
- If a special facility is installed to achieve a credit, the operation and maintenance of that facility should be subject to periodic review to assure that the basis for the credit continues to exist.

It is recommended that the stormwater fee be split into parts, such as (1) basic fee/administrative costs, (2) operation and maintenance costs, and (3) capital improvement/debt service costs. Credits should be given only for the operation and maintenance cost component or, if it can be demonstrated that the City will save capital costs on a specific planned project, for the capital cost component. All properties should pay the basic fee.

The following credits are often considered:

- Credit for "quantity" reductions over and above those required by ordinance or regulation. Quantity reductions may be either in terms of total quantity of runoff or the peak flow rate of the runoff. A privately owned infiltration facility that significantly reduces the amount of stormwater runoff leaving the property, such as a bioretention facility, would be one example of such a practice. If credit is given, the facility

usually must be certified by a professional engineer or qualified stormwater management facility designer as having been designed and constructed in accordance with accepted practices. That professional also provides an estimate of the reduction in annual average runoff from the property.

- Credit for a stormwater treatment system – some municipalities promote the treatment of stormwater to improve the quality of storm runoff. Credit for use of such treatment devices as grease and oil separators, proprietary sediment removal devices and filters is often given.
- Some communities allow credit for properties that discharge runoff directly to a natural water body, without the runoff having to be conveyed through a municipally-owned stormwater conveyance, on the assumption that the municipality has no costs involved in "maintaining" a natural water body.

Some municipalities wish to promote green space and offer a credit based upon the percent imperviousness of the property. For single family residential properties, this sometimes is in the form of a "small homes credit" for those homes which have significantly less impervious surface than the square feet calculated for one ERU.

For larger individual properties, credits are sometimes considered for new conservation easements. A conservation easement permanently protects that part of the property from being developed or otherwise altered from its natural state in the future. Such easements avoid future increases in stormwater runoff. The easement protects some minimum number of contiguous acres. Such easements should not be placed over steep slopes, buffer strips, floodways or wetlands which are already protected from being developed by other regulations.

Some communities also provide credits for educational programs related to stormwater management which are provided at schools. When such programs are credited, the curriculum is usually scheduled with the intention that all students should receive the instruction at least once during their tenure at the school.

It is a common practice to adjust the total ERUs each year for the credits that are granted. The total remaining ERUs can then be divided into the annual budget to determine a revised cost per ERU.

The City staff and consultants have developed suggested credit application forms and a suggested credit application manual for use in the City of Jefferson. These are presented in Appendix 3. It is expected that, with use, these documents will require some refinement and modification.

6. IMPLEMENTATION

6.1 Billing Methods

6.1.1. General Discussion

The easiest and most inexpensive billing method to implement a stormwater charge system is to add the utility charge to water/sewer bills. In Jefferson, water and sewer bills are sent out monthly. Therefore, each customer must receive a monthly ERU charge. Appendix 2 can be used to create the necessary customer charge list for non-residential properties.

6.1.2. Single Water Meters

Most parcels with water service have a single water meter and a single account number. These customers receive a single bill. For these parcels the stormwater charges, whether a flat customer class rate or calculated based upon actual impervious surface area, can be easily added directly to the water and sewer bill.

Where a landlord has multiple tenants who are served by a single meter and that landlord then allocates the meter charges to the tenants in their rents, the stormwater utility charge should be handled in the same way. For the sake of simplicity, the City is advised to not honor requests to split the stormwater charge among tenants.

6.1.3. Multiple Water Meters for a Single Tax Parcel

For parcels which have multiple water meters serving a single parcel the City will have a choice. Either the total stormwater utility charge for that parcel can be divided by the number of meters and each customer will pay the charge, or a special invoice can be created and the stormwater utility charge can be sent directly to the property owner. If the charge is split, the method of splitting should be kept simple. Either the charge should be divided evenly among units, or the split should be related to stormwater generation, e.g. by the floor area of the units. For administrative simplicity it is recommended that the City not split the charge in this category.

6.1.4. Inactive Accounts

Inactive accounts can be a significant percentage of the total number of installed meters. Inactive accounts occur most frequently when a tenant or owner moves out and a period of time elapses before a new tenant or owner moves in. However, during this interim period the property continues to generate stormwater runoff and the property owner should continue to pay the stormwater user fee. The City should put a system into place whereby

water utility accounts are "flagged" when the account goes inactive, and the stormwater user fee billing process is transferred to the same direct billing system as is used for developed properties that do not have water or sewer service. This is particularly important for commercial and industrial properties because these land uses can generate large amounts of runoff.

6.1.5. Unmetered Properties

Some properties, such as mini-warehouse properties or homes on well and septic systems, may have neither water nor sewer service and, therefore, are not included among the water and sewer utility account. These properties still generate stormwater runoff and should be charged the stormwater user fee. The City must set up a direct billing system for such properties. Ideally the bills for such properties should be sent with the same frequency as the water and sewer bills. If this results in an excessive administrative burden, lesser billing frequencies can be considered.

6.1.6. Undeveloped Properties and Changes in Land Use

For undeveloped, fully vegetated properties, most stormwater utility systems either exempt these properties from stormwater user fees altogether, or reduce the amount of the fee to the basic part of the ERU charge. Properties such as vacant lots in newly developed subdivisions are usually brought on line in the stormwater fee billing system either when a building permit is issued or at the time of the installation of the water meter. If such properties are added to the billing system at the time the building permit is issued, it will be necessary to treat these properties as unmetered properties until a water meter is installed. Activating the stormwater charge at the time the water meter is activated is administratively simplest.

Provision must be made in the billing system for properties which change from one land use to another or which change the amount of impervious surface on the property.

For new structures other than single family or duplex land uses, it will be necessary to have a complete site plan showing driveways and private sidewalks, drawn to scale. The impervious service area calculation can then be completed. This site plan should be required as part of the building permit application process. A copy of the site plan should be given by the Building Inspector to the Public Works Department so that the impervious surface area can be calculated.

6.2 Ordinance Development

If a stormwater utility is to be formed, it will be necessary to develop and adopt a stormwater utility ordinance and a stormwater user fee resolution. The

establishment of the magnitude of the fees should be kept separate from the ordinance because modifying ordinances is cumbersome, requiring publication and comment from the public. Fees must be changed periodically to reflect changing ERU's and changing budgets. Making fee changes by resolution avoids the publication requirement of ordinance changes.

Appendix 4 presents a proposed ordinance for Jefferson developed jointly by the authors of this study, the City Administrator, the City Engineer and the City Attorney.

6.3 Stormwater Utility Budgeting and Record-Keeping

It is recommended that segregated accounts for stormwater related expenses be created where possible, and that a budget be prepared on an annual basis. The budget should be split into administrative, capital improvements/debt service, and operation and maintenance components. As part of the budgeting process, the total number of ERU's should be recalculated and the user charge for a single ERU should also be recalculated. The fees can then be changed by resolution as necessary and all water utility and direct billing accounts should be updated. Also, a procedure for changing the ERU's and granting credits between the time of annual updates should be established.

6.4 Conflict Resolution

Despite any efforts made to notify the public during the formation of a stormwater utility, there will be protests of the charges, particularly during the period immediately following the sending out of the first bills following adoption of the Utility ordinance. Careful thought should be given regarding how such protests will be handled and resolved, and whether billing adjustments are made retroactively. In general, the same procedure as used for protests of water bills can be followed, except the review of any technical parts of the protest may require the input of the City Engineer.

It should be recognized that no matter what action is taken by the City, protests can always be appealed to the State Public Service Commission.