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COMMUNITY GUIDE TO
Development Impact Analysis

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1 | Introduction (click chapter titles to return to Contents)

In recent years, considerable attention has been given to the potential impacts of growth and development on communities throughout Wisconsin. In general, growth has been viewed as healthy and desirable for communities because it often leads to additional jobs; increased income for residents; a broader tax base; and the enhancement of cultural amenities such as libraries and parks. However, communities are increasingly aware that growth may also be accompanied by costs such as increased fiscal expenditures for necessary public services and infrastructure, traffic congestion, consumption of local natural resources, loss of open space and unique cultural attributes. In addition, development decisions are too often made without a sufficient understanding of the consequences of those decisions on overall community well-being. Since changes induced by growth in a community are not always positive, carefully planned development is necessary for ensuring that growth is consistent with the long-range goals of the community.

Development impact assessment provides a framework for addressing this issue. It is designed to assist local planners and decision-makers in understanding, ahead of time, what types of impacts a particular development may have on a community, thus allowing time for avoidance or mitigation of any adverse effects of a proposed development.

This chapter provides an overview of development impact assessment, including the benefits of conducting such an assessment. It also provides general guidelines for conducting a development impact assessment, including the types of impacts that should be assessed during the process, when the assessment should be prepared, who should do it and steps to follow in conducting the assessment.

Development impact assessment is premised on the assumption that a community has an up-to-date, comprehensive land use plan. Without this, no context exists to use development impact assessment information in decision-making because the relevant community values and aspirations have not been identified.

What is a Development Impact Assessment?

Development impact assessment involves a process to comprehensively evaluate the consequences of development on a community. The assessment process should be an integral part of the planning process as it provides extensive documentation of the anticipated economic, fiscal, environmental, social and transportation-related impacts of a particular development on a community.

The development impact assessment process makes use of existing information, where possible to determine potential impacts of a proposed development. It also employs techniques to gather additional, new information, where necessary. Development impact assessment provides a framework to integrate these data, models, spatial and statistical analyses and experiences in other locales to predict development impacts. For each, impact area (i.e. fiscal, environmental, socio-economic, and transportation), this guide provides a series of worksheets, questions and other methods that may be used to collect information that will assist local officials and planners in assessing impacts.

What are the Benefits of Conducting a Development Impact Assessment?

The development impact assessment process is designed to enhance sound land use management at the local level. Effective land use planning includes a number of important characteristics. The Department of Natural Resources considers a particular land use to be sound if it minimizes adverse environmental impacts, is suitable for the location, makes efficient use of existing community infrastructure and services, accounts for community costs, is the product of broad public consensus and is consistent with community regional character. This guide and the development impact assessment process, in general, are designed to ensure that sound land use practices are integrated into day-to-day operations of local government and are included in long-range plans for communities.

Development, especially that which is large, unique or precedent-setting may have a substantial impact on a community's financial, environmental and cultural resources. Development impact assessment provides an opportunity for communities to gain advance understanding of the potential impacts of a particular development, so that they may plan to both efficiently meet new service demands (e.g., additional road construction or water line installation) and avoid potential environmental or social costs that may accompany the development. Development impact assessment is also important because it:

- ◆ **Promotes communication and conflict resolution among local officials and residents.** The assessment process involves collaboration between local officials and citizens to identify concerns, exchange information and evaluate potential impacts associated with the development. The process is also a valuable tool for minimizing the risk of conflict between groups about the proposed development.
- ◆ **Encourages responsive and informed decision-making.** The assessment of impacts helps ensure that local officials acknowledge and respond to citizen concerns. Active involvement of both citizens and local officials in the assessment can lead to informed decisions that are consistent with long-term goals of the community.
- ◆ **Addresses the range of potential impacts associated with a proposed development.** The development impact assessment process is designed to address the potential , fiscal, environmental, socio-economic, and traffic impacts related to a proposed development. The comprehensive nature of development impact assessment ensures that many impacts are considered in the planning process and thus results in more informed development-related decisions.
- ◆ **Facilitates interagency cooperation and efficiency.** Since comprehensive impact assessment considers the range of potential impacts of a proposed development, the process requires substantial cooperation among various governmental departments to collect and analyze data about the project. For example, a proposal to construct a shopping center on the outskirts of town may require estimates of increased traffic congestion from the Department of Transportation, a biological assessment of the site from the Department of Natural Resources, and a benefit/cost analysis from the Department of Public Works or Planning Department. Moreover, the development impact assessment provides a common repository for information collected from each agency and the public.
- ◆ **Promotes fairness and consistency in the development process.** The systematic approach applied during the assessment process ensures that all impacts are considered for each proposed development.

◆ **Identifies resource needs and constraints.** An important component of the development impact assessment is that the process helps local officials identify public services that need to be expanded or public facilities that need to be built or improved upon to accommodate growth. It also identifies, in advance of development, potential resource constraints (e.g., financial or environmental resources) that may impede the success of a proposed development.

What Types of Impacts Matter and Why?

FISCAL IMPACTS

Fiscal analysis involves assessing the public service costs and revenues associated with the development. Such an analysis projects the net cost of the development on the fiscal balance sheet of the community. Since fiscal feasibility plays an important role in determining whether or not to proceed with a proposed development, fiscal impact analysis is a critical component of any development impact assessment.

ENVIRONMENTAL IMPACTS

Development often leads to environmental impacts including, but not limited to, loss of open space, impacts on groundwater and surface water quantity and quality (e.g., drinking water supplies), changes in air quality, increases in impervious cover (e.g., paved roads, parking lots), alteration of wildlife habitat and changes in landscape aesthetics. To the extent that a proposed development affects natural resources in a community, an environmental impact assessment is designed to identify the level of impact and assist the community in ensuring that development plans avoid and/or mitigate associated environmental impacts.

SOCIO-ECONOMIC IMPACTS

Socio-economic impact assessment focuses on evaluating the impacts development has on community social and economic well-being. This analysis relies on both quantitative and qualitative measures of impacts. Development impacts are generally evaluated in terms of changes in community demographics, housing, employment and income, market effects, public services, and aesthetic qualities of the community. Qualitative assessment of community perceptions about development is an equally important measure of development impacts. Assessing proposed developments in a socio-economic context will help community leaders and residents identify potential social equity issues, evaluate the adequacy of social services and determine whether the project may adversely affect overall social well-being.

TRAFFIC IMPACTS

Traffic is a natural result of many development projects. Thus, in considering a development proposal, it is important to evaluate potential transportation-related impacts including additional infrastructure requirements (e.g., more roads, traffic lights), and increased traffic congestion. A transportation impact assessment will assist the community in ensuring that traffic in the community continues to flow adequately. When prepared in conjunction with the other impact assessment components included in this guide, the transportation impact assessment will help determine the feasibility of additional transportation projects needed to accommodate growth and whether there are environmental and social issues that need to be addressed if additional infrastructure is required and/or traffic increases.

What are Some Overall Guidelines for Analyzing Specific Development Impacts?

- ◆ Evaluate both positive and negative impacts of the proposed development for each of the impact areas.
- ◆ Focus on significant impacts, not on the nominal effects of development.
- ◆ Consider direct impacts as well as cumulative impacts of the development. The cumulative impacts are often the most difficult to assess, yet may have the most significant consequences.
- ◆ Give high priority to community values and long-term goals of the community when assessing impacts.
- ◆ Involve the community in evaluating impacts, especially during the socio-economic impact assessment process.

It should be noted that development impact assessment is designed to assess the impacts of development taking place at one point in time and space. Although many of the concerns are similar, it would have to be adapted to understand the impacts of many increments of development over time or across an extensive area.

When Should a Development Impact Assessment be Conducted?

As soon as a development is considered and well before substantial capital has been committed, an analysis of potential impacts should begin. Once a draft plan of the proposed development has been submitted to the community, it is appropriate to begin thinking about the potential impacts of the development on the community, especially whether or not the project is consistent with the community's plan or vision for the future. It is also important to keep in mind that the development impact assessment must be responsive to changes in the proposed development (e.g., size, scope, type of development).

Who is this Guide Written for?

This guide is intended for use by community leaders, planners, extension agents and community residents. Ideally, the development impact assessment should be prepared by a planner or staff person in the community who has knowledge of and is responsible for the issues addressed in the assessment. It may often be appropriate for the individual(s) in charge of the assessment to seek the assistance of a community task force or planning commission. Development impact assessment presents the community with an opportunity to provide valuable input into the local planning and decision-making process.

What are the Steps to Development Impact Analysis?

Once a development proposal is received and before the impact analysis is conducted, a number of preliminary questions and concerns should be addressed. Prior to engaging in the impact analysis, consider the following steps:

1. Review the proposal for consistency with your community's zoning code, land use plan and/or comprehensive plan.
2. If the proposal is not consistent, clarify community needs and values about the site and its future use.
3. Consider the following factors: the magnitude of the development proposal (in terms of potential workers or residents and size), your time and your resource constraints. Then, decide how detailed an impact analysis is possible. For example, a smaller development that is not expected to attract a large number of residents or workers may not need a social impact assessment or a traffic impact assessment.

Once you have decided to conduct a development impact assessment, continue the process as follows:

4. Develop an information gathering strategy. The first component is to decide what data will be needed and what is currently available. Then, information collection and integration mechanisms must be developed. Information collection may require gathering data from other agencies, setting up task forces or public meetings, and getting detailed information from developers. Data integration typically involves converting data to common formats in data bases, spreadsheets and geographic information systems, though simply gathering information in existing (e.g., paper) formats may be sufficient for some development impact assessments. It may be necessary to gather additional data as the process progresses.
5. Examine each of the impact categories you have decided to address to gauge the overall effects of the proposed development on the community. This requires gathering information on the development; collecting data on the fiscal and social and economic resources in your community; and eliciting the expertise and opinions of staff and community residents.

The impact assessment should be integrated into the larger planning framework for the community and assist the community in adhering to its priorities. This guide is intended to assist you with Steps four and five described above.

How is the Guide Structured?

The guide allows the user to evaluate a proposed development from a number of important and different dimensions — fiscal, environmental, socio-economic and transportation-related impacts. It is intended to be used to evaluate proposed developments ranging from subdivisions to strip malls.

The chapters of this guide work through each of the impact areas individually, yet emphasize the importance of using the guide as a whole, so that a comprehensive impact analysis may be achieved. Each chapter includes a series of workbook-style pages that are designed to ease the process of preparing the impact assessment. The list of references provided at the end of each chapter offer direction to the user on where to go for additional information on the methods and types of information that may be useful in preparing a comprehensive development impact assessment.

REFERENCES

Wisconsin Department of Natural Resources. *Common Ground: Report of the DNR Land Use Task Force*. Madison, WI.

2 | Fiscal Impact Analysis

The purpose of fiscal impact analysis is to estimate the impact of a development or a land use change on the costs and revenues of governmental units serving the development. The analysis is generally based on the fiscal characteristics of the community—e.g., revenues, expenditures, land values—and characteristics of the development or land use change—e.g., type of land use, distance from central facilities. The analysis enables local governments to estimate the difference between the costs of providing services to a new development and the revenues—taxes and user fees, for example—that will be generated by the development.

Because a fiscal impact analysis is primarily based on an analysis of local government revenues and expenditures, key players on a team to conduct an assessment include the community clerk or finance officer, the tax assessor and a facilitator to gather additional information from several functions, including public works, emergency services, parks and health and human services.

Selecting an Appropriate Method

There are a number of standard approaches to choose from in conducting a fiscal impact analysis, ranging from a per-capita multiplier method to a case study method which relies on local interviews. One consideration in choosing an appropriate method relates to the notion of average costing. There are two basic approaches to assess the cost of services that development imposes on a local government—average costing and marginal costing. Average costing is the simpler more common procedure. It attributes costs to new development according to average cost per unit of service in existing development times the number of units the growth is estimated to create or the demand for that unit. It does not take into account excess or deficient capacity to deliver services, and it assumes that average costs of municipal services will remain stable in the future. Alternatively, marginal costing relies on analysis of the demand and supply relationships for public services. This procedure recognizes that excess and deficient capacity exists in communities. It views growth not in a linear manner, but as a more cyclical process in terms of the impact on expenditures.

The distinction between average and marginal costing is fundamental to fiscal impact analysis. Marginal and average costing approaches may result in dramatically different estimates of fiscal impacts for the same development. This is due to the “lumpy” nature of certain public services, like sewage treatment plants and water supply systems. When such facilities are built in a community, they are typically financed with long-term debt and built with the expectation that they will also serve future population growth in the community. Therefore, the incremental cost of providing the service to one more resident is low. However, these facilities do have a threshold level where surplus capacity is eventually depleted. It is at this point that the new development or new growth requires new infrastructure investment and the marginal cost of serving a new resident may actually be higher than the average cost. The marginal cost approach focuses on defining a community’s marginal response to a

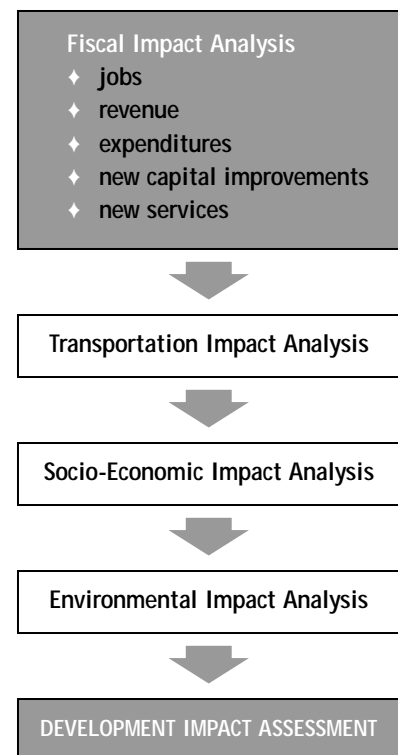


Figure 2.1 Fiscal Impact Component

new development or land use change through careful attention to existing demand and supply relationships in a community.

This chapter includes two sections. This first details a mixed per-capita, case study approach to estimate community costs and revenues associated with the development and the second outlines the steps to calculate impacts on the local school district.

DATA NEEDS

1. Description of the Development: number and type of homes, square footage of non-residential space, for example.
2. Local revenue and expenditure data
3. Local property value data and current mill rate
4. Number of workers in the Community
5. Number of workers anticipated with the new development

Fiscal Impact Analysis: The Process to Estimating Impacts

This chapter takes you through the steps of fiscal impact estimation. The method used here is a hybrid per-capita multiplier and case study approach. It allows for a quick calculation, but acknowledges that a straight average-costing approach is not ideal and builds in a marginal cost dimension.

To use the per capita multiplier method, which is used to calculate all costs and revenues, with the exception of the property taxes, state shared revenues and capital costs associated with the development, you will basically translate population into service costs. The method first requires you to calculate current public service costs on a per-unit basis—per capita and per employee. Service costs are initially apportioned between residential and non-residential development to allow for a more precise accounting of costs. Development costs are then estimated by multiplying per capita costs by the total number of people associated with the development and per employee costs, by the number of workers associated with the development.

Points to Remember

- ◆ **Development results in increased demand for services:** New residents and new workers demand local services and their expectations may be different from those of the existing population and workforce.
- ◆ **Fiscal Impacts vary with the type of the development, the location of development, community services, existing service capacity and local policy:** The type of development—commercial, residential, industrial—has different implications for a community's fiscal balance sheet. The nature of the development—compact residential near central facilities versus sprawling rural residential—matters to the fiscal outcome. A community that must extend public services to new developments will incur greater expenditures.
- ◆ **The fiscal impact method used to make estimates matters to the final results:** Different methods may produce different results. Be aware of the assumptions driving the method.
- ◆ **Impacts are Cumulative:** The impact of a single development may be insignificant to a community's fiscal position; however, the impact of development after development may be substantial. Over time, development has broad effects on revenues, expenditures and the tax base.

- ◆ **Development affects different groups in different ways:** The distributional impacts are not easily incorporated into standard fiscal impact analysis, but new development may provide greater benefits to some groups. It is important to think about how different groups may be affected and how these impacts may vary over time.

Again, the most significant limitation of the straight per capita multiplier approach is that it does not account for excess or deficient capacity. It also assumes that the cost of services for new development is the same as existing; and this is not fully justified in all cases. The modified model detailed here requires you to calculate the operating per-capita costs and revenues associated with development and then to examine your capital facilities using a case study approach to allow for issues of capacity.

This model allows you to examine the fiscal impacts of development if that development were in place in your community today. This approach is intended to make the estimates more meaningful and understandable to citizens and to lessen the need to make assumptions regarding your future fiscal situation. Typical fiscal impact analysis which estimates the future impact of a proposed development requires numerous assumptions as to a community's future fiscal situation. It requires assumptions as to how your community will grow, how property values will change, how much tax revenue will be generated by the development, the timing of the development and how the community will change with the development. It also requires an estimate of a baseline scenario or a assumed future without the development to allow for a comparison with and without development. In contrast, the method detailed below allows you to use your current budget and minimize assumptions that must be made.

The process entails nine steps. The analysis is straight-forward and data requirements are minimal. You must begin by describing the development and its potential impacts in terms of new population and new employees. Then, you will estimate the expenditures associated with

STEPS

- STEP 1** Determine population and employment changes associated with the development.
- STEP 2** Disaggregate budgets into categories of service expenditure (e.g., general gov't, police).
- STEP 3** Allocate costs to residential and non-residential land uses.
- STEP 4** Divide residentially-associated costs by total population to derive a per capita estimate of service costs. Divide nonresidential costs by local employees for a per employee estimate of non-residential service costs.
- STEP 5** Calculate Total Costs Associated with Development:
 - A.** Calculate the residentially-induced costs associated with development by multiplying the per capita estimate of current service costs by the population increase.
 - B.** Calculate nonresidential costs associated with development by multiplying the per employee estimate of service costs by the employment increase associated with the development.
 - C.** Calculate annual debt service costs
- STEP 6** Disaggregate budgets into categories of revenue (e.g., license fees, taxes, intergovernmental revenue).
- STEP 7** Allocate revenues, except shared revenues and property taxes, to residential and non-residential uses, and estimate revenues associated with development using the same process as was used to estimate costs.
- STEP 8** Estimate property taxes, state shared revenue and total revenues associated with the development
- STEP 9** Compare estimated revenues and costs and determine net fiscal impact on your community.

the development using per capita averages as a way to make estimations. Then, you will estimate revenues to be generated by the development using various approaches. Lastly, you will estimate the net fiscal impact on your community.

Cautionary Information

Fiscal impacts are only one type of impact associated with development, and furthermore, fiscal impact analysis has a number of limitations to keep in mind.

- ◆ **The Interaction of Land Uses:** A major limitation of fiscal impact analysis is that it does not capture the interactions among land uses when development occurs. For example, a commercial development may show a net positive fiscal impact, yet it may also generate costs outside of the development that are not necessarily captured in the fiscal analysis—costs such as increased traffic congestion around the area leading to higher expenditures for street maintenance and repair. Development also affects property values in adjacent properties which are not included in the final analysis.
- ◆ **Fiscal Impacts on Other Jurisdictions:** Standard approaches to fiscal impact analysis are typically designed to examine the effects of development on a single unit of government. Development has impacts beyond your community, but there is no formal mechanism to precisely estimate these costs.
- ◆ **The Cumulative Impacts of Development:** Cumulative impacts are not necessarily considered in standard approaches to fiscal impact analysis. Whereas, a single development may have a slight effect on a community's fiscal balance sheet, a series of developments over time may significantly impact revenues and expenditures and tax base.

STEP 1 CALCULATE THE NUMBER OF NEW RESIDENTS AND/OR EMPLOYEES

The first step in the analysis is to estimate the new population and employees associated with the development. If you know the numbers, use these numbers. If not, refer to Table 2.1 in the appendix which includes demographic information by housing type

EXAMPLE DEVELOPMENT SCENARIO

An example development scenario for the “Town of Anywhere” is provided throughout this chapter to illustrate the nine-step technique used in assessing fiscal impacts. Characteristics of the development scenario for the Town of Anywhere include:

1. A mixed-use development comprised of 100 two- and three- bedroom single family homes and 50,000 square feet of retail space.
2. The value of the development is estimated at \$8 million.
3. **New Residents:** Using the demographic multipliers found in the appendix for “other metro areas,” the estimated new population associated with the development is 248 persons.
4. **New Employees:** In this example, there are 70 employees associated with the retail portion of the development.

and use these demographic averages to project residents associated with the new development.

EXAMPLE: Calculating Number of New Residents

	2br	3br	4br	total
a) number of housing units	60	40		100
b) persons per unit	2.11	3.03		
new residents (a x b)	127	121		248

Worksheet 2.1 is provided in the Appendix to help you calculate the number of new residents associated with your proposed development.

NEW EMPLOYEES

A number of studies have shown that the employment intensity of nonresidential development prompts public service expenditures, so a nonresidential development with more employees than another will generate more costs to the local unit. This is the rationale behind using per-employee estimates to calculate the costs associated with non-residential development.

If the developer has provided an estimate of the number of employees associated with the development, use this figure, or use the estimates presented in the appendix to determine the number of employees.

Table 2.2 in the appendix provides estimates of the average number of workers for various types of establishments. These are average numbers, based on national data. For further information on employees by establishment, go to the U.S. Census Bureau’s web site to locate the 1992 Economic Census Results at: www.Census.gov/epcd/www/92result.html/. The results from the 1997 Economic Census are also provided for some categories of employment.

STEP 2 DISAGGREGATE BUDGETS INTO CATEGORIES OF SERVICE EXPENDITURES

DISCUSSION QUESTIONS



- ◆ Will these new residents associated with the development move in from outside the community or will they relocate from within the community?
- ◆ If the proposed development is a residential development, what kind of residences will be built—using this method for a project that will be marketed to the elderly may overestimate the number of new residents, for example.
- ◆ Will new employees be relocating or commuting in to work in the community?

You will now begin to estimate the costs associated with the development. Beginning with expenditures, the initial step is to disaggregate the budget into service categories.

The following service categories represent major services provided by local governments in Wisconsin. A more precise breakdown of service categories may be used.

EXAMPLE: Current Budget Figures

Town of Anywhere: 1999 Expenditures

Expenditure	Amount
General Government	\$275,000
Law Enforcement	400,000
Fire Protection	300,000
Inspection	150,000
Public Works	204,000
Conservation/Development	135,000
Health/Human Services	45,000
Culture/Recreation	185,000
Debt Service	200,000
TOTAL	\$1,894,000

▶ **Worksheet 2.2** in the Appendix will allow you to fill in your community's current budget figures.

STEP 3 ALLOCATE COSTS TO RESIDENTIAL USES AND NON-RESIDENTIAL USES

The portion of costs associated with residential uses is generally estimated using one of two methods: either through local knowledge (If possible, you may want to use the allocations determined in the COCS; see chapter 7 for a discussion of COCS); or through the use of property value data and parcel data as a fall-back method. For example, if you know that all expenditures for health and human services are associated with residents only, then allocate all of these costs to residential land uses. If expenditures are associated with both population and workers in the community, use the fall-back method to allocate costs.

EXAMPLE: Calculating Residential Parameters

Town of Anywhere:
1999 Assessed Value and Number of Parcels

Assessed Value	
Total Assessed Value	60,000,000
Residential Assessed Value	30,000,000
Residential Value Percentage	50.00%
Parcels	
Total Parcels	1500
Residential Parcels	660
Residential Parcel Percentage	44.00%
Estimated Share of Residentially-Associated Costs and Revenues	47.00% ((.44+.50)/2)

In using the fall-back method, the residential share of all service costs is estimated by dividing the residential property value and number of parcels by



DISCUSSION QUESTIONS

- ◆ What are the major spending categories that development will impact?
- ◆ Are there any new services that will be necessary to serve the development?
- ◆ Will the development prompt any change in the delivery of the existing level of services?
- ◆ Will any additional staff be required to provide the same level of service?
- ◆ Will development affect service quality, such as police and fire response time?
- ◆ Will the development be served by new sewer and water lines, existing lines or septic systems?
- ◆ Do user fees and charges cover the costs of such services?

total value and total number of parcels, respectively. These two results are averaged and this value is applied to local costs to determine the residential share of costs.

▶ **Worksheet 2.3** in the Appendix will allow you to calculate residentially-associated parameters for your local government.

Once you have calculated the portion of costs associated with residential and non-residential uses, you can apply the proportion to the appropriate service categories to derive residentially-associated costs for each service category.

In the example below, total costs are multiplied by .47 to estimate residentially-associated costs and the remainder represents those costs associated with non-residential uses. Note that in the example, costs for expenditures of conservation/development, health and human services and culture and recreation, were allocated completely to residential uses. This is assumed to be based on local knowledge of how these expenditures are spent. This may or may not be appropriate for your community. Use your own judgement in allocating costs.

EXAMPLE: Estimating Residential and Non-Residential Costs

Town of Anywhere: 1999 Residential vs. Non-Residential Costs

Expenditure	Total	Residential	Non-Residential
General Government	\$275,000	\$129,250	\$145,750
Law Enforcement	400,000	188,000	212,000
Fire Protection	300,000	141,000	159,000
Inspection	150,000	70,500	79,500
Public Works	204,000	95,880	108,120
Conservation/Development	135,000	135,000	0
Health/Human Services	45,000	45,000	0
Culture/Recreation	185,000	185,000	0
Debt Service	200,000	see Step 5c	
TOTAL	1,894,000	989,630	704,370

▶ **Worksheet 2.4** provided in the Appendix allows you to estimate residential and non-residential costs for your community.

DISCUSSION QUESTION



- ◆ Are these estimates reflective of a typical year? If not, adjust the estimates to reflect a more typical year in terms of what your community spends.

STEP 4


DERIVE PER CAPITA ESTIMATES AND PER WORKER ESTIMATES OF EXPENDITURES

To estimate per capita and per worker figures, divide the residentially-associated expenditures and non-residentially associated expenditures by total population and total workforce in the community, respectively. In the following example, assume that the *population* of the Town of Anywhere is 5500 and the *number of workers* in the town is 3500.

EXAMPLE: Estimating Per Capita and Per Worker Costs

Town of Anywhere: 1999 Per-Capita and Per-Worker Costs

Expenditure	Per Capita	Per-Worker
General Government	23.50	41.64
Law Enforcement	34.18	60.57
Fire Protection	25.64	45.43
Inspection	12.82	22.71
Public Works	17.43	30.89
Conservation/Development	24.55	0
Health/Human Services	8.18	0
Culture/Recreation	33.64	0
Debt Service		
TOTAL	\$179.93	\$201.25

 **Worksheet 2.5** provided in the Appendix will allow you to estimate per capita and per worker costs for your development.

STEP 5 CALCULATE TOTAL COSTS ASSOCIATED WITH DEVELOPMENT


A. Operating Costs

Apply the total per capita and per employee costs to the estimated population and workforce associated with the development to derive the total operating costs associated with development.

EXAMPLE: Calculating Total Operating Costs

Town of Anywhere: 1999 Total Costs of Development

Residential Costs	Amount
a. Per-Capita Costs	\$179.93
b. Population of Development	248
Total (a x b)	\$44,623.32
Non-Residential Costs	
c. Per-Employee Costs	\$201.25
d. Workers in Development	70
Total (c x d)	\$14,087.40
TOTAL	\$58,710.72

 **Worksheet 2.6** provided in the Appendix will help you calculate total operating costs associated with your development.

B. Capital Costs

In growing communities, it is often necessary to invest in capital facilities to accommodate new development. New streets, water and sewer systems and schools may be needed to serve additional population. Because large capital projects such as sewage treatment plants are often financed by debt paid through user fees and charges to new residents, they are often not explicitly included in traditional fiscal impact studies which focus on operating budgets. Furthermore, many of these initial capital investments are required to be paid for by the developer. It is important to understand the long-term consequences of development in terms of capital improvements and facilities.

The following allows you to identify whether the proposed development is expected to generate a need for additional capital facilities or improvements. The impact of such expenditures on residents—new and existing—depends on how the capital investment is financed. If it is to be financed through a bond issue, the annual debt payment should be included as an expenditure when the total impacts of development are calculated. This section follows a case-study approach intended to assist in estimating annual debt service expenditures associated with the new development.

IDENTIFICATION OF FACILITIES AND IMPROVEMENTS NECESSARY TO ACCOMMODATE GROWTH

The identification of infrastructure facilities necessary to accommodate the new development should occur in a systematic manner. This information can be identified in a number of ways. One would be to contact department heads for their expertise on necessary capital improvements to serve new development. Another would be to analyze any support documentation the community may have, such as a capital improvement plan. Special studies can be conducted to identify needs. Lastly, to determine the physical quantities of needed capital investments, a standard for each service or facility may be useful. Ideally, this would be based on a community-needs assessment, but the existing standard of provision is an appropriate alternative. Once these service standards are established, the need for new capital facilities can be determined using the following formula:

$$\text{Needed Improvements} = \text{Service Standard} * \text{Demand Unit}$$

Where the demand unit is associated with the new development, in terms of residents or school age children. For example, your community may have an existing standard for park land, such as 1 acre of park land per 100 residents. If the development includes 200 new residents, 2 acres of park land are necessary to maintain current service standards for parks in the community. This method is useful if the goal is to maintain your current level of services to residents.

PROJECT COSTS OF NECESSARY INFRASTRUCTURE OR CAPITAL FACILITIES AND DETERMINE ANNUAL DEBT

Once you have determined the need for new capital investment, project the costs using staff expertise and/or local records. The following table provides a framework to determine the need for new capital investment and the annual debt service cost to the community.

For those items to be financed through a bond issue, calculate the annual debt payment using your community's current debt policy guidelines.

Three Steps to Determining Infrastructure Needs and Costs Associated with the Development

1. Identify infrastructure facilities needed to accommodate growth.
2. Project the costs of needed infrastructure improvements.
3. Determine annual debt payment and include it in total costs associated with development.

List of Capital Investment Items to Consider in Accommodating New Development

- ◆ Streets, roads and sidewalks
- ◆ Street Lighting
- ◆ Street and road repairs
- ◆ Traffic signals
- ◆ Parking lots
- ◆ Parking meters

- ◆ City halls, courthouses
- ◆ Libraries
- ◆ Major building rehabilitation
- ◆ Jails
- ◆ Tennis courts
- ◆ Playground equipment
- ◆ Recreation buildings
- ◆ Heavy equipment

- ◆ Police and fire stations
- ◆ Fire trucks
- ◆ Police and fire radio systems
- ◆ Police cars

- ◆ Water and sewer treatment plants
- ◆ Storm sewers
- ◆ Sewer and water mains
- ◆ Solid waste sites and equipment

In many cases, development will not generate new capital investment, as the developer is often required to pay for capital facilities such as roads and sewers. However, in this example, the development generated a need for a new library branch. The annual debt service is estimated to be about \$105,000. This illustrates the problem of local capacity in estimating fiscal impacts. Due to this particular development, the community finds itself at the point where surplus capacity in the library system is used up, and new investment in a library branch is required to maintain the current standard of service for residents. In terms of the fiscal analysis, the development is held to be responsible for generating the new library, although the library will not only benefit the entire community, but it just happened that this particular development and not the previous one or the one proposed for next year, generated the need for the new library branch. Because fiscal impact analysis is intended to estimate the net fiscal impact of the development on the community's balance sheet, the debt service should be included in the final calculation. However, it is more useful and informative to illustrate the analysis under two different scenarios—with and without the debt service of the new library.

EXAMPLE: Estimating Capital Costs of Development

Infrastructure Need	Cost	Method of Finance	Length of Bond Issue	Interest Rate	Annual Debt Payment
New Roads	\$800,000	Developer-paid			
Library Branch	\$900,000	Bond	20 years	10%	\$105,714

C. Total Costs

Total costs of the example development are illustrated in the table below.

EXAMPLE: Estimating Total Costs of Development

Town of Anywhere: Costs of Development

Costs of Development (Part A)	\$45,866
+ Debt Service (Part B)	\$105,714
Total Costs	\$164,424

Worksheet 2.7 in the Appendix allows you to calculate the total costs associated with your proposed development.

DISCUSSION QUESTIONS



- ◆ Will new homes be served by public sewer and water lines or private wells and waste water treatment facilities?
- ◆ What is the capital cost to provide potable water for each dwelling unit of a new development?
- ◆ What is the current capacity of the water and sewer system?
- ◆ How will these costs be recouped?
- ◆ Will development affect service quality, such as police and fire response time?
- ◆ What is the average daily consumption of water per person? What is the cost of constructing one gallon of additional capacity?
- ◆ Will the development require extension of sewer and water lines to the area?
- ◆ Who is bearing the up-front costs of extensions?
- ◆ What is the estimated cost to the community of providing sewer and water services?
- ◆ Will the development require expansion of the wastewater treatment plant or is it operating below capacity?
- ◆ How much capacity is left?
- ◆ Will the development require new roads?
- ◆ Who is bearing the cost of the new roads?
- ◆ Will the new population associated with the development generate a need for new social services, such as libraries, park space?
- ◆ What is the current surplus capacity as to these social services?
- ◆ Will the new population generate a need for any more public safety or public works vehicles?

STEP 6 DISSAGGREGATE BUDGETS INTO CATEGORIES OF REVENUE

The table below illustrates a breakdown of major revenue categories.

EXAMPLE: Revenue Categories

Town of Anywhere: 1999 Revenues

Source of Revenue	Amount
Property Taxes	\$230,000
Other Taxes	100,000
Special Assessments	150,000
State Shared Revenues	484,000
Other Intergov't Revenues	150,000
Licenses and Permits	70,000
Fines and Forfeits	43,000
Public Charges	100,000
Intergovernmental Charges	60,000
Miscellaneous	507,000
TOTAL	\$1,894,000

Worksheet 2.8 provides a space for you to record the amount of revenue for similar revenue categories.

STEP 7 ALLOCATE REVENUES TO LAND USES AND ESTIMATE PER CAPITA AND PER EMPLOYEE REVENUES

The same procedure that was used to estimate costs is used to estimate revenues (with the exception of property tax revenue and shared revenues, discussed below). Revenues are initially apportioned to residential and non-residential using local knowledge (including allocations used in the COCS) or the same ratio of .47 to represent the residential share. The remainder represents the non-residential share. In the following example, it is assumed that all special assessment revenue is generated by residential uses and is allocated as such.

EXAMPLE: Estimating Residential and Non-residential Revenues

Town of Anywhere: 1999 Revenues vs. Non-residential Revenues

Source of Revenue	Amount	Residential	Non-Residential
Property Taxes	\$230,000	see step 8	see step 8
Other Taxes	100,000	47,000	53,000
Special Assessments	150,000	150,000	0
State Shared Revenues	484,000	see step 8	see step 8
Other Intergov't Revenues	150,000	70,500	79,500
Licenses and Permits	70,000	32,900	37,100
Fines and Forfeits	43,000	21,210	22,790
Public Charges	100,000	47,000	53,000
Intergovernmental Charges	60,000	28,200	31,800
Miscellaneous	507,000	235,000	265,000
TOTAL	\$1,894,000	\$742,200	\$667,800

Worksheet 2.9 allows you to record residential and non-residential revenues for your community.

To derive the per-capita and per-worker estimates, divide residentially-associated revenues by total population to derive a per-capita estimate of revenues. Divide non-residential revenues by local employees for a per employee estimate of nonresidential revenues.

EXAMPLE: Estimating Per Capita and Per Worker Revenues

Town of Anywhere: 1999 Per-Capita and Per-Worker Revenues

Source of Revenue	Per Capita	Per-Worker
Property Taxes	see step 8	see step 8
Other Taxes	8.55	15.14
Special Assessments	27.27	0
State Shared Revenues	see step 8	see step 8
Other Intergov't Revenue	12.82	22.71
Licenses/Permits	5.98	10.60
Fines/Forfeits	3.67	6.51
Public Charges	8.55	15.14
Intergov't Charges	5.13	9.09
Miscellaneous	43.33	75.71
TOTAL Revenues	\$115.29	\$155.97

Worksheet 2.10 in the Appendix allows you to estimate per worker and per capita revenues.

STEP 8 CALCULATE PROPERTY TAXES, SHARED REVENUES AND TOTAL REVENUES ASSOCIATED WITH DEVELOPMENT

A. Property Taxes

To estimate revenues associated with development from the property tax, multiply the expected assessed value of the development by the current local tax rate (expressed as a decimal).

EXAMPLE: Property Tax Revenue

Town of Anywhere: Property Tax Revenue

a) Property Value of Development	\$8,000,000
b) Local Tax Rate	.00383
Total Property Taxes (a x b)	\$30,640

See **Worksheet 2.11** to estimate property tax revenue.

B. Other Revenues

Calculate the residentially-induced costs associated with development by multiplying the per capita estimate of revenue by the population increase. Calculate the nonresidential costs associated with development by multiplying the per employee estimate of revenue by the employment increase associated with the development.

See **Worksheet 2.12** to calculate other revenues.

C. Shared Revenues

There are three major parts of shared revenues: a per capita payment, a special utility payment and an aidable revenues payment. Of these, the aidable revenues payment is the largest. In addition, the minimum/maximum adjustment, if applicable, either caps year-to-year growth or limits an annual loss.

Per Capita Each town, city and village receives a payment based on its population.

Special Utility A payment based on the value of a company's production plant and general structures, because light, heat and power companies are exempt from local property taxes.

Aidable Revenues The payment is based on two factors—the comparative wealth of the community as measured by the per capita value of taxable property and the extent of its local financial effort.

Value: Under the first part of the formula, the state establishes a standardized value (SV) of taxable property per capita. The amount is determined annually by the Department of Revenue. If the local value per person is less than the state-established amount, the state makes up the difference. A municipality with a per capita value higher than the standardized one receives no payment under this part of the formula.

Local Purpose Revenue: These consist of the 3-year average of several receipts, including the local property tax levy, special assessments, licenses and permits and the aidable revenue payments.

Payment: The payment is based on the above 2 factors. As examples of the formula, if a municipality's equalized value per person were 50% of the standardized value, the aidable revenues entitlement would be 50% of its local purpose revenues; if the local value were 75% of the standardized value, then the payment would be 25% of local purpose revenues.

Minimum/Maximum The minimum guarantee payment provides that a municipality will receive a shared revenue payment equal to at least 95% of the prior years payment. State law also provides a ceiling on the annual growth in shared revenues. To fund the minimum adjustment, the maximum varies each year.

Payment The total payment consists of the sum of the per capita, utility and aidable revenues payment and any min/max adjustments.




DISCUSSION QUESTIONS

- ◆ Will the development change the mix of revenue sources?
- ◆ Will the development require bonding for infrastructure improvements or other capital investment?
- ◆ How will the development affect bonding authority?

EXAMPLE: Estimating Shared Revenues


	Actual Payment	Payment w/ Development
Current Population	5,500	5,748
Per Capita Payment Amount	27	27
Prior Year Population	5,500	5,500
Aidable Revenues Entitlement	500,000	594,275
Standard Valuation	48,796	48,796
Mfg. Adjusted Value (MAV)	60,000,000	68,000,000
Municipal Standard Value (MSV)	268,376,712	268,376,712
MAV/MSV	0.223566	0.253375
1- MAV/MSV	0.77643	0.74662
Aidable Revenue Payment	388,217	443,700
Per Capita Payment Amount	149,225	155,954
Utility Payment	0	0
Payment before Min-Max Adjustment	537,442	599,654
Initial for Min-Max	537,442	599,654
Base for Min-Max	470,223	470,223
Ceiling	483,796	483,796
Floor	446,712	446,712
Excess	-53,646	-115,858
Deficiency	0	0
Min-Max Adjustment	-53,646	-115,858
Shared Revenue Payment	483,796	483,796

The above example illustrates the steps to estimating shared revenues associated with the development. The actual payment for the current year is compared to an estimate of the payment with the development in place. To derive the estimate, the formula is run using the new population and property value associated with the development. The two payment amounts are compared and the difference represents the shared revenue amount associated with the development. In this example, there is no change in the shared revenue payment due to the development. The community is already at its maximum payment level, due to the maximum adjustment factor, and the development does not change this situation.

 **Worksheet 2.13** provided in the Appendix allows you to calculate shared revenues for your proposed development.

D. Total Revenues

The table below illustrates total revenues associated with the example development.

 **Worksheet 2.14** is provided in the Appendix to help you to estimate total revenues associated with your development.

EXAMPLE: Estimating Total Revenues

Town of Anywhere:
Total Revenues Associated with Development

Property Tax Revenue	\$30,640.00
Shared Revenue	0.00
Residential Revenues	
a. Per-Capita revenues	\$115.29
b. Population of Development	248
Total (a x b)	\$28,592.15
Non-Residential Revenues	
c. Per-Employee Revenues	\$155.97
d. Workers in Development	70
Total (c x d)	\$10,918.00
TOTAL	\$70,150.15

STEP 9 COMPARE ESTIMATED COSTS TO ESTIMATED REVENUES TO DETERMINE THE NET FISCAL IMPACT OF DEVELOPMENT

EXAMPLE: Estimating Fiscal Impacts of Development

Town of Anywhere:

Fiscal Impacts of Development	with debt	without debt
Total Costs of Development	\$164,424.72	\$58,710.72
Total Revenues Generated	\$70,150.15	\$70,150.15
Net Fiscal Impact	\$(94,274.57)	\$11,439.43

Worksheet 2.15 is provided to help you estimate the fiscal impacts of your development.

Special Considerations

Although this model results in an estimate of net fiscal impact on your balance sheet, the more important goal of the model is to raise awareness as to the many questions surrounding how development impacts your community's fiscal structure. The final estimate is a rough measure of how this particular development may affect your revenues, expenditures and tax base. This process should also prompt you to think about broad issues relating to fiscal impacts—issues of excess and deficient capacity and whether residents are truly “new” or simply relocating from within the community. These are the important questions to address, as they may change the outcome of the final estimate of impact.

The major limitation of examining a single development is that the cumulative impacts of development are lost. The incremental impact of each development when added together may be significant to your community. This development and all future developments should be examined in the context of all other development in your community. One approach to thinking about cumulative effects is in terms of threshold conditions, beyond which change would be unacceptable to your community. Thresholds are more commonly used in terms of environmental impacts; however, they can also be identified for a community's fiscal structure. You may decide that any tax increase beyond a certain percent per year is unacceptable or that the existing capacity in your water system must last for ten more years. Such threshold values are identified through a community decision-making process. The complexity of cumulative effects requires a more rigorous analysis than can be illustrated in a workbook format and often complex quantitative analysis is difficult to understand, but nonetheless, the cumulative effects of development cannot be ignored.

School District Costs and Revenues Associated with Development

Development often has the most significant impacts on the school district or districts serving the development. The following discussion will assist in determining the operating revenues and costs associated with the new development and the impact on the capacity of the schools in the district. The cost estimates are based on a per-capita method and these methods will provide you with a very general estimate of how the development will impact the school district. State aids are estimated using the equalization aid formula.

STEP 1 ESTIMATE SCHOOL AGE CHILDREN

The most important factor affecting the fiscal impact of new development on local schools is the number of school-age children residing in the new development. The table below illustrates an example to assist in estimating new school age children.

EXAMPLE: Estimating School Age Children

Type of Development	Number of Units	School Age Children per Unit	New School Age Children
Single Family	50	1	50
Apartment Complex	50	1	50
Total			100

Worksheet 2.16 will allow you to calculate, based on the number and type of residential units, the number of school age children you can expect to reside in the development.

STEP 2 ESTIMATE OPERATING COSTS ASSOCIATED WITH THE DEVELOPMENT

Operating costs can be calculated based upon the current operating budget of the school district. Another source for both operating costs and revenues is *Basic Facts*, published by the Wisconsin Department of Public Instruction. It provides fiscal data for every school district in the state. Using local budget data or the DPI data, calculate the per-pupil cost of operations and apply this to the projected number of new students.

COSTS
Total Costs / current number of pupils = cost per pupil
Cost per pupil * new school age children =
Total costs associated with the development

See **Worksheet 2.17**

FIVE STEPS

to Estimating Costs, Revenues and Impacts on School District Capacity

1. Estimate School age children associated with the development.
2. Estimate operating costs associated with the development.
3. Estimate operating revenues generated by the development.
4. Compare costs and revenues to derive a net fiscal impact.
5. Examine current capacity and determine need for new capacity.

STEP 3 ESTIMATE OPERATING REVENUES

School districts derive their revenue through four major sources: state aid, the property tax, federal aid and other local nonproperty tax revenues (interest earnings). Property tax revenue and state aids represent most of a school district's revenue. Based on 1996–97 estimates, school districts received about 93 percent of their revenue through state aid and the property tax. For purposes of this analysis, these two major revenue sources are the focus of the fiscal impact analysis for the school district.

A. Property Tax Revenue

Property tax revenues generated by the development are calculated using the school mill rate and the estimated value of the development. The formula is shown below.

▶ See **Worksheet 2.18**

$$\text{PROPERTY TAXES} \\ \text{School Mill Rate} * \text{Value of Development}$$

B. State Aids


State aids are calculated by simulating the state general aid formula as if the development were currently in place in the community. The state aid formula is simulated as if the development were in place by including the increased property value associated with the development and the increased number of students generated by the development. The difference between actual state aids and those estimated represents the impact of the development on state aids.

State aids may decrease with new development. This is due to the high value associated with the development. The formula for allocating state aids, also known as the equalization formula, distributes aid on the basis of relative fiscal capacity of each school district as measured by the district's per pupil property valuation. There is an inverse relationship between equalization aids and property valuations; those districts with low, per pupil property valuations receive a larger share of their costs through the equalization formula than districts with high, per pupil property valuations. So, holding all else equal, if property values in the school district increase, state aids will decrease.

▶ **Worksheet 2.19** in the Appendix illustrates the state equalization formula and will allow you to calculate state aids for the school district with and without development, similar to the method used to estimate shared revenues.

STEP 4 COMPARE COSTS TO REVENUES

The net fiscal impact on the school district is calculated by comparing the per capita costs to the sum of state aids and property tax revenue generated by the development.


 **Worksheet 2.20** allows you to calculate the net fiscal impact of the development on the school district.

STEP 5 ASSESS NEED FOR NEW CAPACITY

This section requires an analysis of capacity at the local schools in the district. If current facilities are able to absorb the projected number of students associated with the new development, no new capacity is needed. If not, necessary capital improvements in terms of additions to schools or new schools must be determined by the school district and the community. The table below illustrates how to determine whether or not the development will generate a need for new capacity.

EXAMPLE: Estimating Capacity

Grade Level	K-12
Current Capacity	2400
Current Enrollment	2350
Projected Enrollment (w. new development)	100
Excess/Deficient Capacity	(50)

 **Worksheet 2.21** allows you to analyze capacity in your district.

3 | Traffic Impact Analysis

Understanding the demands placed on the community's transportation network by development is an important dimension of assessing the overall impacts of development. All development generates traffic, and it may generate enough traffic to create congestion and to compel the community to invest more capital into the transportation network, whether it is in the form of new roads or traffic signals or turn lanes. Traffic congestion results in a number of problems, including economic costs due to delayed travel times, air pollution and accidents. As one roadway becomes congested, drivers may use others not necessarily intended for through traffic. As a result, traffic impact analyses are becoming more common as a planning tool to foresee demands on the transportation network and to mitigate any negative impacts. Understanding traffic impacts becomes even more important as budgets for public facility and infrastructure improvements become increasingly strained.

WHAT IS TRAFFIC IMPACT ANALYSIS (TIA)?

A traffic impact analysis is a study which assesses the effects that a particular development's traffic will have on the transportation network in the community. These studies vary in their range of detail and complexity depending on the type, size and location of the development. Traffic impact studies should accompany developments which have the potential to impact the transportation network. They are important in assisting public agencies in making land use decisions. These studies can be used to help evaluate whether the development is appropriate for a site and what type of transportation improvements may be necessary.

Traffic impact studies help communities to:

- ◆ Forecast additional traffic associated with new development, based on accepted practices.
- ◆ Determine the improvements that are necessary to accommodate the new development.
- ◆ Assist communities in land use decision making.
- ◆ Assist in allocating scarce resources to areas which need improvements
- ◆ Identify potential problems with the proposed development which may influence the developer's decision to pursue it.
- ◆ Allow the community to assess the impacts that a proposed development may have.
- ◆ Help to ensure safe and reasonable traffic conditions on streets after the development is complete.
- ◆ Reduce the negative impacts created by developments by helping to ensure that the transportation network can accommodate the development.
- ◆ Provide direction to community decision makers and developers of expected impacts.

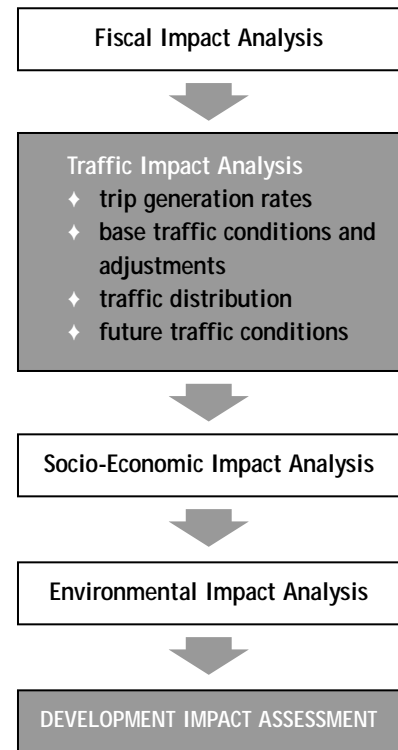


Figure 3.1 Traffic Impact Analysis Component

Traffic impact studies do not:

- ◆ Provide an indication of development's impact on other modes of transportation, such as bus service.
- ◆ Characterize the suitability of a development for other modes, particularly pedestrian and bicycle movement.
- ◆ Characterize the spatial patterns of demand, particularly where alternate route-seekers will travel.

- ◆ Protect the substantial community investment in the street system.

Traffic impact analysis is only one component of the larger transportation puzzle. In addition, large communities in particular will need to determine appropriate mixes of transportation modes, including public transit options. Community growth patterns and characteristics can be substantially affected by highway expansion or realignment decisions made at state or federal levels. Traffic impact analysis is focused on the effects of a particular set of developments, but may provide information relevant to these broader plans and decisions. Traffic impact studies should be used as one piece of several kinds of information to judge the suitability of development from a transportation standpoint.

WHEN IS A TRAFFIC IMPACT STUDY NECESSARY?

A traffic impact study is not necessary for every development. Those developments that are unlikely to generate significant traffic generally do not need a traffic impact assessment. When does a development warrant a traffic impact assessment? One of the approaches for determining whether a traffic impact analysis should be required for a proposed development is the use of trip generation data. The trip generation of a proposed development is essentially the number of inbound and outbound vehicle trips that are expected to be generated by the development during an average day or during peak hour traffic. The process outlined in this chapter entails calculating the expected trip generation of the proposed development and comparing it to accepted thresholds to determine whether the comprehensive traffic analysis is needed. A comprehensive traffic impact analysis procedure is beyond the scope of this workbook; however the workbook does describe the impacts that should be included in a full study.

Generally, a comprehensive traffic analysis should be completed whenever a development is expected to generate 100 or more new inbound or outbound trips during the peak hours (ITE recommended practice). Developments containing about 150 single-family homes, 220 multi-family units, 55,000 square feet of general office space or a 15,500 square foot shopping center would be expected to generate this level of traffic and hence, require a complete traffic analysis.

The trip generation process provides an estimate of the number of trips that will be generated due to the new development. Trip generation rates are then applied to the various land uses within the development.

The ITE trip generation manual is based on hundreds of trip generation surveys nationwide for a range of land use types. It is the most commonly accepted data source for trip generation rates. Generally, examining those numbers based on the peak-hour conditions are used in traffic assessments. An analysis of peak-hour conditions results in a more accurate identification of site traffic impacts.

Table 3.1 provides some examples of developments which would require a traffic impact analysis according to the thresholds recommended by ITE.

Communities may wish to use their own thresholds. A larger community with many high volume streets, for example, may need to consider a higher threshold. Thresholds

INSTITUTE OF TRANSPORTATION ENGINEER'S (ITE) GENERAL THRESHOLD RECOMMENDATION

Any proposed site plan or subdivision plan which would be expected to generate over one hundred (100) directional trips during the peak hour of the traffic generator or the peak hour on the adjacent streets, or over seven hundred fifty (750) trips in an average day.

may need to be lower for corridors which are already experiencing congestion. Table 3.2 provides some examples of thresholds used in other areas. They are generally based on either the size of the development, trip generation or level of service.

Table 3.1 Threshold Levels

Land Use	100 Peak Hour Trips	750 Daily Trips
Residential: Single Family	150 units	70 units
Apartments	245 units	120 units
Condos/Townhouses	295 units	120 units
Mobile Home Park	305 units	150 units
Shopping Center	15,500 sq. ft.	2,700 sq. ft.
Fast Food Restaurant (GFA)	5,200 sq. ft.	1,200 sq. ft.
Convenience Store w/ gas (GFA)	1,300 sq. ft. or 5 pumps	
Bank w/ Drive-In	4,400 sq. ft.	2,800 sq. ft.
Hotel/Motel	250 rooms	90 rooms
General Office	55,000 sq. ft.	45,000 sq. ft.
Medical/Dental Office	37,000 sq. ft.	26,000 sq. ft.
Research & Development	85,000 sq. ft. or 4.5 acres	70,000 sq. ft. or 4 acres
Light Industrial	115,000 sq. ft. or 8 acres	115,000 sq. ft. or 11.5 acres
Manufacturing	250,000 sq. ft.	195,000 sq. ft.

IS A TRAFFIC IMPACT ANALYSIS NECESSARY FOR DEVELOPMENT THAT DO NOT MEET THE THRESHOLD REQUIREMENTS?

Even if the development does not generate the threshold level of trips, a traffic analysis may still be necessary under the following conditions:

- ◆ High traffic volumes on surrounding roads that may affect movement to and from the proposed development.
- ◆ Lack of existing left turn lands on the adjacent roadway at the proposed access drive.
- ◆ Inadequate sight distance at access points
- ◆ The proximity of the proposed access points to other existing drives or intersections.
- ◆ A development that includes a drive-through operation.

METHODS FOR ESTIMATING TRIPS GENERATED BY A DEVELOPMENT

- ◆ The use of standard rates used by local and regional planning agencies, which are most often based on previous projects.
- ◆ Standards from similar locations, built by the same developer or company.
- ◆ Surveys of sites in comparable areas.
- ◆ Literature on rates in journals, such as the ITE Journal.
- ◆ Trip Generation Rates from the Institute of Transportation Engineers' publication, *Trip Generation*.

Table 3.2 Community Threshold Levels
Community/State

Community/State	Traffic Impact Study Threshold
ITE Recommended Practice City of Farmington Hills, Oakland County and Oakland County Traffic Improvement Association	<ul style="list-style-type: none"> - 100 additional peak hour trips - sites with 10 or more acres - building with 100,000 or more sq. ft. GFA - 200 or more dwelling units - 300 or more peak hour trips - substantial departure from Master Plan - discretionary standards based on impact
City of Grand Blanc, Genessee County, MI	<ul style="list-style-type: none"> - rezonings inconsistent with Master Plan - certain special land uses - sites with 20 or more acres - 200 or more dwelling units - 150,000 or more sq. ft. GFA
Northville Township, Wayne County, MI	<ul style="list-style-type: none"> - certain rezonings - 50 peak hour directional trips along selected roads - 100 peak hour trips or 750 daily trips elsewhere
City of Rochester Hills, Oakland County, MI	<ul style="list-style-type: none"> - 150 peak hour trips or 750 trips daily - 75 or more single family dwelling units - 100 or more multiple family dwelling units - 50,000 sq. ft. or more commercial units - 20 acres light industrial
New Jersey Department of Transportation	- 200 peak hour trips
Arizona Department of Transportation	- 100 peak hour directional trips
Maryland	- 50 peak hour directional trips
Indiana Department of Transportation (proposed)	<ul style="list-style-type: none"> - 100 peak hour directional trips - if LOS drops by a letter grade - modifications to roadway are required
California Department of Transportation	- 2,400 daily trips/1,600 along a congested corridor
Oregon Department of Transportation	- 500 vehicles per day
New York Department of Transportation	- 100 peak hour trips
Arapahoe County, Colorado	<ul style="list-style-type: none"> - 500 daily trips - certain smaller projects
DuPage County, Illinois	<ul style="list-style-type: none"> - whenever a development deteriorates LOS beyond community LOS Standard (C or D).
New Mexico	<ul style="list-style-type: none"> - all new commercial/industrial developments
Mississippi	- when a traffic signal is warranted

Source: Dey Soumya, S. and Jon D. Fricker, Traffic Impact Analysis and Impact Fees in State Departments of Transportation, *ITE Journal*, May 1994.

HOW ARE TRIPS GENERATED CALCULATED?

To calculate the number of trips expected to be generated by the proposed development in your community, apply the appropriate rate below to the proposed land use.

Table 3.3 Trip Generation Rates

Land Use	Base Unit	Rates		
		AM Peak	ADT	ADT Range
Residential				
Single Family Home	per dwelling unit	.75	9.55	4.31-21.85
Apartment Building	per dwelling unit	.41	6.63	2.00-11.81
Condo/TownHome	per dwelling unit	.44	10.71	1.83-11.79
Retirement Community	per dwelling unit	.29	5.86	
Mobile Home Park	per dwelling unit	.43	4.81	2.29-10.42
Recreational Home	per dwelling unit	.30	3.16	3.00-3.24
Retail				
Shopping Center	per 1,000 GLA	1.03	42.92	12.5-270.8
Discount Club	per 1,000 GFA	.65	41.8	25.4-78.02
Restaurant				
(High-turnover)	per 1,000 GFA	9.27	130.34	73.5-246.0
Convenience Mart w/ Gas Pumps	per 1,000 GFA		845.60	578.52-1084.72
Convenience Market (24-hour)	per 1,000 GFA	65.3	737.99	330.0-1438.0
Specialty Retail	per 1,000 GFA	6.41	40.67	21.3-50.9
Office				
Business Park	per employee	.45	4.04	3.25-8.19
General Office Bldg	per employee	.48	3.32	1.59-7.28
R & D Center	per employee	.43	2.77	.96-10.63
Medical-Dental	per 1,000 GFA	3.6	36.13	23.16-50.51
Industrial				
Industrial Park	per employee	.43	3.34	1.24-8.8
Manufacturing	per employee	.39	2.10	.60-6.66
Warehousing	1,000 GFA	.55	3.89	1.47-15.71
Other				
Service Station	per pump	12.8	168.56	73.0-306.0
City Park	per acre	1.59	NA	NA
County Park	per acre	.52	2.28	.17-53.4
State Park	per acre	.02	.61	.10-2.94
Movie Theatre w/ Matinee	per movie screen Saturday	89.48 (PM Peak)	529.47	143.5-171.5
Day Care Center	per 1,000 GFA	13.5	79.26	57.17-126.07

Source: Institute of Transportation Engineers (ITE). *Trip Generation*.

How do we account for “pass-by” trips?

Typical trip generation rates are derived from counts taken at the driveways of the various land uses. For many land uses, not all of the trips generated at the driveway represent new trips added to the roadways. This is due to “pass-by” trips. Pass-by trips are made by traffic already using the adjacent roadway and enter the site as an intermediate stop on the way from another destination. The trip may not necessarily be “generated” by the land use under study, and thus, not a new trip added to the transportation system. This pass-by factor should be taken into account in devising a trip generation estimate.

Table 3.4 Pass-by Percentages

Land Use	Pass-by Percentages
Shopping Center	
Larger than 400,000 GLA	20
100,000 to 400,000 GLA	25
Smaller than 100,000 GLA	35
Convenience Market	40
Discount Club/Warehouse Store	20
Fast Food Restaurant	40
Sit Down Restaurant	15
Service Station	45
Supermarket	20

The percentage of pass-by trips varies by land use. The Institute of Transportation Engineers recommends the adjustments for pass-by trips included in Table 3.4. For example, “standard trip generation rates indicate that a 300,000 square foot shopping center would generate approximately 1,320 PM peak hour trips at its driveways. Given the above pass-by percentage of 25 percent, the amount of additional traffic on the adjacent roadway system would be approximately 990 trips $((1,320 \times (1 - .25)))$. Note that the full 1,320 trips should be shown (and analyzed) at the site driveways—the pass-by reduction will only affect the amount of traffic at to non-driveway intersections within the study area.



Worksheet 3.1 is provided in the Appendix to allow you to calculate the number of trips generated by your proposed development.

How do we account for internal trips in a multi-use development?

The method of developing a trip generation estimate must also take into consideration the fact that some of the trips counted at stand-alone sites are actually made within a multi-use development, by vehicle or by an alternate mode such as walking. The most common example of this trip-making occurs at multi-use developments that include both residential and shopping areas. Some of the residents’ work trips and shopping trips are made to the on-site shopping area. These trips are internal to the multi-use site. Because they are captured on-site, a capture rate is used. A capture rate is a percentage reduction in traditionally developed trip forecasts to account for internal trips. The reduction may be applied to the total trips estimated, just as is the pass-by percentage reduction.

The ITE has found that multi-use developments could reduce trip generation estimates by 24%. Note that this trip reduction for captured trips is separate from the reduction for pass-by trips. They are distinct phenomena and both may be applicable to a development.

What should be included in a traffic impact analysis?

Once you have determined that a traffic impact study is necessary, the scope of the study should be specified. The following provides an outline of the recommended content of an impact study and a series of questions for evaluating a study conducted for your community:

I. BACKGROUND:

- Description of proposed development
- Identification of peak hours and whether weekends will be used in the impact analysis
- Description of study area
- Location of proposed Access points

II. BASE TRAFFIC CONDITIONS:

- Description of road network and intersections adjacent to site and at access points
- Counts during peak-impact hours

III. SITE TRAFFIC GENERATION:

- Trip generation rates used and the source of these rates
- Traffic generated during peak impact hours

IV. SITE TRAFFIC DISTRIBUTION:

- Method used to distribute traffic
- Table showing estimated traffic movements by direction
- Discussion of method used for traffic assignment and assumptions for assignment of traffic to network

V. NON-SITE TRAFFIC PROJECTIONS:

- Definition of design year—opening of proposed development
- Identification of development in study area whose traffic is to be included in calculations
- Adjustments of off-site through traffic volumes
- Assembling of off-site traffic forecast for design year

VI. TRAFFIC ASSIGNMENTS:

- Assignment of peak-period traffic to intersections and access points
- Figures for existing peak impact traffic hours, site traffic and total traffic
- Recommended access design improvements

VII. REVIEW OF SITE PLAN:

- Internal Reservoir at access points
- Parking layout
- Loading dock locations and access, including design truck used
- Recommended changes

VIII. DISCUSSION OF FUTURE TRAFFIC CONDITIONS:

- Other developments in area

What are some guidelines to mitigate traffic congestion in your community?

- ◆ Encourage consolidation of trips by providing mixed use development.
- ◆ Encourage alternative modes of transportation.
- ◆ Design development to be pedestrian friendly by including smaller set-backs, requirements for parking behind buildings, and building sidewalks—including sidewalks that provide connections from the development to residential areas.

Endnotes

1. Definitions of each land use class here.
2. The AM Peak rate represents the average vehicle trip generation rate during the hour of highest volume of traffic entering and exiting the sit in the morning. ADT is the Average Daily Trip rate or the vehicle trip generation rate during a 24-hour period for a weekday (unless otherwise noted).



QUESTIONS ADDRESSED BY TIA

- ◆ Is the study area large enough to include all significant impacts from the development?
- ◆ Does it include all critical intersections?
- ◆ Were traffic counts taken during the critical time periods?
- ◆ Are traffic counts recent?
- ◆ Have all the assumptions used in the technical analysis been clearly identified?
- ◆ Do calculated levels of service seem reasonable?
- ◆ Does the community have acceptable standards for level of service?
- ◆ Does the description of the proposed site agree with the site plan submitted?
- ◆ Have trip rates been adjusted to account for public transportation, pedestrians or pass-by-trips?
- ◆ Does the directional distribution of the site traffic seem reasonable?
- ◆ Has pedestrian circulation been accommodated?
- ◆ Has adequate parking been provided to meet demand?

4 | Socio-Economic Impact Analysis

As Wisconsin communities continue to grow, local officials and community members are constantly challenged by the need to balance fiscal, social, economic, and environmental goals. One aspect of this challenge is deciding how much and what types of new development the community can accommodate without compromising the day-to-day quality of life for residents. Socio-economic impact assessment is designed to assist communities in making decisions that promote long-term sustainability, including economic prosperity, a healthy community, and social well-being.

Assessing socio-economic impacts requires both quantitative and qualitative measurements of the impact of a proposed development. For example, a proposed development may increase employment in the community and create demand for more affordable housing. Both effects are easily quantifiable. Also of importance, however, are the perceptions of community members about whether the proposed development is consistent with a commitment to preserving the rural character of the community. Assessing community perceptions about development requires the use of methods capable of revealing often complex and unpredictable community values.

This chapter provides an overview of socio-economic impact assessment, including what it is, why it is important and guidance on how to conduct a socio-economic impact assessment.

WHAT IS SOCIO-ECONOMIC IMPACT ASSESSMENT?

A socio-economic impact assessment examines how a proposed development will change the lives of current and future residents of a community. The indicators used to measure the potential socio-economic impacts of a development include the following:

- ◆ Changes in community **demographics**;
- ◆ Results of retail/service and housing **market analyses**;
- ◆ Demand for **public services**;
- ◆ Changes in **employment** and **income levels**; and
- ◆ Changes in the **aesthetic quality** of the community.

Quantitative measurement of such factors is an important component of the socio-economic impact assessment. At the same time, the perceptions of community members about how a proposed development will affect their lives is a critical part of the assessment and should contribute to any decision to move ahead with a project. In fact, gaining an understanding of community values and concerns is an important first step in conducting a socio-economic impact assessment.

The socio-economic impacts of a proposed development on a community may actually begin the day the project is proposed. Changes in social structure and interactions among community members may occur once the new development is proposed to the community. In addition, real, measurable and often significant effects

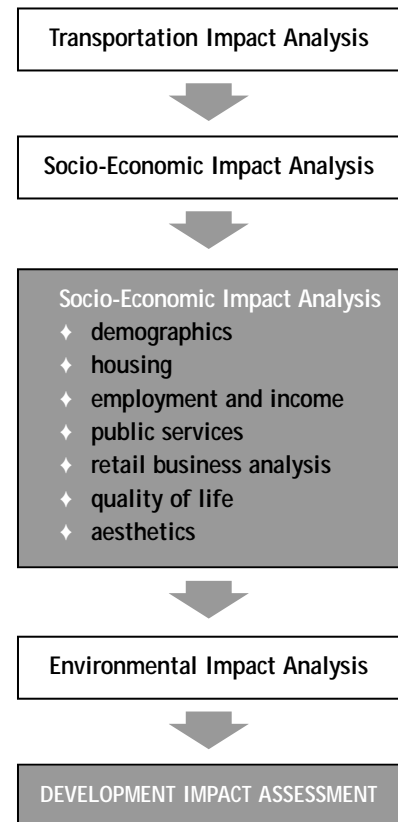


Figure 4.1 Social Impact Component

on the human environment can begin to take place as soon as there are changes in social or economic conditions. From the time of the earliest announcement of a pending policy change or development project, attitudes toward the project are formed, interest groups and other coalitions prepare strategies, speculators may lock up potentially important properties, and politicians can maneuver for position.

WHO SHOULD BE INVOLVED IN THE PROCESS?

Because socio-economic impact assessment is designed to estimate the effects of a proposed development on a community's social and economic welfare, the process should rely heavily on involving community members who may be affected by the development. Others who should be involved in the process include community leaders and others who represent diverse interests in the community such as community service organizations, development and real estate interests, minority and low income groups, and local environmental groups. In addition, local agencies or officials should provide input into the process of assessing changes in the social environment that may occur as a result of the proposed development (e.g., providing estimates and information demographics, employment and service needs).

WHY CONDUCT A SOCIO-ECONOMIC IMPACT ASSESSMENT?

Conducting a social impact assessment is important for several reasons. In general, it is used to alert the community, including residents and local officials, of the impact and magnitude of the proposed development on the community's social and economic well-being. The assessment can help communities avoid creating inequities among community groups as well as encourage the positive impacts associated with the development.

The impact assessment provides estimates of expected changes in demographics, housing, public services, and even the aesthetic quality of the community that will result from the development. Equally important, the assessment provides an opportunity for diverse community values to be integrated into the decision-making process. Together, these components of the assessment provide a foundation on which decisions about whether to alter or change a proposed development can be made.

Development constitutes a significant change in the type and intensity of use on a parcel of land. In Wisconsin, development often means conversion of productive agricultural land. Development may occur in the form of a residential subdivision, industrial park, or commercial center. Depending on the location chosen for the new construction and the type of development, the social impact on the community may affect one group of residents more significantly than another (e.g., farmers, the elderly, low income or minority groups).

It is critically important to devote attention to the potential impacts of development on vulnerable segments of the human population. Hopefully, the proposed development will not require investigation into such possibilities, yet the staff conducting the socio-economic impact assessment should be aware of social equity concerns. Other demographic groups that may be disproportionately affected by a proposed development include adolescents, the unemployed, and women; members of groups that are racially, ethnically or culturally distinctive; or occupational, cultural,

political or value based groups for whom a given community, region or use of the biophysical environment is particularly important. No category of persons, particularly those that might be considered more sensitive or vulnerable as a result of age, gender, ethnicity, race, occupation or other factors, should have to bear the cost of adverse social impacts. Socio-economic impact assessment can help avoid future inequities associated with new development by pre-emptively considering the potential impacts of a project.

In thinking about vulnerable populations, it is also useful to examine the consequences of a no-development option. For example, if the proposed development is a residential care facility for senior citizens, what are the consequences for the community if the facility is not built?

Socio-economic impact assessment also provides a foundation for assessing the cumulative impacts of development on a community's social and economic resources. For example, a community may not recognize a change in their quality of life if a small strip mall goes up on the edge of town. In fact, their quality of life may improve if the businesses located in the strip mall provide services which would otherwise not be available to residents. However, if the construction of a small strip mall on the edge of town sets a precedent for constructing additional commercial establishments on the outskirts of town, the socio-economic impacts on a community may become significant indeed. Small, family-owned businesses located downtown may begin to close as competition lures consumers to the outskirts, where accessibility to more diverse commercial establishments is greater. The result may be a loss in the sense of community and cohesion among residents that existed prior to development because the focal point or "common meeting place" for residents has shifted to a new location. The change is subtle, yet may have a profound impact on the long-term sustainability of the community.

It is necessary to conduct the socio-economic impact assessment in the context of the other impact assessment components (i.e., fiscal, environmental, transportation). The relationship between the socio-economic impacts and other impacts of a proposed development is a close one. For example, changes in the physical environment or fiscal expenditures required of the community as a result of the development may directly influence community perceptions about whether to proceed with the project.

Unfortunately, socio-economic impact assessment often takes a backseat to other types of impact assessment such as fiscal and environmental impact analysis because the impacts are often more difficult to measure, and the social impacts associated with a development are generally more subtle than impacts on a community's fiscal balance sheet or local natural resources. However, it is important to consider, as early in the planning process as possible, whether the proposed development will have a significant effect on the social and economic welfare of the community.

HOW TO CONDUCT A SOCIO-ECONOMIC IMPACT ASSESSMENT

The following section provides a two-step process for conducting a socio-economic impact analysis. The process is designed to establish a framework for evaluating current and future proposed developments in a community.

TWO PHASES OF SOCIO-ECONOMIC IMPACT ASSESSMENT

1. Defining the scope of the Socio-Economic Impact Assessment
2. Identifying and Evaluating Development Impacts
 - A. Quantitative Changes
 - B. Community Perceptions

PHASE 1. DEFINING THE SOCIO-ECONOMIC IMPACT ASSESSMENT

Carefully defining the socio-economic assessment can save considerable and scarce resources (i.e., time and money). Since it is often impossible to assess every socio-economic impact associated with a proposed development, local officials are encouraged to refine the scope of the assessment based on the most important social and economic priorities of the community. The most reliable sources of information about community concerns and needs are residents and community leaders. Surveys and interviews are two excellent methods for identifying priority social and economic goals of the community. If time permits, a survey of community members can guide the design of an assessment for a single proposed development. Such surveys can also provide a foundation for local officials in designing and conducting future assessments, provided that the survey is representative of the diverse community values, concerns, and interests. Box 4.1 provides a sample of the types of survey questions that may be used to gauge community perceptions. Questions that are specific to community perceptions about a particular proposed development are provided later in this chapter. Interviews with community leaders (e.g., civic group representatives, religious leaders, citizen action groups) can also provide valuable information about what social, economic and other issues are important to community members.

The design of the impact assessment also needs to reflect the specific characteristics of the proposed project. The development impacts associated with a new development will vary depending on the proposed project's type, size, location, socio-economic characteristics of the community. As such it is important to be familiar with



SAMPLE SURVEY QUESTIONS . . .

. . . FOR USE IN DESIGNING A SOCIO-ECONOMIC ASSESSMENT

- ◆ What do you feel is important or special about the community (e.g. culture, diverse population, urban or rural qualities, natural environment, access to amenities and services)?
- ◆ What do you consider important to the quality of life (e.g., clean air and water, good jobs, arts and culture, security and safety, good relations with neighbors) in this community? What do people you know think is important to the quality of life in this community?
- ◆ What do the local Chamber of Commerce or other community organizations “pitch” as key community attributes?
- ◆ What aspects of the community are you interested in changing or working to change?
- ◆ Do you feel the quality of life has improved or worsened over the last 10, 20 or 30 years? Why?
- ◆ Do you belong to or know of any particular group (e.g., low-income, minority, farmers, elderly) that feels that their quality of life is disproportionately affected by development in the community?
- ◆ What do you envision as an ideal future for this community? Are there plans or other documents that describe an overall vision?

both the project characteristics and the social and economic resources of the community. The better one understands the proposed project, the more accurate will be the assessment in estimating potential impacts. If you have the time to complete a general survey, you may use the answers to the above questions to define the scope of the assessment. What are the most significant issues facing the community? If you do not have the resources for such a comprehensive survey, you may refine the scope of the analysis based on the specifics of the project.

PHASE 2. IDENTIFYING AND EVALUATING DEVELOPMENT IMPACTS

Explicit in the introductory sections of this chapter is the need to assess impacts both in terms of quantitative and qualitative measures of community socio-economic well-being. Measuring community perceptions about development is important just as is estimating the number of new jobs created by a proposed development.

Thus this section is divided into two sections: estimating quantitative changes in the socio-economic characteristics of the community and measuring community perceptions about a particular development. Each section describes the types of information that may be useful, available resources, and questions to facilitate the data collection process. Please note that this discussion is not exhaustive since methods for social impact assessment are plentiful. It does, however, provide a starting point for gathering information that will be useful in assessing the socio-economic impacts of a proposed development. Additional references are provided at the end of the chapter. Worksheets are provided in the Appendix to assist with the analysis.

A. Estimating Quantitative Changes in the Socio-Economic Characteristics of the Community

Development can cause changes in several community characteristics including demographics, housing, public services, markets, employment and income, and aesthetic quality. Methods for measuring each of these factors is discussed in the following section.

DEMOGRAPHIC IMPACTS

Demographic impacts include the number of new permanent residents or seasonal residents associated with the development, the density and distribution of people and any changes in the composition of the population, (e.g., age, gender, ethnicity, wealth, income, occupational characteristics, educational level, health status).

Development invites growth in new jobs in a community and draws new workers and their families into the community, either as permanent or temporary residents. When this occurs, the incoming population affects the social environment in various ways including increased demand for housing and social services (e.g., health care, day care, education, recreational facilities). Because residents' needs depend on a wide range of variables (e.g., age, gender, employment status, income level and health status), the diversity of service needs are determined not only by the absolute size of the incoming population but also by the old and new populations' demographic and employment profiles. As a result, a proposed development may have a significant impact on the community's ability to accommodate new residents and adapt to changes in the social environment for existing residents. Assessing the magnitude and rate of population change has important implications for community infrastructure and service requirements and can play a major role in determining

social impacts associated with the proposed development.

There are numerous modeling techniques available to aid in assessing population impacts. The models range in complexity and depending on the resources available for your assessment, a particular model may be more appropriate than another. Specific models are not described in this guide, but are referred to at the end of the chapter as part of the various social impact assessment guidance documents reviewed during development of this guide. The questions listed below are designed to help you begin the impact assessment process for a proposed development. Data collected during the Fiscal analysis (i.e., estimation of the number of new residents)



ASSESSING THE DEMOGRAPHIC IMPACTS

- ◆ What is the estimated population change with the proposed development?
- ◆ Of the population change, what percentage are under the age of 18, over 65, minority, female, male?
- ◆ What is the ethnic breakdown of the new population?
- ◆ Is there an influx or outflux of temporary workers (e.g., construction of development)?
- ◆ How many children per housing unit?

will help answer the questions. For each of the questions listed above, estimate and analyze the significance of how the population change will impact the social environment of the community (e.g., will the number of new school-aged children require additional public education facilities?, will an increase in the number of elderly residents require additional health care facilities?)

DATA SOURCES

- U.S. Census Bureau, *Census of Population* is an excellent source of information for demographic characteristics in the United States. The *Census* can be used to establish a baseline for the community as well as provide an indication of estimated changes in population. It contains data for counties and cities on age, sex, race, ethnicity, marital status, income, occupational characteristics, educational level, and health status of residents.
- At the state and county levels, various agencies (e.g., Department of Administration—Demographic Services section, Planning, Health and Human Services, school districts) also collect data which may be useful in establishing baseline demographic characteristics of the community as well as estimating changes in the social environment given certain types of development.
- Regional planning commissions provide basic information on demographics, employment and other socio-economic indicators.

HOUSING MARKET IMPACTS

A housing market analysis helps determine whether the proposed development will be beneficial to your community in terms of its effect on your housing market needs. In the case of a residential development, the market study assists in ascertaining whether there is sufficient demand for the type of housing proposed and whether a sufficient number of households in the area can afford to purchase or rent the proposed type of housing. The analysis also assists in the examination of the connec-

tions between the housing market and employment. For example, if the proposed development is a manufacturing plant expected to generate a specified number of low-wage jobs, can the community's current housing market absorb the new workers or is there a need for more affordable housing?

To understand the impact of a new residential development or a new employment center on your housing market (or on the regional market), the initial step of the analysis is to complete an inventory and analysis of existing and projected housing needs—a supply and demand analysis. To better understand whether your community is meeting the needs of residents and workers in terms of affordability, an analysis of housing affordability which includes an examination of typical rents and mortgage payments compared to what households at various income levels can afford is necessary.

Once these analyses are complete, the proposed development can be placed in a context in which a number of important questions specific to the development can be addressed. The Guidebook does not provide the steps for the housing market needs and affordability analysis, as it is provided in another recent publication, "Housing Wisconsin: A Guide to preparing the Housing Element of a Comprehensive Plan," available soon from UW–Extension. This publication provides a practical guide on how to organize and analyze the data necessary for a housing needs assessment. Having conducted this analysis, you can examine the proposed development within a broader framework, using the questions provided below as a guide.

Beyond consideration of the need for new housing, it is also important to consider the location of the proposed housing development and the impacts of that particular choice of location on the community. Housing is strongly linked to a community's employment centers, land use and transportation system. The location of housing affects commuting patterns. Separation and segregation of residential areas from other areas, including retail, service and office centers, generates more commuting trips and eventually requires more investment in roads and other transportation-related facilities. The location of housing in relation to other public facilities also affects overall energy use, lifestyles and personal costs for transportation. Furthermore, if there is a lack of affordable housing in the area, people may be forced to commute longer distances to work, because the affordable homes are far away from employment centers. The location of housing is also important if historical develop-

ASSESSING LOCAL HOUSING MARKET AFFECTS



- ◆ Does the development help to satisfy current or projected housing needs?
- ◆ Does the proposed residential development contribute to the diversification of available housing opportunities (types and prices)?
- ◆ Are rents and housing prices affordable to new segments (new employees) of the population?
- ◆ Does the development result in further concentrations of one type of housing? Is this desirable from the viewpoint of the community?
- ◆ If there is a need for affordable housing in the community, does this development help to meet that need?
- ◆ Is the development easily accessible to public and private facilities and services, such as retail establishments, parks and public transportation?
- ◆ If the residential development is specialty housing, have the unique needs of the special groups been considered?

ment patterns in the community have resulted in large areas of all one type of housing or housing that serves a majority of one income group. When one type of housing is over-concentrated in an area, the impacts on land utilization, infrastructure and public service needs may become distorted. Over-concentrations of single-family housing, for example, becomes an issue in terms of the infrastructure needs of education services. The housing needs assessment will also assist in the identification of concentrations of housing and diversity of housing patterns.

RETAIL MARKET IMPACTS

Growing communities often attract a variety of new commercial developments including both free-standing stores and neighborhood or community shopping centers. These developments provide a community with products, services and conveniences important to the quality of life of local residents. The challenge to accommodating these types of new developments becomes one of minimizing losses to existing retailers in the area, such as those downtown, while allowing the market to respond to the wishes of the increasingly demanding consumer.

To respond to this challenge, community leaders can conduct an assessment of the retail market with a focus on anticipated market supply and demand by retail category. The intent is to anticipate how well the market will respond to changes in the number, type and location of retail businesses and to provide community leaders with information to guide future business expansion and recruitment efforts. This section provides guidelines on how to conduct such an analysis. The Appendix includes several worksheets to facilitate the retail analysis in your community.



ASSESSING MARKET FOR RETAIL DEVELOPMENT

- ◆ What issues are currently facing local retailers?
- ◆ How is the trade area and its consumers changing?
- ◆ How is competition changing?
- ◆ What retail opportunities (or gaps) exist for business expansion or development?

Before an analysis of a particular development can be conducted, the economic health of the local retail community must be assessed. This requires a close look at retail activity, particularly in the central business district. Key indicators of economic health in the retail sector include vacancy levels, property values, store turnover, retail mix, employment, tax revenues, new business incubation, critical mass/concentration of retail, and the availability of goods and services demanded by the community. See the following web address for more information:
<http://www.uwex.edu/ces/cced/lets/lets798.html>

Second, changes in trade area demographics should be estimated. The trade area is generally defined as the geographic area in which three-fourths of current customers reside. A significant increase in population could signal new opportunities for retail expansion or development. The profile of these new or anticipated residents can help you assess future market demand for various types of products or services.

See the following web address for more information.
<http://www.uwex.edu/ces/cced/lts/0599ltb.pdf>

Third, regional retail competition must be assessed. New retail concepts are threatening traditional retail stores. These concepts include large non-mall stores offering assortment and low prices for selected types of goods like electronics, off-price apparel stores, food/drug stores and neighborhood drug stores that offer convenience, outlet centers, warehouse clubs and the internet. By recognizing the changes in competition, both locally and regionally, your assessment of proposed retail developments can offer valuable insight into the changing market and risk facing the traditional retailers in the community. See the following web address for more information. <http://www.uwex.edu/ces/cced/lts/ltsrt.html/>

Finally, with an understanding of general retail trends, changes in trade area demographics, and regional competition you can use secondary data to measure market gaps in the community and assess the impacts of the proposed development. Two techniques can be used: retail mix analysis and retail space analysis.

Retail Mix Analysis—The retail mix in “comparison” communities can be used to measure how many and what type of retail stores might be supported in your community. Comparison communities might include those with similar population, household incomes and distances from major metropolitan areas. If your community is growing in population, comparison communities with a larger population can be used.

Once the comparison communities are identified, the retail mix in each community is inventoried by specific retail category. The average numbers of stores by retail category in the comparison communities is then compared with the number in your community to identify any significant differences that might suggest business expansion or development opportunities. See the Appendix for data and a retail mix worksheet that can be used in your community.

Retail Space Analysis—The amount of additional retail space that can be supported by a growing community can be projected using two types of data: Household Consumer Expenditure Estimates and Sales per Square Foot of Existing Retailers.

Table 4.2 in the Appendix provides a rough approximation of how many square feet of retail space can be supported per additional household in a “typical” Wisconsin community (last column). These estimates were based on state and national data and do not reflect local supply and demand conditions. Nevertheless, they provide a starting point in determining potential market opportunities.

This analysis can be refined by using “household consumer expenditure data” or “median store sales per square foot” that more accurately reflect the socio-economic conditions of your community. Data can be purchased through private data firms that describe spending of consumers or store sales in your particular community or other representative areas. By using more reflective data, your calculations will more accurately determine the additional retail space necessary to serve the market area.

These steps can help you to anticipate how well the market will respond to changes in the number and type of retail businesses. Assessing the impact of community growth in the retail sector is important to ensure a successful and sustainable business community. In addition, it helps ensure that necessary goods and services will be available to a growing population. A guidebook on how to conduct a comprehensive Business District Market Analysis is available through the University of



ASSESSING THE IMPACTS ON EMPLOYMENT AND INCOME

- ◆ What is the current unemployment rate in the community? What has it been historically? What are the differences in unemployment between gender, ethnicity, etc?
- ◆ How will the proposed development influence the unemployment rate and distribution of employment among different groups?
- ◆ What is the average, maximum and minimum overall income of workers in the community?
- ◆ What is the range of incomes or wage rates for jobs associated with the new development?
- ◆ Will the new development offer temporary or permanent jobs?
- ◆ Will the development require additional workers to move in from outside the community or will the current population fill available positions?

Wisconsin, Center for Community Economic Development. The Center provides information through their web address <http://www.uwex.edu/ces/cced/>. They also offer educational programs and technical assistance to business districts in Wisconsin interested in analyzing their local economy, including market opportunities.

EMPLOYMENT AND INCOME

Development directly influences changes in employment and income opportunities in communities. Such changes may be more or less temporary (e.g., construction projects, or seasonal employment) or may constitute a permanent change in the employment and income profile of the community should the development project bring long-term job opportunities for community residents (e.g., establishment of a light industrial, manufacturing, or commercial establishment). Assessing these types of changes is an important component of social impact analysis because growth in employment places additional demands on community services and resources. For example, a development that brings lower-wage jobs to a community may generate the need for different types of housing in the area. Changes in income also influence the social environment in a number of ways such as raising or lowering the average standard of living for residents.

DATA SOURCES

Data sources for analysis of the local economy, employment and income trends include the University of Wisconsin's Center for Community Economic Development, which provides information and data sources for local economic analysis. The U.S. Census Bureau also provides information on employment and income. To retrieve community data from the 1990 Census, go to <http://venus.census.gov/cdrom/lookup/>. The Bureau of Labor Statistics provides information on employment and wages. To view Metropolitan Area Occupational Employment and Wage Estimates, go to <http://www.bls.gov/oes/msa/oessrch1.htm>.

PUBLIC SERVICES

The new residents and their associated activities will require a variety of services provided by the areas public and private institutions. A social impact assessment must determine the quantity and variety of anticipated needs. The goods and services most commonly included in a social evaluation are open space and parks; cultural and recreation facilities; education; health care; special care for the elderly, the dis-



ASSESSING THE CURRENT ACCESSIBILITY OF PUBLIC SERVICES

- ◆ What is the present level of services in the community?
- ◆ What is the current distribution of services in the community (to social groups or to neighborhoods)?
- ◆ What are the anticipated needs and accessibility to services of the future population?
- ◆ Are there organizational or coordination problems currently being encountered by service organizations or agencies? May such problems be encountered in future service delivery? If so, what are they?
- ◆ What are the implications of future service and facility requirements and revenue sources on tax levels, net fiscal balance and service quality?

abled, the indigent and preschool-age children; police and fire protection; and a variety of administrative support functions. The optimum amount of resources that would be required for the satisfaction of needs is based on either planning standards, which are guidelines established by professional organizations and government agencies, or service levels, which are observed national (or regional) average amounts of resources expended per capita or some unit of size.

Service resources are objective indicators of the level of resources available for the satisfaction of society's needs. For example, the number of physicians, dentists, acute-care hospital beds, and psychiatric care hospital beds are indicators of the level of health care resources. Square feet of parkland, picnic areas, tot lots, etc., are indicators of facilities for recreation needs.

The Appendix includes worksheets designed to assist you in assessing the specific current and future needs of a variety of public services based on commonly applied planning standards. Once the tables are complete with information about the community's current service level and current and future needs, you can begin to determine the feasibility of the proposed development and how it may affect the quality of services provided to residents.

AESTHETIC IMPACTS

Impacts on the aesthetic quality of a community are often the most obvious sign of development; yet, are too often not included in the development impact assessment. Shopping malls and subdivisions in the rural landscape are one example of the impact development has on the aesthetic quality of a community. In many cases, community members perceive themselves as powerless in guiding "the way development looks" in their community and thus do not participate in making decisions that protect the visual and aesthetic qualities of the natural and built environment. While aesthetic impacts are often associated with environmental impacts, they also have a significant impact on the social well-being of the community and resident perceptions about the quality of life in the community.

There are several methods available to local communities for assessing the potential impact of a proposed development on the aesthetic quality of a community. These include: design review, geographical information technology, image processing technology, multi-media technology, and communications technology.

Design review is an effective tool for identifying urban and rural community aesthetic preferences and integrating such preferences into comprehensive plans and

zoning ordinances. In fact, many Wisconsin communities have adopted design review processes which involve the review of individual development proposals by a special body such as the planning commission, an architectural review board, design review committee or a historic preservation commission (Ohm 1999). Citizen surveys and photographs depicting desirable as well as non-desirable types of development are often used to formulate and document community preferences which can then be translated into a formal zoning ordinance or integrated into the comprehensive plan. In particular, design review provides an opportunity for community members to influence the layout and appearance of buildings or express preference for open space preservation as an area is developed. The elements for conducting a design review for a proposed development are outlined below. Other technologies for assessing aesthetic impacts include:

1. *Geographical Information Technology* which provides the basis to plan by documenting and analyzing current growth management factors, allocating new uses and assessing social, environmental, and economic impacts.
2. *Image Processing Technology* which provides the basis to visualize and evaluate the consequences of alternative planning, management, and design scenarios as each would appear on the landscape.
3. *Multimedia Technology* which provides the basis for combining the proposed planning outcomes and visualizations with relevant ordinances, laws and planning principles.
4. *Communications Technology* such as the internet and web browsers provide the basis to interactively share information, plans and evaluations to a broad spectrum of interested and affected parties and gather feedback on proposed solutions. Note that the University of Wisconsin Land Information and Computer Graphics Facility is currently developing communications technology.

ELEMENTS OF DESIGN REVIEW

1. *Setting Characteristics*: Review the proposed development for visual and experiential appropriateness to the surrounding area (i.e., neighborhood character, mainstreet, community entry, business park).
2. *Site Plan Review*: Does the proposed development integrate natural resources, buildings, parking and landscaping which is both functional and aesthetic, and in keeping with desired future character?
3. *Architectural Review*: Are the proposed buildings sensitive to the existing desirable built environment; will the architectural style provide a new desirable quality for community character?
4. *Landscaping Review*: Is the development of sufficiently high quality in planting design; amount of green space; sensitivity to species selection; and preservation of sensitive areas? Does it "fit" with the desired future character?
5. *Signs Review*: Is signage directional rather than advertising information; relates to street graphics more than conventional signage; consistent in size, number, and materials which reflect desired community character?

B. Measuring Community Perceptions About Social Well-Being

Socio-economic impact assessment is also important for assessing changes in a community's social well-being that result from development. This type of social change is more difficult to quantify than changes in the social environment because the assessment relies on the *perceptions* of current and new residents about how a proposed development may affect their quality of life. Social impact assessment of this nature is important because it can help local officials, planners, developers and the public identify and address potential conflicts of interest that may accompany development. In addition to quality of life issues, it is important to assess how a proposed development may influence neighborhood cohesion or cultural differences among members of the community.

QUALITY OF LIFE

The attitudes community residents have toward development and the specific actions being proposed as well as their perceptions of community and personal well-being are important determinants of the social effects of a proposed action. Such attitudes are a reflection of the quality of life residents seek to enjoy and preserve, whether it be limiting growth in order to maintain the rural image of a small community; expanding the boundaries of the village; or providing a variety of housing choices to new, diverse residents and businesses. Changes in a community's social well-being can be determined by asking the individuals and representatives of groups or neighborhoods in the area to make explicit their perceptions and attitudes about the anticipated changes in the social environment.

Information about attitudes and perceptions should be gathered from community leaders because their attitudes are important and may lend insight into the overall attitudes of residents if community leaders are perceptive and sensitive to community concerns and interests. However, it is perhaps more important, though generally more time-consuming and costly, to profile the attitudes of the residents living and working in the community and each of the distinguishable social groups because

ASSESSING ATTITUDES TOWARD DEVELOPMENT



- ◆ What is the opinion of residents regarding the proposed development or development in general and the strength of the position they take, including their reasons why?
- ◆ What do the residents view as anticipated effects from development or the proposed action?
- ◆ How might those effects be evaluated in the context of community attitudes? Is a “fear of change” bias inherent in community attitudes towards development?
- ◆ Are community attitudes generally supportive of the kind of development which is being proposed, or has there been consistent opposition to this type of development? Is the opposition to the nature of the development or to its schedule or other specific characteristic?
- ◆ How large and important are the effects of the project likely to be? If they are anticipated to be large, more attention to attitudes is warranted, and information may be needed in more detail to properly assess and evaluate the effects on different groups.
- ◆ Has there been controversy over the proposed action? Why?
- ◆ What local issues have emerged as a result of the proposed project?
- ◆ What have been the dimensions of disagreement? Which groups have taken what position? Are the positions consistent with previous patterns in the community or are new alliances and divisions being formed?

TECHNIQUES FOR PUBLIC INVOLVEMENT

- Focus Groups:** Includes small discussion groups to give “typical” reactions of the general public. Normally conducted by a professional facilitator. May be several parallel groups or sessions. Advantages: provides in-depth reaction and detailed input; good for predicting emotional reactions. Disadvantages: may not be representative of the general public or a specific group. Might be perceived as manipulative.
- Interviews:** Face-to face interviews with key persons or stakeholders. Advantages: can be used to anticipate reactions or gain key individual support and provide targeted education. Disadvantages: requires extensive staff time and an effective interviewer.
- Hearings:** Formal meetings where people present formal speeches and presentations. Advantages: may be used for introductory or “wrap-up” meetings; useful for legal purposes or to handle general emotional public input safely. Disadvantages: can exaggerate differences without opportunity for feedback or rebuttal; does not permit dialogue; requires time to organize and conduct.
- Meetings:** Less formal meetings of persons to present information, ask questions, etc. Advantages: highly legitimate form for public to be heard on issues. May be structured to allow public to be heard on issues and small group interaction. Disadvantages: may permit only limited dialogue; may get exaggerated positions or grandstanding; may be dominated by forceful individuals.
- Workshops:** Smaller meeting designed to complete a task or communicate detailed or technical information. Advantages: very useful to handle specific tasks or to communicate, in a hands-on way, technical information; permits maximum use of dialogue and consensus building. Disadvantages: inappropriate for large audiences; may require several different workshops due to size limitations; requires much staff time in detailed preparations and many meetings.
- Surveys/Polls:** Carefully designed questions are asked of a selected portion of the public. Advantages: provides a quantitative estimate of public opinion. Disadvantages: susceptible to specific wording of questions; provides only a static snapshot of a changing public opinion; can be costly. (EPA 1990)

they represent the population in the community most affected by changes in social well-being. In assessing resident attitudes, consider the questions on page 46. The responses may provide an indication of what additional information is necessary and in what detail it should be gathered for a particular proposed development.

Some of the methodologies and techniques for assessing changes to the social environment are quantitative in nature and existing sources of data such as the Census Bureau provide a useful starting point for estimating social impacts. Other techniques such as surveys, focus groups, charrettes, public hearings and meetings with community residents may be appropriate for collecting data that is both more qualitative in nature and useful for assessing the perceptions of community members. A

summary of techniques that may be used to elicit community perceptions about development, including features of the technique, advantages, and disadvantages to their use is provided page 50.

CONCLUSION

As should be evident from the preceding discussion, socio-economic impact assessment is a complex, yet important aspect of development impact analysis. The various changes in the social environment and social well-being of a community that result from development may be significant, yet they are often subtle and not easy to quantify. However, this does not mean that socio-economic impact assessment should not be considered an essential component of the development impact assessment process.

It is important to bear in mind that while certain individuals or community groups may be active and forthcoming with input into the planning process, other community groups (e.g., low income or minority groups) that may be equally or even disproportionately affected by the proposed development may be less vocal in expressing concerns and interests. In situations where traditionally disempowered groups may be impacted by a development, it is important to make a concerted effort to involve them in the social impact assessment process.

Depending on the resources available to conduct the socio-economic impact assessment and the specific objectives of the analysis, some methods may be more appropriate than others. At any rate, a list of references is provided at the end of this chapter to guide further efforts in conducting a socio-economic impact assessment.

Finally, it is important to note that a socio-economic impact assessment not only forecasts impacts, but should also identify means to mitigate adverse impacts. Mitigation should include efforts to avoid an impact by not taking or modifying an action; minimizing, rectifying or reducing the impacts through the design or operation of the project or policy; or compensating for the impact by providing substitute facilities, resources or opportunities.

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5 | Environmental Impact Analysis

Local officials, planners, and developers increasingly recognize that economic development and environmental quality are equally important components of community growth. Unfortunately, this awareness comes after decades of environmental neglect: sprawling development beyond urban boundaries, rapid and irreversible conversion of prime agricultural land, loss of unique plant and animal communities, and increased pollution of water and air resources. It goes without saying that development often has substantial impacts on the quality and quantity of a community's air, land, water, and biological resources; yet, economic development often takes precedence over environmental protection.

The benefits of economic development are often more immediate, important, and obvious to community members and local officials: the creation of good-paying jobs; provision of affordable housing; and diverse shopping opportunities satisfy many of the priority needs and desires of local consumers. The benefits of environmental protection are often less evident and immediate, but are nonetheless important as natural resources continue to become scarce and threats to environmental and human health are ever-present. Yet, tradeoffs between economic development and environmental protection need not continue as Wisconsin communities continue to grow.

The purpose of this chapter is to help community members and local officials take a leadership role in ensuring that future development reflects environmental protection as well as fiscal, social, and economic community goals. This chapter defines environmental impact assessment; explains reasons for conducting an impact assessment; discusses who should be involved in the process and the limitations of the process; and provides guidance on how to conduct an environmental impact assessment.

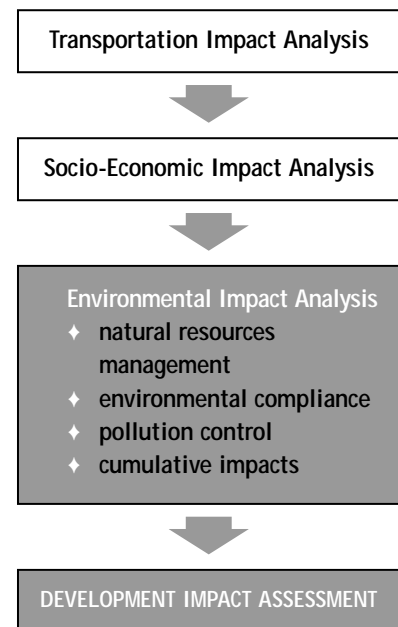


Figure 5.1 Environmental Impact Component

WHAT IS AN ENVIRONMENTAL IMPACT ASSESSMENT?

Community environmental impact assessment provides a systematic process for identifying, describing and evaluating community natural and human resources in order to improve decisions about their management. Choosing to assess the community environment does not imply that all identified resources must be preserved or protected. It does imply that the community must be knowledgeable about its resources, so that development decisions reflect the range of community values, not just economic values. An environmental impact assessment facilitates community planning by assisting local government officials, community leaders, and citizens:

- ◆ identify valuable environmental resources in the community and surrounding area that may be affected by a proposed development;
- ◆ evaluate the community's capacity for additional development given environmental protection priorities ;

- ◆ identify the deficiencies or tradeoffs between possible development alternatives or courses of action and the environmental impacts associated with each alternative;
- ◆ determine which groups in the community may be directly or indirectly affected by the project or action.

WHO SHOULD BE INVOLVED IN THE PROCESS?

The environmental impact assessment process requires input from a variety of individuals including: professionals and civil servants with expertise in environmental science and engineering; local officials who are knowledgeable of local, state, and federal environmental management procedures and regulations; and members of the community who possess both expertise and interest in the local environment and natural resources.

Naturally, the developer, planner, local officials and perhaps a hired consultant should be involved in the process. Because the environmental impact assessment process often requires technical expertise and consideration of numerous environmental compliance issues, it is appropriate to involve other individuals such as an engineer, land or ecological conservation expert, state agency staff (e.g., Department of Natural Resources). Local conservation organizations such as land trusts and conservancies as well as the local offices of national organizations such as The Nature Conservancy are often an excellent source of information about local environmental concerns, community biological resources, and conservation tools.

Selecting the appropriate individuals to be involved in the assessment will ensure that more adequate (and accurate) consideration is given to potential impacts associated with the development. The up-front investment made in identifying and engaging relevant participants in the process will pay off in the long run as potentially costly mistakes in planning and estimating impacts are avoided.

WHY CONDUCT AN ENVIRONMENTAL IMPACT ASSESSMENT?

Including an environmental analysis component in the overall development impact assessment process can:

- ◆ Promote communication among local officials, developers, community leaders and citizens about the nature of the proposal and potential impacts on the local environment;
- ◆ Ensure compliance with all relevant and appropriate environmental laws and regulations (e.g., storm-water management, compliance with wetland and floodplain regulations) during construction and operation of the new development;
- ◆ Ensure consistent and fair review of development proposals by applying a systematic review process that includes environmental assessment; and
- ◆ Provide a forum for exploring alternatives to the proposed development or strategies to mitigate impacts, if necessary.

For example, an environmental impact assessment can inform development decisions about the most suitable site for a housing development. While economics often drive such decisions, an environmental impact assessment can provide the stepping stone for exploring alternative sites that would minimize farmland conversion or other environmental impacts.

An environmental impact assessment can also aid in developing mitigation strategies for proposed development that are approved (e.g., site design elements that reduce storm-water runoff volume or contamination). This is particularly useful since it is typically much easier to prevent problems from occurring in the design of the development than correcting problems after the development is built.

WHAT AN ENVIRONMENTAL IMPACT ASSESSMENT DOESN'T DO.

An environmental impact assessment provides general information about the potential for adverse environmental impacts associated with a proposed development, not detailed quantitative information for design or regulatory purposes (e.g., could indicate areas where private on-site waste disposal may become a groundwater problem, not what density of housing will exceed contaminant attenuation capacity). Design standards and regulations typically require models with much greater data requirements.

HOW TO CONDUCT AN ENVIRONMENTAL IMPACT ASSESSMENT.

This chapter outlines five phases of preparing an environmental impact assessment. It is expected that each of the five phases will be adapted to meet the specific assessment needs of the community, therefore the following discussion is intended to provide only an outline of general procedures for conducting an environmental impact assessment.

Before proceeding with the environmental impact assessment, however, an important first step is to obtain a map of the proposed development and if possible, a map of the community. Maps are useful tools for visualizing how a proposed development “fits” into the layout of the community. The various types and sources of map information available to communities are discussed later in this section.

A worksheet is provided to assist in completing the environmental impact assessment. Depending on your community's needs, all or portions of the information provided will be useful to your assessment efforts. For example, if a list of all relevant environmental guidelines and standards has already been compiled by a local agency or organization, it is not necessary to duplicate efforts.

PHASE 1: DEFINING THE SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

Similar to fiscal, social and economic impacts, development impacts on the environment vary significantly by project type, size, location, and the environmental conditions at the proposed site. As such, the first phase of environmental impact assessment involves becoming familiar with the characteristics of the proposed development. The better understanding one has about the project, the more accurate will be the assessment of environmental impacts. In designing the environmental impact assessment, it is important to consider the following unique characteristics of the proposed development site:

◆ **The size and nature of the development.** A small, low density residential subdivision, for example, may have a much differ-

FIVE STEPS

1. Define the scope of the Environmental Impact Assessment;
2. Inventory community natural resources, their quality and current use;
3. Compile and review existing community environmental management standards and guidelines;
4. Assess the extent and significance of environmental impacts resulting from the proposed development; and
5. Evaluate the potential cumulative impacts associated with the proposed development.

ent impact on the environment than would a large regional shopping mall. This refers to impacts during development/construction as well as impacts from the operation of the facility itself.

- ◆ **The location of the proposed development.** Is the site of the proposed development located in a rural, urban, or suburban part of a Wisconsin community? If the proposed development is located in an urban or suburban area, it will be appropriate to assess potential impacts such as urban runoff from impervious surfaces, increased pollutant loadings, and decreases in available water supply.
- ◆ **The character of the natural environment being impacted.** The ability of the natural environment to support or sustain certain land uses will vary according to such factors as soil type, bedrock conditions, drainage patterns, vegetative cover, whether the development is built on a floodplain or bluff.
- ◆ **The spill-over effects of environmental impacts.** Although the purpose of an environmental impact assessment is primarily to inform a community, it must be recognized that environmental impacts may affect resources far from the community in time and/or space. The type and magnitude of off-site and out-of-community impacts may influence who needs to become involved in the process.

PHASE 2: INVENTORYING COMMUNITY NATURAL RESOURCES, THEIR QUALITY AND CURRENT USE

Once elements of the proposed development are understood, inventorying community natural resources, their quality and current use is an important next step in determining what impact a proposed development may have on the community's environment. Moreover, an environmental inventory can provide citizens with a better understanding of local natural resources, economic opportunities for resource use, factors that might constrain development and problems that might result from resource use or new development. The inventory of current use and quality of natural resources in the community can either be specific to the proposed development or may include a comprehensive assessment of the community's natural resources.

There are many aspects to consider in preparing an inventory. For example, a community may choose to protect a resource that is currently "useful" or of "high quality" from even the most minimal impacts. Other sources may lend themselves to a variety of functions without noticeably degrading the local environment. It is important to keep in mind that each resource may be affected by certain types of development pressures, but not by others. Finally, the inventory should include not only existing resources, but also threats to those resources (e.g., loss of prime agricultural land or open space) and citizen concerns about the quality of those resources (e.g., quality of drinking water supply). Box 5.1 provides an overview of environmental resources and potential impacts associated with development. Development may also affect a community's environment by impacting the aesthetic quality of a community, an issue further addressed in the Socio-Economic chapter of this guide.

Methods for Inventorying Natural Resources, Their Quality and Current Use

Gathering information should not require the community to invest substantial resources in collecting original data about the local natural resources. Rather, the inventory process should involve the collection of *existing* information, which has already been collected by various agencies and organizations (e.g., Department of

Box 5.1: Environmental Resources and Potential Impacts of Development

Land Resources:

Loss of Plant Species and Communities: Direct impacts result from: disturbances that cause changes in temperature, light, moisture, and nutrient levels; removal activities (e.g., clearcutting, bulldozing); impacts resulting from air and water pollution (e.g., turbidity, eutrophication). Indirect impacts result from changes in natural community processes (e.g., fire) or invasion of non-native plant species. Loss of plant communities also results in decreased water quality (e.g., loss of filter function associated with plant communities), increased erosion as a result of unstable soil, nutrient imbalances in the soil, and/or compaction of soil.

Loss of Wildlife and Wildlife Habitat: Like plant communities, wildlife habitat may be impacted both from direct and indirect activities associated with development. Alteration, fragmentation, or destruction of wildlife habitat can result in the direct loss or displacement of species and the ability of the ecosystem to support other biological resources such as the plant communities upon which the wildlife relied for survival.

Loss of Other Natural Resources: Loss of natural resources such as quality water supply, clean air, forests, mineral resources, wetlands, farmland, game species, rare species and recreation opportunities can impact a community's ability to sustain itself over the long term.

Soil Erosion: Construction activities are of particular concern. Soil erosion is an important problem both at its source and downstream of the development site. Lost soil will be deposited somewhere, and the location of the deposition could alter downstream hydrology and increase flooding. It may also pose a water quality issue directly as a result of siltation and indirectly from contaminants carried with or attached to soil particles.

Water Resources

Surface and Groundwater Hydrology: Changes in surface hydrology alter the flow of water through the landscape. Construction of impervious surfaces such as parking lots, roads, and buildings increase the volume and rate of runoff, resulting in habitat destruction, increased pollutant loads, and flooding. Built or paved areas and changes in the shape of the land also influence groundwater hydrology (i.e., recharge rates, flow, conditions).

Water Quality: Development activities (e.g., construction, industrial or residential development) as well as the spillover effects of development such as increased demand for drinking water and increased auto use can impact water quality by contributing sediment, nutrients, and other pollutants to limited water supplies, increasing the temperature of the water, and increasing the rate and volume of runoff.

Aquatic Species and Communities: Changes in surface hydrology and water quality can have adverse impacts on aquatic species such as fish, plants, and microbes. Increased turbidity, temperature, velocity of flow, and pollutant loads can have direct impacts on the species and their habitat.

Air Resources: Air pollution has direct and potentially hazardous impacts on human health. Air pollution includes two types: gas emissions, and particulate emissions. Non-hazardous, yet undesirable air pollution includes odors produced from certain manufacturers and fast food restaurants, etc.

Noise: Noise pollution can have a significant impact on both human health and quality of life for the residents of a community. Such pollution is most commonly associated with airports, highway and interstate traffic, large industrial facilities, and high volumes of truck and auto traffic on city streets.

Natural Resources, the University of Wisconsin system, conservation groups).

However, if there is no existing data, it may be possible to obtain the support of University researchers or a local conservation organization in inventorying the environmental resources at a particular site. Professors, graduate students, or local conservationists may be willing to pursue research projects such as conducting a biological inventory of the site, collecting environmental attribute data for the development of a GIS database, or surveying community concerns about a proposed project.

The three methods for gathering environmental assessment information outlined

in this chapter include: Geographic Information Systems, Community Resources, or a Worksheet Approach.

1. GEOGRAPHIC INFORMATION SYSTEMS

The evolution of geographic information system (GIS) development and application to natural resource issues in Wisconsin has made it possible for researchers, agencies, local communities and others to compile inventories of natural resources, assess threats to those resources and apply such findings to planning efforts. In fact, many local governments are beginning to use GIS to perform more complex analytical functions that reach beyond inventorying natural resources such as identifying land suitability for certain types of development. Some types of information currently being entered into and used in GISs include data on land ownership, soils and land use in Wisconsin. A list of potential sources of geographic information is provided below.

SOURCES OF LAND INFORMATION

The Wisconsin Land Information Program: <http://badger.state.wi.us/agencies/wlib/index.html>

Wisconsin Land Information Association: <http://www.wlia.org>

WISCLAND: <http://feature.geography.wisc.edu/sco/wiscland/wiscland.html>

Department of Natural Resources Geographic Services Section (GEO):
<http://www.dnr.state.wi.us/org/at/et/geol>

Wisconsin Interagency Land Use Council: <http://badger.state.wi.us/agencies/dor/iluc.html>

Wisconsin State Cartographer's Office:
<http://feature.geography.wisc.edu/sco/sco.html>

Land Information and Computer Graphics Facility: <http://www.lic.wisc.edu/>

If a decision is made to use digital geographic information, it is important to ensure the high quality and accuracy of data sets and/or data layers; compatibility with other data used in the environmental impact assessment; and avoidance of other potential limitations such as time dependent data or inaccurate projection and scale of GIS products.

2. COMMUNITY RESOURCES

Community members are often the most useful source of information and expertise about local natural resources, environmental concerns, and the potential impacts associated with a proposed development. Residents are often familiar with local landforms, wildlife, and land use patterns. For example, a farmer whose land is being surveyed for possible development may be aware of nesting grassland birds that are currently protected by federal law. Such information is critical to the environmental impact assessment.

In addition to the technical and scientific aspects such as calculating the increase in storm-water runoff from a proposed development, community perceptions, values

and opinions about the types of development are also important. A proposed development may be technically feasible and consistent with past development practices in the community; however, community input is the most reliable source of information for determining whether the project is compatible with the community's long-term goals. A preliminary list of survey questions for gathering information from community members about the potential environmental impacts of a proposed development is provided below. This list is not meant to be exhaustive; users are encouraged to add questions where appropriate.

3. WORKSHEET APPROACH

For communities that may not have existing GIS capabilities, a less-technical guide to use in the preparation of the inventory is a series of *Environmental Resources Inventory* worksheets developed by the University of Wisconsin–Extension, Environmental Resources Center. Assistance with this method of inventory is available through your county Cooperative Extension office or the UW Environmental Resources Center. The worksheets provide descriptive information about various resources and what aspects of the resource may be impacted by development. They also provide a systematic method for collecting information about the resource, which can be particularly useful in evaluating specific impacts and determining whether to proceed with the proposed development. A list of the categories for which worksheets have been developed is provided below.

The worksheets developed by the University of Wisconsin–Extension are accompanied by specific and thorough background information on each of the resources mentioned above.

SURVEY QUESTIONS FOR COMMUNITY MEMBERS



- ◆ What are the important natural resources in the community (e.g., water supply, agricultural land)? Why? To whom are they most important?
- ◆ What are the major threats to natural resources in this community?
- ◆ How do citizens in the community feel local natural resources should be managed (e.g., water usage, scenic waterways, air quality, hazardous waste management)?
- ◆ Is the general environmental ethic in your community one that encourages limits on use of natural resources or one that promotes unlimited use?
- ◆ What is the connection of land use in the area to history and culture? Would the proposed development enhance or threaten that connection?
- ◆ Has the community ever experienced a time of scarcity for any of its natural resources? If so, what were the effects? Would the proposed development contribute to the potential for scarcity?
- ◆ In your opinion, would any secondary effects of the proposed development pose any threat to the community's environmental resources?

WORKSHEET CATEGORIES

- ◆ Aesthetic Qualities
- ◆ Cultural Features
- ◆ Human Health/Environmental Hazards
- ◆ Waste Reduction
- ◆ Geographic Setting/Soil and Mineral Resources
- ◆ Surface Water Resources/Water Supply
- ◆ Groundwater/Water Supply
- ◆ Plant Communities
- ◆ Wildlife and Wildlife Habitat

Sources of Information for the Inventory

Agencies at all level of government are useful sources of information for the community inventory. Expertise and technical assistance within the various levels of government vary across a wide range of issues, including planning, environmental compliance and protection, geographic information and mapping. Depending on the needs of the community in gathering information for the environmental assessment, it may be prudent to browse through several of the websites referenced in the following list of sources. The list includes local and area offices, State agencies and the university system, and Federal agencies involved in environmental protection and management.

LOCAL AND AREA OFFICES:

◆ **Wisconsin Department of Natural Resources, Field Offices and Geographic Management Units:** Much of DNR's workforce is assigned to field offices in five regions. Their work is further divided into Geographic Management Units (GMUs), which are responsible for defining the natural ecology and threats to natural resources and the environment. Work teams provide expertise on a range of issues and work with communities to manage public resources. Website:

www.dnr.state.wi.us/aboutdnr/gmumap

- ◆ **County/City/village/ regional (multi-county) planning offices:** Planning offices, such as the West Central Wisconsin Regional Planning Commission, which serves the counties of Barron, Chippewa, Clark, Eau Claire, Dunn, Polk and St. Croix, provide planning and technical assistance to local governments. Such agencies often provide a wide range of services including, but not limited to, community planning (e.g., subdivision regulations, land use planning), transportation studies (e.g., traffic, parking), and environmental planning (e.g., water quality planning, solid waste planning). For more information on local and area planning offices visit the State's website, www.state.wi.us/local, which provides links to every county and local government website in the State.
- ◆ **County/City public works departments:** For more information, visit the State's website www.state.wi.us/local, which will provide a link to the county or local government's public works department.
- ◆ **County/city health department:** Information available through these offices may include data on environmental health concerns (e.g., air and water quality) affecting the community. For more information, visit the State's website www.state.wi.us/local, which will provide a link to the county or local government's health department.
- ◆ **County extension office:** County extension offices link local communities to University Resources. County extension educators can help identify sources of information and consider how the information could be applied or adapted to a local setting.
- ◆ **County Land Conservation Department:** The department is a county-based conservation service primarily for agricultural lands.
- ◆ **Local colleges and university staff and faculty:** Academic staff, students and faculty may provide research capabilities, technical expertise, and archival information on a number of issues relating to the environmental assessment (e.g., may have prepared environmental impact statements for development projects).

STATE RESOURCES:

- ◆ **Wisconsin Department of Natural Resources (DNR):** The Wisconsin DNR is a primary source of information for anyone requiring information about natural resources management, including technical expertise, compliance and guidance. The Department is divided into several Divisions including Air and Waste, Land, Water, Customer Service and External Relations, Administration and Technology, and Enforcement and Science. Each Division has a number of offices, which address the various natural resources and environmental management issues pertinent to the state. For more information on DNR and the types of information available, begin with a visit to the agency website at: www.dnr.state.wi.us/
- ◆ **Wisconsin Geological and Natural History Survey:** The Survey conducts earth-science surveys, field studies and other types of research. They provide scientific information about the geology, mineral resources, water resources, soil, climate and biology of Wisconsin. Website: www.uwex.edu/wgnhs/
- ◆ **State universities:** The University of Wisconsin system conducts research in many disciplines that may have relevance to an community inventory (e.g., planning, forestry, wetlands protection, agricultural land protection, water resources conservation). In coordination with other agencies, local governments and the private sector, the University system maintains an extensive network of geographic information system development, maintenance and analysis for the State.
- ◆ **State Historical Society:** Conducts and provides access to research on the State's natural history and maintains land records. Website: www.shsw.wisc.edu

FEDERAL RESOURCES:

- ◆ **U.S. Geological Survey:** The USGS provides a wide range of information including mapped data on natural and cultural features, land use and other forms of geographic information available at varying scales (e.g., state, county, local). Website: www.usgs.gov. The Wisconsin USGS office website address is: <http://wi.water.usgs.gov/index.html>
- ◆ **Natural Resources Conservation Service:** This service is part of the U.S. Department of Agriculture. The NRCS provides funding and technical assistance to counties for land conservation improvements. For example, the NRCS develops soil survey maps for counties in the U.S. The soil surveys include an inventory of soil resources such as the type of soil and appropriateness for certain types of land use (e.g., agriculture, building). Website: www.nssc.nrcs.usda
- ◆ **U.S. Fish and Wildlife Service:** This agency is a source of information on the federal status of threatened and endangered species and technical information regarding biological resources in the U.S. Website: www.fws.gov
- ◆ **U.S. Army Corps of Engineers:** The Corps is tasked with planning, designing, and building projects that provide river and harbor navigation, flood control, water supply, environmental restoration, wildlife protection and recreation; The agency is also in charge of approving projects that impact waterways and wetlands and thus is often a necessary source of information for environmental compliance and technical assistance issues. Website: www.usace.army.mil/
- ◆ **U.S. Environmental Protection Agency:** EPA provides a wealth of information on environmental protection standards and regulations, technical information on environmental and human health related issues ranging from air and water quality to solid waste management, environmental compliance permitting and licensing, guidance for managing natural resources, and funding for a variety of community-based programs. Website: www.epa.gov

PHASE 3: COMPILING AND REVIEWING EXISTING COMMUNITY SUBDIVISION ORDINANCES AND ENVIRONMENTAL MANAGEMENT STANDARDS, REGULATIONS AND GUIDELINES.

An environmental impact assessment should also reflect the extent to which community natural resources, human and environmental health, and aesthetics are protected by existing subdivision ordinances and environmental management regulations and guidelines. Before a proposed development can begin, both the developer and local officials need to ensure that the development will comply with federal, state, and local environmental regulations, subdivision ordinances and any other local plans such as master or long-range plans. The Wisconsin Department of Natural Resources is an excellent source of information on federal and state requirements and the county planning agency or other local government agency will be able to provide necessary information on local standards.

Wisconsin and National Environmental Policy Acts (WEPA and NEPA)

While environmental impact assessment guidelines exist at the state and federal levels, communities cannot depend on state or federal regulations to require developers to complete an environmental impact analysis. The Wisconsin and National Environmental Policy Acts (WEPA and NEPA) only require evaluation of impacts from developments funded by the state or federal government or which require state or federal permits and have the potential to cause significant adverse environmental impacts. WEPA and NEPA require state or federal agencies to prepare an Environmental Impact Statement for “major actions significantly affecting the quality of the human environment.” For example, an EIS might be required for the development of highways, new buildings, projects which include government financing and projects which require government permitting. These policies cannot be used to stop, approve or modify projects on their own, but the environmental impact statement may indicate where other environmental regulations may be violated by the project.

Locally or privately funded projects are not required to submit a WEPA or NEPA impact evaluation. However, there are many other state and federal regulations which govern management of designated land categories and activities associated with some kinds of development. These cover topics such as wetland and shoreland protection, flood control, discharge of water and air pollutants from facilities, storm-water management, hazardous waste management, farmland protection, and protection of threatened and endangered species. Communities are advised to determine which environmental statutes might apply to properties within their community as part of an initial site inventory. An environmental consultant can assist the community in identifying concerns specific to their project.

State, County, Local Subdivision Ordinances

As discussed earlier in this chapter, the local subdivision ordinance (or county ordinance if no local ordinance is in effect) requires the developer to comply with local, state and federal environmental regulations regarding such issues as storm-water management, construction site erosion, floodplain and wetlands protection. Wisconsin Statute, Chapter 236 provides general guidelines and requirements for platting lands, recording and vacating plats, while county and local ordinances may specify requirements for considering the environmental impacts associated with each proposed development. For example, the Dane County, Wisconsin Land Division and

Subdivision Regulations (Title 14, Chapter 75, Dane County Ordinances) specifically mandates that, in addition to preparing a plat (map) of the proposed subdivision, the subdivider shall comply with all applicable ordinances, statutes, regulations and plans, including but not limited to, State regulations regarding floodplain management, all county ordinances and regulations, and all master plans and master plan components. To gather additional detail on the Dane County ordinance and regulations, visit the County's website at www.co.dane.wi.us.

In addition to county level ordinances, local ordinances may also specify the extent to which environmental impact assessments are required for proposed developments. For example, the City of Middleton in its Subdivision Ordinance (Revised August 1992), specifically requires the subdivider to conduct an environmental assessment of the proposed development. The assessment includes a checklist, to be completed by the subdivider, indicating changes in land, water, and biological resources among other factors.

Box 5.5 includes a copy of the City of Middleton's Environmental Assessment Checklist. If the proposed development will affect a change in any resource identified in the checklist, the subdivider must provide a written explanation and supportive documentation describing the impacts of the proposed development. The assessment is then reviewed by the Plan Commission, which may, in turn, determine a need for and require an expanded environmental assessment of the subdivider. The Plan Commission also has the authority to invite the public to comment on the assessment during a scheduled public hearing.

Wisconsin Statute, Chapter 236, Platting Lands and Recording and Vacating Plats.

Purpose: "...to regulate the subdivision of land to promote public health, safety and general welfare; to further the orderly layout and use of land; to prevent the overcrowding of land; to lessen congestion in the streets and highways; to provide for adequate light and air; to facilitate adequate provision for water, sewerage and other public requirements...."

Delegation of Authority: To achieve the above stated purpose, Section 236.45, Local subdivision regulation, specifically delegates power to, "...any municipality, town or county which has established a planning agency..." to "...adopt ordinances governing the subdivision or other division of land which are more restrictive than the provisions of this Chapter [236]."

Source: To obtain details of this and other Wisconsin Statutes, visit the State's legislative website at www.legis.state.wi.us/statutes

Federal, State and Local Environmental Regulations

Environmental regulations and standards implemented at the Federal, State and local levels will significantly influence the nature and substance of the environmental impact assessment. In effect, environmental regulations and standards often provide the framework for the environmental assessment requirements outlined in subdivision ordinances such as those discussed above. However, because subdivision ordinances do not always provide explicit reference to the environmental regulations with which proposed developments must comply, it is important to understand the range of possible regulations that may apply to a development project. Box 5.6 lists many of the environmental regulations which may apply to a proposed development. For a list of local regulations, which may implement more stringent compliance standards than Federal and State law, contact the Land Use Council or Board.

**Box 5.5 City of Middleton’s Environmental Assessment Checklist.
(Does not include Cultural/Geological Preservation,
Transportation, Population components of the assessment).**

1. Land Resources

YES

NO

Does the project site involve:

- A.** Changes in relief and drainage patterns.
Attach a topographic map showing, at a minimum, two (2) foot contour intervals.
- B.** A landform or topographic feature of local or regional interest
- C.** A floodplain
(If yes, attach two (2) copies of a typical stream valley cross-section showing the channel of the stream, the 100 year floodplain limits and the floodway limits (if officially adopted), of each side of the channel and a cross-section of area to be developed)
- D.** An area of soil instability — greater than 18% slope and/or organic soils, peaks, or mucks at or near the surface
- E.** An area of bedrock within 6 ft. of the soil surface
- F.** An area with the groundwater table within 10 ft. of the soil surface
- G.** An area with fractured bedrock within 10 ft. of the soil surface
- H.** Prevention of gravel extraction
- I.** A drainage way for 5 or more acres of land
- J.** Lot coverage of more than 50% impermeable surfaces
- K.** Prime agricultural land
- L.** Wetlands and marshes
- M.** Land Elevation above 950 (USGS Datum)
- N.** Mapped environmental corridors

II. Water Resources

Does the proposed project involve:

- A.** Location within an area traversed by a navigable stream or dry run
- B.** Greater than 10% change in the capacity of storm-water facility or flow of a waterway within 1 mile.
- C.** The use of septic tank-soil absorption fields for on-site waste disposal
- D.** Lowering of water table by pumping or drainage
- E.** Raising of water table by altered drainage patterns
- F.** Lake frontage

III. Biological Resources

Does the project site involve:

- A.** Critical habitat for plants and animals of community interest
- B.** Endangered, unusual or rare species of:
 - 1. Land animals
 - 2. Birds
 - 3. Plants
- C.** Removal of over 25% of the present trees

Box 5.6 List of Federal and State Environmental Laws, Statutes and Regulations

Agricultural Land (Wisconsin Statute, Chapters 91, 92)

Agricultural land protection: Ag 91,92

Soil Erosion: Ag 92

Air Quality (Clean Air Act; Wisconsin Statute, Chapter 285; NR 400–499)

Endangered Species (Endangered Species Act; NR 27)

Hazardous Waste Management (Toxic Substances Control Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response and Liability Act (Superfund); Wisconsin Statute, Chapter 291; NR 600–690)

Underground storage tanks: NR 630

Highway and Street Standards (Wisconsin Statute, Chapters 80–90)

Solid Waste Management (Solid Waste Disposal Act; Wisconsin Statute, Chapters 287, 289; NR 500–590)

Waste Reduction: NR 538–555

Water Quality (Clean Water Act; Wisconsin Statute, Chapter 280,281)

Drinking water supply protection: NR 809.

Groundwater protection: +Ch. 160; NR 140, 160

Floodplain management: NR 116

Sewage Treatment: NR 210

Septic System sanitary codes: NR 210

Shoreland protection: NR 115

Soil erosion: Ch. 281; Ag 92

Storm-water Discharges/Runoff: NR 216

Surface Water: NR 102–106

Wetland Protection: NR 103, 107

Local Guidelines, including Master Plans, Long-Range Plans, Comprehensive Plans

To ensure that a proposed development is consistent with a community's long-range, master or comprehensive plan, the environmental impact assessment should include an analysis of whether the proposed development either meets or does not conform to the goals set forth in the community's plan. In communities where a long-range or similar plan has been developed, the local subdivision ordinance typically specifies that the proposed development be consistent with the community's plan. For example, in Burnett County, Wisconsin, a long-range plan was recently developed to address growth management concerns in the County. The plan, which is being implemented throughout the County, provides County officials and the public with a guide for reviewing subdivision plats, certified survey maps, and other land use proposals. While the land use requirements set forth by the Burnett County Zoning Administration do not specifically mandate that an environmental assessment be prepared for each proposed development, the goals of the long-range land use plan are specific and are to be used as a guide in approving proposed developments. For more information on Burnett County's approach in addressing growth management issues, visit the website at www.med.com/burnett/landuse.

PHASE 4: -ASSESSING THE EXTENT AND SIGNIFICANCE OF ENVIRONMENTAL IMPACTS RESULTING FROM THE PROPOSED DEVELOPMENT.

Information about the proposed development needs to be reviewed in a systematic way. Assessing some basic environmental considerations that are easily quantified is a good place to begin—for example, the wetland acreage that could be lost at the proposed development site. Worksheet 5.1 provides a general framework for recording the level of impact anticipated from the development. The Wisconsin Department of Commerce has developed a Developer/Planning Checklist for assessing possible environmental impacts associated with a proposed development. The checklist is included at the end of this chapter.

Depending on the characteristics of the proposed development, as identified during completion of Phase 2 of the environmental impact assessment, quantifying some impacts may have more relevance than others. Of particular concern in already developed communities (i.e., suburban and urban areas), are the environmental impacts associated with increased imperviousness of surface areas. Built or paved surfaces prevent infiltration of water into soil, thereby increasing storm-water runoff and the amount of pollutants transported to receiving waters. The result may be degraded water quality and wildlife/aquatic habitat.

Estimating increases in urban runoff provides a useful measure of potential environmental damage resulting from an individual project and may also be used to estimate the cumulative impacts of development. While addressing polluted runoff seems to demand extensive technical information on such complex matters as pollutant levels, hydrologic models, and the complex specifications of pollution control technologies, recent innovations have made it easier for local communities to estimate potential environmental impacts based on such estimations. It is possible to estimate increased runoff using standardized methods such as the Rational Method which relies on average constants (see Gupta, Ram S. 1989. *Hydrology and Hydraulic Systems*. Prospect Height, IL: Waveland Press, Inc.); however, increases in storm-water runoff are highly dependent on local conditions and the characteristics of the proposed development. The preferred approach for estimating runoff is one that factors in local conditions. Researchers at the University of Connecticut have developed a tool for local communities to use in understanding the links between land use and water quality. The Nonpoint Education for Municipal Officials (NEMO) project uses geographic information systems to conduct build-out analyses which integrate existing levels of impervious cover with future projections of development. The analysis allows community members to visualize options for future development in terms of impervious cover and by inference, impacts on land and water resources. See the side bar on this page for contact information. Local officials may also find it useful to consult with a local engineer who has prior experience estimating runoff for future developments or designing pollution control/storm-water management technologies. In addition, communities should contact the DNR for more information regarding the developers obligations to manage storm-water runoff. The DNR website also provides a link to the Center for Watershed Protection, an organization which provides assistance to local communities in addressing urban watershed issues. (410) 461-8323; website: www.pipeline.com.

For more information on NEMO...

Chester Arnold or Jim Gibbons University of Connecticut Cooperative Extension System (860) 345-4511. Mr. Arnold may also be contacted through email at carnold@canr1.cag.uconn.edu

PHASE 5: -EVALUATING CUMULATIVE ENVIRONMENTAL IMPACTS

Understanding the cumulative effects of development is an important component of community planning and long term environmental protection. As reported by the Council on Environmental Quality, evidence is increasing that the most significant environmental effects may result not from the direct effects of a particular action, but from the combination of individual effects of multiple actions over time. For example, while the development of a subdivision on the urban periphery may not on its own pose a significant threat to a community's environment, the development of additional subdivisions over time may seriously impact the community's land, water, and air resources. Conversion of acre after acre of prime farmland for roads, houses and businesses, increased demand for drinking water, impacts on water and air quality, and loss of critical habitat for biological resources are all examples of the cumulative effects of development.

METHODS FOR EVALUATING CUMULATIVE EFFECTS

- ◆ **Geographic Information System Analysis** assesses the spatial relationship between activities and potential environmental effects and may be used to explore development alternatives.
- ◆ **Questionnaires, interviews, and panels** to gather information about the range of proposed developments and natural resources potentially impacted by development.
- ◆ **Checklists** are useful for identifying potential cumulative effects by providing a list of common or likely effects and actions which may cause the effects.
- ◆ **Matrices** can be used to quantify the interactions between human activities and resources of concern.
- ◆ **Networks and System Diagrams** provide a method for identifying the cause-effect relationships which result in cumulative effects.
- ◆ **Modeling** is another method for quantifying cause-effect relationships which result in cumulative effects.
- ◆ **Trends Analysis** assesses the status of a resource or community over time and changes in the occurrence or intensity of stressors over the same time period. It can also be used to establish acceptable environmental baselines and/or estimate future cumulative effects.

There are various methods for analyzing cumulative effects, some of which are most effective when used with other methods. The methods outlined here are discussed more thoroughly in the Council on Environmental Quality's guide to considering cumulative effects, referenced at the end of the chapter. While the method selected for evaluating cumulative impacts may vary depending on the availability of resources, the scope and goal of the evaluation should remain consistent.

One method for assessing potential cumulative impacts of development that continues to gain popularity among communities faced with development challenges is the use of a geographic information system (GIS). In general, GIS is a powerful tool for carrying out spatial analysis of cumulative environmental change. The capability of GIS in layering different types of data (e.g., land use, water resources, infrastructure) and providing a graphic display of alternative development scenarios makes it an excellent planning tool for communities to use. As referred to in earlier sections of this chapter, the State of Wisconsin has invested considerable resources in compil-

Box 5.8 Cumulative Impact Assessment Checklist Example

POTENTIAL ENVIRONMENTAL IMPACTS

Impacts are defined by these indicators: Cumulative (C), Direct (D), Indirect (I), Positive (+), Negative (-), or any combination of these indicators. Provide comments/contacts for each as attachment.

	NONE	MINOR	MAJOR
1. Subsurface Conditions (soils, groundwater)			
2. Hydrology (drainage, storm-water, water quality, supply)			
3. Landforms (topography, floodplains, related water quality)			
4. Wildlife and Vegetation (vegetation, endangered species, parklands, conservation areas, ecologically critical areas)			
5. Land Use (existing zoning, land use, proposed community long-range plans, productive farmland or timberland)			
6. Natural Hazards (seismic, other)			
7. Cultural Resources (historic concerns, architecturally sensitive archaeological sensitive)			
8. Utilities/services (energy, solid waste disposal, water supply, sewer system and drainage)			
9. Transportation (public transit system, traffic circulation, parking)			
10. Hazardous Materials (underground storage tanks, site contamination, storage of hazardous substances, other)			
11. Other (ambient air, ambient noise, controversy)			

ALTERNATIVES TO THE PROPOSED ACTION:

MITIGATION FOR POTENTIALLY MINOR ENVIRONMENTAL IMPACTS:

POTENTIALLY MAJOR ENVIRONMENTAL IMPACTS REQUIRING FURTHER ANALYSIS:

RECOMMENDATIONS AND FINDINGS:

ing compatible data layers for all 72 counties in Wisconsin and continues to support local efforts to use the data in a variety of capacities, including comprehensive planning and natural resources management efforts. These functions significantly

increase the ability of communities to consider and evaluate potential cumulative impacts of development. However, current limitations do exist in the number of available, skilled personnel who can perform analytical functions such as cumulative impact assessment.

Checklists can be a useful tool for identifying and documenting the cumulative impacts that are associated with a particular development. They can be helpful in focusing the discussion of those conducting the assessment on the key cumulative impacts and for documenting how the impacts were selected for future technical analyses. Once a checklist is adapted to the needs of the community, it can be used as a consistent and valid tool for addressing the anticipated cumulative impacts of future projects. Box 5.8 provides a sample checklist used by the General Services Administration (GSA) during the agency's preparation of Environmental Impact Statements as required under the National Environmental Policy Act. Local communities may find it useful and necessary to adapt standardized questionnaires such as the one used by GSA to their specific needs by adding or deleting questions, or modifying the specific focus of existing questions. It is important to keep in mind that checklists are only intended to identify potential impacts. As such, they should be used in conjunction with other methods that are designed to quantify cumulative impacts, evaluate the costs and benefits of alternatives, and to develop appropriate mitigation measures.

Continual reference to the community's comprehensive plan as developments are proposed is one simple method for ensuring that growth in the community does not become unmanageable. A community with a long-range plan and comprehensive environmental inventory is well-equipped to anticipate and avoid the potential effects of development on the community's environment over the long-term.

Various other methods for assessing the cumulative impacts of development exist and may be appropriate for a community environmental impact assessment. The President's Council on Environmental Quality (CEQ) has assembled a comprehensive guidance document for considering cumulative effects under the National Environmental Policy Act (NEPA). While the guide is written specifically for Federal agencies, it does offer a useful information about how to conduct a cumulative effects assessment, the types of information that should be collected and how to evaluate a proposed development in the context of such effects.

CONCLUSION

While the task of conducting an environmental impact assessment may seem daunting at first, it is important to recognize the importance of assessing the environmental impacts associated with community development. To do otherwise will likely result in an even greater challenge (and cost) of addressing adverse impacts in years to come.

Moreover, tremendous gains have been made by Wisconsin communities, state government, and the universities in collecting and managing information about the State's natural resources. The process of conducting an environmental impact assessment is no longer as resource-intensive or time consuming, especially where baseline data about the current quality and use of natural resources have already been compiled. For communities that have not collected the relevant information for an environmental impact assessment, but are facing development pressure, now is the time to begin thinking about the long-term sustainability of the community. How does

environmental protection fit into the future of the community? It may not be a paramount goal for community members, but must be balanced with other economic and social goals if the community's quality of life is to be preserved.

Citizen participation and input is an important part of the process; however, a professional environmental consultant or engineer may offer necessary technical support and analysis of the environmental impacts of a proposed development. It is up to the community that hires the consultant to provide direction to the investigation and review results with community values in mind, in order to ensure that the community can pursue its own vision for a quality life.

REFERENCES

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Wisconsin Department of Commerce Developer/Planning Checklist

LOCAL APPROVALS

Does the project meet with all of the local approvals, conditions, and zoning requirements?

1. What is the current zoning of the property? Any zoning changes (conditional use permit) needed for the project to move forward?
2. Does the project meet fire and police protection standards? What changes are needed to bring the project into conformity?
3. Does the project meet with local wetland, shoreline, erosion control, and buffer requirements?
4. How will the project or facility fit into the local community's effective solid waste recycling program?
5. If wastewater is discharged to the local municipal treatment plant, can the community accept and handle the flow and treat the effluent?
6. Any health and safety risks associated with the project?
7. What types and levels of noise would be created by or associated with the project on a short-term or long-term basis? (e.g., traffic, construction, operations)
8. What type of light or glare will the proposed project produce? When will the light have the greatest impact?
9. What impact will the project have on the surrounding neighbors? Describe the types or kinds of existing facilities within a 1/2 mile radius of the project.
10. What impact will the project have on local streets and roads in the area? Describe any changes in traffic patterns, increased traffic to the area, traffic noises, etc.
11. Does the project need new roads, rail, airport services, and other infrastructure improvements such as

storm drains, retention ponds, water supply and storage? Can the local community handle all of these special needs of the project?

12. What designated or informal recreational opportunities are in the immediate vicinity? Would the project displace any existing recreational uses?

ENVIRONMENTAL APPROVALS

Does the project meet with the federal and state environmental regulations? What is the likelihood that these permits can be obtained without significant objections from the local residents and environmental groups?

AIR

1. What types of emissions to the air would result from the proposal (e.g., industry source, dust, automobile, odors, smoke) during construction and when the project is completed? If any emissions, describe and given approximate quantities.
2. If the project needs an air permit and is located in a "nonattainment" region of Wisconsin, does the project have the necessary air credits needed to off-set the source's air emissions?
3. Does the source emit more than ten tons of toxic air pollutants? If so, does the project meet Maximum Achievable Control Technology (MACE)?

WATER

1. Is there any surface water on or in the immediate vicinity of the site (including year-round and seasonal streams, lakes ponds, and wetlands)?
2. Are there any irrigation or drainage ditches on or near the site?
3. Will the project require any work over, in, or adjacent to (within 200 feet) of the described waters?
4. Will any work be needed to fill or dredge materials placed in or removed from surface water or wetland?
5. Will the proposed project require surface water withdrawals or water diversions?
6. Does the project lie within a 100-year flood plain?
7. Does the project involve any discharges of wastewater to surface waters or to the ground? If so, does it meet the pretreatment requirements of the state and pretreatment requirements of the local municipality if the discharge is going to the municipal treatment plant?
8. Is the project over five acres in size or fall within the Standard Industrial Classification in the areas of transportation, plastics manufacturing, metal coatings, food processing, or lumber?
9. Could any waste materials enter ground or surface waters associated with the site?
10. If the location is near one of the four wild and scenic rivers in Wisconsin, has the National Park Service commented upon the project?

SOLID/HAZARDOUS WASTE

1. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill or hazardous waste that could occur as a result of this project?
2. Does [will] this project process solid or hazardous waste?
3. Does [will] this proposal transport solid or hazardous materials? Have the proper licenses been applied for and approved?
4. Does [will] this site have storage tanks, underground or above ground? If so, what will be stored in the tanks?
5. Is the site located on or near a landfill?

ENDANGERED SPECIES — PLANTS AND ANIMALS

1. What kinds of vegetation are found on the site?
2. What kinds of vegetation will be removed from the site?
3. Was the Wisconsin Natural Heritage Inventory Program contacted as to possible sightings or habitats on the site that may contain state and federal endangered species?
4. Is the site part of a migration route?
5. Does the project need state and federal opinion (U.S. Fish and Wildlife) or approval regarding impact to wildlife and endangered species?

HISTORICAL/ARCHEOLOGICAL SURVEYS/APPROVALS

1. Are there any places or objects listed on, or proposed for national, state, or local preservation registers known to be on or next to the site?
2. Did the State Historical Preservation Officer (SHPO) identify any historic buildings or archaeological sites which would be affected by the project?
3. If historic buildings and archeological sites are present on the proposed development site, was documentation obtained from the SHPO as to their eligibility for the National Register of Historic Places?
4. If the SHPO agreed that the project would have an adverse effect, was there documentation of the Section 106 consultation process with the Advisory Council on Historic Preservation?

TRANSPORTATION IMPACTS

1. Is the project located in the state's nonattainment region in terms of air quality standards? If so, will the project employ more than 100 workers?
2. Will the project require new roads, highways, and special access points to get to the site?
3. What impact will any new roads and highways have on the vicinity of the project?
4. Will the project use water, rail or air transportation?

FARMLAND PRESERVATION

1. Does the project involve conversion of existing farm land? If so, was the Department of Agriculture's (USDA) Preservation Program contacted?
2. Does the project contain "prime, unique, or important" farmland as designated by the USDA?
3. If the land is located on any of the above classifications of farmland, did the USDA review the project?

6 | Putting It All Together

The first section of this chapter recommends ways to organize, integrate and understand the results of the development impact assessment. The second section discusses ways to use the results of the development impact assessment to facilitate planning and decision-making processes for the community.

ORGANIZING, INTEGRATING AND UNDERSTANDING THE RESULTS

At this point, your community's development impact assessment probably includes a wealth of information about the fiscal, traffic, socio-economic, and environmental impacts associated with a particular proposed development. Depending on the type and extent of the proposed development, it may have been necessary to collect information on each of the four impact areas discussed in this guide. On the other hand, you may have determined early on in the process that the proposed development will result in impacts on certain resources (e.g., fiscal, environmental) and not others. At any rate, the next step in the development impact assessment process is to organize the data collected in such a way that it can be used to make informed decisions about whether to proceed with the proposed project.

While you may have a clear understanding of what the results of each impact component (i.e., fiscal, traffic, socio-economic, and environmental) mean, you may not be completely clear on how these results relate to one another. Since the goal of development impact assessment is to inform community decisions about the impacts of a particular development, it is important to organize and integrate the information so that the proposed development can be evaluated in the context of all potential impacts. This process allows the community to weigh the benefits and costs of a project, identify tradeoffs, and begin identifying alternatives and/or measures to mitigate the impacts of the project.

To begin making sense of the results of the development impact assessment, it may be useful to summarize the findings for each component of the assessment. Worksheet 6.1 provides a simple framework for putting all of the information together. Depending on the amount of information collected during the process, it may be appropriate to summarize the results of each part of the impact assessment on a separate sheet of paper or enter the information into a computer database. Another option for organizing data may be to develop a system for ranking or coding the information contained in each of the parts according to severity of the impacts or level of benefit expected from the proposed development. It is important to be cautious when using the latter method, however, as valuable detail about specific impacts may be lost during the ranking process. In addition, using a ranking system to score the fiscal, traffic, socio-economic, and environmental impacts associated with a proposed development may limit one's ability to identify workable alternatives to the proposed project.

Once the data is organized and summarized, it is then possible to evaluate the proposed development by identifying areas of commonality and difference among the fiscal, traffic, social and environmental impacts.

IDENTIFYING AREAS OF COMMONALITY AND DIFFERENCE AMONG IMPACTS

While conducting the development impact assessment, you may identify issues that have a positive or negative impact on the community in terms of one or more resource areas. For example, the construction of a new manufacturing facility may result in a positive impact on both the fiscal balance sheet of the community (e.g., property taxes paid by the industry) and on the socio-economic needs of community members (e.g., new jobs). On the other hand, the new manufacturing facility may also result in an increase in traffic and environmental impacts (e.g., loss of open space) that may require reconsideration of where to locate the facility. Identifying common issues between the various types of impacts will help organize and integrate the information collected during the assessment process.

Just as it is important to identify areas of common benefit or cost to the community with regard to a particular project, it is also essential to evaluate the differences among impacts and determine how to address the differences which are most significant. For example, development of a single family residential complex may generate modest returns for a town once the fiscal impacts are calculated; yet, result in loss of prime agricultural land. Identifying such differences among the various impacts of a proposed development is the key to evaluating whether to proceed with a project and identifying potential alternatives to the proposed project which avoid or mitigate significant impacts.

Suggested steps for identifying areas of commonality and differences include:

- ◆ Review data collected for each impact area (i.e., fiscal, traffic, social and environmental) to identify similar and different concerns about a proposed development.
- ◆ Compile additional information from similar projects in the community in order to identify common/different impacts and issues.
- ◆ Decide which information is ultimately useful in reflecting real impacts and assess the significance of fiscal, traffic, social and environmental impacts relative to one another. Such decisions can be based on particular standards or criteria (e.g., ranking/coding, accuracy of information, community preference).

USING THE RESULTS

The results of the development impact assessment may be used in a variety of ways. Perhaps the results alone provide a valuable source of information about the types of development that are favored by community members or the capacity of the natural

RESULTS PROVIDE:

- ◆ Increased community awareness of growth issues and concerns;
- ◆ Information about community preferences and values regarding development;
- ◆ A well-balanced understanding of a community's resources, including, socio-economic, environmental, and transportation;
- ◆ A tool for facilitating implementation of the community's long-range plan;
- ◆ A foundation for identifying alternatives and modifications to the proposed development.

environment to accommodate increased growth. Even the development impact assessment process itself can be a valuable tool for raising community awareness of the need for growth management in the surrounding area. The process can also provide the impetus for a community to take action in setting goals and planning for its long-term economic, social and environmental sustainability. While the development impact assessment process is designed to evaluate the fiscal, traffic, socio-economic and environmental impacts of a particular proposed development, each assessment that is completed can be used as an example for subsequent assessments. Much of the information gathered during an initial development impact assessment may also be used in later assessments, thus facilitating the planning process and making efficient use of potentially limited resources.

The integration of data from the different components of the development impact assessment provides a well-balanced understanding of the community's make-up in terms of all its resources (i.e., social, economic and environmental). Collectively, these resources are important in guiding the community decision-making, goal-setting, and planning process towards producing sustainable growth strategies. Economic goals need to be compatible with environmental protection and social values and vice versa. The most profitable use of a certain parcel of land can be developed while still preserving environmental and social uses.

One of the most important uses of the results of the development impact assessment is for the identification and evaluation of alternatives should the proposed development result in significant impacts on the community. Once the data are compiled and organized, local officials, planners and community members alike can evaluate the project in terms of the impacts it may have on the community's environment, socio-economic construct, fiscal balance sheet and transportation network. Depending on the significance of the impact in each of these areas, community decision-makers can decide to move ahead with approval of the project, reject the proposal altogether, or modify plans for development in such a way that impacts can be mitigated. Worksheet 6.2 may be used to list alternatives or modifications to the proposed development. In filling out the worksheet, be sure to include all relevant details about the project that may require modifications to avoid significant impacts. In describing potential alternatives and modifications, it is important to focus on measures that will realistically mitigate the various impacts, including both simple modifications such as scaling down the size of the project and more substantial alternatives such as finding another location for the project.

Determining alternatives to the proposed development may often include identifying alternate sites for the proposed development. In fact, a study conducted by the University of Wisconsin, Department of Rural Sociology recently revealed that the highest concern for Wisconsin towns regarding land use development policies is the *location* of development in their towns. In addition, towns ranked the *type* and *rate* of development as the second and third highest priorities, respectively, in land use policies. An additional survey revealed that the *type* of development is the concern of highest priority among Wisconsin cities and villages. *Budgetary impacts* and the *location* of development were second and third highest priority concerns for city and village land use policies. Given these results, a development impact assessment can provide the information necessary for determining acceptable and appropriate locations for and types of development in Wisconsin communities. The development impact assessment provides the

necessary foundation for determining whether an alternative location or type of development is preferable to the original proposal for a particular project.

REFERENCES:

Green, G.P, D. Diaz, D. Long, A. Dunn. 1998. Wisconsin Towns and The Management of Growth. University of Wisconsin, Department of Rural Sociology. September 1998.

Green, G.P, D. Diaz, D. Long, A. Dunn. 1998. Growth Management in Wisconsin Cities and Villages. University of Wisconsin, Department of Rural Sociology. October 1998.

7 | Cost of Community Services

Over the past decade, as urban sprawl has intensified and citizens and policy makers have become more aware of the range of impacts of sprawling development, a number of studies have emerged that attempt to shed some light on how different types of land use affect a community's fiscal position. The method outlined in this chapter, known as COCS (Cost of Community Services) allows for an assessment of the cost-revenue impacts of broad land use categories on a community. This differs from the discussion in Chapter 2, which provided the process to estimate the fiscal impacts of a specific development. It is not necessary to conduct a COCS study to assess the fiscal impact of a specific development, but such a study may provide more precise information in terms of allocating costs and revenues to residential and non-residential land uses.

Studies described in this chapter are used to examine differences in the impacts of farmland, residential land, commercial land, industrial land and open space and forest land on a community's fiscal balance sheet in a single year. The studies are snapshots of the net fiscal costs of different land uses. They are snapshots because they measure one year in time and do not make projections into the future. The American Farmland Trust (AFT) developed a relatively simple method for conducting such studies, known as the Cost of Community Services Studies (COCS). In general, they found that predominantly agricultural uses generate more revenue than they require in public service expenditures¹.

WHAT IS THE COST OF COMMUNITY SERVICES APPROACH IN FISCAL IMPACT ANALYSIS?

The COCS approach compares annual revenues to annual expenses of public services for various land use categories. Local revenues and expenditures are apportioned to major categories of land use and the result is a set of ratios showing the proportional relationship of revenues and expenditures for different land uses at one point in time. Various assumptions are made in apportioning costs across land uses, and these are most often based on discussions with local staff and officials.

WHAT TO KNOW BEFORE USING THE COCS APPROACH

Critics of COCS studies discount them because of the many underlying assumptions. Most notably, the studies often fail to acknowledge workers or residents living on farms. The costs for both workers and residents are apportioned to other land uses, namely residential. There are no costs, such as street maintenance, garbage collection or protective services, assigned to agricultural uses. Predictably, overall costs associated with these uses will be low or nonexistent. Furthermore, many studies do not differentiate between different types of open space—farmland versus forest versus vacant lots for example. These different types of land uses may have different costs and revenues associated with them. In the procedures outlined herein, an attempt is made to account for these issues through the use of property classifications distinguishing farms from forest and open space and through the addition of a new category, Agricultural Residence. It is also important to realize that the studies

do not account for amenity value or economic activity of land uses, nor the interaction of multiple land uses.

It is also important to be aware of what conclusions can be drawn from these studies. Critics point to the fact that the studies are often interpreted incorrectly. A cost of community services study does not provide a community with a measure of the fiscal impact of a proposed development—one residential development may result in a fiscal benefit to a community, and another, a fiscal deficit—depending on a variety of factors from the location of the development to the design. A more detailed fiscal impact analysis must be conducted to ascertain the impact of a specific development proposal—COCS does not provide this information. The ratios represent averages across land use categories and do not speak to a particular development nor to a particular type of land use within a category—apartment buildings, for example. The studies do not provide specific ratios on types of uses within categories. They do not distinguish new, extensive residential from older or centralized or compact residential, which may have different costs, for example. These studies also are not intended to prescribe a course of action. They are intended to provide an assessment of a community's fiscal situation with regard to different types of land use at a particular point in time.

STEPS

1. Define Land Use Categories
2. Collect initial local data
3. Calculate a default percentage for allocation of various costs and revenues
4. Allocate expenditures by land use category
5. Allocate revenues by land use category
6. Compute the cost-revenue ratios for each land use type.

HOW TO CONDUCT A COCS STUDY

This chapter outlines the basic process for conducting a COCS study. The six basic steps in the process are summarized below. In an attempt to address some of the criticisms leveled at previous COCS studies and to improve on the standard processes, the procedures outlined may differ from the original procedures used by AFT. Their methods were refined and adapted to Wisconsin through a series of pilot projects reported in Edwards, et al. (1999). The process outlined here includes steps to determine revenue-cost ratios from the perspective of the community only. COCS should also include school costs, as they represent a major cost to the taxpayer. The example here does not include school costs in an attempt to keep it simple. Please refer to Edwards, et al. (1999) to review the school district process of computing ratios.

1. DEFINE LAND USE CATEGORIES

The land use categories described in the box on the following page are based on the seven classes of real property used in the state of Wisconsin for assessment purposes.

2. COLLECT LOCAL DATA

Before you begin collecting data, choose a typical year to examine. The last fiscal year is often used, as records are easy to locate and recall of information is likely to be better among local staff. However, if that year was a unique one for any reason, choose a different year, as the idea is to study a typical year.

All of the data necessary can be located in local city, village and town offices. Table 7.1 provides an example of assessed values for the land use categories that should be included in the data collection process. Much of the data can be found in the local budgets, the tax assessment rolls and the statements of assessment. It is also necessary to gather some demographic data on your community, including population and number of farm and non-farm dwelling units.

Residential:

Property used as a dwelling, including homes, mobile homes and apartment buildings of three units or less.

Commercial:

All land and improvements devoted to buying and reselling goods for profit, including apartment of four or more units, stores with apartments above, and golf courses.

Manufacturing:

Properties used in manufacturing, assembling, processing, fabricating, making or milling tangible personal property for profit, including warehouses, storage facilities and offices that support manufacturing.

Agricultural:

Land devoted primarily to farming.

Swamp and Waste:

Includes bog, marsh, lowland brush and other nonproductive land not classified elsewhere.

Forest Lands:

Land which is producing or capable of producing commercial forest products.

Other:

Agricultural buildings and improvements and the land necessary for their location and convenience, including farm residences, silos, sheds and barns.

3. CALCULATE A DEFAULT PERCENTAGE

The default percentage represents an approach to allocate revenues and expenditures across land use categories when there is no other appropriate approach. It is based on the relative property value of each land use category. For example, often general government expenditures are allocated based on this default percentage due to the difficulty in identifying exactly where general government expenses are spent across land uses. However, this method should be used to allocate costs and revenues as seldom as possible, as it does assume that property value is an appropriate proxy for local spending and revenues. Table 7.1 also illustrates the calculations involved in determining the default percentages. If these were used to allocate general government expenses, ninety-one percent of the expenses would be allocated to residential land and .18 percent to forest lands, for example. Worksheets are provided in the appendix to allow you to conduct your own cost of community services study.

Table 7.1 Assessed Values, Town of Anywhere

Land Use	Assessed Value	Relative Value (relative to Total)
Residential	\$275,000,000	91.70%
Commercial	5,350,000	1.78%
Manufacturing	2,000,000	0.70%
Agricultural Land	8,744,600	2.92%
Other (Ag Residence)	6,680,000	2.67%
Forest	535,500	0.18%
Swamp and Waste	293,500	0.10%
Total	\$298,603,600	100.00%

4. ALLOCATE EXPENDITURES BY LAND USE CATEGORY

The allocation of expenditures and revenues is the crux of the approach to estimating fiscal impacts of different land uses. It is extremely important to be as precise as possible in allocating across land use categories. This requires examining local records for items such as police and fire calls and extensive interviewing of staff who are familiar with services provided by the community. Table 7.2 illustrates the significant

expenditure categories for a typical local government in Wisconsin. It also includes approaches to allocate the expenditure items. These approaches are suggestions and you may have a better approach, depending on your own local records and staff. Table 7.3 provides an example of the allocation of expenditures across land use categories for a typical town in Wisconsin.

Cost of community services studies measure demand for services and not the benefit derived from the public services. For example, expenditures such as health and human services are demanded by citizens and therefore, completely allocated to residential uses, even though the entire community may benefit from a healthy population. It is also important to investigate expenses that may not be as obvious as they appear.

Table 7.2 Allocation Methods

EXPENDITURES	METHODS OF ALLOCATION
General Government:	Default percentage
Public Safety:	
Law enforcement	Number of police calls to land use categories
Fire protection	Number of fire calls to land use categories
Ambulance	Number of ambulance calls to land use categories
Inspection	Local records detailing specific sites of inspections
Public works:	
Street maintenance	Local records detailing where maintenance occurred
Street lighting	Location of street lights; often only in residential areas
Refuse/garbage collection	Local records of where collection occurs
Solid waste disposal	Local records and local interviews
Recycling program expense	Local records and interviews
Health/human services	Residential and Other (Ag-Residences)
Culture/rec/education	Residential and Other (Ag-Residences)
Conserv/development	Residential and Other (Ag-Residences)
Debt service	Dependent upon what the debt is financing; elicit through interviews

Public works and public safety generally represent the two largest expenses in municipal budgets. It is important to obtain detailed information on the categories of expense within these broad public services. Interviews with police and fire personnel and public works personnel are crucial to an accurate analysis of costs across categories.

5. ALLOCATE REVENUES BY LAND USE CATEGORY

Revenues are allocated across land use categories, just as are expenditures. Again, local interviews and local records provide much of the information necessary to allocate revenues. Many local revenues come from a clearly identifiable source, which can be discerned through the examination of local records. Building permits, for example, can be tracked back to the source of the permit. Table 7.4 provides an example of the methods used to allocate revenues.

Table 7.3 Allocation of Expenditures, Town of Anywhere

EXPENDITURES	TOTAL	Residential	Commercial	Manufacturing	Agricultural	Swamp/Waste	Forest	AgRes/Other
Total general government	400,000	368,880	7,040	2,640	11,520	400	720	8,800
Law enforcement	100,000	90,000	2,500	2,500				5,000
Fire Protection	125,000	110,000	5,000	5,000				5,000
Ambulance	55,000	45,000	5,000					5,000
Inspection	8,500	8,000	500					
Total public safety	288,500							
Street maintenance	250,000	200,000	12,500	7,500	12,500			17,500
Street lighting	7,000	7,000						
Refuse/garbage collection	105,000	99,750						5,250
Solid waste disposal	1,500	1,425						75
Recycling program	80,000	76,000						4,000
Total public works	443,500							
Total Health/human services	85,000	80,750						4,250
Total Cultural/rec/education	35,000	33,250						1,750
Total conservation/development	18,500	17,575						925
Total debt service	68,000	68,000						
TOTAL Expenditures	1,338,500	1,205,630	32,540	17,640	24,020	400	720	57,550

Table 7.4 Allocation Methods

Property Tax Revenues (PTR)
 The amount of property tax revenue generated by each land use can be obtained by multiplying the local mill rate by the amount of assessed value of property (V) in each land use category.

State Shared Revenues
 - Per capita
 - Special utility
 - Aidable Revenues
 - Minimum/Maximum

REVENUES	METHODS OF ALLOCATION
Taxes:	
General property taxes	See sidebar
Mobile home fees	Residential uses
Forest crop tax	Forest
Woodland tax	Forest
Special assessments:	Dependent upon particular assessment; elicit through interviews
Intergovernmental revenue:	
Shared revenue	See sidebar and following discussion
General transportation aids	Same allocation approach as street maintenance expenditures
LRIP	Same allocation as street maintenance expenditures
Recycling grants	Dependent upon who recycles; elicit through records or interviews
Payment for muni -services	Default percentage or as stipulated in contracts
Highway and bridge aid	same allocation as street maintenance expenditures
Licenses/permits:	
Business/ licenses	Direct source of revenue found in local records
Non-business licenses	Direct source of revenue found in local records
Building permits/inspect	Direct source of revenue found in local records
Other regulatory/permits	Direct source of revenue found in local records
Fines/forfeits:	Default
Public charges:	
General govt fees	Default percentage
Refuse garbage collect	Local records; same approach as used in expenditures
Solid waste disposal fee	Local records; same approach as used in expenditures
Recycling fees	Local records; same approach as used in expenditures
Cemetery	Residential and other
Parks	Residential and other
Intergovernmental charges	Local records
Miscellaneous revenue	Local records; default percentage
Proceeds from debt	Dependent upon nature of debt

State Shared Revenues:

One approach to the allocation of shared revenues (discussed in chapter 2) across land use categories is to allocate each payment separately. The state Department of Revenue is responsible for calculating payment amounts and can provide a community with a breakdown of the individual payments—per capita, utility, etc. The per-capita payment is allocated to residences and ag. residences based on the populations or number of dwelling units in each category. The aidable revenue payment is allocated through the default formula (excluding manufacturing value). The utility payment is generated by exempt lands and does not figure into the final ratios for the seven land use categories. Note that in the example below, the town receives only a per-capita aid payment and so the total payment is allocated among residen-

tial and agricultural residences. Table 2.5 provides example of the allocation of revenues for a typical town in Wisconsin.

6. CALCULATE REVENUE -COST RATIOS FOR EACH LAND USE CATEGORY

Land use ratios are calculated by dividing total expenditures by total revenues in each category of land use. Table 7.5 illustrates the ratio for the example provided in this chapter.

The numbers above are interpreted as: For every \$1 in revenue generated from residential uses, \$1.01 is spent in public services to these uses in the particular year under examination. Similarly, it costs \$.74 to serve the agricultural residences for every \$1 they generate in revenue. The ratios represent a hypothetical example. For more information on previous studies, contact the American Farmland Trust.

Table 7.5 Cost Revenue Ratios

	Residential	Commercial	Manufacturing	Agricultural	Swamp/ Waste	Forest	AG/ other
Total							
Revenues	1,193,075	33,356	15,818	32,324	676	1,511	60,384
Total							
Expenses	1,205,630	32,540	17,640	24,020	400	720	57,550
Ratio	1.00:1.01	1.00:.98	1.00:1.12	1.00:.74	1.00:.59	1.00:.48	1.00.95

END NOTES

1. American Farmland Trust. 1992. *Does Farmland Protection Pay? the Cost of Community Services in Three Massachusetts Towns*. Northampton, MA: American Farmland Trust.
2. Definitions from: Property Assessment Manual for Wisconsin Assessors, Volume 1: Administrative, Procedural, 1998. The "Other" category is a new category of as of 1996. Using it a COCS study, allows for a more precise tracking of revenues and expenditures associated with agricultural residences.

REFERENCES

Edwards, M., D. Jackson-Smith, S. Ventura, J. Bukovak. 1999. *The Cost of Community Services for Three Dane County Towns: Dunn, Perry, and Westport*. Madison: Wisconsin Land Use Research Program

Table 7.6 Allocation of Revenues-Town of Anywhere

	TOTAL	Residential	Commercial	Manufacturing	Agricultural	Swamp/Waste	Forest	AgRes/Other
Property taxes	576,000	525,000	10,000	6,000	16,000	500	1,000	17,500
Mobile home fees	20,000	20,000						
Forest crop tax	60						60	
Woodland tax	135						135	
Total taxes	596,195							
Total special assessments	1,100	1,100						
Shared revenue	165,000	156,750						8,250
Transportation aids	90,000	69,300	4,500	2,700	4,500			9,000
Local Road Improvement Program	20,000	15,400	1,000	600	1,000			2,000
Recycling grants	65,000	50,050	3,250	1,950	3,250			6,500
Highway/bridge aid	6,300	4,851	315	189	315			630
Total Intergovt revenue	358,300							
Business licenses	15,000		10,000	5,000				
Non-business lic	1,800	1,710						90
Building permits	15,000	14,250						750
Other regulatory permits	100	95						5
Total Licenses/permits	31,900							
Total fines/forfeits/pen	12,000	9,240	600	360	600	0	0	1,200
General government fees	600	550						50
Garbage collection	100,000	95,000						5,000
Solid waste disposal fees	400	380						20
Recycling fees	50,000	47,500						2,500
Cemetery fees	4,500	4,275						225
Parks fees	2,000	1,900						100
Total public charges	157,500							
Interest income	55,650	51,320	979	367	1,603	56	100	1,224
Int on special assessments	4,500	4,500						
Miscellaneous revenue	60,150							
Proceeds from debt	120,000	110,664	2,112	792	3,456	120	216	2,640
TOTAL Revenues	1,337,145	1,193,075	33,356	15,818	32,324	676	1,511	60,384

WORKSHEETS (click)

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WORKSHEET 2.1

Estimate new residents associated with development. Refer to Table 2.1 for demographic multipliers.

Type of Residential Development	Number of Units	Persons per unit	Total New Persons
Single Family-Detached			
2-bedroom			
3-bedroom			
4 bedroom			
Apartment Building			
2-4 units			
5-9 units			
10-19 units			
Mobile Home			
Other:			
TOTAL			

WORKSHEET 2.2

Enter expenditure amounts from current budget.

EXPENDITURE CATEGORY	DOLLAR AMOUNT
GENERAL GOVERNMENT	
LAW ENFORCEMENT	
FIRE PROTECTION	
INSPECTION	
PUBLIC WORKS	
CONSERVATION/DEVELOPMENT	
HEALTH/HUMAN SERVICES	
CULTURE AND RECREATION	
DEBT SERVICE	
TOTAL	

WORKSHEET 2.3

Estimate residential parameters for your community. Divide the residential property value and number of parcels by total value and total number of parcels respectively. Average the two results.

Assessed Value:

Total Value (a)	
Residential Assessed Value (b)	
Residential Value Percentage $(b \div a) = c$	

Parcels:

Total Parcels (d)	
Residential Parcels (e)	
Residential Parcel Percentage $(e \div d) = f$	

Estimated Share of Residentially-Associated Costs and Revenues $((c + f) \div 2)$

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WORKSHEET 2.4

Based on Worksheet 2.3 and local knowledge, allocate expenditures to land uses to estimate residential and non-residential costs.

EXPENDITURE	Residential	Non-Residential
GENERAL GOVERNMENT		
LAW ENFORCEMENT		
FIRE PROTECTION		
INSPECTION		
PUBLIC WORKS		
CONSERVATION/DEVELOPMENT		
HEALTH/HUMAN SERVICES		
CULTURE AND RECREATION		
DEBT SERVICE		
TOTAL		

WORKSHEET 2.5

Estimate current per capita and per worker costs. Divide the residentially-associated expenditures and non-residentially associated expenditures by total population and total workforce in the community, respectively.

Total Population _____
 Total number of employees _____

EXPENDITURE CATEGORY	Per Capita	Per Worker
GENERAL GOVERNMENT		
LAW ENFORCEMENT		
FIRE PROTECTION		
INSPECTION		
PUBLIC WORKS		
CONSERVATION/DEVELOPMENT		
HEALTH/HUMAN SERVICES		
CULTURE AND RECREATION		
DEBT SERVICE		
TOTAL		

WORKSHEET 2.6

Estimate total operating costs associated with development. Apply the total per capita and per employee costs to the estimated population and workforce associated with the development to derive the total costs associated with development.

Per-Capita Costs (a)	
Population of Development (b)	
Total Residential Costs (a x b)	
Per-Employee Costs (c)	
Workers in Development (d)	
Total Non-Residential Costs (c x d)	
TOTAL COSTS	

WORKSHEET 2.7

Estimate total costs (operating and capital) associated with development. Add the estimated debt service costs to the operating costs calculated in Worksheet 2.6.

Operating Costs of Development (a)	
Debt Service (b)	
Total Costs of Development (a+b)	

WORKSHEET 2.8

Enter revenue amounts from current budget.

REVENUE SOURCE	DOLLAR AMOUNT
PROPERTY TAXES	
OTHER TAXES	
SPECIAL ASSESSMENTS	
STATE SHARED REVENUES	
OTHER INTERGOVER'T REVENUE	
LICENSES/PERMITS	
FINES/FORFEITS	
PUBLIC CHARGES	
INTERGOV'T CHARGES	
MISCELLANEOUS	
TOTAL REVENUES	

WORKSHEET 2.9

Using the same procedure used to allocate costs, allocate revenues to residential and non-residential land uses.

REVENUE SOURCE	Residential	Non-Residential
PROPERTY TAXES	see worksheet 2.11	---
OTHER TAXES		
SPECIAL ASSESSMENTS		
STATE SHARED REVENUES	see worksheet 2.13	---
OTHER INTERGOV'T REVENUE		
LICENSES/PERMITS		
FINES/FORFEITS		
PUBLIC CHARGES		
INTERGOV'T CHARGES		
MISCELLANEOUS		
TOTAL REVENUES		

WORKSHEET 2.10

Estimate current per capita and per worker revenues. Divide residentially associated revenues by population for a per capita estimate of revenues. Divide non-residentially associated revenues by local workers for a per-employee estimate of revenue.

REVENUE SOURCE	Per Capita	Per Worker
PROPERTY TAXES	---	---
OTHER TAXES		
SPECIAL ASSESSMENTS		
STATE SHARED REVENUES	---	---
OTHER INTERGOV'T REVENUE		
LICENSES/PERMITS		
FINES/FORFEITS		
PUBLIC CHARGES		
INTERGOV'T CHARGES		
MISCELLANEOUS		
TOTAL REVENUES		

WORKSHEET 2.11

Estimate property taxes generated by development tax.

Property Value of Development (a)	
Local Tax Rate (b)	
Total Property Taxes (a x b)	

WORKSHEET 2.12

Estimate all other revenues generated by development. Calculate the residentially-induced costs associated with development by multiplying the per capita estimate of revenue by the population increase. Calculate the nonresidential costs associated with development by multiplying the per employee estimate of revenue by the employment increase associated with the development.

Residential Per-Capita Revenues (a)		
Population of Development (b)		
Total Residential Revenues (other) (a x b)=c		
Non-Residential Per-Worker Revenues (d)		
Workers of Development (e)		
Total Non-Residential Revenues (d x e)=f		
TOTAL ALL OTHER REVENUES (f + c)		

WORKSHEET 2.13

Line	Shared Revenue Calculation	Current actual payment	Payment w/ development
1	Current Population (enter your current population)		
2	Population Generated by Development (enter new residents)	0	
3	Total Population (add line 1 to line 2)		
4	Prior Year Population (enter last year's population)		
5	Local Purpose Revenues¹		
6	Local Purpose Revenues Generated by Development ²		
7	Total Local Purpose Revenues (add line 5 to line 6)		
8	State Determined Standard Valuation		
9	Total Equalized Property Value less Manufacturing Value ³		
10	Total Value of Development less Manufacturing Value of Development	0	
11	Total Manufacturing Adjusted Value-MAV (add line 9 to line 10)		
12	Municipal Standard Value-MSV (multiply line 4 by line 8)		
13	MAV/MSV (divide line 11 by line 12. This is the local share)		
14	1- MAV/MSV (subtract line 13 from 1. This is the state share)		
15	Aidable Revenue Payment (multiply line 7 by line 14)		
16	State determined per capita payment factor		
17	Per capita payment amount (multiply line 3 by line 16)		
18	Utility Payment		
19	Payment before min-max adj.(add line 15 to line 17 to line 18)		
20	Initial for min-max (add line 15 to line 17)		
21	Base for Min-Max Adjustment		
22	State Determined Ceiling for total payment		
23	Ceiling (multiply line 21 by line 22)		
24	Floor (multiply line 21 by .95)		
25	Excess (If line 20 is greater than line 23, subtract line 20 from line 23; otherwise enter 0)		
26	Deficiency (subtract line 20 from line 24. If this number is greater than 0, enter the number; otherwise, enter 0.		
27	Min-Max Adjustment (add line 25 to line 26)		
28	SHARED REVENUE PAYMENT (add lines 15, 17, 18 and 27) ⁴		

¹.All items in bold print should be obtained from records from the Wisconsin Department of Revenue.

². Local purpose revenues generated by the development are estimated using the spending impact of the development calculated using the techniques discussed in Chapter 2. Local revenues must be generated to pay for the necessary spending impact. Although the effect of the increase in local purpose revenues will not immediately impact the shared revenue formula, the intent here is to simulate the formula as if the development is fully in place.

³. Manufacturing real estate value is excluded from the shared revenue calculation for municipalities. The calculation is also based on prior year value; however, in an attempt to simulate the impact of the development as if it were fully in place, the current year is used.

⁴.The impact of the development on shared revenues is the difference between the actual calculation and the calculation including the development

WORKSHEET 2.14

Estimate total revenues generated by development.

Property Tax Revenue (a)	
Shared Revenues (b)	
Total Other Revenues (c)	
TOTAL REVENUES (a + b + c)	

WORKSHEET 2.15

Estimate the net fiscal impact of development.

TOTAL COSTS OF DEVELOPMENT	
TOTAL REVENUES GENERATED	
NET FISCAL IMPACT	

WORKSHEET 2.16

Estimate the number of school-age children associated with the development (See Table 2.1)

Type of Residential Development	Number of Units	School-age children per unit	Total school-age children
Single Family-Detached			
2-bedroom			
3-bedroom			
4 bedroom			
Apartment Building			
2-4 units			
5-9 units			
10-19 units			
Mobile Home			
Other:			
TOTAL			

WORKSHEET 2.17

Estimate costs to school district associated with the development:

Current Total Spending (a)	
Current number of students (b)	
Current spending per student (a÷b) = c	
New students (d)	
Total spending due to development (c x d)	

WORKSHEET 2.18

Estimate School Property taxes generated by the development:

Property Value of Development (a)	
School Mill Rate, expressed as a decimal (b)	
Total property taxes due to development (a x b)	

WORKSHEET 2.19

LINE	State Aid Formula Component	Current Aids	Aids With Development
1	Number of Students (enter current number of students)¹		
2	Equalized Property Value of District		
3	Value Per Student (divide line 2 by line 1)		
4	Spending Per Student (enter spending per student for current year)		
5	Primary shared Cost per student (if line 4 is less than \$1000, use line 4; otherwise use 1000)		
6	Primary Shared Cost (multiply line 1 by line 5)		
7	Local Share(divide line 3 by line 24)		
8	Primary Calculation Rate (subtract line 7 from 1.00)		
9	Primary School Aids (multiply line 6 by line 8)		
10	State Determined Secondary Cost Ceiling		
11	Local Secondary Cost Ceiling (subtract line 5 from line 10)		
12	Secondary Shared Cost per Student (subtract line 5 from line 4; if it is less than line 11, enter the number; otherwise enter line 11)		
13	Secondary Shared Costs (multiply line 1 by line 12)		
14	Local Share (divide line 3 by line 25)		
15	Secondary Calculation Rate (subtract line 14 from 1.00)		
16	Secondary School Aids (multiply line 13 by line 15)		
17	Tertiary Shared Cost per Student (subtract line 12 and line 5 from line 4; if this number is less than zero, use zero)		
18	Tertiary Shared Costs (multiply line 1 by line 17)		
19	Local Share (divide line 3 by line 26)		
20	Tertiary Calculation Rate (subtract line 19 from 1.00)		
21	Tertiary School Aids (multiply line 18 by line 20)		
22	Total Secondary and Tertiary Aids (add line 16 to line 21)		
23	Total State Aid (add line 9 to line 22)		
	TOTAL REVENUE CHANGE ASSOCIATED WITH DEVELOPMENT ²		
24	Primary Guaranteed Value		
25	Secondary Guaranteed Value		
26	Tertiary Guaranteed Value		

¹ All items in **bold print** should be obtained from records of the Wisconsin Department of Public Instruction.

² To calculate total revenue change due to development, subtract the current state aid from state aid with development (line 23)

WORKSHEET 2.20

Estimate the net fiscal cost of the development:

Total Costs	
Property tax revenue (b)	
State equalization aids (c)	
All other revenues (d)	
Total Revenue (b + c + d)	
Net Fiscal Impact (Total Revenue-Total Costs)	

WORKSHEET 2.21

Determine current capacity of schools:

Grade Level	Current Capacity	Current Enrollment	Projected Enrollment	Excess/Deficient Capacity
K-12				
Highschool				

TABLE 2.1
Demographic Multipliers

Average Total Household Size				Average Number School-Age Children Per Household			
Housing Type	Milwaukee MSA	Other-Metro Area	Non-Metro Area	Housing Type	Milwaukee MSA	Other-Metro Area	Non-Metro Area
Single Family-Detached:				Single Family-Detached:			
Tenure: Owner				Tenure: Owned			
One Bedroom	2.434	1.336	0.731	One Bedroom			0.040
Two Bedroom	2.142	2.110	1.250	Two Bedroom		0.386	0.298
Three Bedroom	3.138	3.037	2.570	Three Bedroom	0.819	1.086	1.040
Four Bedroom	3.593	3.981	3.274	Four Bedroom	1.801	1.627	1.612
Five+ Bedroom	4.398	4.261	3.204	Five+ Bedroom	1.638	1.647	2.379
Single Family-Attached				Single Family-Attached			
Tenure: Owner				Tenure: Owned			
One Bedroom		0.558	1.412	One Bedroom			
Two Bedroom	1.757	1.829	1.333	Two Bedroom		0.384	0.269
Three Bedroom	2.556	2.667	2.925	Three Bedroom	0.841	1.080	
Four Bedroom		5.000		Four Bedroom			
Five+ Bedroom				Five+ Bedroom			
2-4 Units				2-4 Units			
Tenure: Owned				Tenure: Owned			
One Bedroom		2.000	0.850	One Bedroom			
Two Bedroom	1.069	1.352	1.151	Two Bedroom		0.130	0.261
Three Bedroom	2.517	1.360	2.045	Three Bedroom	0.784	0.527	0.632
Four Bedroom		2.000	2.048	Four Bedroom			
Five+ Bedroom				Five+ Bedroom			
2-4 Units				2-4 Units			
Tenure: Rented				Tenure: Rented			
One Bedroom	1.513	1.462	1.582	One Bedroom	0.197		0.189
Two Bedroom	2.271	2.153	1.912	Two Bedroom	0.574	0.195	0.375
Three Bedroom	3.164	3.247	3.396	Three Bedroom	1.102	1.509	2.178
Four Bedroom	6.000	4.289	3.972	Four Bedroom			1.167
Five+ Bedroom	2.000		5.375	Five+ Bedroom			
5-9 Units				5-9 Units			
Tenure: Owned				Tenure: Owned			
One Bedroom				One Bedroom			
Two Bedroom	0.228	1.067	0.567	Two Bedroom			
Three Bedroom		2.275	1.397	Three Bedroom			
Four Bedroom				Four Bedroom			
Five+ Bedroom				Five+ Bedroom			
5-9 Units				5-9 Units			
Tenure: Rented				Tenure: Rented			
One Bedroom	1.214	1.253	1.383	One Bedroom			
Two Bedroom	2.071	1.654	1.857	Two Bedroom	0.254	0.189	0.094
Three Bedroom	3.252	2.903	3.467	Three Bedroom	0.304	0.422	1.810
Four Bedroom				Four Bedroom			
Five+ Bedroom		8.000		Five+ Bedroom			
10-19 Units				10-19 Units			
Tenure: Rented				Tenure: Rented			
One Bedroom	1.373	1.339	1.030	One Bedroom			
Two Bedroom	1.772	1.811	1.999	Two Bedroom	0.281	0.320	0.222
Three Bedroom	3.000	6.269	3.000	Three Bedroom			
Four Bedroom			4.000	Four Bedroom			
Five+ Bedroom		4.000		Five+ Bedroom		4.000	

TABLE 2.1 (continued)

20+ Units				20+ Units			
Tenure: Rented				Tenure: Rented			
One Bedroom	1.046	1.184	1.189	One Bedroom		0.089	
Two Bedroom	1.562	1.543	1.747	Two Bedroom	0.062	0.087	0.099
Three Bedroom	4.5	3.511	1.21	Three Bedroom	4.5	1.744	0.355
Four Bedroom				Four Bedroom			
Five+ Bedroom				Five+ Bedroom			
Mobile Home				Mobile Home			
Tenure: Owned				Tenure: Owned			
One Bedroom				One Bedroom			
Two Bedroom	1.577	1.799	1.254	Two Bedroom			0.207
Three Bedroom	3.220	3.040	2.515	Three Bedroom	0.512	0.672	0.902
Four Bedroom			1.370	Four Bedroom			
Five+ Bedroom				Five+ Bedroom			
Mobile Home				Mobile Home			
Tenure: Rented				Tenure: Rented			
One Bedroom		1	0.336	One Bedroom			
Two Bedroom	2.000	2.17	1.353	Two Bedroom		0.259	0.347
Three Bedroom		3.047	2.428	Three Bedroom			1.161
Four Bedroom				Four Bedroom			
Five+ Bedroom				Five+ Bedroom			

Source: 1990 Census of Population and Housing, PUMSA (5%) File.

TABLE 2.2
Employees by Business

Establishment	Average Number of Employees
Grocery Stores	20
Convenience Food Stores	5.6
Convenience/Gas Stores	6.1
Commercial Banks	24
Offices of Doctors and Medicine	6.4
Dental Clinics	8.7
Child Day Care Services	8.0
Apparel and Accesory Stores	7.8
Investment Offices	20.2
Offices of Real Estate Agents/Brokers	3.7

Source: 1992 Economic Census

WORKSHEET 3.1

Space is provided below to allow you to calculate the number of trips generated by your proposed development.

Land use	# Units	Trip generation rate	Pass-by trip percentage	Internal trip percentage	Total trips generated

TABLE 4.1: Average Number of Retail Businesses in Wisconsin Cities and Villages

SIC	Store type	2,500–5,000 population	5,000–7,500 population	7,500–10,000 population	10,000–15,000 population
521, 523	Building Material	5	7.9	12	12.2
525	Hardware	1.3	1.6	1.9	1.7
526	Lawn/Garden	2.6	4.2	4.8	6.2
527	Mobile Homes	0.2	0.4	0.7	0.6
531, 533, 539	Department/Variety	1	1.5	3.2	3
541101, 541105	Food-Grocery	1.7	2.3	3.3	3.6
541103	Food-Convenience	2.9	4.5	5.9	6.2
542–549	Specialty Foods	2.9	5.7	6.4	7.9
551–552	Auto/Truck	3	4.8	6.4	7.3
553	Auto Supply	2.9	5	8	7.6
554	Gas Stations	1.3	2.1	3.9	3.6
555–559, 561–563	Boat/RV/Snow Mobile	1.2	2.1	3.8	3.9
564, 565, 569	Apparel	1.7	4.9	6.9	7.4
566	Shoe	0.3	0.9	2.2	1.4
5712	Furniture	1.5	4	5.4	5.3
5713, 5714, 5719	Home Furnishing	1.2	3.3	4.7	4.7
572	Appliance	1.4	2.6	3.5	3.9
573	Radio/TV/Comp/Music	2.6	6.1	7.6	8
5812	Eating Places	11.1	19.9	26.5	30.9
5813	Drinking Places	6.8	6.3	12.8	13.8
591	Drug	1.2	1.9	2.1	2.3
5921	Liquor	0.8	1.9	1.7	1.9
593	Antiques/Used	2	3.3	5.1	6.3
5941	Sporting Goods	1.6	3.5	4.5	5.5
5942	Book	0.2	0.8	1.2	1.3
5943	Office Supply	0.3	0.7	1	1.3
5944	Jewelry	0.7	1.4	2.4	2.6
5945	Hobby/Toy	0.8	1.3	1.8	2
5947	Gift	2.1	4.4	7.2	7.1
5949	Sewing	0.2	0.5	0.4	0.4
5992	Flower	1.1	1.4	1.8	2.1
596–598, 5993–5999	Other	5	10.2	17	17.4
	TOTAL	68.5	121.1	176.2	189.7

Worksheet 4.1: Analysis of Your Community's Retail Mix

SIC	Store type	Number of businesses	Average Number of businesses*	Difference
521, 523	Building Material			
525	Hardware			
526	Lawn/Garden			
527	Mobile Home			
531, 533, 539	Department/Variety			
541101, 541105	Food-Grocery			
541103	Food-Convenience			
542-549	Specialty Foods			
551-552	Auto/Truck			
553	Auto Supply			
554	Gas Stations			
555-559, 561-563	Boat/RV/Snow Mobile			
564, 565, 569	Apparel			
566	Shoe			
5712	Furniture			
5713, 5714, 5719	Home Furnishing			
572	Appliance			
573	Radio/TV/Comp/Music			
5812	Eating Places			
5813	Drinking Places			
591	Drug			
5921	Liquor			
593	Antiques/Used			
5941	Sporting Goods			
5942	Book			
5943	Office Supply			
5944	Jewelry			
5945	Hobby/Toy			
5947	Gift			
5949	Sewing			
5992	Flower			
596-598, 5993-5999	Other			
	TOTAL			

*figures located in Table 4.1. Analysis is based on "comparison communities" in terms of population.

TABLE 4.2: Wisconsin Retail Demand in Square Feet (SF) Per Household (HH)

Store type	Average spending per household	Median Store GLA	Median Store Sales per square foot.	S.F. demand per HH
Building Material	\$481	3,533	\$165	2.6
Hardware	\$62	7,857	\$121	0.5
Department/Variety	\$1,913	73,500	\$142	13.4
Food-Grocery	\$4,299	42,228	\$372	11.6
Auto Supply	\$390	6,038	\$148	2.6
Gas Stations	\$1,862	2,508	\$339	5.5
Apparel	\$832	5,775	\$187	4.5
Shoe	\$214	3,150	\$159	1.3
Furniture	\$503	7,471	\$142	3.5
Home Furnishing	\$269	4,821	\$167	1.6
Appliance	\$119	4,200	\$245	0.5
Radio/TV/Music	\$421	3,013	\$183	2.3
Eating Places	\$2,609	4,278	\$210	12.4
Drinking Places	\$130	3,850	\$88	1.5
Drug	\$755	11,115	\$247	3.1
Liquor	\$69	2,648	\$250	0.3
Sporting Goods	\$218	4,100	\$153	1.4
Book	\$167	2,905	\$161	1
Jewelry	\$103	1,263	\$264	0.4
Hobby/Toy	\$149	2,225	\$149	1
Camera	\$62	1,069	\$543	0.1
Gift	\$122	3,000	\$127	1
Luggage	\$11	2,398	\$199	0.1
Sewing	\$29	10,254	\$75	0.4
Flower	\$78	1,600	\$150	0.5

Notes: This table is based on U.S. "Community Shopping Center" gross leasable area (GLA) and median sales per square foot as reported in the 1997 Dollars and Cents of Shopping Centers (Urban Land Institute).

Square feet (S.F.) demand per household (H.H) was estimated using 1998 consumer expenditure estimates (by store type) and the number of households for the State of Wisconsin as estimated by Claritas Data Services, divided by the median store sales per square foot.

These estimates are only approximations, as consumer demand for new households in your community will likely vary from the state average. Further, national shopping center median sales per square foot may not reflect local retail store requirements. Nevertheless, these estimates can be used as a starting point to identify retail categories that will experience significant demand growth as a result of an increase in local households.

Service resources are objective indicators of the level of resources available for the satisfaction of society's needs. For example, the number of physicians, dentists, acute-care hospital beds, and psychiatric care hospital beds are indicators of the level of health care resources. Square feet of parkland, picnic areas, tot lots, etc., are indicators of facilities for recreation needs.

The following tables may assist you in assessing the specific current and future needs of a variety of public services based on commonly applied planning standards. Once the tables are complete with information about the community's current service level and current and future needs, you can begin to determine the feasibility of the proposed development and how it may affect the quality of services provided to residents. A list of questions is provided following the table to assist you with this process.

WORKSHEET 4.4 **Public Safety**

Service	Current Service Level	Planning Standard	Current Need	Future Need with Development
Police				
Personnel per 1,000 population		2		
Vehicles per 1,000 population		0.6		
Facilities -sq. Ft. per 1,000 population		200		
Fire				
Personnel per 1,000 population		1.65		
Vehicles per 1,000 population		0.2		
Facilities-sq ft. Per 1,000 population		250		
Emergency Medical Services (EMS)				
EMS Calls per 1,000 population per year		36.5		
EMS Vehicles per 30,000 population		1		
EMS Personnel per 30,000 population		4.1		

Notes: International Association of Fire Chiefs "rule of thumb:" 1 call per 10,000 population per year.

Sources: International Association of Fire Chiefs; L.W. Canter, S.F. Atkinson and F. Leistritz, *Impact of Growth*, Chelsea, WI: Lewis Publishers, 1985.

WORKSHEET 4.5
Education and Libraries

Service	Current Service Level	Planning Standard	Current Need	Need with Development
Students Per Classroom:				
K-6		24		
Junior High		25		
High School		26		
Student-Staff Ratios:				
K-6		22		
Junior High		20		
High School		19		
Space -Sq Feet per Occupant				
K-6		90		
Junior High		120		
High School		150		
Book Stock-Volume Per Capita for municipalities:				
Under 10,000		3.5-5		
10,000-35,000		2.75-3		
35,000-100,000		2.5-2.75		
100,000-200,000		1.75-2		
200,000-500,000		1.25-1.5		
500,000+		1-1.25		
Library space-square feet per capita for municipalities:				
under 10,000		.7-.8		
10,000-35,000		.6-.65		
35,000-100,000		.5-.6		
100,000-200,000		.4-.5		
200,000-500,000		.35-.4		
500,000+		0.3		

WORKSHEET 4.6
Health and Recreation

Service	Current Service Level	Planning Standard	Current Need	Need with Development
Health Services				
Physicians per 1,000 population		1.5		
Dentists per 1,000 population		.53		
Nurses per 1,000 population		4.5		
Mental Health Personnel per 1,000 population		.5		
Support Personnel per 1,000 population		2.5		
Hospital Beds per 1,000 population		4		
Open Space				
Mini Park-acres per 1,000 population		.25-.5		
Neighborhood Park acres per 1,000 population		1.0-2.0		
Community Park acres per 1,000 population		5.0-8.0		

Sources:

L.W. Canter, S.F. Atkinson, and F. Leistritz, 1985. *Impact of Growth*. Chelsea, WI: Lewis Publishers
 Joseph L. Wheeler and Herbert Goldhor, 1962. *Practical Administration of Public Libraries*. New York:
 Harper National Recreation and Park Association,1983. *Recreation, Park and Open Space Standards and Guidelines*

WORKSHEET 5.1 Quantifying Environmental Impacts

RESOURCE	UNIT	EXPECTED IMPACT			COMMENTS
		Short-term Impact	Long-term Impact	Impact Rating (none, beneficial, moderate, severe)	
LAND RESOURCES					
<i>EXAMPLE: Acres to be developed</i>	<i>100 acres</i>	<i>X construction activity</i>	<i>X permanent conversion</i>	<i>moderate</i>	<i>The development will take up 10% of undeveloped land located within municipal boundaries. Of the total amount of land conversion in community, this project poses a moderate threat. Explore alternatives.</i>
Acres to be developed					
Prime crop/rangeland, forest lost					
Quantity of soil lost to erosion					
Wetlands altered/destroyed					
Habitat of rare/endangered species altered, destroyed					
Loss of other uses (open space, recreation, commercial)					
Value of lost mineral resources (non-metallic, metallic)					
WATER RESOURCES					
Reduction in surface water supply from increased consumption (human/industrial use, waste treatment)					
Calculated change in surface water flow/rate due to					

RESOURCE	UNIT	EXPECTED IMPACT			COMMENTS
		Short-term Impact	Long-term Impact	Impact Rating (none, beneficial, moderate, severe)	
<p>increased imperviousness or construction activity</p> <p>Change in water temperature</p> <p>Changes in turbidity, siltation</p> <p>Additional contaminants in surface/ground water (type and quantity)</p> <p>Alterations in hydrologic regime (e.g. groundwater flow, supply, recharge)</p>					
WILDLIFE/PLANT COMMUNITIES					
<p>Unique plant/animal communities lost to development</p> <p>Types of species potentially impacted (e.g., threatened or endangered)</p>					
AIR RESOURCES					
<p>Additional air contaminants (type and quantity)</p> <p>Objectionable odors</p>					
OTHER					
<p>Change in noise pollution</p> <p>Aesthetic changes (e.g., landmarks, views altered)</p> <p>Loss of recreational resources</p> <p>Cultural resource (e.g., architectural, historical) alterations</p>					

WORKSHEET 6.1

Summarize Development Impact Assessment Information:

Description of Proposed Development:

Impact Component	Summary of Impacts
Fiscal Impacts	
Traffic Impacts	
Socio-economic Impacts	
Environmental Impacts	

WORKSHEET 6.2

Identify Alternatives and/or Modifications to the Proposed Development:

Proposed Development	Alternatives and/or Modifications
-----------------------------	--

Note: It is important to list all appropriate elements of the development for which alternatives or modifications may need to be made. The elements listed below are examples of the types of modifications that are possible, but are general in nature. Space is provided to allow for more specific descriptions of potential modifications.

Size of Development	
Location of Development	
Facility Design	

WORKSHEET 7.3

Using the fall-back percentages, local knowledge, local records and interviews, allocate current revenues to land use categories

REVENUES	Total	Residential	Commercial	Manufacturing	Agricultural	Swamp/Waste	Forest	Other
Property taxes								
Other taxes								
Total taxes								
Total special assessments								
Shared revenue								
Transportation aids								
Local Road Improvement Pgm.								
Recycling grants								
PILT on state cons lands								
Highway/bridge aid								
Total intergovt revenue								
Business licenses								
Non-business lic								
Building permits								
Other regulatory permits								
Total licenses/permits								
Total fines/forfeits/pen								
General government fees								
Garbage collection								
Solid waster disposal fees								
Recycling fees								
Other								
Total public charges								
Interest income								
Int on special assessmts								
Miscellaneous revenue								
Proceeds from debt								
Total expenditures								

WORKSHEET 7.4

Calculate Cost-Revenue Ratios

	Residential	Commercial	Manufacturing	Agricultural	Swamp/Waste	Forest	Other
Total Revenues							
Total Expenses							
Ratio							