AN ANALYSIS OF THE IMPACTS OF LAND USE AND ZONING DECISIONS ON THE DEMAND FOR PUBLIC FACILITIES AND SERVICES

FOR
THE COMMUNITIES OF
BAY COUNTY, MICHIGAN

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1. INTRODUCTION AND BASIS FOR STUDY

STUDY PURPOSE

The Bay County Department of Environmental Affairs and Community Development has initiated a series of reports that serve as planning resources that can be utilized by each Bay County community in its own planning and zoning efforts. The first report, The *September 2000 Zoning and Land Use Plan Build-Out Assessment* (prepared by Beckett and Raeder, Inc), is a build-out assessment of communities within Bay County. This build-out assessment provides a "picture" through maps and a series of tables, of each community's allowable development based on zoning ordinances and master plans.

The second report in the series of planning resources is this fiscal impact analysis. The purpose of this report is to analyze the relationship between land use as identified in the build-out assessment and the demand for public facilities and services. The fiscal impact analysis provides the means to quantifiably measure how much more of any given public facility or service (i.e., fire trucks, water or sewer capacity, school classrooms, etc.) will be needed to serve the additional zoned or planned development in a community along with the means to estimate the cost to provide the facilities and services.

Cities, villages, townships, counties and special districts are the ultimate providers of the public facilities and services that new development requires. Paying for the costs of new development is a matter of local government financing. A community's land use plan serves as the blueprint for identifying where and when the public infrastructure investments will occur.

Local governments should consider the impacts of plans and land use decisions on existing development as well as future generations. Will present decisions benefit the existing and future community or will these decisions limit future choices or create future problems?

When public facilities and services are installed, expanded or upgraded (i.e., a sewer line extension or the paving of a road) new development will use it. Proposed increases to the tax revenue base created by new development can be misleading if it results in increases in public service costs beyond the increase in revenues to pay for those costs. An analysis of the capacity requirement and cost of providing public facilities and services to a new development is one of many pieces of information to take into consideration when measuring the benefits and determents of any land use or zoning decision. The net result may fall anywhere within a range of enhancing the community and it's vision to resulting in a loss in the community quality of life (i.e., lower level of service). Many times a land use decision results in a balance between these two effects. Does the proposed development pay for itself or is the community willing to tax

itself to support new development because of other benefits the development will bring to the community? Conversely, if facilities and services are not expanded and the level of service the community is currently experiencing degrades, is the community willing to live with the change in the quality of life in order to allow the proposed development and the benefits which that development may bring into the community to occur?

BASIS FOR ANALYSIS

The fiscal impact analysis is done based on two land use scenarios:

Scenario 1:

This land use scenario is based on Scenario D of the September 2000 *Zoning and Land Use Plan Build-Out Assessment.* This scenario, which is itself based on existing zoning as allowed in the local zoning ordinances of each community within Bay County, assumes the following types of land are not available for new development because they are either already developed or they have some other use or constraint that makes them unavailable or undesirable for future development:

- Developed parcels;
- Tax-exempt parcels;
- Other non-developable lands including
  - Priority 1 wetlands;
  - Remnant native landscape areas;
  - State-owned lands;
  - 100-year floodplains
- Prime agriculture land

For further information about this scenario the reader should reference the September 2000 *Zoning and Land Use Plan Build-Out Assessment* prepared by Beckett and Raeder Inc.

Scenario 2:

This land use scenario is also based on Scenario D of the September 2000 *Zoning and Land Use Plan Build-Out Assessment.* However, the projected build-out for residential acres is modified in Scenario 2 to reflect population projections from 2000–2020 (per current MDOT REMI population projections for Bay County and local communities). The forecast of non-residential acres for Scenario 2 remains the same as for Scenario 2.

Developed Acres At Build-out:

Table 1A identifies the build-out (year 2020) projection of developed acres for both scenarios. Scenario 1 is shown in Column 2 and Scenario 2 is shown in Column 3. The base for both scenarios is 57,507 existing developed residential and non-residential

acres in Bay County (see Scenario 1 description above for definition of what is excluded from these acres). The additional acres available to be developed in Scenario 1 is 90,968 residential and non-residential acres, or a 158% increase, for a total at build-out of 148,475 developed acres. In contrast in Scenario 2 the additional developed acres is 2,790, or a 5% increase, for a total at build-out of 60,297 developed acres.

Table 1A
Projection of Developed Acres for Bay County

(1) Time Frame	(2) Scenario 1 Build-Out Year 2020	(3) Scenario 2 Build-Out Year 2020
Year 2000: Current Developed Acres	57,507	57,507
2001-2020 Additional Developed Acres	90,968	2,790
Year 2020: Build-Out	148,475	60,297
Scenario 1 Additional Acres: 88,790 residential; 2,178 non-residential Scenario 2 Additional Acres: 612 residential; 2,178 non-residential (same as Scenario 2)		

Table 1B shows the base (year 2000) developed acres (Column 2) and the total developed acres at build-out for Scenario 1 (Column 3) and Scenario 2 (Column 4) for each community in Bay County.

Table 1B
Existing and Build-Out Developed Acres
Scenario 1 and Scenario 2

(1) Government Unit	(2) Existing Developed Acres (Year 2000)	(3) Scenario 1 Build-Out Developed Acres (Year 2020)	(4) Scenario 2 Build-Out Developed Acres (Year 2020)
Bay County Total	57,507	148,475	60,297
Auburn City	397	414	416
Bangor Township	3,941	5,558	3,991
Bay City	4,657	4,826	4,637
Beaver Township	3,535	18,468	3,510
Essexville	680	686	664
Frankenlust Township	2,722	3,866	2,984
Fraser Township	4,776	8,207	4,349
Garfield Township	8,003	19,572	8,072
Gibson Township	1,990	19,160	3,659
Hampton Township	3,590	4,162	3,737
Kawkawlin Township	3,575	10,185	3,715

Merritt Township	801	2,784	807
Monitor Township	5,015	7,647	5,611
Mt Forest Township	4,504	18,131	4,640
Pinconning City	468	468	496
Pinconning Township	3,071	10,586	3,074
Portsmouth Township	1,334	2,069	1,220
Williams Township	4,361	11,597	4,724

Population Projections At Build-out:
Table 1C shows the current (2000) and projected (2020) population for Bay County and each community within Bay County. The 1990 and 2000 census population is in Columns 2 and 3 respectively. Column 4 shows the projected population based on Scenario 1 (build-out assessment Scenario D). The accumulative effect of the existing zoning ordinances provides enough zoning throughout the County to accommodate nearly 90,000 additional people or an 82% population increase over the 2000 Census. In contrast, in Scenario 2 (Column 4), which is based on MDOT 2000 Census based projections adjusted for current development activity, the population is projected to increase by slightly more than 600 people or 0.5% over the 2000 Census by the year 2020.

Table 1C
Current and Projected Population
Scenario 1 and Scenario 2

(1) Government Unit	(2) 1990 Census	(3) 2000 Census	(4) Scenario 1 2020 Population Projection	(4) Scenario 2 2020 Population Projection
Bay County Total *	111,489	109,935	199,676	110,555
Auburn City	1,855	2,011	2,129	2,146
Bangor Township	16,028	15,547	26,610	15,359
Bay City	38,936	36,817	38,327	36,023
Beaver Township	2,810	2,806	9,326	2,795
Essexville	4,088	3,766	3,801	3,647
Frankenlust Township	2,281	2,530	3,495	2,751
Fraser Township	3,680	3,375	4,225	3,254
Garfield Township	1,736	1,775	6,968	1,806
Gibson Township	1,090	1,245	8,723	1,386
Hampton Township	9,520	9,902	12,445	10,218
Kawkawlin Township	4,852	5,104	19,099	5,320
Merritt Township	1,510	1,510	3,080	1,515
Monitor Township	9,512	10,037	12,022	10,478
Mt Forest Township	1,457	1,405	7,355	1,385
Pinconning City	1,291	1,386	1,386	1,468
Pinconning Township	2,647	2,608	7,226	2,592
Portsmouth Township	3,918	3,619	4,324	3,509
Williams Township	4,278	4,492	29,135	4,903

* Does not include the portion of the City of Midland that is within Bay County

Residential Density At Build-out:
Table 1D shows the current (2000) and projected (2020) persons per developed residential acre for Bay County and each community within Bay County. The current developed residential acres and persons per developed residential acre are shown in Column 2. The same data for Scenario 1 build-out and Scenario 2 build-out are shown in Column 3 and Column 4 respectively. As show in the County total at the bottom of

the Table Scenario 1 would result in an overall reduction in density from 2.26 persons per residential acre in the year 2000 to a build-out residential density of 1.45 persons per developed residential acre. This equates to a 36% reduction in residential density. In contrast Scenario 2, which is based on MDOT 2000 Census based projections adjusted for current development activity, results in less than a 1% reduction in residential density of 2.24 persons per developed residential acre compared to the current density of 2.26.

Table 1D
Current and Projected Residential Density
Scenario 1 and Scenario 2

(1)	(2) Year 2000 Residential Development		(3) Scenario 1 Build-Out Residential Development		(4) Scenario 2 Build-Out Residential Development	
Governmental Unit	Acres	Density	Acres	Density	Acres	Density
Auburn City	286	7.03	303	7.03	305	7.03
Bangor Township	2,093	7.43	3,634	7.32	2,067	7.43
Bay City	2,370	15.53	2,494	15.37	2,305	15.63
Beaver Township	3,535	0.79	18,468	0.50	3,510	0.80
Essexville	441	8.54	446	8.52	424	8.60
Frankenlust Township	2,712	0.93	3,856	0.91	2,974	0.93
Fraser Township	4,399	0.77	7,776	0.54	3,918	0.83
Garfield Township	7,993	0.22	19,562	0.36	8,062	0.22
Gibson Township	1,713	0.73	17,481	0.50	2,010	0.69
Hampton Township	3,208	3.09	3,693	3.37	3,268	3.13
Kawkawlin Township	3,220	1.59	9,791	1.95	3,321	1.60
Merritt Township	773	1.95	2,756	1.12	779	1.94
Monitor Township	4,039	2.49	6,656	1.81	4,620	2.27
Mt Forest Township	4,420	0.32	17,866	0.41	4,375	0.32
Pinconning City	327	4.24	327	4.24	347	4.24
Pinconning Township	2,894	0.90	10,380	0.70	2,868	0.90
Portsmouth Township	1,132	3.20	1,866	2.32	1,017	3.45
Williams Township	3,152	1.43	10,142	2.87	3,269	1.50
Total: Bay County *	48,708	2.26	137,498	1.45	49,320	2.24

* Excludes portion of City of Midland that is in Bay County

SUMMARY OF DEMAND FOR FACILITIES AND SERVICES

Both residential and non-residential development require streets, water, sewer, stormwater management, law enforcement, fire protection, schools, libraries, and parks, for themselves, their children and employees. The analysis in this report includes the following types of public facilities and services that are needed by both commercial and residential development: 911 Central Dispatch, Fire and Rescue, Jail, Law Enforcement, Library, Parks and Recreation, Public Schools, Roads, Sewer, Stormwater and Water.

This report includes a detailed analysis of the demand for service for each type of facility listed above. Table 1E is a summary of the results of the analysis of the amount

or capacity of facilities and services that each of the 2 scenarios would require. The report itself should be read in order to understand this summary. Note that the summary is not comprehensive for the entire County for all types of facilities and services because not all cities and townships fully participated in the study.

Table 1E Summary of Analysis of Demand for Facilities and Services				
(1) Facility or Service and Provider	(2) Measure of Demand	(3) Current Demand (Year 2000)	(4) Scenario 1 Build-Out Demand (Year 2020)	(5) Scenario 2 Build-Out Demand (Year 2020)
911 CENTRAL DISPATCH				
Bay County	Annual Computer Aided Dispatch Events	120,132	310,164	125,960
	Personnel (FTE)	25.1	64.9	26.3
FIRE PROTECTION				
Auburn/Williams Fire District	Annual Incidents	430	1,086	465
	Fire Trucks (excludes any reserve units)	4.0	10.1	4.3
Bangor Township Fire Dept.	Annual Incidents	1,277	1,801	1,293
	Fire/Rescue Vehicles (excludes reserves)	4.0	8.6	4.1
Bay City Fire Dept.	Annual Incidents	3,935	4,078	3,918
	Fire Trucks (excludes any reserve units)	6.0	6.2	6.0
Beaver Township Fire Dept.	Annual Dispatched Incidents	164	855	163
City of Essexville Fire Dept.	Annual Dispatched Incidents	146	147	143
Frankenlust Township Fire Dept.	Annual Dispatched Incidents	242	344	265
Garfield Township Fire Dept.	Annual Dispatched Incidents	127	311	128
Gibson Township Fire Dept.	Annual Dispatched Incidents	49	471	90
Hampton Township Fire Dept.	Annual Dispatched Incidents	839	973	873
Kawkawlin Township Fire Dept.	Annual Dispatched Incidents	368	1,048	382
Merritt Township Fire Dept.	Annual Dispatched Incidents	63	219	63
Monitor Township Fire Dept.	Annual Dispatched Incidents	725	1,106	811
	Fire/ Rescue Vehicles (excludes reserves)	5.0	7.6	5.6
Mt. Forest Township Fire Dept.	Annual Dispatched Incidents	95	384	98
Pinconning/Fraser Fire District	Annual Dispatched Incidents	838	1,942	798
	Fire Trucks (excludes any reserve units)	4.0	9.3	3.8
Portsmouth Township Fire Dept.	Annual Dispatched Incidents	229	355	209
Total: Annual Fire & Rescue Incidents		9,527	15,120	9,699
JAIL				
Bay County Sheriff	Certified Capacity: Beds	215	555	225

Table 1E
Summary of Analysis of Demand for Facilities and Services

(1) Facility or Service and Provider	(2) Measure of Demand	(3) Current Demand (Year 2000)	(4) Scenario 1 Build-Out Demand (Year 2020)	(5) Scenario 2 Build-Out Demand (Year 2020)
LAW ENFORCEMENT				
Bay County Sheriff	Annual Dispatched Calls for Service	13,079	37,804	13,800
City of Auburn Police Dept.	Annual Dispatched Calls for Service	347	362	364
	Sworn Officers	2.0	2.1	2.1
City of Bay City Police Dept.	Annual Calls for Service	35,100	36,374	34,949
	Sworn Officers	63.0	65.3	62.7
	Annual Criminal Investigations	2,505	2,596	2,494
	Criminal Investigators	10.0	10.4	10.0
City of Essexville Police Dept.	Annual Dispatched Calls for Service	2,479	2,501	2,421
	Sworn Officers	8.0	8.1	7.8
Hampton Township Police Dept	Annual Dispatched Calls for Service	5,108	5,922	5,317
	Sworn Officers	9.0	10.4	9.4
City of Pinconning Police Dept.	Annual Calls for Service	4,475	4,475	4,743
	Sworn Officers	4.0	4.0	4.0
Total: Annual Calls For Service		60,588	87,438	61,594
LIBRARY				
Bay County Library System	Library Buildings Square Feet	44,269	114,296	46,417
	Library Collection: Number of Items	307,882	794,908	322,819
PARKS AND RECREATION				
Bay County	Regional Park Acres	418.8	1,081.3	439.1
City of Auburn	Community Park Acres	20.0	20.9	21.0
Bangor Township	Community Park Acres	65.0	91.7	65.8
City of Bay City	Community Park Acres	62.0	64.3	61.7
Fraser Township	Community Park Acres	80.0	137.5	72.9
Monitor Township	Park Acres	22.5	34.3	25.2
City of Pinconning	Community Park Acres	50.2	50.2	50.7
	Baseball Fields	2.0	2.0	2.1
	Soccer Fields	5.0	5.0	5.0
	Annual Recreation League Participants	200	200	212
Williams Township	Community Park Acres	18.0	47.8	19.5
PUBLIC SCHOOLS				
Bangor Township Schools	Enrollment: Grades K-12	2,396	4,160	2,366
Bay City Public Schools	Enrollment: Grades K-12	10,165	25,430	10,303
	Regular Classrooms: Grades K-12	381	952	386

Table 1E Summary of Analysis of Demand for Facilities and Services				
(1) Facility or Service and Provider	(2) Measure of Demand	(3) Current Demand (Year 2000)	(4) Scenario 1 Build-Out Demand (Year 2020)	(5) Scenario 2 Build-Out Demand (Year 2020)
ROADS				
Bay County Road Commission	Miles of County and Local Roads	1,023	2,641	1,073
City of Pinconning	Miles of Major Streets and Local Roads	9.15	9.15	9.70
SEWER				
Bay County (West County Wastewater Treatment Plant)	Million Gallons per Day (MGD)	4.11	8.06	4.40
City of Bay City	Million Gallons per Day (MGD)	7.00	7.25	6.97
City of Pinconning	Million Gallons per Day (MGD)	0.30	0.30	0.32
STORMWATER	Pending outcome of Phase II Stormwater Committee study and recommendations for a Watershed Management Plan.			
WATER				
Bay Metropolitan Water (Water Treatment Plant)	Million Gallons per Day (MGD)	10.9	16.4	11.1
City of Auburn (City of Midland Water Treatment Plant)	Million Gallons per Day (MGD)	0.210	0.219	0.220

WHAT DOES THIS MEAN?

If all developable land within Bay County were built out at the density permitted under existing zoning as defined in Scenario 1 the population would increase by 82% at build-out (year 2020 is the time frame in the *Build-out Assessment*). At the same time the population projections indicate a very modest increase over the County's actual experience of a reduction in population from the 1990 to the 2000 Census (see Table 1C) Assuming that in both Scenario 1 and Scenario 2 non-residential development will occur at the density and intensity the zoning ordinances currently allow there is still a significant gap between Scenario 1 (148,475 developed acres at build-out) and Scenario 2 (60,297 developed acres at build-out). The difference is in the residential zoning.

This "overzoning" of residential acres means that homes can be built nearly anywhere in the communities at often times very scattered and low rural densities. The accumulative effect could trigger the need (or the expectation on the part of homeowners) for a more urban level of service for capital facilities and services although the actual scattered development pattern would not be conducive to the

efficient provision of urban type facilities and services. Note that this situation does not exist in all communities in Bay County. For some communities the total allowable zoning under Scenarios 1 and 2 are nearly equal while for other communities the difference is very significant.

A recently released report (October, 2002) *Measuring Sprawl And Its Impact*, is the first in a series of research documents developed by Rutgers University, Cornell University and Smart Growth America that defines, measures and evaluates metropolitan sprawl and its impact. The report identifies sprawl as

> *"the process in which the spread of development across the landscape far outpaces population growth. The landscape sprawl creates has four dimensions: a population that is widely dispersed in low-density development; rigidly separated homes, shops, and workplaces; a network of roads marked by huge blocks and poor access; and a lack of well-defined thriving activity centers, such as downtowns and town centers."*

The report identifies residential density as the most widely recognized indicator of sprawl with spread-out subdivisions being the "hallmark" of sprawl. The report goes on to state that higher density does not mean high-rises but can consist of densities of 6-7 houses per acre which is sufficient to support neighborhood retail and schools.

The report also makes the point that density is not the only measure of sprawl and the resulting impact on quality of life. Segregation of land uses is another factor analyzed in *Measuring Sprawl* and identified as an indicator of sprawl. Where housing is separated from shopping, offices, community/civic activities and schools the result is more miles driven and more cars per household to allow the members of the household to go where they need or want to be. This first report focuses on the effect of sprawl on transportation. The resulting analysis determined that *"as sprawl increases, so do the number of miles driven each day; the number of vehicles owned per household; the annual traffic fatality rate; and the concentrations of ground-level ozone, a component of smog. At the same time, the number of commuters walking, biking or taking transit to work decreases to a significant extent."*

There are many good reasons to re-think an "overzoning" situation including the location of non-residential development and how the residential zoning patterns relate to it; redevelopment efforts to preserve and improve the existing housing stock; the expectations of new development for "urban" level services; the community's willingness and ability to provide the needed facilities and services at the *location* that development occurs; and comprehensive economic development of an area.

It will take many more years beyond 2020 for all the developable land in Bay County to be built out at the densities allowed in the zoning ordinances. The availability of planning tools such as *The Zoning and Land Use Plan Build-Out Assessment* and this

report provide an opportunity for communities to consider different alternatives to planning and zoning to better accommodate the new development that will come and to assure the continued service and support to development that is already here.

FORMAT OF REPORT

The balance of the report consists of 19 chapters that contain an analysis of public facilities and service requirements for multi-jurisdictional providers such as the Bay County Sheriff and Library, school districts, fire districts, wastewater treatment plants and water treatment plants, etc. (Chapter 2) as well as a separate analysis for each community (Chapters 3 through 20). Each community's analysis includes an analysis of services they provide to themselves as well as their portion of the overall demand for service of a multi-jurisdictional provider. For example, the Auburn/Williams Fire District serves both the City of Auburn and Williams Township. The fire district analysis is in Chapter 2. Both the City of Auburn and the Williams Township chapters contain a separate analysis of their respective demand for fire protection service consistent with the district-wide analysis. The level of analysis for each community depends on its level of participation in the study.

Each Chapter contains the following 4 items for each type of facility or service:

1. Provider and Service Area
   Identifies who provides the service, the population and developed acres served, and a description of the service

2. Basis for Analysis
   Identifies the source for the data and the current and projected population and developed acres for both Scenario 1 and Scenario 2.

3. Demand for Service
   Description and calculation of the required capacity or amount of activity that each scenario will require and/or generate. The analysis is based on the current level of service for each facility or service. Level of service is expressed as the ratio of facility capacity to demand (demand being the existing or potential users). The method for using levels of service in the analysis answers 2 questions in order to determine the impact of the land use scenarios:

   1. What is the quantity of public facilities and services that new development will require?

   Formula 1:

   Demand x Standard = Requirement

   Demand = current and potential users (i.e., developed acres)
   Standard = the ratio of facility capacity to demand (i.e., park acres per 1,000 developed acres)

   Formula 2:

   Requirement – Inventory = Surplus or Deficiency

   Inventory = current capacity (i.e., park acre inventory, fire and rescue vehicles, etc.)

2. What will be the estimated cost to provide the quantity of facilities that new development will require?

Formula 3:

Deficiency x Average Cost Per Unit = Deficiency Cost

Average costs are used rather than specific project costs for impact analysis. Appendix A of this study includes a list of typical capital costs for types of facilities and can be used to calculate an estimated cost for any land use scenarios. These calculations are for planning purposes only and of themselves do not represent a capital improvements program.

4. Capital and Other Cost Implication

Discussion of cost implications for the analysis includes, where data was provided, an estimate of the operating cost impact per unit of measure. As mentioned above, Appendix A provides a detailed list of various capital costs for types of facilities that can be applied to the analysis results. Specific total costs are not tabulated here because of the multitude of variables regarding how to best address the need for additional facilities including adjusting the level of service; sharing of facilities; the quality of the service provided (i.e., cost criteria and design standards of the capital item as opposed to the quantity) and a community's ability or willingness to fund the need.

STUDIES IDENTIFYING THE COST OF GROWTH

The American Farmland Trust has reviewed 40 studies conducted in the Northeastern and Midwestern United States. These studies analyzed the net cost of different types of new development. Net cost is the measure of the total cost of providing services to different types of land use compared to the revenue that land use generates to help offset the cost of providing services. The following table shows the American Farmland Trust summary of the 40 studies.

Table 1E
Median Cost Per Dollar of Revenue Raised
To Provide Public Services To Land Uses

(1) Commercial/Industrial	(2) Farm/Forest	(3) Residential
$0.29	$0.31	$1.11

Source: American Farmland Trust, 1997

While the cost of new development will vary from community to community, according to the American Farmland Trust a common thread which each study demonstrates is that, in general, open space and agricultural lands contribute more to the revenue stream than they cost in services (i.e., for every $1.00 of revenue generated by commercial/industrial land it only demands $0.29 in service costs), while residential development demands more costs than the revenue it generates to pay those costs (for every $1.00 of revenue generated by residential development it demands $1.11 in service costs.

Appendix B of this report provides further documentation of the results of a number of other studies conducted throughout the Country which identify the fiscal impact of growth and development.

Data Rounding

The data in this study was prepared using computer spreadsheet software. In some tables in this study, there will be very small variations from the results that would be obtained using a calculator to compute the same data. The reason for these insignificant differences is that the spreadsheet software was allowed to calculate results to more places after the decimal than is reported in the tables of these reports. The calculation to extra places after the decimal increases the accuracy of the end results, but causes occasional differences due to rounding of data that appears in this study.

2. ANALYSIS OF PUBLIC FACILITIES AND SERVICES FOR MULTI-JURISDICTION PROVIDERS

BAY COUNTY

CENTRAL DISPATCH

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County, serving a population of 109,935 and 57,507 developed acres.

Basis for Analysis

Source: Bay County 911 Central Dispatch; Bay County 2002 Budget

Service Area Data:

	Population	Developed Acres
2000 Base:	109,935	57,507
2020 Scenario 1:	199,676	148,475
2020 Scenario 2:	110,555	60,297

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. Column 3 of Table 2A shows the number of additional CAD events the two land use scenarios would generate through the year 2020 (based on 2,089 events per 1,000 developed acres, and calculates the additional personnel required to handle the increase in CAD events (Column 4)

TABLE 2A CENTRAL DISPATCH CURRENT LOS= 2.089 CAD EVENTS PER 1,000 DEVELOPED ACRES			
SCENARIO 1: Build-out Analysis Scenario D			
(1) Time Frame	(2) Developed Acres	(3) Annual Cad Events 2,089 Annual CAD Events Per 1,000 Developed Acres	(4) Annual Personnel (4,777 per FTE)
Year 2000	57,507	120,132	25.1
2001 - 2020	90,968	190,032	39.8
Year 2020 Build Out	148,475	310,164	64.9
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections			
Year 2000	57,507	120,132	25.1
2001 - 2020	2,790	5,828	1.2
Year 2020 Build Out	60,297	125,960	26.3

The analysis in the table assumes providing the same level of service for central dispatch services to future development as is currently provided to existing development. The result of the analysis shows an additional 190,032 annual CAD events for Scenario 1 compared to 5,828 for Scenario 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate (including prisoners “boarded in” from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections; Bay County 2002 Budget

Service Area Data:

	Population	Developed Acres
2000 Base:	109,935	57,507
2020 Scenario 1:	199,676	148,475
2020 Scenario 2:	110,555	60,297

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 2B shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 2B BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) County-wide Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	57,507	215	215	0
2001 - 2020	90,968	340	0	-340
Year 2020 Build-Out	148,475	555	215	-340
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	57,507	215	215	0
2001-2020	2,790	10	0	-10
Year 2020 Build-Out	60,297	225	215	-10

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 340 jail beds for Scenario 1 compared to 10 additional beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $ 3,935,700 or $ 18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all of Bay County except for the following cities and townships that have their own police departments: Auburn, Bay City, Essexville, City of Pinconning and Hampton Township. The primary service area encompasses 47,715 developed acres and services a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

	Population	Developed Acres
2000 Base:	56,053	47,715
2020 Scenario 1:	141,588	137,919

2020 Scenario 2:	57,053	50,347

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 2C shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 2C LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Primary Service Area Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	47,715	13,079	37	37	0
2001 - 2020	90,204	24,725	70	0	-70
Year 2020 Build-Out	137,919	37,804	107	37	-70
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	47,715	13,079	37.0	37	0
2001-2020	2,632	721	2.0	0	-2
Year 2020 Build-Out	50,347	13,800	39.0	37	-2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 24,725 calls for service for Scenario 1 compared to 721 for Scenario 2, resulting in the need for an additional 70 sworn officers in scenario 1 and an additional 2 officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol (including COPS) is $ 2,109,535 or $ 161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data:

	Population	Developed Acres

2000 Base:	109,935	57,507
2020 Scenario 1:	199,676	148,475
2020 Scenario 2:	110,555	60,297

Demand for Service

Library Buildings:

The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 2D shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 2D
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acres)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	57,507	44,269	44,269	0
2001 - 2020	90,968	70,027	0	-70,027
Year 2020 Build-Out	148,475	114,296	44,269	-70,027
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	57,507	44,269	44,269	0
2001-2020	2,790	2,148	0	-2,148
Year 2020 Build-Out	60,297	46,417	44,269	-2,148

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 70,027 square feet for Scenario 1 compared to 2,148 for Scenario 2.

Note: The Bay County Library System has an extensive expansion and renovation capital improvement plan that includes the construction of a new central library in Bay City and a new branch library in the City of Pinconning. Both buildings are replacing existing library buildings for a net increase of approximately 70,800 square feet. These and other planned additions will raise the level of service for library services for both existing and new development.

Library Collection

The Bay County Library system consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000

population and 5,354 per 1,000 developed acres. Column 3 of Table 2E shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 2E
LIBRARY COLLECTION
CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Developed Acres	(3) Collection Required (5,354 per 1,000 Acres)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	57,507	307,882	307,882	0
2001 - 2020	90,968	487,026	0	-487,026
Year 2020 Build-Out	148,475	794,908	307,882	-487,026
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	57,507	307,882	307,882	0
2001-2020	2,790	14,937	0	-14,937
Year 2020 Build-Out	60,297	322,819	307,882	-14,937

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 487,026 collection items for Scenario 1 compared to 14,937 for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

REGIONAL PARKS

Provider and Service Area

Bay County provides regional parks for the entire County serving a population of 109,935 and 57,507 developed acres. The regional park inventory includes the following:

Park	Acres
Veterans Memorial Park	87.5
Bigelow Park	90.0

County Fairgrounds	40.3
Pinconning Park	201.0
Total	418.8

Basis for Analysis

Source: Bay County and Bay City

Service Area Data:

	Population	Developed Acres
2000 Base:	109,935	57,507
2020 Scenario 1:	199,676	148,475
2020 Scenario 2:	110,555	60,297

Demand for Service

As shown above, the Bay County Regional Park system consists of 418.8 acres of parkland. This equates to 3.8 regional park acres per 1,000 population and 7.3 acres per 1,000 developed acres. Column 3 of Table 2F shows the number of regional park acres the two land use scenarios would require through the year 2020 (based on 7.3 acres per 1,000 developed acres). The current inventory of regional park acres is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 2F
REGIONAL PARK LAND
CURRENT LOS = 7.3 ACRES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Developed Acres	(3) Required Regional Park Acres (0.0133 per acre)	(4) Regional Park Acres Available	(5) Surplus/ Deficiency Col 4-Col 5
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	57,507	418.8	418.8	0.0
2001 - 2020	90,968	662.5	0.0	-662.5
Year 2020 Build-Out	148,475	1,081.3	418.8	-662.5
SCENARIO 1: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	57,507	418.8	418.8	0.0
2001 - 2020	2,790	20.3	0.0	-20.3
Year 2020 Build-Out	60,297	439.1	418.8	-20.3

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 662.5 regional park acres for Scenario 1 compared to 20.3 for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads. The Road Commission also maintains 202 miles of state highways within the County.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data:

	Population	Developed Acres
2000 Base:	109,935	57,507
2020 Scenario 1:	199,676	148,475
2020 Scenario 2:	110,555	60,297

Demand for Service

As stated above, the Bay County Road Commission road system consists of 1,023 miles of paved and gravel roads. This equates to 9.3 miles per 1,000 population and 17.8 miles per 1,000 developed acres. Column 3 of Table 2G shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 17.8 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 2G BAY COUNTY ROAD COMMISSION CURRENT LOS = 17.8 MILES PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-Out analysis Scenario D				
(1) Time Frame	(2) Developed Acres	(3) Miles Required (17.8 per 1,000 Acre)	(4) Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	57,507	1,023	1,023	0
2001 - 2020	90,968	1,618	0	-1,618
Year 2020 Build-Out	148,475	2,641	1,023	-1,618
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	57,507	1,023	1,023	0
2001-2020	2,790	50	0	-50
Year 2020 Build-Out	60,297	1,073	1,023	-50

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 1,618 miles of roads for Scenario 1 compared to 50 miles for Scenario 2. *Note: The miles per developed acre varies from township to township. A separate analysis for each township is included in each township's section of this report.*

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

FIRE DISTRICTS

AUBURN/WILLIAMS FIRE DISTRICT

Provider and Service Area

The Auburn/Williams Fire Department provides fire and rescue services to the City of Auburn and Williams Township, serving a total population of 6,503 and 4,758 developed acres. The Fire Department operates 4 fire and rescue vehicles out of one station (Station 12). During 2000 and 2001 the Fire Department was dispatched to an average of 430 emergency incidents per year.

Basis for Analysis

Source: Auburn/Williams Township Fire Department and Bay County 911 Central Dispatch

Service Area Data:

	Population	Developed Acres
2000 Base:	2,146	4,758
2020 Scenario 1:	31,264	12,011
2020 Scenario 2:	7,049	5,140

Demand for Service

As stated above, the Fire Department is dispatched to an average of 430 emergency incidents per year. This equates to 66 emergency incidents per 1,000 population and 90.4 per 1,000 developed acres. Column 3 of Table 2H shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 90.4 emergency incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 107.5 annual emergency incidents per apparatus (430 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 2H
AUBURN/WILLIAMS FIRE DISTRICT
CURRENT LOS = 90.4 EMERGENCY INCIDENTS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1) Time Frame	(2) Developed Acres	(3) Annual Incidents (90.4 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷107.5)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,758	430	4.0	4.0	0.0

2001 - 2020	7,253	656	6.1	0.0	-6.1
Year 2020 Build-Out	12,011	1,086	10.1	4.0	-6.1
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	4,758	430	4.0	4.0	0.0
2001 - 2020	382	35	0.3	0.0	-0.3
Year 2020 Build-Out	5,140	465	4.3	4.0	-0.3

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 656 annual emergency incidents and slightly more than 6 more fire and rescue apparatus for Scenario 1 compared to 35 additional annual incidents and 0.3 more apparatus for Scenario 2.

Capital and Other Cost Implications

The current operating budget (2003 proposed) for the Fire District is $180,600 or $420 per emergency incident. Refer to Appendix A for capital cost information.

PINCONNING/FRASER FIRE DISTRICT

Provider and Service Area

The Pinconning/Fraser Fire Department provides fire protection services within the geographical boundaries of the City of Pinconning, Fraser Township and Pinconning Township, serving a total population of 7,369 and 8,315 developed acres. It operates under a joint service agreement created in 1993 to maintain and operate a joint fire department. The Fire Department operates 4 primary fire and rescue vehicles out of two stations (Stations 15 and 16). During 2001, when Station 16 became operational, the Fire Department was dispatched to 838 emergency incidents.

Basis for Analysis

Source: Pinconning/Fraser Fire Department and Bay County 911 Central Dispatch

Service Area Data:

	Population	Developed Acres
2000 Base:	7,369	8,315
2020 Scenario 1:	12,837	19,261
2020 Scenario 2:	7,314	7,919

Demand for Service

As stated above, the Fire Department was dispatched to 838 emergency incidents in the year 2001. This is an increase over prior years due to Station 16 becoming operational. This equates to 113.7 emergency incidents per 1,000 population and 100.8 per 1,000 developed acres. Column 3 of Table 2I shows the annual incident rate the two

land use scenarios would generate through the year 2020 (based on 100.8 emergency incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 209.5 annual emergency incidents per apparatus (838 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 2I PINCONNING/FRASER FIRE DISTRICT CURRENT LOS = 100.8 EMERGENCY INCIDENTS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Developed Acres	(3) Annual Incidents (100.8 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷209.5)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	8,315	838	4.0	4.0	0.0
2001 - 2020	10,946	1,103	5.3	0.0	-5.3
Year 2020 Build-Out	19,261	1,942	9.3	4.0	-5.3
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	8,315	838	4.0	4.0	0.0
2001 - 2020	-396	-40	-0.2	0.0	0.2
Year 2020 Build-Out	7,919	798	3.8	4.0	0.2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 1,103 annual emergency incidents and 5.3 more fire and rescue apparatus for Scenario 1 compared to a reduction of 396 annual incidents and a need for 0.2 fewer apparatus for Scenario 2.

Capital and Other Cost Implications

The current operating budget for the District is $96,030 or $114.59 per emergency incident. Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data:

	Population	Residential Developed Acres
2000 Base:	72,065	33,325
2020 Scenario 1:	131,756	83,367
2020 Scenario 2:	72,354	33,775

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165 This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 2J shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 2J
BAY CITY PUBLIC SCHOOLS
CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3) Annual K-12	(4)	(5)	(6)

Time Frame	School District Developed Residential Acres	Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 27.6 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	33,325	10,165	381	433	52
2001 - 2020	50,042	15,265	572	0	(572)
Year 2020 Build-Out	83,367	25,430	952	433	(519)
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	33,325	10,165	381	433	52
2001 - 2020	450	137	5	0	(5)
Year 2020 Build-Out	33,775	10,303	386	433	47

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 15,265 K-12 students and 572 more classrooms for Scenario 1 compared to 137 additional students and 5 more classrooms for Scenario 2.

Capital and Other Cost Implications

As shown in Column 6 of the preceding table there is a surplus of classrooms that, depending on the needs by type of school (i.e., K-5, 6-8 and 9-12) can accommodate some of the projected additional students in Scenario 1 and all of the projected additional students in Scenario 2. The District also has other facilities that could be remodeled to serve as student facilities if needed. Refer to Appendix A for capital cost information.

ESSEXVILLE-HAMPTON PUBLIC SCHOOLS

Provider and Service Area

The Essexville-Hampton Public School District provides school instruction for grades K-12 out of 5 school sites for the City of Essexville and parts of Hampton Township

This area includes 4,270 developed acres and a total population of 13,668 (2000 Census). Approximately 14% of the total population attended Essexville-Hampton Public schools in the year 2000.

Basis for Analysis

Source: Essexville-Hampton Public Schools

Service Area Data:

	Population	Residential Developed Acres
2000 Base:	13,668	3,649
2020 Scenario 1:	16,246	4,139
2020 Scenario 2:	13,865	3,692

Demand for Service

The Essexville-Hampton Public School K-12 enrollment for the year 2000/01 was 1,923 This equates to 140.7 K-12 students per 1,000 population for the total population within the areas served and 527 per 1,000 developed residential acres for the total residential acres within the area served. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Projection of school enrollment assumes the same current ratio of persons/acres utilizing the school system through the year 2020 as is currently using the school district.

Column 3 of Table 2K shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 527 K-12 students per 1,000 developed residential acres). In Column 4 the current capacity (student stations) of the school system is shown. According to the School District it is currently at full capacity. The surplus or deficiency of capacity (student stations) to serve the additional development is calculated in Column 5.

TABLE 2K ESSEXVILLE-HAMPTON PUBLIC SCHOOLS CURRENT LOS: 527 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) School District Developed Residential Acres	(3) Annual K-12 Enrollment At 0.527 Students Per Residential Acre	(4) K-12 Enrollment Capacity (students)	(5) Surplus Deficiency of K-12 Capacity (Col. 4 – Col. 3)
Year 2000	3,649	1,923	1,923	0
2001 - 2020	490	258	0	-258
Year 2020 Build-Out	4,139	2,181	1,923	-258
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,649	1,923	1,923	0
2001 - 2020	43	23	0	-23
Year 2020 Build-Out	3,692	1,946	1,923	-23

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 258 K-12 students for Scenario 1 compared to 23 fewer students for Scenario 2.

Capital and Other Cost Implications

As shown in Column 5 of the preceding table there is no existing capacity that can accommodate the projected additional students in Scenario 1. The School District's current operating budget totals $13,820,726 or $7,187 per student. Refer to Appendix A for capital cost information.

SEWER

WEST COUNTY WASTEWATER TREATMENT PLANT

Provider and Service Area

The Bay County Department of Water and Sewer operates the West County Wastewater Sewer Treatment Plant providing wastewater treatment for the following areas in Bay County which include a total population of 39,721 and 20,011 developed acres:

Auburn	Kawkawlin Township
Bangor Township	Monitor Township
Frankenlust Township	Williams Township

The wastewater treatment plant has a design capacity of 10.25 MGD (million gallons per day) and an average daily demand of 4.11 MGD. This demand varies from user to user as follows:

Auburn: 0.29 MGD	Kawkawlin Township: 0.12 MGD
Bangor Township: 2.28 MGD	Monitor Township: 1.02 MGD
Frankenlust Township: 0.26 MGD	Williams Township: 0.14 MGD

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data:

	Population	Developed Acres
2000 Base:	39,721	20,011
2020 Scenario 1:	92,490	39,267
2020 Scenario 2:	40,957	21,441

Demand for Service

As stated above, the average daily flow for the areas served for the 2 year period 2000-2001 was 4.11 MGD. This equates to 103.4 GPD (gallons per day) per capita for the total population within the areas served and 205 GPD per developed acre for all developed acres within the areas served. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Note: The average daily demand varies from user to user. A separate analysis of each user is included in each user's section of this report.

Column 3 of Table 2L shows the MGD the two land use scenarios would require through the year 2020 (based on 205 GPD per developed acre). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 2L
WEST BAY COUNTY WASTEWATER TREATMENT PLANT
CURRENT LOS = 205 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Service Area Developed Acres	(3) MGD Required (205 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	20,011	4.11	10.25	6.14
2001 - 2020	19,256	3.95	0.00	-3.95
Year 2020 Build-Out	39,267	8.06	10.25	2.19
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	20,011	4.11	10.25	6.14
2001 - 2020	1,430	0.29	0.00	-0.29
Year 2020 Build-Out	21,441	4.40	10.25	5.85

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 3.95 MGD required for Scenario 1 compared to 0.29 for Scenario 2.
Note: there is also a separate analysis of each user in their respective sections of this report.

Capital and Other Cost Implications

As shown in Column 5 of the preceding table there is a surplus of capacity that can provide service to future development for both scenarios (Scenario 1 = 2.19 MGD surplus and Scenario 2 = 5.85 MGD surplus) therefore capital costs for plant capacity expansion is not needed for the area currently served (plant upgrades may be needed in the future for other non-capacity issues).

Operating costs are funded with charges for services and permit fees. This study assumes that the rate structure is designed based on demand and therefore cost, and any adjustments would be made to reflect future demand.

STORMWATER

Bay County and the Phase II Storm Water Committee are currently working with a Consultant to prepare the tools needed to comply with the State of Michigan stormwater requirements. The outcome of the study will include recommendations for a future Watershed Management Plan and implementation phase, along with anticipated costs

for compliance. The actual development of a Watershed Management Plan is not a part of this initial study but will be part of subsequent tasks evolving from this study.

Because of this ongoing study and recommendations resulting from the study storm water has not been included as part of the analysis for this report.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers served through Bay County Department of Water and Sewer account for 3.423 MGD of the daily demand. Demand data was not available for Bay City, Essexville and Hampton Township. This study assumes that the average daily demand from these 3 entities is 7.477 MGD (the difference between 10.9 MGD total average daily demand less 3.423 for Bay County customers).

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer and the City of Bay City

Service Area Data:

	Population	Developed Acres
2000 Base:	103,499	42,526
2020 Scenario 1:	174,501	91,109
2020 Scenario 2:	103,832	43,519

Demand for Service

As stated above, the average daily demand is 10.9 MGD. Because wholesale customer contracts have been terminated and there are no allocations of capacity to users the following projection of demand is based on the allocation of the 10.9 MGD as described above (3.423 MGD to Bay County and 7.477 MGD to Bay City, Essexville and Hampton Township).

This allocation equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population within the areas served by Bay County Department of Water and Sewer. For Bay City, Essexville and Hampton Township this equates to 838 GPD per developed acre or 148.1 gallons per day per capita for the total population and developed acres within these areas. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the

same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Note: A separate analysis of each user is included in each user's section of this report. The following table summarizes the results of the individual analyses.

The existing and forecast of developed acres for the two components of users are shown in Columns 2 and 3 of Table 2M. Column 4 shows the total existing and projected developed acres. Column 5 shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers and 838 GPD for the balance of customers). The current available capacity of the water treatment plant is show in Column 6 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 7.

TABLE 2M BAY METROPOLITAN WATER CURRENT LOS = 102 GPD – 838 GPD PER DEVELOPED ACRE						
SCENARIO 1: Build-Out Analysis Scenario D						
(1) Time Frame	(2) BCDWS Customers Developed Acres	(3) Other Customers Developed Acres	(4) Total Developed Acres	(5) MGD Required	(6) MGD Available	(7) MGD Surplus/ Deficiency (Co. 6 - Col. 5)
Year 2000	33,599	8,927	42,526	10.9	20.0	9.1
2001-2020 Additional	47,836	747	48,583	5.5	0.0	-5.5
Year 2020	81,435	9,674	91,109	16.4	20.0	3.6
SCENARIO 2: Build-Out Analysis Scenario D Adjusted For 2000 Census Projections						
Year 2000	33,599	8,927	42,526	10.9	20.0	9.1
2001-2020 Additional	882	111	993	0.2	0.0	-0.2
Year 2020	34,481	9,038	43,519	11.1	20.0	8.9

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 5.5 MGD required for Scenario 1 compared to 0.2 for Scenario 2.

Capital and Other Cost Implications

As shown in Column 7 of the preceding table a there is a surplus of capacity that can provide service to future development for both scenarios (Scenario 1 = 3.6 MGD surplus capacity and Scenario 2 = 8.9 MGD surplus capacity) therefore capital costs for plant capacity expansion are not needed for the area currently served (plant upgrades may be needed in the future for other non-capacity issues such as intake problems and peak demand).

Operating costs are funded with charges for services and permit fees. This study assumes that the rate structure is designed based on demand and therefore cost, and any adjustments would be made to reflect future demand.

3. CITY OF AUBURN
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Auburn Police Department and Auburn/Williams Fire Department.

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Auburn

	Population	Developed Acres
2000 Base:	2,011	397
2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Auburn. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate (including prisoners “boarded in” from other jurisdictions) with an average daily

population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Auburn

	Population	Developed Acres
2000 Base:	2,011	397
2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 3A shows the number of additional jail beds the two City of Auburn land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 3A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Auburn Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	397	1.5	*	*
2001 - 2020	17	0.1	*	*
Year 2020 Build-Out	414	1.6	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	397	1.5	*	*
2001-2020	19	0.1	*	*
Year 2020 Build-Out	416	1.6	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 0.1 jail beds for both Scenario 1 and Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Auburn

	Population	Developed Acres
2000 Base:	2,011	397

2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

Library Buildings:

The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 3B shows the number of building square feet the two City of Auburn land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 3B
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Auburn Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	397	306	*	*
2001 - 2020	17	13	*	*
Year 2020 Build-Out	414	319	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	397	306	*	*
2001-2020	19	15	*	*
Year 2020 Build-Out	416	321	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 13 square feet for Scenario 1 compared to 19 for Scenario 2.

Library Collection

The Bay County Library system consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 3C shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 3C LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Auburn Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	397	2,126	*	*
2001 - 2020	17	91	*	*
Year 2020 Build-Out	414	2,217	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	397	2,126	*	*
2001-2020	19	102	*	*
Year 2020 Build-Out	416	2,228	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 91 collection items for Scenario 1 compared to 102 for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

FIRE DISTRICTS

AUBURN/WILLIAMS FIRE DISTRICT

Provider and Service Area

The Auburn/Williams Fire Department provides fire and rescue services to the City of Auburn and Williams Township, serving a total population of 6,503 and 4,758 developed acres. The Fire Department operates 4 fire and rescue vehicles out of one station (Station 12). During 2000 and 2001 the Fire Department was dispatched to an average of 430 emergency incidents per year.

Basis for Analysis

Source: Auburn/Williams Township Fire Department and Bay County 911 Central Dispatch

Service Area Data: Auburn

	Population	Developed Acres
2000 Base:	2,011	397
2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

As stated above, the Fire Department is dispatched to an average of 430 emergency incidents per year. This equates to 66 emergency incidents per 1,000 population and 90.4 per 1,000 developed acres for the service area. Column 3 of Table 3D shows the annual incident rate the two City of Auburn land use scenarios would generate through the year 2020 (based on 90.4 emergency incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 107.5 annual emergency incidents per apparatus (430 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 3D
AUBURN/WILLIAMS FIRE DISTRICT
CURRENT LOS = 90.4 EMERGENCY INCIDENTS PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Auburn Developed Acres	(3) Annual Incidents (90.4 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷107.5)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D					
Year 2000	397	36	0.3	*	*
2001 - 2020	17	2	0.0	*	*
Year 2020 Build-Out	414	38	0.2	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	397	36	0.3	*	*
2001 - 2020	19	2	0.0	*	*
Year 2020 Build-Out	416	38	0.2	*	*

* See Auburn/Williams Fire District analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles.

The result of the analysis shows an additional 2 annual emergency incidents and no additional fire and rescue apparatus for Scenario 1 and Scenario 2.

Capital and Other Cost Implications

The current operating budget for the District is $180,600 or $420 per emergency incident. Refer to Appendix A_ for capital cost information.

SEWER

WEST COUNTY WASTEWATER TREATMENT PLANT

Provider and Service Area

The Bay County Department of Water and Sewer operates the West County Wastewater Sewer Treatment Plant providing wastewater treatment for the following areas in Bay County which include a total population of 39,721 and 20,011 developed acres:

Auburn	Kawkawlin Township
Bangor Township	Monitor Township
Frankenlust Township	Williams Township

The wastewater treatment plant has a design capacity of 10.25 MGD (million gallons per day) and an average daily demand of 4.11 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Auburn

	Population	Developed Acres
2000 Base:	2,011	397
2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

As stated above, the average daily flow for the areas served for the 2 year period 2000-2001 was 4.11 MGD. The daily demand varies from user to user. The average daily flow for Auburn for 2000 and 2001 has been 0.29 MGD. This equates to 141.9 GPD (gallons per day) per capita for the total population within the City of Auburn and 719 GPD per developed acre for all developed acres within Auburn. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within Auburn. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 3E shows the MGD the two City of Auburn land use scenarios would require through the year 2020 (based on 719 GPD per developed acre). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 3E WEST BAY COUNTY WASTEWATER TREATMENT PLANT CURRENT LOS = 719 GPD PER DEVELOPED ACRE				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Auburn Developed Acres	(3) MGD Required (719 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	397	0.29	*	*
2001 - 2020	17	0.01	*	*
Year 2020 Build-Out	414	0.30	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	397	0.29	*	*
2001 - 2020	19	0.01	*	*
Year 2020 Build-Out	416	0.30	*	*

* See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.01 MGD required for Scenario 1 and Scenario 2.

Capital and Other Cost Implications

See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

WATER

City of Midland Water Treatment Plant

Provider and Service Area

The City of Auburn purchases water and utilizes the City of Midland system. The system as a design capacity of 48 MGD. Data regarding average daily demand was not analyzed for this report.

Basis for Analysis

Source: City of Auburn

Service Area Data: Auburn

	Population	Developed Acres
2000 Base:	2,011	397
2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

The average daily flow for Auburn is 0.21 MGD. This equates to 104.4 GPD (gallons per day) per capita for the total population within the City of Auburn and 529 GPD per developed acre for all developed acres within Auburn. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within Auburn. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 3F shows the MGD the two City of Auburn land use scenarios would require through the year 2020 (based on 529 GPD per developed acre). The current capacity of the water treatment plant is show in Column 4. There is no analysis of a surplus or deficiency of capacity because the demand from other users of the system is not known.

TABLE 3F CITY OF AUBURN WATER TREATMENT CURRENT LOS = 529 GPD PER DEVELOPED ACRE				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Auburn Developed Acres	(3) MGD Required (529 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	397	0.210	*	*
2001 - 2020	17	0.009	*	*
Year 2020 Build-Out	414	0.219	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	397	0.210	*	*
2001 - 2020	19	0.010	*	*
Year 2020 Build-Out	416	0.220	*	*

* Midland System was not analyzed.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.009 MGD required for Scenario 1 compared to 0.010 MGD for Scenario 2.

Capital and Other Cost Implications

No analysis

CITY OF AUBURN

LAW ENFORCEMENT

Provider and Service Area

The City of Auburn Police Department is the primary law enforcement provider the City of Auburn. The primary service area is 397 developed acres and a population of 2,011. The Police Department provides law enforcement services with 2 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and City of Auburn

Service Area Data: Auburn

	Population	Developed Acres

2000 Base:	2,011	397
2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

During the year 2000 the City of Auburn Police Department responded to 347 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 172.5 calls for service per 1,000 population and 874 per 1,000 developed acres. Column 3 of Table 3G shows the number of additional annual calls for service the two City of Auburn land use scenarios would generate through the year 2020 (based on 874 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (173.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 3G LAW ENFORCEMENT: CITY OF AUBURN POLICE DEPARTMENT CURRENT LOS: 874 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Auburn Developed Acres	(3) Annual Dispatch Calls (874 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷173.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	397	347	2.0	2.0	0.0
2001 - 2020	17	15	0.1	0.0	-0.1
Year 2020 Build-Out	414	362	2.1	2.0	-0.1
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	397	347	2.0	2.0	0.0
2001-2020	19	17	0.1	0.0	-0.1
Year 2020 Build-Out	416	364	2.1	2.0	-0.1

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 15 calls for service for Scenario 1 compared to 17 for Scenario 2, resulting in the need for 0.1 additional sworn officers in Scenario 1 and Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the City of Auburn Police Department is $159,500 or 459.65 per dispatched call for service. Refer to Appendix A for capital cost information.

COMMUNITY PARKS

Provider and Service Area

The City of Auburn provides community parks for the City serving a population of 2,011 and 397 developed acres. The Community park inventory consists of one 20 acre park.

Basis for Analysis

Source: City of Auburn

Service Area Data: Auburn

	Population	Developed Acres
2000 Base:	2,011	397
2020 Scenario 1:	2,129	414
2020 Scenario 2:	2,146	416

Demand for Service

As shown above, the City of Auburn Park system consists of 20 acres of parkland. This equates to 9.9 park acres per 1,000 population and 50.4 acres per 1,000 developed acres. Column 3 of Table 3H shows the number of community park acres the two City of Auburn land use scenarios would require through the year 2020 (based on 50.4 acres per 1,000 developed acres). The current inventory of community park acres is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 3H
COMMUNITY PARK LAND
CURRENT LOS = 50.4 ACRES PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D				
(1)	(2)	(3)	(4)	(5)
Time Frame	Auburn Developed Acres	Community Park Acres (0.0133 per acre)	Community Park Acres Available	Surplus/ Deficiency Col 4-Col 5
Year 2000	397	20.00	20.00	0.00
2001 - 2020	17	0.86	0.00	-0.86
Year 2020 Build-Out	414	20.86	20.00	-0.86
SCENARIO 1: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	397	20.00	20.00	0.00
2001 - 2020	19	0.96	0.00	-0.96
Year 2020 Build-Out	416	20.96	20.00	-0.96

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.86 community park acres for Scenario 1 compared to 0.96 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the City of Auburn parks system is $58,620 (excludes capital improvements) or $293 per acre. Refer to Appendix A for capital cost information.

4. BANGOR TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Bangor Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Bangor Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 4A shows the number of additional jail beds the two Bangor Township land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 4A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bangor Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	3,941	14.7	*	*
2001 - 2020	1,617	6.0	*	*
Year 2020 Build-Out	5,558	20.7	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,941	14.7	*	*
2001-2020	50	0.2	*	*
Year 2020 Build-Out	3,991	14.9	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 6 jail beds for Scenario 1 compared to an additional 0.2 beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Bangor Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Bangor Township

	Population	Developed Acres

2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 4B shows the number of additional annual calls for service the two Bangor Township land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 4B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Bangor Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	3,941	1,080	3.1	*	*
2001 - 2020	1,617	443	1.3	*	*
Year 2020 Build-Out	5,558	1,523	4.4	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	3,941	1,080	3.1	*	*
2001-2020	50	14	0.0	*	*
Year 2020 Build-Out	3,991	1,094	3.1	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 443 calls for service for Scenario 1 compared to 14 for Scenario 2, resulting in the need for an additional 1.3 sworn officers in scenario 1 and no additional officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Libraries

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941

2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

Library Buildings:

The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 4C shows the number of building square feet the two Bangor Township land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 4C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Bangor Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	3,941	3,034	*	*
2001 - 2020	1,617	1,245	*	*
Year 2020 Build-Out	5,558	4,279	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,941	3,034	*	*
2001-2020	50	38	*	*
Year 2020 Build-Out	3,991	3,072	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 1,245 square feet for Scenario 1 compared to 38 for Scenario 2.

Library Collection

The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 4D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 4D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bangor Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	3,941	21,000	*	*
2001 - 2020	1,617	8,657	*	*
Year 2020 Build-Out	5,558	29,757	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	3,941	21,100	*	*
2001-2020	50	268	*	*
Year 2020 Build-Out	3,991	21,368	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 8,657 collection items for Scenario 1 compared to 268 for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads. The Road Commission also maintains 202 miles of state highways within the County. There are 43.91 miles of local roads in Bangor Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

As stated above, the local road system within Bangor Township totals of 43.91 miles. This equates to 2.8 miles per 1,000 population and 11.14 miles per 1,000 developed acres. Column 3 of Table 4E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 11.14 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 4E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 1.142 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Bangor Township Developed Acres	(3) Miles Required (11.14 per 1,000 Acres)	(4) Bangor Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	3,941	43.91	43.91	0.00
2001 - 2020	1,617	18.02	0.0	-18.02
Year 2020 Build-Out	5,558	61.93	43.91	-18.02
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,941	43.91	43.91	0.00
2001-2020	50	0.56	0.0	-0.56
Year 2020 Build-Out	3,991	44.47	43.91	-0.56

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 18.02 miles of roads for Scenario 1 compared to 0.56 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SEWER

WEST COUNTY WASTEWATER TREATMENT PLANT

Provider and Service Area

The Bay County Department of Water and Sewer operates the West County Wastewater Sewer Treatment Plant providing wastewater treatment for the following areas in Bay County which include a total population of 39,721 and 20,011 developed acres:

Auburn	Kawkawlin Township
Bangor Township	Monitor Township
Frankenlust Township	Williams Township

The wastewater treatment plan has a design capacity of 10.25 MGD (million gallons per day) and an average daily demand of 4.11 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

As stated above, the average daily flow for the areas served for the 2 year period 2000-2001 was 4.11 MGD. The daily demand varies from user to user. The average daily flow for Bangor Township for 2000 and 2001 has been 2.28 MGD. This equates to 146.8 GPD (gallons per day) per capita for the total population within Bangor Township and 579 GPD per developed acre for all developed acres within Bangor Township. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within Auburn. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 4F shows the MGD the two Bangor Township land use scenarios would require through the year 2020 (based on 579 GPD per developed acre). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 4F
WEST BAY COUNTY WASTEWATER TREATMENT PLANT
CURRENT LOS = 579 GPD PER DEVELOPED ACRE

SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bangor Township Developed Acres	(3) MGD Required (579 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	3,941	2.28	*	*
2001 - 2020	1,617	0.94	*	*
Year 2020 Build-Out	5,558	3.22	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	3,941	2.28	*	*
2001 - 2020	50	0.03	*	*
Year 2020 Build-Out	3,991	2.31	*	*

* See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.94 MGD required for Scenario 1 compared to 0.03 MGD for Scenario 2.

Capital and Other Cost Implications

See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Bangor Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Bangor Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 4G shows the MGD the two Bangor Township land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 4G BAY METROPOLITAN WATER CURRENT LOS = 102 GPD PER DEVELOPED ACRE				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bangor Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	3,941	0.402	*	*
2001 - 2020	1,617	0.165	*	*
Year 2020 Build-Out	5,558	0.567	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	3,941	0.402	*	*
2001 - 2020	50	0.005	*	*
Year 2020 Build-Out	3,991	0.407	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.165 MGD required for Scenario 1 compared to 0.005 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

BANGOR TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Bangor Township Fire Department provides fire and rescue services to Bangor Township, serving a total population of 15,547 and 3,941 developed acres. The Fire Department operates 4 fire and rescue vehicles out of two stations (Stations 6 and 7) with 15 fulltime firefighters (2001) and providing an average response time of just over 3.0 minutes. During 2000 and 2001 the Fire Department responded to an average of 1,277 incidents per year.

Basis for Analysis

Source: Bangor Township Fire Department

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

As stated above, the Fire Department responded to 1,277 annual incidents. This equates to 82 incidents per 1,000 population and 324 per 1,000 developed acres. Column 3 of Table 4H shows the annual incident rate the two Bangor Township land use scenarios would generate through the year 2020 (based on 324 incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 319.25 annual incidents per apparatus (1,277 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 4H
BANGOR TOWNSHIP FIRE DEPARTMENT
CURRENT LOS = 324 ANNUAL INCIDENTS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3)	(4)	(5)	(6)
Time Frame	Bangor Township Developed Acres	Annual Incidents (324 per 1,000 Acres)	Primary Fire & Rescue Apparatus Required (Col. 3÷ 319.25))	Primary Apparatus Available	Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	3,941	1,277	4.0	4.0	0.0

2001 - 2020	1,617	524	1.6	0.0	-1.6
Year 2020 Build-Out	5,558	1,801	8.6	4.0	-1.6
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	3,941	1,277	4.0	4.0	0.0
2001 - 2020	50	16	0.1	0.0	-0.1
Year 2020 Build-Out	3,991	1,293	4.1	4.0	-0.1

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 524 annual incidents and 1.6 apparatus for Scenario 1 compared to 16 additional annual incidents and 0.1 apparatus for Scenario 2.

Capital and Other Cost Implications

The current (2002) operating budget for the Fire Department is $732,683 or $573.75 per emergency incident. Refer to Appendix A for capital cost information.

COMMUNITY PARKS

Provider and Service Area

The Bangor Township provides park land for the Township serving a population of 15,547 and 3,941 developed acres. The park inventory consists of 65 acres of undeveloped park land at 2 sites: 38 acres on Patterson Road (between Wilder Road and Wheeler Road) and 27 acres west of Bangor Road and Zimmer Road. Recreation facilities programs are administered through the Bangor Township Schools.

Basis for Analysis

Source: Bangor Township

Service Area Data: Bangor Township

	Population	Developed Acres
2000 Base:	15,547	3,941
2020 Scenario 1:	26,610	5,558
2020 Scenario 2:	15,359	3,991

Demand for Service

As shown above, the Bangor Township park system consists of 65 acres of undeveloped park land. This equates to 4.18 park acres per 1,000 population and 16.5 acres per 1,000 developed acres. Column 3 of Table 4I shows the number of park acres the two Bangor Township land use scenarios would require through the year 2020 (based on 16.5 acres per 1,000 developed acres). The current inventory of park acres

is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 4I COMMUNITY PARK LAND CURRENT LOS = 16.5 ACRES PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bangor Township Developed Acres	(3) Community Park Acres (0.0165 per acre)	(4) Community Park Acres Available	(5) Surplus/ Deficiency Col 4-Col 5
Year 2000	3,941	65.0	65.00	0.00
2001 - 2020	1,617	26.7	0.00	-26.7
Year 2020 Build-Out	5,558	91.7	65.00	-26.7
SCENARIO 1: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	3,941	65.0	65.00	0.00
2001 - 2020	50	0.8	0.00	-0.80
Year 2020 Build-Out	3,991	65.8	65.00	-0.80

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 26.7 park acres for Scenario 1 compared to 0.8 for Scenario 2.

Capital and Other Cost Implications

The Township does not currently have significant costs for maintenance of the existing park sites because they are undeveloped.. The Township's 2002 budget for contractual services for recreational programs is $70,000. This equates to $17.76 per developed acre or $4.50 per capita within the Township. Refer to Appendix A for capital cost information.

BANGOR TOWNSHIP SCHOOLS

Provider and Service Area

The Bangor Township School District provides school instruction for grades K-12 serving a total population of 15,547 and 3,941 developed acres. Approximately 15.4% of the total township population attended Bangor Township schools in the year 2000.

Basis for Analysis

Source: Bangor Township Schools; Michigan Department of Treasury, Standard & Poor's School Evaluation Services

Service Area Data: Bangor Township

	Population	Residential Developed Acres

2000 Base:	15,547	2,093
2020 Scenario 1:	26,610	3,634
2020 Scenario 2:	15,359	2,067

Demand for Service

The Bangor Township Schools K-12 enrollment for the year 2000 was 2,396 This equates to 154 K-12 students per 1,000 population and 1,145 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 4J shows the annual enrollment the two Bangor Township land use scenarios would require through the year 2020 (based on 1,145 K-12 students per 1,000 developed residential acres). The current inventory of K-12 capacity (number of students) is shown in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 4J
BANGOR TOWNSHIP SCHOOLS
CURRENT LOS = 1,145 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

(1) Time Frame	(2) Bangor Township Developed Residential Acres	(3) Annual K-12 Enrollment At 1.145 Students per Residential Acre	(4) Permanent Student Capacity Available (2002)	(5) Surplus/ (Deficiency) Of permanent Capacity (Col.4 - Col. 2)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	2,093	2,396	2,292	(104)
2001 - 2020	1,541	1,764	0	(1,764)
Year 2020 Build-Out	3,634	4,160	2,292	(1,868)
SCENARIO 2: Scenario 1 Adjusted For 2000 Census Projections				
Year 2000	2,093	2,396	2,292	(104)
2001 - 2020	(26)	(30)	0	30
Year 2020 Build-Out	2,067	2,366	2,292	(134)

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 1,764 K-12 students for Scenario 1 compared to a reduction of 26 students for Scenario 2.

Capital and Other Cost Implications

The 2001 operating expenditures for the district was $7,304 per student (Standard and Poor's School Evaluation Services). According to the School District they have adequate facility space to house the additional students from scenario 2 by reconfiguring the use of existing buildings. Refer to Appendix A for capital cost information.

5. BAY CITY
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay City Police Department and Bay City Fire Department.

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657
2020 Scenario 1:	38,327	4,826
2020 Scenario 2:	36,023	4,637

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Bay City. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate (including prisoners “boarded in” from other jurisdictions) with an average daily

population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and bay County 2002 Budget

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657
2020 Scenario 1:	38,327	4,826
2020 Scenario 2:	36,023	4,637

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 5A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 5A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bay City Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	4,657	17.4	*	*
2001 - 2020	169	0.6	*	*
Year 2020 Build-Out	4,826	18.0	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,657	17.4	*	*
2001-2020	-20	-0.1	*	*
Year 2020 Build-Out	4,637	17.3	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 0.6 jail beds for Scenario 1 and a reduction of 0.1 jail beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657

2020 Scenario 1:	38,327	4,826
2020 Scenario 2:	36,023	4,637

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 5B shows the number of building square feet the two City of Bay City land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 5B
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Bay City Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,657	3,585	*	*
2001 - 2020	169	130	*	*
Year 2020 Build-Out	4,826	3,715	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,657	3,585	*	*
2001-2020	-20	-15	*	*
Year 2020 Build-Out	4,637	3,570	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 130 square feet for Scenario 1 and 15 fewer square feet for Scenario 2.

Library Collection
The Bay County Library system consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 5C shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 5C LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bay City Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	4,657	24,934	*	*
2001 - 2020	169	905	*	*
Year 2020 Build-Out	4,826	25,939	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	4,657	24,934	*	*
2001-2020	-20	-107	*	*
Year 2020 Build-Out	4,637	24,827	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 905 collection items for Scenario 1 and a reduction of 107 collection items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City
Beaver Township
Frankenlust Township
Fraser Township
Garfield Township
Kawkawlin Township
Merritt Township
Monitor Township
Portsmouth Township
Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Bay City

	Population	Residential Developed Acres
2000 Base:	36,817	2,370
2020 Scenario 1:	38,327	2,494
2020 Scenario 2:	36,023	2,305

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165 This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 5D shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 5D
BAY CITY PUBLIC SCHOOLS
CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

(1) Time Frame	(2) Bay City Developed Residential Acres	(3) Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	(4) Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	(5) Regular Classrooms Available	(6) Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
SCENARIO 1: Build-out Analysis Scenario D					
Year 2000	2,370	723	27.1	*	*
2001 - 2020	124	38	1.4	*	*
Year 2020 Build-Out	2,494	761	28.5	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	2,370	723	27.1	*	*
2001 - 2020	-65	-20	-0.7	*	*
Year 2020 Build-Out	2,305	703	26.4	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 38 K-12 students and 1.4 more classrooms for Scenario 1 compared to a 20 fewer students and 0.7 fewer classrooms for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer account for 3.423 MGD of the daily demand. Demand data was not available for Bay City, Essexville and Hampton Township. This study assumes that the average daily demand from these 3 entities is 7.477 MGD (the difference between 10.9 MGD total average daily demand less 3.423 for Bay County).

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer and Bay City

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657
2020 Scenario 1:	38,327	4,826
2020 Scenario 2:	36,023	4,637

Demand for Service

As stated above, the average daily demand for Bay City, Essexville and Hampton Township is calculated at 7.477 MGD. This equates to 838 GPD (gallons per day) per developed acre or 148.1 gallons per day per capita for the total developed acres and population of the City of Bay City. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 5E shows the MGD the two land use scenarios would require through the year 2020 (based on 838 GPD per developed acre). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 5E
BAY METROPOLITAN WATER
CURRENT LOS = 838 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Bay City Developed Acres	(3) MGD Required (838 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,657	3.903	*	*
2001 - 2020	169	0.142	*	*
Year 2020 Build-Out	4,826	4.045	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	4,657	3.903	*	*
2001 - 2020	-20	-0.017	*	*
Year 2020 Build-Out	4,637	3.886	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.142 MGD required for Scenario 1 and a reduction in demand of 0.017 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

CITY OF BAY CITY

FIRE PROTECTION

Provider and Service Area

The Bay City Fire Department provides fire and rescue services to the city, serving a total population of 36,817 and 4,657 developed acres. The Fire Department dispatches 6 primary fire and rescue vehicles and 54 firefighters out of 4 stations. During 2000 the Fire Department was dispatched to 3,935 incidents.

Basis for Analysis

Source: Bay City and Bay County 911 Central Dispatch

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657
2020 Scenario 1:	38,327	4,826
2020 Scenario 2:	36,023	4,637

Demand for Service

As stated above, the Fire Department responds to 3,935 annual incidents. This equates to 106.8 incidents per 1,000 population and 845 per 1,000 developed acres. Column 3 of Table 5F shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 845 incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 655.8 annual incidents per primary apparatus (3,935 incidents divided by 6 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. (Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 5F
BAY CITY FIRE DEPARTMENT
CURRENT LOS = 845 ANNUAL INCIDENTS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1) Time Frame	(2) Bay City Developed Acres	(3) Annual Incidents (845 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷655.8)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,657	3,935	6.0	6.0	0.00
2001 - 2020	169	143	0.2	0.0	-0.2
Year 2020 Build-Out	4,826	4,078	6.2	6.0	-0.2

SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	4,657	3,935	6.0	6.0	0.0
2001 - 2020	-20	-17	0.0	0.0	0.0
Year 2020 Build-Out	4,637	3,918	6.0	6.0	0.0

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 143 annual incidents and 0.2 apparatus for Scenario 1 compared to 17 fewer annual incidents and no additional apparatus for Scenario 2.

Capital and Other Cost Implications

The current operating budget for the Fire Department is $ 5,144,123 or $ 1,307.27 per incident. Refer to Appendix A ___ for capital cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay City Police Department is the primary law enforcement provider for the City of Bay City. The primary service area consists of 4,657 developed acres and a population of 36,817 The Police Department provides law enforcement services with 63 sworn patrol operations officers and 10 Investigators (year 2000)

Basis for Analysis

Source: City of Bay City Police Department

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657
2020 Scenario 1:	38,327	4,826
2020 Scenario 2:	36,023	4,637

Demand for Service

Calls for Service:

During the year 2000 the City of Bay City Police Department responded to 35,100 911 Central Dispatch and officer-initiated calls for service. These calls included 911 Central Dispatch calls, non-911 telephone calls and officer initiated responses. This equates to 953 calls for service per 1,000 population and 7,537 per 1,000 developed acres. Column 3 of Table 5G shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 7,537 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve

development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 557.2 calls for service per year (the current workload based on statistics provided). In reality the workload is greater because of the performance of other tasks such as court time, report writing and responses to non-emergency incidents. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 5G
LAW ENFORCEMENT: CITY OF BAY CITY POLICE DEPARTMENT
CURRENT LOS: 7,537 CALLS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) City of Bay City Developed Acres	(3) Annual Calls (7,537 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷557.2)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,657	35,100	63.0	63.0	0.0
2001 - 2020	169	1,274	2.3	0.0	-2.3
Year 2020 Build-Out	4,826	36.374	65.3	63.0	-2.3
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	4,657	35,100	63.0	63.0	0.0
2001-2020	-20	-151	-0.3	0.0	-0.3
Year 2020 Build-Out	4,637	34,949	62.7	63.0	-0.3

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 1,274 calls for service for Scenario 1 compared to 151 fewer calls for service for Scenario 2, resulting in the need for 2.3 additional sworn officers in Scenario 1 and a reduction of 0.3 in Scenario 2.

Criminal Investigations:
During the year 2000 the City of Bay City Police Department conducted 2,505 criminal investigations. This equates to 68 investigations per 1,000 population and 538 per 1,000 developed acres. Column 3 of Table 5H shows the number of additional annual criminal investigations the two land use scenarios would generate through the year 2020 (based on 538 per 1,000 developed acres). Column 4 calculates the number of investigators (sworn officers) needed to serve development through the year 2020. This calculation assumes that each investigator can handle a maximum of 250.5 criminal investigations per year (the current workload based on statistics provided). The current number of investigators is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 5H LAW ENFORCEMENT: CITY OF BAY CITY POLICE DEPARTMENT CURRENT LOS: 538 CRIMINAL INVESTIGATIONS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) City of Bay City Developed Acres	(3) Annual Investigations (7,537 per 1,000 Acre)	(4) Investigators Required (Col 3÷250.5)	(5) Investigators Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,657	2,505	10.0	10.0	0.0
2001 - 2020	169	91	0.4	0.0	-0.4
Year 2020 Build-Out	4,826	2,596	10.4	10.0	-0.4
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	4,657	2,505	10.0	10.0	0.0
2001-2020	-20	-11	0.0	0.0	0.0
Year 2020 Build-Out	4,637	2,494	10.0	10.0	0.0

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 91 annual criminal investigations for Scenario 1 compared to 11 fewer for Scenario 2, resulting in the need for 0.4 additional investigators in Scenario 1 and a 0.0 in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the City of Bay City Police Department is $6,805,086 or $ $ 85,064 per sworn officer (based on a total of 80 sworn officers including road patrol, criminal investigations, special operations and administrative support). Refer to Appendix A for capital cost information.

PARKS AND RECREATION

Provider and Service Area

The City of Bay City provides community parks and recreational facilities for the City serving a population of 36,817 and 4,657 developed acres. The park and recreation inventory consists of 62.0 * community and neighborhood park acres:

Park Site	Acres
Trombley/Banks Park	0.5
Defoe Park	11.0
Nate Doan Park	6.4
Pershing Park	1.5
Ramsey Park	1.3
Roosevelt Park	2.8
HeWitt Field	6.1
Birney Park	3.4
Wenonah Park	4.0
Battery Park	1.0
Maplewood Park	9.7
Carroll Park	13.7
Unity Park	0.1
Total	62.0

* Regional parks are included in the Chapter 2 analysis as county-wide facilities.

Basis for Analysis

Source: City of Bay City

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657
2020 Scenario 1:	38,327	4,826
2020 Scenario 2:	36,023	4,637

Demand for Service

As shown above, the City of Bay City Park system consists of 62.00 acres of community and neighborhood park land. This equates to 1.7 park acres per 1,000 population and 13.3 acres per 1,000 developed acres. Column 3 of Table 5I shows the number of park acres the two land use scenarios would require through the year 2020 (based on 13.3 acres per 1,000 developed acres). The current inventory of park acres is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 5I PARK ACRES CURRENT LOS = 13.3 ACRES PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Bay City Developed Acres	(3) Park Acres Required (13.3 per 1,000 acres)	(4) Community Park Acres Available	(5) Surplus/ Deficiency Col 4-Col 5
Year 2000	4,657	62.00	62.00	0.00
2001 - 2020	169	2.25	0.00	-2.25
Year 2020 Build-Out	4,826	64.25	62.00	-2.25
SCENARIO 1: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	4,657	62.00	62.00	0.00
2001 - 2020	-20	-0.27	0.00	0.27
Year 2020 Build-Out	4,637	61.73	62.00	0.27

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 2.25 park acres for Scenario 1 compared to a reduction of 0.27 park acres for Scenario 2.

Capital and Other Cost Implications

The 2003 proposed operating and maintenance budget for various park and recreational facilities on approximately 160 acres of grounds (including the community and neighborhood parks listed above) is $1,499,928 or $9,375 per acre. Refer to Appendix A_ for capital cost information.

SEWER

Provider and Service Area

The City of Bay City owns and operates a wastewater treatment plant providing wastewater treatment for the City. The plant also provides minimal service to Hampton Township, Portsmouth Township and Monitor Township. The wastewater treatment plant's design capacity is 18.0 MGD (million gallons per day) with 27.3 total million gallons of retention in 5 retention basins and 4 pump stations.

Basis for Analysis

Source: City of Bay City

Service Area Data: Bay City

	Population	Developed Acres
2000 Base:	36,817	4,657
2020 Scenario 1:	38,327	4,826

2020 Scenario 2: 36,023 4,637

Demand for Service

As stated above, the average daily flow to the wastewater treatment plant is 18.0 MGD (according to Bay City the service to the other townships is so minimal; therefore thee townships are not included in this analysis) This equates to 190.13 GPD (gallons per day) per capita for the total population within the City of Bay City and 1.5 MGD per 1,000 developed acres for all developed acres. (Note: these GPD and MGD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within the City. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 5J shows the MGD the two land use scenarios would require through the year 2020 (based on 1.5 MGD per 1,000 developed acres). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 5J
CITY OF BAY CITY WASTEWATER TREATMENT PLANT
CURRENT LOS = 1.5 MGD PER 1,000 DEVELOPED ACRE

(1) Time Frame	(2) City of Bay City Developed Acres	(3) MGD Required (1.5 per (1,000 Acres)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,657	7.00	18.00	11.00
2001 - 2020	169	0.25	0.00	-0.25
Year 2020 Build-Out	4,826	7.25	18.00	10.75
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	4,657	7.00	18.00	11.00
2001 - 2020	-20	-0.03	0.00	0.03
Year 2020 Build-Out	4,637	6.97	18.00	11.03

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.25 MGD required for Scenario 1 compared to 0.03 fewer MGD for Scenario 2.

Capital and Other Cost Implications

As shown in Column 5 of the preceding table there is a surplus of capacity that can provide service to future development for both scenarios (Scenario 1 = 10.75 MGD surplus and Scenario 2 = 11.03 MGD surplus) therefore capital costs for plant capacity expansion is not needed for the area currently served (plant upgrades may be needed in the future for other non-capacity issues).

Operating costs are funded with charges for services and permit fees. This study assumes that the rate structure is designed based on demand and therefore cost, and any adjustments would be made to reflect future demand.

6. BEAVER TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Beaver Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Beaver Township

	Population	Developed Acres
2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	12,795	3,510

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Beaver Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating Budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Beaver Township

	Population	Developed Acres
2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	2,795	3,510

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 6A shows the number of additional jail beds the two Beaver Township land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 6A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Beaver Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	3,535	13.2	*	*
2001 - 2020	14,933	55.8	*	*
Year 2020 Build-Out	18,468	69.0	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,535	13.2	*	*
2001-2020	-25	-0.1	*	*
Year 2020 Build-Out	3,510	13.1	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 55.8 jail beds for Scenario 1 compared to 0.1 less beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Beaver Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch, and Bay County 2002 Budget

Service Area Data: Beaver Township

	Population	Developed Acres

2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	2,795	3,510

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 6B shows the number of additional annual calls for service the two Beaver Township land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 6B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Beaver Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	3,535	959	2.7	*	*
2001 - 2020	14,933	4,093	11.6	*	*
Year 2020 Build-Out	18,468	5,062	14.3	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	3,535	969	2.7	*	*
2001-2020	-25	-7	0.0	*	*
Year 2020 Build-Out	3,510	962	2.7	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 4,093 calls for service for Scenario 1 compared to 7 less for Scenario 2, resulting in the need for an additional 11.6 sworn officers in Scenario 1 and no additional officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Beaver Township

	Population	Developed Acres

2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	12,795	3,510

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 6C shows the number of building square feet the two Beaver Township land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 6C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Beaver Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	3,535	2,721	*	*
2001 - 2020	14,933	11,495	*	*
Year 2020 Build-Out	18,468	14,216	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,535	2,721	*	*
2001-2020	-25	-19	*	*
Year 2020 Build-Out	3,510	2,702	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 11,495 square feet for Scenario 1 compared to a reduction of 19 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 6D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 6D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Beaver Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	3,535	18,926	*	*
2001 - 2020	14,933	79,591	*	*
Year 2020 Build-Out	18,468	98,877	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	3,535	18,926	*	*
2001-2020	-25	-134	*	*
Year 2020 Build-Out	3,510	18,792	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 79,591 collection items for Scenario 1 compared to a reduction of 134 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 44.37 miles of local roads in Beaver Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Beaver Township

	Population	Developed Acres
2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	12,795	3,510

Demand for Service

As stated above, the local road system within Beaver Township totals of 44.37 miles. This equates to 15.8 miles per 1,000 population and 12.5 miles per 1,000 developed acres. Column 3 of Table 6E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 12.5 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 6E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 12.5 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Beaver Township Developed Acres	(3) Miles Required (12.5 per 1,000 Acre)	(4) Beaver Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	3,535	44.37	44.37	0.00
2001 - 2020	14,933	187.44	0.0	-187.44
Year 2020 Build-Out	18,468	231.81	44.37	-187.44
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,535	44.37	44.37	0.00
2001-2020	-25	-0.31	0.0	0.31
Year 2020 Build-Out	3,510	44.06	44.37	0.31

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 187.44 miles of roads for Scenario 1 compared to a reduction of 0.31 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Beaver Township

	Population	Residential Developed Acres
2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	2,795	3,510

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165 This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 6F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 6F
BAY CITY PUBLIC SCHOOLS
CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Beaver Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	3,535	1,078	40.4	*	*
2001 - 2020	14,933	4,555	170.6	*	*
Year 2020 Build-Out	18,468	5,633	211.0	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	3,535	1,078	40.4	*	*
2001 - 2020	-25	-8	-0.3	*	*
Year 2020 Build-Out	3,510	1,070	40.1	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 4,555 K-12 students and 170.6 more classrooms for Scenario 1 compared to a reduction of 8 students and 0.3 fewer classrooms for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

- Bangor Township
- Beaver Township
- Frankenlust Township
- Fraser Township
- Kawkawlin Township
- Merritt Township
- Monitor Township
- Pinconning Township
- Portsmouth Township
- Williams Township
- City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Beaver Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Beaver Township

	Population	Developed Acres
2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	2,795	3,510

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Beaver Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of

persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 6G shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 6G
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Beaver Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	3,535	0.361	*	*
2001 - 2020	14,933	1.523	*	*
Year 2020 Build-Out	18,468	1.884	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	3,535	0.361	*	*
2001 - 2020	-25	-0.003	*	*
Year 2020 Build-Out	3.510	0.358	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 1.523 MGD required for Scenario 1 compared to a reduction of 0.003 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

BEAVER TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Beaver Township Fire Department provides fire and rescue services to Beaver Township, serving a total population of 2,806 and 3,535 developed acres. The Fire

Department operates out of one station (Station 19). During 2000 and 2001 the Fire Department was dispatched to an average of 164 incidents per year.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Beaver Township

	Population	Developed Acres
2000 Base:	2,806	3,535
2020 Scenario 1:	9,326	18,468
2020 Scenario 2:	2,795	3,510

Demand for Service

As stated above, the Fire Department was dispatched to an average 164 incidents per year. This equates to 58.4 incidents per 1,000 population and 46.3 per 1,000 developed acres. Column 3 of Table 6H shows the annual incident rate the two Beaver Township land use scenarios would generate through the year 2020 (based on 46.3 incidents per 1,000 developed acres).

TABLE 6H
BEAVER TOWNSHIP FIRE DEPARTMENT
CURRENT LOS = 46.3 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Beaver Township Developed Acres	(3) Annual Incidents 46.3 per 1,000 Acres)
SCENARIO 1: Build-out Analysis Scenario D		
Year 2000	3,535	164
2001 - 2020	14,933	691
Year 2020 Build-Out	18,468	855
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	3,535	164
2001-2020	(25)	(1)
Year 2020 Build-Out	3,510	163

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 691 annual incidents for Scenario 1 compared to a reduction of 25 annual incidents for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

7. CITY OF ESSEXVILLE
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Essexville Police and Fire Departments.

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Essexville

	Population	Developed Acres
2000 Base:	3,766	680
2020 Scenario 1:	3,801	686
2020 Scenario 2:	3,647	664

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Essexville. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate (including prisoners “boarded in” from other jurisdictions) with an average daily

population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Essexville

	Population	Developed Acres
2000 Base:	3,766	680
2020 Scenario 1:	3,801	686
2020 Scenario 2:	3,647	664

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 7A shows the number of additional jail beds the two City of Essexville land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 7A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Essexville Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	380	2.5	*	*
2001 - 2020	6	0.0	*	*
Year 2020 Build-Out	686	2.5	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	680	2.5	*	*
2001-2020	-16	-0.1	*	*
Year 2020 Build-Out	664	2.4	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows no need for additional jail beds for Scenario 1 and 0.1 fewer jail beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Essexville

	Population	Developed Acres
2000 Base:	3,766	680
2020 Scenario 1:	3,801	686

2020 Scenario 2: 3,647 664

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 7B shows the number of building square feet the two City of Essexville land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 7B
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Essexville Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	680	523	*	*
2001 - 2020	6	5	*	*
Year 2020 Build-Out	686	528	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	680	523	*	*
2001-2020	-16	-12	*	*
Year 2020 Build-Out	664	511	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 5 square feet for Scenario 1 compared to a reduction of 12 square feet for Scenario 2.

Library Collection
The Bay County Library system consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 7C shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 7C LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Essexville Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	680	3,641	*	*
2001 - 2020	6	32	*	*
Year 2020 Build-Out	686	3,673	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	680	3,641	*	*
2001-2020	-16	-86	*	*
Year 2020 Build-Out	664	3,555	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 32 collection items for Scenario 1 compared to a reduction of 86 for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

ESSEXVILLE-HAMPTON PUBLIC SCHOOLS

Provider and Service Area

The Essexville-Hampton Public School District provides school instruction for grades K-12 out of 5 school sites for the City of Essexville and parts of Hampton Township

This area includes 4,270 developed acres and a total population of 13,668 (2000 Census). Approximately 14% of the total population attended Essexville-Hampton Public schools in the year 2000.

Basis for Analysis

Source: Essexville-Hampton Public Schools

Service Area Data: Essexville

	Population	Residential Developed Acres
2000 Base:	3,766	441
2020 Scenario 1:	3,801	446
2020 Scenario 2:	3,647	424

Demand for Service

The Essexville-Hampton Public School K-12 enrollment for the year 2000/01 was 1,923 This equates to 140.7 K-12 students per 1,000 population for the total population within the areas served and 527 per 1,000 developed residential acres for the total residential acres within the area served. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Projection of school enrollment assumes the same current ratio of persons/acres utilizing the school system through the year 2020 as is currently using the school district.

Column 3 of Table 7D shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 527 K-12 students per 1,000 developed residential acres). In Column 4 the current capacity (student stations) of the school system is shown. According to the School District it is currently at full capacity. The surplus or deficiency of capacity (student stations) to serve the additional development is calculated in Column 5.

TABLE 7D ESSEXVILLE-HAMPTON PUBLIC SCHOOLS CURRENT LOS: 527 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Essexville Developed Residential Acres	(3) Annual K-12 Enrollment At 0.527 Students Per Residential Acre	(4) K-12 Enrollment Capacity (students)	(5) Surplus Deficiency of K-12 Capacity (Col. 4 – Col. 3)
Year 2000	441	232	*	*
2001 - 2020	5	3	*	*
Year 2020 Build-Out	446	235	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	441	232	*	*
2001 - 2020	-17	-9	*	*
Year 2020 Build-Out	424	223	*	*

* See Essexville-Hampton Public Schools analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 3 K-12 students for Scenario 1 compared to 9 fewer students for Scenario 2.

Capital and Other Cost Implications

See Essexville-Hampton Public Schools analysis in Chapter 2.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Bangor Township account for 3.423 MGD of the daily demand. Demand data was not available for Bay City, Essexville and Hampton Township. This study assumes that the average daily demand from these 3 entities is 7.477 MGD (the difference between 10.9 MGD total average daily demand less 3.423 for Bay County).

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Essexville

	Population	Developed Acres
2000 Base:	3,766	680
2020 Scenario 1:	3,801	686
2020 Scenario 2:	3,647	664

Demand for Service

As stated above, the average daily demand for Bay City, Essexville and Hampton Township is calculated at 7.477 MGD. This equates to 838 GPD (gallons per day) per developed acre or 148.1 gallons per day per capita for the total developed acres and population of the City of Essexville. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 7E shows the MGD the two land use scenarios would require through the year 2020 (based on 838 GPD per developed acre). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 7E
BAY METROPOLITAN WATER
CURRENT LOS = 838 GPD PER DEVELOPED ACRE

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3)	(4)	(5)
	Essexville	MGD		Surplus/

Time Frame	Developed Acres	Required (838 GPD per Acre)	MGD Available	Deficiency (Col 4-Col 3)
Year 2000	680	0.570	*	*
2001 - 2020	6	0.005	*	*
Year 2020 Build-Out	686	0.575	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	680	0.570	*	*
2001 - 2020	-16	-0.013	*	*
Year 2020 Build-Out	664	0.557	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.005 MGD required for Scenario 1 compared to a reduction of 0.013 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

CITY OF ESSEXVILLE

FIRE PROTECTION

Provider and Service Area

The City of Essexville Fire Department provides fire and rescue services to the City, serving a total population of 3,766 and 680 developed acres. During 2000 and 2001 the Fire Department was dispatched to an average of 146 incidents per year out of Station 17.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Essexville

	Population	Developed Acres
2000 Base:	3,766	680
2020 Scenario 1:	3,801	686
2020 Scenario 2:	3,647	664

Demand for Service

As stated above, the Fire Department is dispatched to an average 146 annual incidents. This equates to 38.8 incidents per 1,000 population and 214.7 per 1,000 developed acres. Column 3 of Table 7F shows the annual incident rate the two land use scenarios

would generate through the year 2020 (based on 214.7 incidents per 1,000 developed acres).

TABLE 7F ESSEXVILLE FIRE DEPARTMENT CURRENT LOS = 214.7 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Essexville Developed Acres	(3) Annual Incidents 214.7 per 1,000 Acres)
Year 2000	680	146
2001 - 2020	6	1
Year 2020 Build-Out	686	147
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	680	146
2001-2020	-16	-3
Year 2020 Build-Out	664	143

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows 1 additional annual incident for Scenario 1 compared to 3 fewer annual incidents for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

LAW ENFORCEMENT

Provider and Service Area

The Essexville Police Department is the primary law enforcement the City of Essexville. The primary service area includes 680 developed acres and a population of 3,766. The Police Department provides law enforcement services with 8 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center and Bay County 911 Central Dispatch

Service Area Data: Essexville

	Population	Developed Acres
2000 Base:	3,766	680
2020 Scenario 1:	3,801	686
2020 Scenario 2:	3,647	664

Demand for Service

During the year 2000 the City of Essexville Police Department responded to 2,479 emergency calls for service that were dispatched from Bay County 911 Central Dispatch. This equates to 1,519 calls for service per 1,000 population and 3,645.6 per 1,000 developed acres. Column 3 of Table 7G shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 3,645.6 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 310 emergency calls for service per year (the current workload based on statistics provided). This number (310 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 7G
LAW ENFORCEMENT: CITY OF ESSEXVILLE POLICE DEPARTMENT
CURRENT LOS: 3,645.6 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Essexville Developed Acres	(3) Annual Dispatch Calls (3,645.6 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷310)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D					
Year 2000	680	2,479	8.0	8.0	0.0
2001 - 2020	6	22	0.1	0.0	-0.1
Year 2020 Build-Out	686	2,501	8.1	8.0	-0.1.
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	680	2,479	8.0	8.0	0.0
2001-2020	-16	-58	-0.2	0.0	0.2
Year 2020 Build-Out	664	2,421	7.8	8.0	0.2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 22 calls for service for service and 0.1 sworn officers for Scenario 1 compared to a reduction of 58 calls for service and 0.2 sworn officers for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

8. FRANKENLUST TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Frankenlust Township Fire Department.

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Frankenlust Township

	Population	Developed Acres
2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Frankenlust Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating Budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Frankenlust Township

	Population	Developed Acres
2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 8A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 8A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Frankenlust Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	2,722	10.2	*	*
2001 - 2020	1,144	4.3	*	*
Year 2020 Build-Out	3,866	14.5	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	2,722	10.2	*	*
2001-2020	262	1.0	*	*
Year 2020 Build-Out	2,984	11.2	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 4.3 jail beds for Scenario 1 compared to 1.0 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Frankenlust Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Frankenlust Township

	Population	Developed Acres

2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 8B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 8B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Frankenlust Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	2,722	746	2.1	*	*
2001 - 2020	1,144	314	0.9	*	*
Year 2020 Build-Out	3,866	1,060	3.0	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	2,722	746	2.1	*	*
2001-2020	262	72	0.2	*	*
Year 2020 Build-Out	2,984	818	2.3	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 314 calls for service for Scenario 1 compared to 72 for Scenario 2, resulting in the need for an additional 0.9 sworn officers in Scenario 1 and 0.2 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Frankenlust Township

	Population	Developed Acres

2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 8C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 8C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Frankenlust Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	2,722	2,095	*	*
2001 - 2020	1,144	881	*	*
Year 2020 Build-Out	3,866	2,976	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	2,722	2,095	*	*
2001-2020	262	202	*	*
Year 2020 Build-Out	2,984	2,297	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 881 square feet for Scenario 1 compared to a 202 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 8D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 8D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Frankenlust Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	2,722	14,574	*	*
2001 - 2020	1,144	6,125	*	*
Year 2020 Build-Out	3,866	20,699	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	2,722	14,574	*	*
2001-2020	262	1,403	*	*
Year 2020 Build-Out	2,984	15,977	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 6,125 collection items for Scenario 1 compared to 1,403 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads. The Road Commission also maintains 202 miles of state highways within the County. There are 31.03 miles of local roads in Frankenlust Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Frankenlust Township

	Population	Developed Acres
2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

As stated above, the local road system within Frankenlust Township totals of 31.03 miles. This equates to 12.26 miles per 1,000 population and 11.4 miles per 1,000 developed acres. Column 3 of Table 8E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 11.4 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 8E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 11.4 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Frankenlust Township Developed Acres	(3) Miles Required (11.4 per 1,000 Acre)	(4) Frankenlust Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	2,722	31.03	31.03	0.00
2001 - 2020	1,144	13.04	0.00	-13.04
Year 2020 Build-Out	3,866	44.07	31.03	-13.04
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	2,722	31.03	31.03	0.00
2001-2020	262	2.99	0.00	-2.99
Year 2020 Build-Out	2,984	34.02	31.03	-2.99

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 13.04 miles of roads for Scenario 1 compared to a 2.99 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Frankenlust Township

	Population	Residential Developed Acres
2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165 This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 8F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 8F BAY CITY PUBLIC SCHOOLS CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Frankenlust Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	2,722	830	31.1	*	*
2001 - 2020	1,144	349	13.1	*	*
Year 2020 Build-Out	3,866	1,179	44.2	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	2,722	830	31.1	*	*
2001 - 2020	262	80	3.0	*	*
Year 2020 Build-Out	2,984	910	34.1	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 349 K-12 students and 13 more classrooms for Scenario 1 compared to a 80 students and 3 classrooms for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

SEWER

WEST COUNTY WASTEWATER TREATMENT PLANT

Provider and Service Area

The Bay County Department of Water and Sewer operates the West County Wastewater Sewer Treatment Plant providing wastewater treatment for the following areas in Bay County which include a total population of 39,721 and 20,011 developed acres:

Auburn	Kawkawlin Township
Bangor Township	Monitor Township
Frankenlust Township	Williams Township

The wastewater treatment plant has a design capacity of 10.25 MGD (million gallons per day) and an average daily demand of 4.11 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Frankenlust Township

	Population	Developed Acres
2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

As stated above, the average daily flow for the areas served for the 2 year period 2000-2001 was 4.11 MGD. The daily demand varies from user to user. The average daily flow for Frankenlust Township for 2000 and 2001 has been 0.26 MGD. This equates to 104.0 GPD (gallons per day) per capita for the total population within Frankenlust Township and 97 GPD per developed acre for all developed acres within Frankenlust Township. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within Frankenlust Township. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 8G shows the MGD the two land use scenarios would require through the year 2020 (based on 97 GPD per developed acre). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 8G WEST BAY COUNTY WASTEWATER TREATMENT PLANT CURRENT LOS = 97 GPD PER DEVELOPED ACRE				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Frankenlust Township Developed Acres	(3) MGD Required (97 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	2,722	0.26	*	*
2001 - 2020	1,144	0.11	*	*
Year 2020 Build-Out	3,866	0.37	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	2,722	0.26	*	*
2001 - 2020	262	0.03	*	*
Year 2020 Build-Out	2,984	0.29	*	*

* See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.11 MGD required for Scenario 1 compared to 0.03 MGD for Scenario 2.

Capital and Other Cost Implications

See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Frankenlust Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Frankenlust Township

	Population	Developed Acres
2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Frankenlust Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of

persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 8H shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 8H
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1)	(2)	(3)	(4)	(5)
Time Frame	Frankenlust Township Developed Acres	MGD Required (102 GPD per Acre)	MGD Available	Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	2,722	0.278	*	*
2001 - 2020	1,144	0.117	*	*
Year 2020 Build-Out	3,866	0.395	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	2,722	0.278	*	*
2001 - 2020	262	0.027	*	*
Year 2020 Build-Out	2,984	0.305	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.117 MGD required for Scenario 1 compared to a 0.027 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

FRANKENLUST TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Frankenlust Township Fire Department provides fire and rescue services to Frankenlust Township, serving a total population of 2,530 and 2,722 developed acres.

The Fire Department operates out of one station (Station 20). During 2000 and 2001 the Fire Department was dispatched to an average 242 incidents per year.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Frankenlust Township

	Population	Developed Acres
2000 Base:	2,530	2,722
2020 Scenario 1:	3,495	3,866
2020 Scenario 2:	2,751	2,984

Demand for Service

As stated above, the Fire Department was dispatched to an average 242 incidents per year. This equates to 95.6 annual incidents per 1,000 population and 88.9 per 1,000 developed acres. Column 3 of Table 8I shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 88.9 annual incidents per 1,000 developed acres).

TABLE 8I
FRANKENLUST TOWNSHIP FIRE DEPARTMENT
CURRENT LOS = 88.9 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D		
(1)	(2)	(3)
Time Frame	Frankenlust Township Developed Acres	Annual Incidents 88.9 per 1,000 Acres)
Year 2000	2,722	242
2001 - 2020	1,144	102
Year 2020 Build-Out	3,866	344
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	2,722	242
2001-2020	262	23
Year 2020 Build-Out	2,984	265

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 102 annual incidents for Scenario 1 compared to 23,; annual incidents for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

9. FRASER TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Fraser Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Fraser Township

	Population	Developed Acres
2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Fraser Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating Budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Fraser Township

	Population	Developed Acres
2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 9A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 9A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Fraser Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	4,776	17.9	*	*
2001 - 2020	3,431	12.8	*	*
Year 2020 Build-Out	8,207	30.7	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,776	17.9	*	*
2001-2020	-427	-1.6	*	*
Year 2020 Build-Out	4,349	16.3	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 12.8 jail beds for Scenario 1 compared to a reduction of 1.6 beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Fraser Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Fraser Township

Population	Developed Acres

2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 9B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 9B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Fraser Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,776	1,309	3.7	*	*
2001 - 2020	3,431	940	2.7	*	*
Year 2020 Build-Out	8,207	2,249	6.4	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	4,776	1,309	3.7	*	*
2001-2020	-427	-117	-0.3	*	*
Year 2020 Build-Out	4,349	1,192	3.4	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 940 calls for service for Scenario 1 compared to a reduction of 117 for Scenario 2, resulting in the need for an additional 2.7 sworn officers in Scenario 1 and a reduction of 0.3 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget.

Service Area Data: Fraser Township

	Population	Developed Acres

2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 9C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 9C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Fraser Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,776	3,677	*	*
2001 - 2020	3,431	2,641	*	*
Year 2020 Build-Out	8,207	6,318	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,776	3,677	*	*
2001-2020	-427	-329	*	*
Year 2020 Build-Out	4,349	3,348	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 2,641 square feet for Scenario 1 compared to a reduction of 329 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 9D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 9D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Fraser Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	4,776	25,571	*	*
2001 - 2020	3,431	18,370	*	*
Year 2020 Build-Out	8,207	43,941	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	4,776	25,571	*	*
2001-2020	-427	-2,286	*	*
Year 2020 Build-Out	4,349	23,285	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 18,370 collection items for Scenario 1 compared to a reduction of 2,286 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $4,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads. The Road Commission also maintains 202 miles of state highways within the County. There are 56.5 miles of local roads in Fraser Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Fraser Township

	Population	Developed Acres
2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

As stated above, the local road system within Fraser Township totals of 56.5 miles. This equates to 16.7 mil9s per 1,000 population and 11.8 miles per 1,000 developed acres. Column 3 of Table 8E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 11.8 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 9E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 11.8 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Fraser Township Developed Acres	(3) Miles Required (11.8 per 1,000 Acre)	(4) Fraser Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	4,776	56.50	56.50	0.00
2001 - 2020	3,431	40.59	0.00	-40.59
Year 2020 Build-Out	8,207	97.09	56.50	-40.59
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,776	45.50	56.50	0.00
2001-2020	-427	-5.05	0.00	5.05
Year 2020 Build-Out	4,349	51.45	56.50	5.05

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 40.59 miles of roads for Scenario 1 compared to a reduction of 5.05 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

FIRE DISTRICTS

PINCONNING/FRASER FIRE DISTRICT

Provider and Service Area

The Pinconning/Fraser Fire Department provides fire and rescue services to the City of Pinconning, Fraser Township and Pinconning Township, serving a total population of 7,369 and 8,315 developed acres. The Fire Department operates 4 primary fire and rescue vehicles out of two stations (Stations 15 and 16). During 2001, when Station 16 became operational, the Fire Department was dispatched to 838 emergency incidents.

Basis for Analysis

Source: Pinconning/Fraser Fire Department and Bay County 911 Central Dispatch

Service Area Data: Fraser Township

	Population	Developed Acres
2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

As stated above, the Fire Department was dispatched to 838 emergency incidents in the year 2001. This is an increase over prior years due to Station 16 becoming operational. This equates to 113.7 emergency incidents per 1,000 population and 100.8 per 1,000 developed acres. Column 3 of Table 9H shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 100.8 emergency incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 209.5 annual emergency incidents per apparatus (838 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 9H
PINCONNING/FRASER FIRE DISTRICT
CURRENT LOS = 100.8 EMERGENCY INCIDENTS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1) Time Frame	(2) Fraser Township Developed Acres	(3) Annual Incidents (100.8 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷209.5)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,776	481	2.30	*	*

2001 - 2020	3,431	346	1.65	*	*
Year 2020 Build-Out	8,207	827	3.95	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	4,776	481	2.30	*	*
2001 - 2020	-427	-43	-0.21	*	*
Year 2020 Build-Out	4,349	438	2.09	*	*

* See Pinconning/Fraser Fire District analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 346 annual emergency incidents and 1.65 more fire and rescue apparatus for Scenario 1 compared to a reduction of 43 annual incidents and 0.21 apparatus for Scenario 2.

Capital and Other Cost Implications

The current operating budget for the District is $96,030 or $114.59 per emergency incident. Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Fraser Township

	Population	Residential Developed Acres
2000 Base:	3,375	4,399
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165. This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 9F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 9F BAY CITY PUBLIC SCHOOLS CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Fraser Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	4,399	1,342	50.3	*	*
2001 - 2020	3,377	1,030	39.6	*	*
Year 2020 Build-Out	7,776	2,372	88.9	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	4,399	1,342	50.3	*	*
2001 - 2020	-481	-147	-5.5	*	*
Year 2020 Build-Out	3,918	1,195	44.8	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 1,030 K-12 students and 39.6 more classrooms for Scenario 1 compared to a reduction of 147 students and 5.5 classrooms for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

- Bangor Township
- Beaver Township
- Frankenlust Township
- Fraser Township
- Kawkawlin Township
- Merritt Township
- Monitor Township
- Pinconning Township
- Portsmouth Township
- Williams Township
- City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Fraser Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Fraser Township

	Population	Developed Acres
2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Fraser Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of

persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 9G shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 9G
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Fraser Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,776	0.487	*	*
2001 - 2020	3,431	0.350	*	*
Year 2020 Build-Out	8,207	0.837	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	4,776	0.487	*	*
2001 - 2020	-427	-0.044	*	*
Year 2020 Build-Out	4,349	0.443	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.350 MGD required for Scenario 1 compared to a reduction of 0.044 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

FRASER TOWNSHIP

COMMUNITY PARKS

Provider and Service Area

Fraser Township provides community parks for the Township serving a population of 3,375 and 4,776 developed acres. The community park inventory consists of 80 acres of park land.

Basis for Analysis

Source: Fraser Township

Service Area Data: Fraser Township

	Population	Developed Acres
2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	8,207
2020 Scenario 2:	3,254	4,349

Demand for Service

As shown above, the Fraser Township park system consists of 80 acres of park land. This equates to 23.7 park acres per 1,000 population and 16.8 acres per 1,000 developed acres. Column 3 of Table 9I shows the number of community park acres the two land use scenarios would require through the year 2020 (based on 16.8 acres per 1,000 developed acres). The current inventory of community park acres is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 9I COMMUNITY PARK LAND CURRENT LOS = 16.8 ACRES PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Fraser Township Developed Acres	(3) Community Park Acres (16.8 per 1,000 acres)	(4) Community Park Acres Available	(5) Surplus/ Deficiency Col 4-Col 5
Year 2000	4,776	80.00	80.00	0.00
2001 - 2020	3,431	57.47	0.00	-57.47
Year 2020 Build-Out	8,207	137.47	80.00	-57.47
SCENARIO 1: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	4,776	80.00	80.00	0.00
2001 - 2020	-427	-7.15	0.00	7.15
Year 2020 Build-Out	4,349	72.85	80.00	7.15

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 57.47 community park acres for Scenario 1 compared to a reduction of 7.15 for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

10. GARFIELD TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Garfield Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Garfield Township

	Population	Developed Acres
2000 Base:	1,775	8,003
2020 Scenario 1:	6,968	19,572
2020 Scenario 2:	1,806	8,072

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Garfield Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Garfield Township

	Population	Developed Acres
2000 Base:	1,775	8,003
2020 Scenario 1:	6,968	19,572
2020 Scenario 2:	1,806	8,072

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 10A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 10A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Garfield Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	8,003	29.9	*	*
2001 - 2020	11,569	43.3	*	*
Year 2020 Build-Out	19,572	73.2	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	8,003	29.9	*	*
2001-2020	69	0.3	*	*
Year 2020 Build-Out	8,072	30.2	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 43.3 jail beds for Scenario 1 compared to 0.3 beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Garfield Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Garfield Township

	Population	Developed Acres
2000 Base:	1,775	8,003
2020 Scenario 1:	6,968	19,572
2020 Scenario 2:	1,806	8,072

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 10B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 10B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Garfield Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	8,003	2,194	6.2	*	*
2001 - 2020	1,569	3,171	9.0	*	*
Year 2020 Build-Out	19,572	5,365	15.2	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	8,003	2,194	6.2	*	*
2001-2020	69	19	0.1	*	*
Year 2020 Build-Out	8,072	2,213	6.3	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 3,171 calls for service for Scenario 1 compared to 19 for Scenario 2, resulting in the need for an additional 9.0 sworn officers in Scenario 1 and 0.1 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Garfield Township

	Population	Developed Acres

2000 Base:	1,775	8,003
2020 Scenario 1:	6,968	19,572
2020 Scenario 2:	1,806	8,072

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 10C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 10C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Garfield Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	8,003	6,161	*	*
2001 - 2020	11,569	8,906	*	*
Year 2020 Build-Out	19,572	15,067	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	8,003	6,161	*	*
2001-2020	69	53	*	*
Year 2020 Build-Out	8,072	6,214	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 8,906 square feet for Scenario 1 compared to 53 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 10D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 10D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Garfield Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	8,003	42,848	*	*
2001 - 2020	11,569	61,940	*	*
Year 2020 Build-Out	19,572	104,788	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	8,003	42,848	*	*
2001-2020	69	369	*	*
Year 2020 Build-Out	8,072	43,217	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 61,940 collection items for Scenario 1 compared to 369 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads. The Road Commission also maintains 202 miles of state highways within the County. There are 41.59 miles of local roads in Garfield Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Garfield Township

	Population	Developed Acres
2000 Base:	1,775	8,003
2020 Scenario 1:	6,968	19,572
2020 Scenario 2:	1,806	8,072

Demand for Service

As stated above, the local road system within Garfield Township totals of 41.59 miles. This equates to 2,343 10E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 5.2 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 10E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 5.2 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Garfield Township Developed Acres	(3) Miles Required (5.2 per 1,000 Acre)	(4) Garfield Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	8,003	41.59	41.59	0.00
2001 - 2020	11,569	60.12	0.00	-60.12
Year 2020 Build-Out	19,572	101.71	41.59	-60.12
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	8,003	41.59	41.59	0.00
2001-2020	69	0.36	0.00	-0.36
Year 2020 Build-Out	8,072	41.95	41.59	-0.36

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 60.12 miles of roads for Scenario 1 compared 0.36 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Garfield Township

	Population	Residential Developed Acres
2000 Base:	1,775	7,993
2020 Scenario 1:	6,968	19,562
2020 Scenario 2:	1,806	8,062

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165. This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 10F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 10F
BAY CITY PUBLIC SCHOOLS
CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Garfield Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	7,993	2,438	91.3	*	*
2001 - 2020	11,569	3,529	132.2	*	*
Year 2020 Build-Out	19,562	5,967	223.5	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	7,993	1,438	91.3	*	*
2001 - 2020	69	21	0.8	*	*
Year 2020 Build-Out	8,062	2,459	92.1	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 3,529 K-12 students and 132.2 more classrooms for Scenario 1 compared to 21 students and 0.8 classroom for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

GARFIELD TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Garfield Township Fire Department provides fire and rescue services to Garfield Township, serving a total population of 1,775 and 8,003 developed acres. The Fire Department operates out of one station (Station 21). During 2000 and 2001 the Fire Department was dispatched to an average 127 incidents per year.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Garfield Township

	Population	Developed Acres
2000 Base:	1,775	8,003
2020 Scenario 1:	6,968	19,572
2020 Scenario 2:	1,806	8,072

Demand for Service

As stated above, the Fire Department was dispatched to an average 127 incidents per year. This equates to 71.5 annual incidents per 1,000 population and 15.9 per 1,000 developed acres. Column 3 of Table 10G shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 15.9 annual incidents per 1,000 developed acres).

TABLE 10G GARFIELD TOWNSHIP FIRE DEPARTMENT CURRENT LOS = 15.9 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Garfield Township Developed Acres	(3) Annual Incidents 15.9 per 1,000 Acres)
Year 2000	8,003	127
2001 - 2020	11,569	184
Year 2020 Build-Out	19,572	311
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	8,003	127
2001-2020	69	1
Year 2020 Build-Out	8,072	128

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 184 annual incidents for Scenario 1 compared to 1 for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

11. GIBSON TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Gibson Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Gibson Township

	Population	Developed Acres
2000 Base:	1,245	1,990
2020 Scenario 1:	8,723	19,160
2020 Scenario 2:	1,386	3,659

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Garfield Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Gibson Township

	Population	Developed Acres
2000 Base:	1,245	1,990
2020 Scenario 1:	8,723	19,160
2020 Scenario 2:	1,386	3,659

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 11A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 11A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Gibson Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	1,990	7.4	*	*
2001 - 2020	17,170	64.2	*	*
Year 2020 Build-Out	19,160	71.6	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	1,990	7.4	*	*
2001-2020	1,669	6.2	*	*
Year 2020 Build-Out	3,659	13.6	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 64.2 jail beds for Scenario 1 compared to 6.2 beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Gibson Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000).

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Gibson Township

	Population	Developed Acres

2000 Base:	1,245	1,990
2020 Scenario 1:	8,723	19,160
2020 Scenario 2:	1,386	3,659

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 11B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 11B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Gibson Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	1,990	545	1.5	*	*
2001 - 2020	17,170	4,706	13.3	*	*
Year 2020 Build-Out	19,160	5,251	14.8	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	1,990	545	1.5	*	*
2001-2020	1,669	457	1.3	*	*
Year 2020 Build-Out	3,659	1,002	2.8	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 4,706 calls for service for Scenario 1 compared to 457 for Scenario 2, resulting in the need for an additional 13.3 sworn officers in Scenario 1 and 1.3 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Gibson Township

	Population	Developed Acres

2000 Base:	1,245	1,990
2020 Scenario 1:	8,723	19,160
2020 Scenario 2:	1,386	3,659

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 11C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 11C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Gibson Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	1,990	1,532	*	*
2001 - 2020	17,170	13,217	*	*
Year 2020 Build-Out	19,160	14,749	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	1,990	1,532	*	*
2001-2020	1,669	1,285	*	*
Year 2020 Build-Out	3,659	2,817	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 13,217 square feet for Scenario 1 compared to 1,285 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 11D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 11D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Gibson Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	1,990	10,654	*	*
2001 - 2020	17,170	91,928	*	*
Year 2020 Build-Out	19,160	101,582	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	1,990	10,654	*	*
2001-2020	1,669	8,936	*	*
Year 2020 Build-Out	3,659	19,590	*	*

* See Bay County analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 91,928 collection items for Scenario 1 compared to 8,936 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 47.0 miles of local roads in Gibson Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Gibson Township

	Population	Developed Acres
2000 Base:	1,245	1,990
2020 Scenario 1:	8,723	19,160
2020 Scenario 2:	1,386	3,659

Demand for Service

As stated above, the local road system within Gibson Township totals of 47.0 miles. This equates to 37.75 miles per 1,000 population and 23.6 miles per 1,000 developed acres. Column 3 of Table 11E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 23.6 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 11E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 23.6 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Gibson Township Developed Acres	(3) Miles Required (23.6 per 1,000 Acre)	(4) Gibson Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	1,990	47.00	47.00	0.00
2001 - 2020	17,170	405.52	0.00	-405.52
Year 2020 Build-Out	19,160	452.52	47.00	-405.52
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	1,990	47.00	47.00	0.00
2001-2020	1,669	39.42	0.00	-39.42
Year 2020 Build-Out	3,659	86.42	47.00	-39.42

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 405.52 miles of roads for Scenario 1 compared 39.42 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

GIBSON TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Gibson Township Fire Department provides fire and rescue services to Gibson Township, serving a total population of 1,245 and 1,990 developed acres. The Fire Department operates out of one station (Station 24). During 2000 and 2001 the Fire Department was dispatched to an average 49 incidents per year.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Gibson Township

	Population	Developed Acres
2000 Base:	1,245	1,990
2020 Scenario 1:	8,723	19,160
2020 Scenario 2:	1,386	3,659

Demand for Service

As stated above, the Fire Department was dispatched to an average 49 incidents per year. This equates to 39.3 annual incidents per 1,000 population and 24.6 per 1,000 developed acres. Column 3 of Table 11F shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 24.6 annual incidents per 1,000 developed acres).

TABLE 11F GIBSON TOWNSHIP FIRE DEPARTMENT CURRENT LOS = 24.6 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Gibson Township Developed Acres	(3) Annual Incidents 24.6 per 1,000 Acres)
Year 2000	1,990	49
2001 - 2020	17,170	422
Year 2020 Build-Out	19,160	471
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	1,990	49
2001-2020	1,669	41
Year 2020 Build-Out	3,659	90

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 422 annual incidents for Scenario 1 compared to 41 for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

12. HAMPTON TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Hampton Township Police and Fire Departments.

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Hampton Township

	Population	Developed Acres
2000 Base:	9,902	3,590
2020 Scenario 1:	12,445	4,162
2020 Scenario 2:	10,218	3,737

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Hampton Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating Budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate (including prisoners “boarded in” from other jurisdictions) with an average daily

population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Hampton Township

	Population	Developed Acres
2000 Base:	9,902	3,590
2020 Scenario 1:	12,445	4,162
2020 Scenario 2:	10,218	3,737

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 12A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 12A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Hampton Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	3,590	13.4	*	*
2001 - 2020	572	2.1	*	*
Year 2020 Build-Out	4,162	15.5	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,590	13.4	*	*
2001-2020	147	0.5	*	*
Year 2020 Build-Out	3,737	13.9	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 2.1 jail beds for Scenario 1 compared to 0.5 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Hampton Township

	Population	Developed Acres
2000 Base:	9,902	3,590

2020 Scenario 1:	12,445	4,162
2020 Scenario 2:	10,218	3,737

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 12B shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 12B
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Hampton Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	3,590	2,764	*	*
2001 - 2020	572	440	*	*
Year 2020 Build-Out	4,162	3,204	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,590	2,764	*	*
2001-2020	147	113	*	*
Year 2020 Build-Out	3,737	2,877	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 440 square feet for Scenario 1 compared 113 square feet for Scenario 2.

Library Collection
The Bay County Library system consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 12C shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 12C LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Hampton Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	3,590	19,221	*	*
2001 - 2020	572	3,062	*	*
Year 2020 Build-Out	4,162	22,283	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	3,590	19,221	*	*
2001-2020	147	787	*	*
Year 2020 Build-Out	3,737	20,008	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 3,062 collection items for Scenario 1 compared to 787 for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 65.07 miles of local roads in Hampton Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Hampton Township

	Population	Developed Acres
2000 Base:	9,902	3,590
2020 Scenario 1:	12,445	4,162
2020 Scenario 2:	10,218	3,737

Demand for Service

As stated above, the local road system within Hampton Township totals of 65.07 miles. This equates to 6.57 miles per 1,000 population and 18.1 miles per 1,000 developed acres. Column 3 of Table 12D shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 18.1 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 12D
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 18.1 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Hampton Township Developed Acres	(3) Miles Required (18.1 per 1,000 Acre)	(4) Hampton Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	3,590	65.07	65.07	0.00
2001 - 2020	572	10.37	0.00	-10.37
Year 2020 Build-Out	4,162	75.44	65.07	-10.37
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,590	65.07	65.07	0.00
2001-2020	572	2.66	0.00	-2.66
Year 2020 Build-Out	4,162	67.73	65.07	-2.66

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 10.37 miles of roads for Scenario 1 compared 2.66 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

ESSEXVILLE-HAMPTON PUBLIC SCHOOLS

Provider and Service Area

The Essexville-Hampton Public School District provides school instruction for grades K-12 out of 5 school sites for the City of Essexville and parts of Hampton Township

This area includes 4,270 developed acres and a total population of 13,668 (2000 Census). Approximately 14% of the total population attended Essexville-Hampton Public schools in the year 2000.

Basis for Analysis

Source: Essexville-Hampton Public Schools

Service Area Data: Hampton Township

	Population	Residential Developed Acres
2000 Base:	9,902	3,208
2020 Scenario 1:	12,445	3,693
2020 Scenario 2:	10,218	3,268

Demand for Service

The Essexville-Hampton Public School K-12 enrollment for the year 2000/01 was 1,923 This equates to 140.7 K-12 students per 1,000 population for the total population within the areas served and 527 per 1,000 developed residential acres for the total residential acres within the area served. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Projection of school enrollment assumes the same current ratio of persons/acres utilizing the school system through the year 2020 as is currently using the school district.

Column 3 of Table 12E shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 527 K-12 students per 1,000 developed residential acres). In Column 4 the current capacity (student stations) of the school system is shown. According to the School District it is currently at full capacity. The surplus or deficiency of capacity (student stations) to serve the additional development is calculated in Column 5.

TABLE 12E ESSEXVILLE-HAMPTON PUBLIC SCHOOLS CURRENT LOS: 527 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Hampton Township Developed Residential Acres	(3) Annual K-12 Enrollment At 0.527 Students Per Residential Acre	(4) K-12 Enrollment Capacity (students)	(5) Surplus Deficiency of K-12 Capacity (Col. 4 – Col. 3)
Year 2000	3,208	1,691	*	*
2001 - 2020	485	256	*	*
Year 2020 Build-Out	3,693	1,947	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,208	1,691	*	*
2001 - 2020	60	32	*	*
Year 2020 Build-Out	3,268	1,723	*	*

* See Essexville-Hampton Public Schools analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 256 K-12 students for Scenario 1 compared to 32 more students for Scenario 2.

Capital and Other Cost Implications

See Essexville-Hampton Public Schools analysis in Chapter 2.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Bangor Township account for 3.423 MGD of the daily demand. Demand data was not available for Bay City, Essexville and Hampton Township. This study assumes that the average daily demand from these 3 entities is 7.477 MGD (the difference between 10.9 MGD total average daily demand less 3.423 for Bay County).

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Hampton Township

	Population	Developed Acres
2000 Base:	9,902	3,590
2020 Scenario 1:	12,445	4,162
2020 Scenario 2:	10,218	3,737

Demand for Service

As stated above, the average daily demand for Bay City, Essexville and Hampton Township is calculated at 7.477 MGD. This equates to 838 GPD (gallons per day) per developed acre or 148.1 gallons per day per capita for the total developed acres and population of the Hampton Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 12F shows the MGD the two land use scenarios would require through the year 2020 (based on 838 GPD per developed acre). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 12F
BAY METROPOLITAN WATER
CURRENT LOS = 838 GPD PER DEVELOPED ACRE

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2) Hampton	(3)	(4)	(5)

Time Frame	Township Developed Acres	MGD Required (838 GPD per Acre)	MGD Available	Surplus/ Deficiency (Col 4-Col 3)
Year 2000	3,590	3.008	*	*
2001 - 2020	572	0.479	*	*
Year 2020 Build-Out	4,162	3.487	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	3,590	3.008	*	*
2001 - 2020	147	0.123	*	*
Year 2020 Build-Out	3,737	0.131	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.479 MGD required for Scenario 1 compared to 0.123 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

HAMPTON TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Hampton Township Fire Department provides fire and rescue services to the Township, serving a total population of 9,902 and 3,590 developed acres. During 2000 and 2001 the Fire Department was dispatched to an average of 839 incidents per year out of Station 8.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Hampton Township

	Population	Developed Acres
2000 Base:	9,902	3,590
2020 Scenario 1:	12,445	4,162
2020 Scenario 2:	10,218	3,737

Demand for Service

As stated above, the Fire Department is dispatched to an average 839 annual incidents. This equates to 84.7 incidents per 1,000 population and 233.6 per 1,000 developed

acres. Column 3 of Table 12G shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 233.6 incidents per 1,000 developed acres).

TABLE 12G HMAPTON TOWNSHIP FIRE DEPARTMENT CURRENT LOS = 233.6 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Hampton Township Developed Acres	(3) Annual Incidents 233.6 per 1,000 Acres)
Year 2000	3,590	839
2001 - 2020	572	134
Year 2020 Build-Out	4,162	973
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	3,590	839
2001-2020	147	34
Year 2020 Build-Out	3,737	873

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 134 annual incidents for Scenario 1 compared to 34 annual incidents for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

LAW ENFORCEMENT

Provider and Service Area

The Hampton Township Police Department is the primary law enforcement provider for the Township. The primary service area includes 3,590 developed acres and a population of 9,902. The Police Department provides law enforcement services with 9 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center and Bay County 911 Central Dispatch

Service Area Data: Hampton Township

	Population	Developed Acres
2000 Base:	9,902	3,590
2020 Scenario 1:	12,445	4,162
2020 Scenario 2:	10,218	3,737

Demand for Service

During the years 2000 and 2001 the Hampton Township Police Department responded to an average 5,108 annual emergency calls for service that were dispatched from Bay County 911 Central Dispatch. This equates to 515.8 calls for service per 1,000 population and 1,422.8 per 1,000 developed acres. Column 3 of Table 12H shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 1,422.8 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 567.5 emergency calls for service per year (the current workload based on statistics provided). This number (567.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 12H LAW ENFORCEMENT: HAMPTON TOWNSHIP POLICE DEPARTMENT CURRENT LOS: 1,422.8 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Hampton Township Developed Acres	(3) Annual Dispatch Calls (1422.8 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷567.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	3,590	5,108	9.0	9.0	0.0
2001 - 2020	572	814	1.4	0.0	-1.4
Year 2020 Build-Out	4,162	5,922	10.4	9.0	-1.4
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	3,590	5,108	9.0	9.0	0.0
2001-2020	147	209	0.4	0.0	-0.4
Year 2020 Build-Out	3,737	5,317	9.4	9.0	-0.4

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 814 calls for service for service and 1.4 sworn officers for Scenario 1 compared to 209 calls for service and 0.4 sworn officers for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

13. KAWKAWLIN TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Kawkawlin Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Kawkawlin Township

	Population	Developed Acres
2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Kawkawlin Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating Budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Kawkawlin Township

	Population	Developed Acres
2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 13A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 13A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Kawkawlin Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	3,575	13.4	*	*
2001 - 2020	6,610	24.7	*	*
Year 2020 Build-Out	10,185	38.1	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,575	13.4	*	*
2001-2020	140	0.5	*	*
Year 2020 Build-Out	3,715	13.9	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 24.7 jail beds for Scenario 1 compared to 0.5 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Kawkawlin Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Kawkawlin Township

	Population	Developed Acres

2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 13B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 13B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Kawkawlin Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	3,575	980	2.8	*	*
2001 - 2020	6,610	1,812	5.1	*	*
Year 2020 Build-Out	10,185	2,792	7.9	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	3,575	980	2.8	*	*
2001-2020	140	38	0.1	*	*
Year 2020 Build-Out	3,715	1,018	2.9	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 1,812 calls for service for Scenario 1 compared to 38 for Scenario 2, resulting in the need for an additional 5.1 sworn officers in Scenario 1 and 0.1 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Kawkawlin Township

	Population	Developed Acres

2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 13C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 13C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Kawkawlin Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	3,575	2,752	*	*
2001 - 2020	6,610	5,088	*	*
Year 2020 Build-Out	10,185	7,840	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,575	2,752	*	*
2001-2020	140	108	*	*
Year 2020 Build-Out	3,715	2,860	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 5,088 square feet for Scenario 1 compared to a 108 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 13D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 13D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Kawkawlin Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	3,575	19,141	*	*
2001 - 2020	6,610	35,390	*	*
Year 2020 Build-Out	10,185	54,531	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	3,575	19,141	*	*
2001-2020	140	750	*	*
Year 2020 Build-Out	3,715	19,891	*	*

* See Bay County analysis in Chapter 2

.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 35,390 collection items for Scenario 1 compared to 750 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $#,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads. The Road Commission also maintains 202 miles of state highways within the County. There are 50.81 miles of local roads in Kawkawlin Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Kawkawlin Township

	Population	Developed Acres
2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

As stated above, the local road system within Kawkawlin Township totals of 50.81 miles. This equates to 9.95 miles per 1,000 population and 14.2 miles per 1,000 developed acres. Column 3 of Table 13E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 14.2 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 13E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 14.2 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Kawkawlin Township Developed Acres	(3) Miles Required (14.2 per 1,000 Acre)	(4) Kawkawlin Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	3,575	50.81	50.81	0.00
2001 - 2020	6,610	93.95	0.00	-93.95
Year 2020 Build-Out	10,185	144.76	50.81	-93.95
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,575	50.81	50.81	0.00
2001-2020	140	1.99	0.00	-1.99
Year 2020 Build-Out	3,715	52.80	50.81	-1.99

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 93.95 miles of roads for Scenario 1 compared to 1.99 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Kawkawlin Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Kawkawlin Township

	Population	Residential Developed Acres
2000 Base:	5,104	3,220
2020 Scenario 1	19,099	9,791
2020 Scenario 2:	5,320	3,321

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165. This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 13F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 13F
BAY CITY PUBLIC SCHOOLS
CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Kawkawlin Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	3,220	982	36.8	*	*
2001 - 2020	6,571	2,004	75.0	*	*
Year 2020 Build-Out	9,791	2,986	11.8	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	3,220	3,220	36.8	*	*
2001 - 2020	101	101	1.2	*	*
Year 2020 Build-Out	3,321	3,321	38.0	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 2,004 K-12 students and 75.0 more classrooms for Scenario 1 compared to a 31 students and 1.2 classroom for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

SEWER

WEST COUNTY WASTEWATER TREATMENT PLANT

Provider and Service Area

The Bay County Department of Water and Sewer operates the West County Wastewater Sewer Treatment Plant providing wastewater treatment for the following areas in Bay County which include a total population of 39,721 and 20,011 developed acres:

Auburn	Kawkawlin Township
Bangor Township	Monitor Township
Kawkawlin Township	Williams Township

The wastewater treatment plant has a design capacity of 10.25 MGD (million gallons per day) and an average daily demand of 4.11 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Kawkawlin Township

	Population	Developed Acres
2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

As stated above, the average daily flow for the areas served for the 2 year period 2000-2001 was 4.11 MGD. The daily demand varies from user to user. The average daily flow for Kawkawlin Township for 2000 and 2001 has been 0.12 MGD. This equates to 22.6 GPD (gallons per day) per capita for the total population within Kawkawlin Township and 32 GPD per developed acre for all developed acres within Kawkawlin Township. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within Kawkawlin Township. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 13G shows the MGD the two land use scenarios would require through the year 2020 (based on 32 GPD per developed acre). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 13G WEST BAY COUNTY WASTEWATER TREATMENT PLANT CURRENT LOS = 32 GPD PER DEVELOPED ACRE				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Kawkawlin Township Developed Acres	(3) MGD Required (32 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	3,575	0.12	*	*
2001 - 2020	6,610	0.21	*	*
Year 2020 Build-Out	10,185	0.33	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	3,575	0.12	*	*
2001 - 2020	140	0.00	*	*
Year 2020 Build-Out	3,715	0.12	*	*

* See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.21 MGD required for Scenario 1 compared to 0.00 MGD for Scenario 2.

Capital and Other Cost Implications

See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township	Monitor Township
Beaver Township	Pinconning Township
Kawkawlin Township	Portsmouth Township
Fraser Township	Williams Township
Kawkawlin Township	City of Pinconning
Merritt Township	

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Kawkawlin Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Kawkawlin Township

	Population	Developed Acres
2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Kawkawlin Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of

persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 13H shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 13H
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

SCENARIO 1: Build-out Analysis Scenario D				
(1)	(2)	(3)	(4)	(5)
Time Frame	Kawkawlin Township Developed Acres	MGD Required (102 GPD per Acre)	MGD Available	Surplus/ Deficiency (Col 4-Col 3)
Year 2000	3,575	0.365	*	*
2001 - 2020	6,610	0.674	*	*
Year 2020 Build-Out	10,185	1.039	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	3,575	0.365	*	*
2001 - 2020	140	0.014	*	*
Year 2020 Build-Out	3,715	0.379	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.365 MGD required for Scenario 1 compared to a 0.014 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

KAWKAWLIN TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Kawkawlin Township Fire Department provides fire and rescue services to Kawkawlin Township, serving a total population of 2,530 and 2,722 developed acres.

The Fire Department operates out of one station (Station 20). During 2000 and 2001 the Fire Department was dispatched to an average 368 incidents per year.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Kawkawlin Township

	Population	Developed Acres
2000 Base:	5,104	3,575
2020 Scenario 1	19,099	10,185
2020 Scenario 2:	5,320	3,715

Demand for Service

As stated above, the Fire Department was dispatched to an average 368 incidents per year. This equates to 72.1 annual incidents per 1,000 population and 102.1 per 1,000 developed acres. Column 3 of Table 13I shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 102.1 annual incidents per 1,000 developed acres).

TABLE 13I KAWKAWLIN TOWNSHIP FIRE DEPARTMENT CURRENT LOS = 102.1 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Kawkawlin Township Developed Acres	(3) Annual Incidents 102.1 per 1,000 Acres)
Year 2000	3,575	368
2001 - 2020	6,610	680
Year 2020 Build-Out	10,185	1,048
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	3,575	368
2001-2020	140	14
Year 2020 Build-Out	3,715	382

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 680 annual incidents for Scenario 1 compared to 14 annual incidents for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

14. MERRITT TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Merritt Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Merritt Township

	Population	Developed Acres
2000 Base:	1,510	801
2020 Scenario 1:	3,080	2,784
2020 Scenario 2:	1,515	807

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Merritt Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Merritt Township

	Population	Developed Acres
2000 Base:	1,510	801
2020 Scenario 1:	3,080	2,784
2020 Scenario 2:	1,515	807

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 14A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 14A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Merritt Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	801	3.0	*	*
2001 - 2020	1,983	7.4	*	*
Year 2020 Build-Out	2,784	10.4	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	801	3.0	*	*
2001-2020	6	0.0	*	*
Year 2020 Build-Out	807	3.0	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 7.4 jail beds for Scenario 1 compared to 0.0 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Merritt Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Merritt Township

	Population	Developed Acres
2000 Base:	1,510	801
2020 Scenario 1:	3,080	2,784
2020 Scenario 2:	1,515	807

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 14B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 14B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Merritt Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	801	220	0.6	*	*
2001 - 2020	1,983	544	1.5	*	*
Year 2020 Build-Out	2,784	764	2.1	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	801	220	0.6	*	*
2001-2020	6	2	0.0	*	*
Year 2020 Build-Out	807	222	0.6	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 544 calls for service for Scenario 1 compared to 2 for Scenario 2, resulting in the need for an additional 5.1 sworn officers in Scenario 1 and 0.1 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Secondary and Township Sheriff Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Merritt Township

	Population	Developed Acres

2000 Base:	1,510	801
2020 Scenario 1:	3,080	2,784
2020 Scenario 2:	1,515	807

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 14C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 14C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Merritt Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	801	617	*	*
2001 - 2020	1,983	1,527	*	*
Year 2020 Build-Out	2,784	2,144	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	801	617	*	*
2001-2020	6	5	*	*
Year 2020 Build-Out	807	622	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 1,527 square feet for Scenario 1 compared to a 5 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 14D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 14D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Merritt Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	801	4,289	*	*
2001 - 2020	1,983	10,617	*	*
Year 2020 Build-Out	2,784	14,906	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	801	4,289	*	*
2001-2020	6	32	*	*
Year 2020 Build-Out	807	4,321	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 10,617 collection items for Scenario 1 compared to 32 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $25.12 per collection item. Refer to Appendix for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 56.75 miles of local roads in Merritt Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Merritt Township

	Population	Developed Acres
2000 Base:	1,510	801
2020 Scenario 1:	3,080	2,784
2020 Scenario 2:	1,515	807

Demand for Service

As stated above, the local road system within Merritt Township totals of 56.75 miles. This equates to 37.6 miles per 1,000 population and 70.8 miles per 1,000 developed acres. Column 3 of Table 14E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 70.8 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 14E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 70.8 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Merritt Township Developed Acres	(3) Miles Required (70.8 per 1,000 Acre)	(4) Merritt Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	801	56.75	56.75	0.00
2001 - 2020	1,983	140.49	0.00	-140.49
Year 2020 Build-Out	2,784	197.28	56.75	-140.49
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	801	56.75	56.75	0.00
2001-2020	6	0.43	0.00	-0.43
Year 2020 Build-Out	807	57.18	56.75	-0.43

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 140.49 miles of roads for Scenario 1 compared to a 0.43 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Merritt Township

	Population	Residential Developed Acres
2000 Base:	1,510	773
2020 Scenario 1:	3,080	2,756
2020 Scenario 2:	1,515	779

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165. This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 14F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 14F
BAY CITY PUBLIC SCHOOLS
CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Merritt Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	773	236	8.8	*	*
2001 - 2020	1,983	605	22.6	*	*
Year 2020 Build-Out	2,756	841	31.4	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	773	236	8.8	*	*
2001 - 2020	6	2	0.0	*	*
Year 2020 Build-Out	779	238	8.8	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 605 K-12 students and 22.6 more classrooms for Scenario 1 compared to a 6 students and 0.0 additional classrooms for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

- Bangor Township
- Beaver Township
- Frankenlust Township
- Fraser Township
- Kawkawlin Township
- Merritt Township
- Monitor Township
- Pinconning Township
- Portsmouth Township
- Williams Township
- City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Merritt Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Merritt Township

	Population	Developed Acres
2000 Base:	1,510	801
2020 Scenario 1:	3,080	2,784
2020 Scenario 2:	1,515	807

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Merritt Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 14G shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 14G
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Merritt Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	801	0.082	*	*
2001 - 2020	1,983	0.202	*	*
Year 2020 Build-Out	2,784	0.284	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	801	0.082	*	*
2001 - 2020	6	0.001	*	*
Year 2020 Build-Out	807	0.083	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.202 MGD required for Scenario 1 compared to a 0.001 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

MERRITT TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Merritt Township Fire Department provides fire and rescue services to Merritt Township, serving a total population of 2,530 and 2,722 developed acres. The Fire Department operates out of one station (Station 22). During 2000 and 2001 the Fire Department was dispatched to an average 63 incidents per year.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Merritt Township

	Population	Developed Acres
2000 Base:	1,510	801
2020 Scenario 1:	3,080	2,784
2020 Scenario 2:	1,515	807

Demand for Service

As stated above, the Fire Department was dispatched to an average 63 incidents per year. This equates to 41.7 annual incidents per 1,000 population and 78.7 per 1,000 developed acres. Column 3 of Table 14H shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 78.7 annual incidents per 1,000 developed acres).

TABLE 14H MERRITT TOWNSHIP FIRE DEPARTMENT CURRENT LOS = 78.7 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Merritt Township Developed Acres	(3) Annual Incidents 78.7 per 1,000 Acres)
Year 2000	801	63
2001 - 2020	1,983	145
Year 2020 Build-Out	2,784	219
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	801	63
2001-2020	6	0
Year 2020 Build-Out	807	63

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 145 annual incidents for Scenario 1 compared to 0 annual incidents for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

15. MONITOR TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Monitor Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Monitor Township

	Population	Developed Acres
2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Monitor Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Monitor Township

	Population	Developed Acres
2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 15A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 15A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Monitor Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	5,015	18.8	*	*
2001 - 2020	2,632	9.8	*	*
Year 2020 Build-Out	7,647	28.6	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	5,015	18.8	*	*
2001-2020	596	2.2	*	*
Year 2020 Build-Out	5,611	21.0	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 9.8 jail beds for Scenario 1 compared to 2.2 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Monitor Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Monitor Township

	Population	Developed Acres
2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 15B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 15B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Monitor Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	5,015	1,375	3.9	*	*
2001 - 2020	2,632	721	2.0	*	*
Year 2020 Build-Out	7,647	2,096	5.9	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	5,015	1,375	3.9	*	*
2001-2020	596	163	0.5	*	*
Year 2020 Build-Out	5,611	1,538	4.4	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 721 calls for service for Scenario 1 compared to 163 for Scenario 2, resulting in the need for an additional 2.0 sworn officers in Scenario 1 and 0.5 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Monitor Township

	Population	Developed Acres

2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 15C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 15C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Monitor Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	5,015	3,861	*	*
2001 - 2020	2,632	2,026	*	*
Year 2020 Build-Out	7,647	5,887	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	5,015	3,861	*	*
2001-2020	596	459	*	*
Year 2020 Build-Out	5,611	4,320	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 2,026 square feet for Scenario 1 compared to a 459 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 15D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 15D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Monitor Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	5,015	26,850	*	*
2001 - 2020	2,632	14,092	*	*
Year 2020 Build-Out	7,647	40,942	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	5,015	26,850	*	*
2001-2020	596	3,191	*	*
Year 2020 Build-Out	5,611	30,041	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 14,092 collection items for Scenario 1 compared to 3,191 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 54.04 miles of local roads in Monitor Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Monitor Township

	Population	Developed Acres
2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

As stated above, the local road system within Monitor Township totals of 54.04 miles. This equates to 5.4 miles per 1,000 population and 10.8 miles per 1,000 developed acres. Column 3 of Table 15E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 10.8 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 15E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 14.2 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Monitor Township Developed Acres	(3) Miles Required (10.8 per 1,000 Acre)	(4) Monitor Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	5,015	54.04	54.04	0.00
2001 - 2020	2,632	28.36	0.00	-28.36
Year 2020 Build-Out	7,647	82.40	54.04	-28.36
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	5,015	54.04	54.04	0.00
2001-2020	596	6.42	0.00	-6.42
Year 2020 Build-Out	5,611	60.46	54.04	-6.42

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 28.36 miles of roads for Scenario 1 compared to a 6.42 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Monitor Township

	Population	Residential Developed Acres
2000 Base:	10,037	4,039
2020 Scenario 1:	12,022	6,656
2020 Scenario 2:	10.478	4,620

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165 This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 15F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 15F BAY CITY PUBLIC SCHOOLS CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Monitor Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	4,039	1,232	46.1	*	*
2001 - 2020	2,617	798	29.9	*	*
Year 2020 Build-Out	6,656	2,030	76.0	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	4,039	1,232	46.1	*	*
2001 - 2020	581	177	6.6	*	*
Year 2020 Build-Out	4,620	1,409	52.7	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 798 K-12 students and 29.9 more classrooms for Scenario 1 compared to a 177 students and 6.6 additional classrooms for Scenario 2.

Capital and Other Cost Implications

See Bay City Public Schools analysis in Chapter 2

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Monitor Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Monitor Township

	Population	Developed Acres
2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Monitor Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of

persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 15H shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 15H
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Monitor Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	5,015	0.512	*	*
2001 - 2020	2,632	0.268	*	*
Year 2020 Build-Out	7,647	0.780	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	5,015	0.512	*	*
2001 - 2020	596	0.061	*	*
Year 2020 Build-Out	5,611	0.573	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.268 MGD required for Scenario 1 compared to a 0.061 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

MONITOR TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Monitor Township Fire Department provides fire medical assistance and extraction services to Monitor Township, serving a total population of 10,037 and 5,015 developed acres. The Fire Department operates out of one station (Station 10) with 5 primary fire

and rescue apparatus, 4 full time fire fighters and 32 paid on-call firefighters. During 2001 the Fire department's average response time was 6.0 minutes.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Monitor Township

	Population	Developed Acres
2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

During 2000 the Fire Department was dispatched to 725 incidents. This equates to 72.2 annual incidents per 1,000 population and 144.6 per 1,000 developed acres. Column 3 of Table 15H shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 144.6 annual incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 145 annual incidents per apparatus (725 incidents divided by 5 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is shown in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6.
Note: the analysis is based in primary response apparatus and does not include reserves.

TABLE 15I
MONITOR TOWNSHIP FIRE DEPARTMENT
CURRENT LOS = 144.6 ANNUAL INCIDENTS PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Monitor Township Developed Acres	(3) Annual Incidents (144.6 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷145)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D					
Year 2000	5,015	725	5.0	5.0	0.0
2001 - 2020	2,632	381	2.6	0.0	-2.6
Year 2020 Build-Out	7,647	1,106	7.6	5.0	-2.6
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	5,015	725	5.0	5.0	0.0
2001 - 2020	596	86	0.6	0.0	-0.6
Year 2020 Build-Out	5,611	811	5.6	5.0	-0.6

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles.

The result of the analysis shows an additional 381 annual incidents and 2.6 apparatus for Scenario 1 compared to 86 additional annual incidents and 0.6 apparatus for Scenario 2.

Capital and Other Cost Implications

The current (2002) operating budget for the Fire Department is $433,848 or $598.41 per emergency incident. Refer to Appendix A for capital cost information.

PARKS

Provider and Service Area

Monitor Township provides park land for the Township serving a population of 10,037 and 5,015 developed acres. The park inventory consists of 22.49 acres of park land at 2 sites:(Monitor Township Park = 21.25 acres and Stelb Park = 1.24 acres.

Basis for Analysis

Source: Monitor Township

Service Area Data: Monitor Township

	Population	Developed Acres
2000 Base:	10,037	5,015
2020 Scenario 1:	12,022	7,647
2020 Scenario 2:	10.478	5,611

Demand for Service

As shown above, the Monitor Township park system consists of 22.49 acres of park land. This equates to 2.24 park acres per 1,000 population and 4.48 acres per 1,000 developed acres. Column 3 of Table 15J shows the number of park acres the two land use scenarios would require through the year 2020 (based on 16.5 acres per 1,000 developed acres). The current inventory of park acres is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 15J COMMUNITY PARK LAND CURRENT LOS = 4.48 ACRES PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Monitor Township Developed Acres	(3) Park Acres (4.48 per 1,000 acres)	(4) Park Acres Available	(5) Surplus/ Deficiency Col 4-Col 5
Year 2000	5,015	22.49	22.49	0.00
2001 - 2020	2,632	11.80	0.00	-11.80
Year 2020 Build-Out	7,647	34.29	22.49	-11.80
SCENARIO 1: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	5,015	22.49	22.49	0.00
2001 - 2020	596	2.67	0.00	-2.67
Year 2020 Build-Out	5,611	25.16	22.49	-2.67

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 11.8 park acres for Scenario 1 compared to 2.67 for Scenario 2.

Capital and Other Cost Implications

The current (2002) budget for the parks totals $43,877 of which $20,000 is for capital improvements and $23,877 is for operations and maintenance. The operations and maintenance portion of the budget equals $1,061.67 per park acre. Refer to Appendix A for capital cost information.

16. MT. FOREST TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Mt. Forest Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Mt. Forest Township

	Population	Developed Acres
2000 Base:	1,405	4,504
2020 Scenario 1:	7,355	18,131
2020 Scenario 2:	1,385	4,640

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Mt. Forest Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 216 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Mt. Forest Township

	Population	Developed Acres
2000 Base:	1,405	4,504
2020 Scenario 1:	7,355	18,131
2020 Scenario 2:	1,385	4,640

Demand for Service

As stated above the Jail's State certified capacity is 216 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 16A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 16A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Mt. Forest Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	4,504	16.8	*	*
2001 - 2020	13,627	51.0	*	*
Year 2020 Build-Out	18,131	67.8	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,504	16.8	*	*
2001-2020	136	0.5	*	*
Year 2020 Build-Out	4,640	17.3	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 51.0 jail beds for Scenario 1 compared to 0.5 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Mt. Forest Township. The Sheriff's primary service area for law enforcement area includes 47,716 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Mt. Forest Township

	Population	Developed Acres

2000 Base:	1,405	4,504
2020 Scenario 1:	7,355	18,131
2020 Scenario 2:	1,385	4,640

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 16B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 16B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Mt. Forest Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,504	1,235	3.5	*	*
2001 - 2020	13,627	3,735	10.6	*	*
Year 2020 Build-Out	18,131	4,970	14.1	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	4,504	1,235	3.5	*	*
2001-2020	136	37	0.1	*	*
Year 2020 Build-Out	4,640	1,272	3.6	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 3,735 calls for service for Scenario 1 compared to 37 for Scenario 2, resulting in the need for an additional 10.6 sworn officers in Scenario 1 and 0.1 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Mt. Forest Township

	Population	Developed Acres

2000 Base:	1,405	4,504
2020 Scenario 1:	7,355	18,131
2020 Scenario 2:	1,385	4,640

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 16C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 16C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Mt. Forest Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,504	3,467	*	*
2001 - 2020	13,627	10,490	*	*
Year 2020 Build-Out	18,131	13,957	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,504	3,467	*	*
2001-2020	136	105	*	*
Year 2020 Build-Out	4,640	3,572	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 10,490 square feet for Scenario 1 compared to a 105 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 16D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 16D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Mt. Forest Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	4,504	24,114	*	*
2001 - 2020	13,627	72,959	*	*
Year 2020 Build-Out	18,131	97,073	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	4,504	24,114	*	*
2001-2020	136	728	*	*
Year 2020 Build-Out	4,640	24,842	*	*

* See Bay County analysis in Chapter 2

.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 72,959 collection items for Scenario 1 compared to 728 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 16% (163 miles) are gravel surface roads and 85% (870 miles) are paved roads. The Road Commission also maintains 202 miles of state highways within the County. There are 41.85 miles of local roads in Mt. Forest Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Mt. Forest Township

	Population	Developed Acres
2000 Base:	1,405	4,504
2020 Scenario 1:	7,355	18,131
2020 Scenario 2:	1,385	4,640

Demand for Service

As stated above, the local road system within Mt. Forest Township totals of 41.85 miles. This equates to 29.8 miles per 1,000 population and 9.3 miles per 1,000 developed acres. Column 3 of Table 16E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 9.3 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 16E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 9.3 MILES PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-Out analysis Scenario D				
(1)	(2)	(3)	(4)	(5)
Time Frame	Mt. Forest Township Developed Acres	Miles Required (9.3 per 1,000 Acre)	Mt. Forest Township Miles Available	Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	4,504	41.85	41.85	0.00
2001 - 2020	13,627	126.62	0.00	-126.62
Year 2020 Build-Out	18,131	168.47	41.85	-126.62
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,504	41.85	41.85	0.00
2001-2020	136	1.26	0.00	-1.26
Year 2020 Build-Out	4,640	43.11	41.85	-1.26

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 126.62 miles of roads for Scenario 1 compared to 1.26 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

MT. FOREST TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Mt. Forest Township Fire Department provides fire and rescue services to Mt. Forest Township, serving a total population of 1,405 and 4,504 developed acres. The Fire Department operates out of one station (Station 23).

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Mt. Forest Township

	Population	Developed Acres
2000 Base:	1,405	4,504
2020 Scenario 1:	7,355	18,131
2020 Scenario 2:	1,385	4,640

Demand for Service

During 2000 and 2001 the Fire Department was dispatched to an average 95 annual incidents. This equates to 67.6 annual incidents per 1,000 population and 21.2 per 1,000 developed acres. Column 3 of Table 16H shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 21.2 annual incidents per 1,000 developed acres

TABLE 16H MT. FOREST TOWNSHIP FIRE DEPARTMENT CURRENT LOS = 21.2 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Mt. Forest Township Developed Acres	(3) Annual Incidents 21.2 per 1,000 Acres)
Year 2000	4,504	95
2001 - 2020	13,627	289
Year 2020 Build-Out	18,131	384
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	4,504	95
2001-2020	136	3
Year 2020 Build-Out	4,640	98

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 289 annual incidents for Scenario 1 compared to 3 for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

17. CITY OF PINCONNING
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

Note: City of Pinconning was not included in the Bay County Build-out Assessment. For the purpose of the analysis in this report no forecast of additional development is included in Scenario 1. The forecast of development in Scenario 2 is based on MDOT population projections. The Scenario 2 projection of developed acres includes both residential and non-residential development and assumes that the ratio of residential to non-residential developed acres will be the same in the year 2020 as it was in the base year (i.e., 2000).

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Pinconning Police Department and Pinconning/Fraser Fire Department.

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Pinconning. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002 operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate (including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 17A shows the number of additional jail beds the two City of Pinconning land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 17A
BAY COUNTY JAIL
CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES

(1)	(2)	(3)	(4)	(5)
Time Frame	Pinconning Developed Acres	Jail Beds Required (3.7 per 1,000 Acre)	Jail Beds Available	Surplus/ Deficiency Col 4-Col 3
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	468	1.8	*	*
2001 - 2020	0	0.0	*	*
Year 2020 Build-Out	468	1.8	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	468	1.8	*	*
2001-2020	28	0.1	*	*
Year 2020 Build-Out	496	1.9	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 0.1 jail beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1: *	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

Library Buildings:

The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 17B shows the number of building square feet the two City of Pinconning land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 17B LIBRARY BUILDINGS CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES
SCENARIO 1: Build-out Analysis Scenario D

(1) Time Frame	(2) Pinconning Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	468	360	*	*
2001 - 2020	0	0	*	*
Year 2020 Build-Out	468	360	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	468	360	*	*
2001-2020	28	22	*	*
Year 2020 Build-Out	496	382	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 22 square feet for Scenario 2.

Library Collection

The Bay County Library system consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 17C shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 17C
LIBRARY COLLECTION
CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Pinconning Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	468	2,506	*	*
2001 - 2020	0	0	*	*
Year 2020 Build-Out	468	2,506	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	468	2,506	*	*
2001-2020	28	150	*	*
Year 2020 Build-Out	496	2,656	*	*

* See Bay County analysis in Chapter 2

.
The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 150 collection items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

FIRE DISTRICTS

PINCONNING/FRASER FIRE DISTRICT

Provider and Service Area

The Pinconning/Fraser Fire Department provides fire and rescue services to the City of Pinconning, Fraser Township and Pinconning Township, serving a total population of 7,369 and 8,315 developed acres. The Fire Department operates 4 primary fire and rescue vehicles out of two stations (Stations 15 and 16). During 2001, when Station 16 became operational, the Fire Department was dispatched to 838 emergency incident.

Basis for Analysis

Source: Pinconning/Fraser Fire Department and Bay County 911 Central Dispatch

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

As stated above, the Fire Department was dispatched to 838 emergency incidents in the year 2001. This is an increase over prior years due to Station 16 becoming operational. This equates to 113.7 emergency incidents per 1,000 population and 100.8 per 1,000 developed acres. Column 3 of Table 17D shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 100.8 emergency incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 209.5 annual emergency incidents per apparatus (838 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is

calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 17D PINCONNING/FRASER FIRE DISTRICT CURRENT LOS = 100.8 EMERGENCY INCIDENTS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) City of Pinconning Developed Acres	(3) Annual Incidents (100.8 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷209.5)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	468	47	0.22	*	*
2001 - 2020	0	0	0.00	*	*
Year 2020 Build-Out	468	47	0.22	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	468	47	0.22	*	*
2001 - 2020	28	3	0.01	*	*
Year 2020 Build-Out	496	50	0.24	*	*

* See Pinconning/Fraser Fire District analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 0 annual emergency incidents and 0.0 more fire and rescue apparatus for Scenario 1 compared to a 3 additional annual incidents and 0.01 apparatus for Scenario 2.

Capital and Other Cost Implications

The current operating budget for the District is $96,030 or $114.59 per emergency incident. Refer to Appendix A for capital cost information.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

Bangor Township
Beaver Township
Frankenlust Township
Fraser Township
Kawkawlin Township
Merritt Township
Monitor Township
Pinconning Township
Portsmouth Township
Williams Township
City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Fraser Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of the City of Pinconning. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 17E shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 17E
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

SCENARIO 1: Build-out Analysis Scenario D				
(1)	(2)	(3)	(4)	(5)
Time Frame	City of Pinconning Developed Acres	MGD Required (102 GPD per Acre)	MGD Available	Surplus/ Deficiency (Col 4-Col 3)
Year 2000	468	0.048	*	*
2001 - 2020	0	0.000	*	*
Year 2020 Build-Out	468	0.048	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	468	0.048	*	*
2001 - 2020	28	0.003	*	*
Year 2020 Build-Out	496	0.051	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.003 MGD required for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

CITY OF PINCONNING

LAW ENFORCEMENT

Provider and Service Area

The City of Pinconning Police Department is the primary law enforcement provider for the City of Pinconning. The primary service area consists of 468 developed acres and a population of 1,386. The Police Department provides law enforcement services with 4 sworn officers (year 2000)

Basis for Analysis

Source: City of Pinconning and Bay County 911 Central Dispatch

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

During the year 2000 the City of Pinconning Police Department responded to 4,475 call for services. These calls included 911 Central Dispatch calls, non-911 telephone calls and officer initiated responses. This equates to 3,229 calls for service per 1,000 population and 9,562 per 1,000 developed acres. Column 3 of Table 17F shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 9,562 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 1,118.75 calls for service per year (the current workload based on statistics provided. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 17F
LAW ENFORCEMENT: CITY OF PINCONNING POLICE DEPARTMENT
CURRENT LOS: 9,562 CALLS PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) City of Pinconning Developed Acres	(3) Annual Calls (9,562 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷1118.75)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D					
Year 2000	468	4,475	4.0	4.0	0.0
2001 - 2020	0	0	0.0	0.0	0.0
Year 2020 Build-Out	468	4,475	4.0	4.0	0.0
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	468	4,475	4.0	4.0	0.0
2001-2020	28	268	0.2	0.0	-0.2
Year 2020 Build-Out	496	4,743	4.0	4.0	-0.2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 0 calls for service for Scenario 1 compared to 268 for Scenario 2, resulting in the need for no additional sworn officers in Scenario 1 and 0.2 in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the City of Pinconning Police Department is $208,367 or $46,56 per call for service. Refer to Appendix A for capital cost information.

PARKS AND RECREATION

Provider and Service Area

The City of Pinconning provides community parks and recreational facilities for the City serving a population of 1,386 and 468 developed acres. The park and recreation inventory consists of 50.23 park acres. There are about 200 participants in the recreational league programs each year.

Basis for Analysis

Source: City of Pinconning

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

Park Acres

As shown above, the City of Pinconning Park system consists of 50.23 acres of park land. This equates to 144.3 park acres per 1,000 population and 107.3 acres per 1,000 developed acres. Column 3 of Table 17G shows the number of community park acres the two land use scenarios would require through the year 2020 (based on 107.3 acres per 1,000 developed acres). The current inventory of community park acres is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 17G COMMUNITY PARK LAND CURRENT LOS = 107.3 ACRES PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Pinconning Developed Acres	(3) Community Park Acres (107.3 per 1,000 acres)	(4) Community Park Acres Available	(5) Surplus/ Deficiency Col 4-Col 5
Year 2000	468	50.23	50.23	0.00
2001 - 2020	0	0.00	0.00	0.00
Year 2020 Build-Out	468	50.23	50.23	0.00
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	468	50.23	50.23	0.00
2001 - 2020	28	0.42	0.00	-0.42
Year 2020 Build-Out	496	50.65	50.23	-0.42

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.00 community park acres for Scenario 1 compared to 0.42 for Scenario 2.

Baseball Fields

The City's inventory of recreational facilities includes 2 baseball fields. This equates to 1.4 baseball fields per 1,000 population and 4.27 baseball fields per 1,000 developed acres. Column 3 of Table 17H shows the number of soccer fields the two land use scenarios would require through the year 2020 (based on 4.27 per 1,000 developed acres). The current inventory of baseball fields is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 17H BASEBALL FIELDS CURRENT LOS = 4.27 PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Pinconning Developed Acres	(3) Baseball Fields (4.27 per 1,000 acres)	(4) Baseball Fields Available	(5) Surplus/ Deficiency Col 4-Col 5
Year 2000	468	2.00	2.00	0.00
2001 - 2020	0	0.00	0.00	0.00
Year 2020 Build-Out	468	2.00	2.00	0.00
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	468	2.00	2.00	0.00
2001 - 2020	28	0.12	0.00	-0.12
Year 2020 Build-Out	496	2.12	2.00	-0.12

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.00 baseball fields for Scenario 1 compared to 0.12 for Scenario 2.

Soccer Fields

The City's inventory of recreational facilities includes 5 soccer fields. This equates to 3.6 soccer fields per 1,000 population and 10.68 soccer fields per 1,000 developed acres. Column 3 of Table 17I shows the number of soccer fields the two land use scenarios would require through the year 2020 (based on 10.68 per 1,000 developed acres). The current inventory of soccer fields is show in Column 4 and the surplus or deficiency of soccer fields to serve the additional development is calculated in Column 5.

TABLE 17I SOCCER FIELDS CURRENT LOS = 0.427 PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Pinconning Developed Acres	(3) Soccer Fields (10.68 per 1,000 acres)	(4) Soccer Fields Available	(5) Surplus/ Deficiency Col 4-Col 5
Year 2000	468	5.00	5.00	0.00
2001 - 2020	0	0.00	0.00	0.00
Year 2020 Build-Out	468	5.00	5.00	0.00
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	468	5.00	5.00	0.00
2001 - 2020	28	0.30	0.00	-0.30
Year 2020 Build-Out	496	5.30	5.00	-0.30

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.00 soccer fields for Scenario 1 compared to 0.30 for Scenario 2.

Recreation League Participants

The provides services for approximately 200 recreation league participants per year. This equates to 144.3 participants per 1,000 population and 427.4 participants per 1,000 developed acres. Column 3 of Table 17J shows the number of recreation league participants the two land use scenarios would generate through the year 2020 (based on 427.4 per 1,000 developed acres.

TABLE 17J CITY OF PINCONNING RECREATION LEAGUE PARTICIPANTS CURRENT LOS = 427.4 PER 1,000 DEVELOPED ACRES		
SCENARIO 1: Build-out Analysis Scenario D		
(1) Time Frame	(2) Developed Acres	(3) Recreation League Participants (0.4274 per acre)
Year 2000	468	200.0
2001 - 2020	0	0.0
Year 2020 Build-Out	468	200.0
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections		
Year 2000	468	200.0
2001 - 2020	28	12.0
Year 2020 Build-Out	496	212.0

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.00 additional participants for Scenario 1 compared to 28 for Scenario 2.

Capital and Other Cost Implications

The City of Pinconning maintains the parks. Other groups or organizations operate the recreation programs. The City parks and recreation budget for 2003 is $48,385 or $963.27 per park acre. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

The City of Pinconning road network consists of 9.15 miles including 3.96 miles of major streets and 5.19 miles of local streets.

Basis for Analysis

Source: City of Pinconning

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

As stated above, the road network within the City of Pinconning totals of 9.15 miles. This equates to 6.6 miles per 1,000 population and 19.5 miles per 1,000 developed acres. Column 3 of Table 17K shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 19.5 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 17K
CITY OFF PINCONNING LOCAL ROADS
CURRENT LOS = 19.5 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) City of Pinconning Developed Acres	(3) Miles Required (19.5 per 1,000 Acre)	(4) City of Pinconning Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	468	9.15	9.15	0.00
2001 - 2020	0	0.00	0.00	0.00
Year 2020 Build-Out	468	9.15	9.15	0.00
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	468	9.15	9.15	0.00
2001-2020	28	0.55	0.00	-0.55
Year 2020 Build-Out	496	9.70	9.15	-0.55

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 0.00 miles of roads for Scenario 1 compared to a 0.55 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SEWER

Provider and Service Area

The City of Pinconning provides sanitary sewer service for the City of Pinconning

The wastewater system consists of a wastewater treatment plant with a design capacity of 0.50 MGD (million gallons per day), approximately 8 miles of sanitary sewer lines and 3 lift stations.

Basis for Analysis

Source: City of Pinconning

Service Area Data: Pinconning

	Population	Developed Acres
2000 Base:	1,386	468
2020 Scenario 1:	1,386	468
2020 Scenario 2:	1,468	496

Demand for Service

The average daily flow to the City of Pinconning wastewater treatment plant is 0.30 MGD. This equates to 216.5 GPD (gallons per day) per capita for the total population within the City of Pinconning and 641 GPD per developed acre for all developed acres. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within the City. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 17L shows the MGD the two land use scenarios would require through the year 2020 (based on 641 GPD per developed acre). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 17L
CITY OF PINCONNING WASTEWATER TREATMENT PLANT
CURRENT LOS = 641 GPD PER DEVELOPED ACRE

SCENARIO 1: Build-out Analysis Scenario D

(1) Time Frame	(2) City of Pinconning Developed Acres	(3) MGD Required (641 per (1,000 Acres)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	468	0.30	0.50	0.20

2001 - 2020	0	0.00	0.00	0.00
Year 2020 Build-Out	468	0.30	0.50	0.20
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	468	0.30	0.50	0.20
2001 - 2020	28	0.02	0.00	-0.02
Year 2020 Build-Out	496	0.32	0.50	0.18

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.00 MGD required for Scenario 1 compared to 0.02 MGD for Scenario 2.

Capital and Other Cost Implications

As shown in Column 5 of the preceding table there is a surplus of capacity that can provide service to future development for both scenarios (Scenario 1 = 0.20 MGD surplus and Scenario 2 = 0.18 MGD surplus) therefore capital costs for plant capacity expansion is not needed for the area currently served (plant upgrades may be needed in the future for other non-capacity issues).

Operating costs are funded with charges for services and permit fees. This study assumes that the rate structure is designed based on demand and therefore cost, and any adjustments would be made to reflect future demand. The 2002/2003 operating budget for the Sewer Department is $234,740.

18. PINCONNING TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Pinconning/Fraser Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Pinconning Township

	Population	Developed Acres
2000 Base:	2,608	3,071
2020 Scenario 1:	7,226	10,586
2020 Scenario 2:	2,592	3,074

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Pinconning Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002 operating Budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Pinconning Township

	Population	Developed Acres
2000 Base:	2,608	3,071
2020 Scenario 1:	7,226	10,586
2020 Scenario 2:	2,592	3,074

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 18A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 18A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Pinconning Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	3,071	11.5	*	*
2001 - 2020	7,515	28.1	*	*
Year 2020 Build-Out	10,586	39.6	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,071	11.5	*	*
2001-2020	3	0.0	*	*
Year 2020 Build-Out	3,074	11.5	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 28.1 jail beds for Scenario 1 compared 0.0 beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Pinconning Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Pinconning Township

	Population	Developed Acres
2000 Base:	2,608	3,071
2020 Scenario 1:	7,226	10,586
2020 Scenario 2:	2,592	3,074

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 18B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 18B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Pinconning Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	3,071	842	2.4	*	*
2001 - 2020	7,515	2,060	5.8	*	*
Year 2020 Build-Out	10,586	2,902	8.2	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	3,071	842	2.4	*	*
2001-2020	3	1	0.0	*	*
Year 2020 Build-Out	3,074	843	2.4	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 2,060 calls for service for Scenario 1 compared to 1 for Scenario 2, resulting in the need for an additional 5.8 sworn officers in Scenario 1 and 0.0 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Pinconning Township

	Population	Developed Acres

2000 Base:	2,608	3,071
2020 Scenario 1:	7,226	10,586
2020 Scenario 2:	2,592	3,074

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 18C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 18C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Pinconning Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	3,071	2,364	*	*
2001 - 2020	7,515	5,785	*	*
Year 2020 Build-Out	10,586	8,149	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,071	2,364	*	*
2001-2020	3	2	*	*
Year 2020 Build-Out	3,074	2,366	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 5,785 square feet for Scenario 1 compared to 2 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 18D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE1 8D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Pinconning Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	3,071	16,442	*	*
2001 - 2020	7,515	40,235	*	*
Year 2020 Build-Out	10,586	56,677	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	3,071	16,442	*	*
2001-2020	3	16	*	*
Year 2020 Build-Out	3,074	16,458	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 40,235 collection items for Scenario 1 compared to 16 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 56.33 miles of local roads in Pinconning Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Pinconning Township

	Population	Developed Acres
2000 Base:	2,608	3,071
2020 Scenario 1:	7,226	10,586
2020 Scenario 2:	2,592	3,074

Demand for Service

As stated above, the local road system within Pinconning Township totals of 56.33 miles. This equates to 21.6 miles per 1,000 population and 18.3 miles per 1,000 developed acres. Column 3 of Table 18E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 18.3 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 18E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 12.5 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Pinconning Township Developed Acres	(3) Miles Required (18.3 per 1,000 Acre)	(4) Pinconning Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	3,071	56.33	56.33	0.00
2001 - 2020	7,515	137.85	0.00	-137.85
Year 2020 Build-Out	10,586	194.18	56.33	-137.85
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	3,071	56.33	56.33	0.00
2001-2020	3	0.06	0.00	-0.06
Year 2020 Build-Out	3,074	56.39	56.33	-0.06

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 137.85 miles of roads for Scenario 1 compared to 0.06 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

FIRE DISTRICTS

PINCONNING/FRASER FIRE DISTRICT

Provider and Service Area

The Pinconning/Fraser Fire Department provides fire and rescue services to the City of Pinconning, Fraser Township and Pinconning Township, serving a total population of 7,369 and 8,315 developed acres. The Fire Department operates 4 primary fire and rescue vehicles out of two stations (Stations 15 and 16). During 2001, when Station 16 became operational, the Fire Department was dispatched to 838 emergency incidents.

Basis for Analysis

Source: Pinconning/Fraser Fire Department and Bay County 911 Central Dispatch

Service Area Data: Pinconning Township

	Population	Developed Acres
2000 Base:	2,608	3,071
2020 Scenario 1:	7,226	10,586
2020 Scenario 2:	2,592	3,074

Demand for Service

As stated above, the Fire Department was dispatched to 838 emergency incidents in the year 2001. This is an increase over prior years due to Station 16 becoming operational. This equates to 113.7 emergency incidents per 1,000 population and 100.8 per 1,000 developed acres. Column 3 of Table 18H shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 100.8 emergency incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 209.5 annual emergency incidents per apparatus (838 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 18H PINCONNING/FRASER FIRE DISTRICT CURRENT LOS = 100.8 EMERGENCY INCIDENTS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Pinconning Township Developed Acres	(3) Annual Incidents (100.8 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷209.5)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	3,071	310	1.48	*	*
2001 - 2020	7,515	758	3.62	*	*
Year 2020 Build-Out	10,586	1,068	5.10	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	3,071	310	1.48	*	*
2001 - 2020	3	0	0.00	*	*
Year 2020 Build-Out	3,074	310	1.48	*	*

* See Pinconning/Fraser Fire District analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 758 annual emergency incidents and 3.62 more fire and rescue apparatus for Scenario 1 compared to 0 additional annual incidents and apparatus for Scenario 2.

Capital and Other Cost Implications

The current operating budget for the District is $96,030 or $114.59 per emergency incident. Refer to Appendix A for capital cost information.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

- Bangor Township
- Beaver Township
- Frankenlust Township
- Fraser Township
- Kawkawlin Township
- Merritt Township
- Monitor Township
- Pinconning Township
- Portsmouth Township
- Williams Township
- City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Pinconning Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Pinconning Township

	Population	Developed Acres
2000 Base:	2,608	3,071
2020 Scenario 1:	7,226	10,586
2020 Scenario 2:	2,592	3,074

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Pinconning Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of

persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 18G shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 18G
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Pinconning Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	3,071	0.313	*	*
2001 - 2020	7,515	0.767	*	*
Year 2020 Build-Out	10,586	1.080	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	3,071	0.313	*	*
2001 - 2020	3	0.000	*	*
Year 2020 Build-Out	3,074	0.313	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.767 MGD required for Scenario 1 compared to 0.000 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

19. PORTSMOUTH TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Portsmouth Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Portsmouth Township

	Population	Developed Acres
2000 Base:	3,619	1,334
2020 Scenario 1:	4,324	2,069
2020 Scenario 2:	3,509	1,220

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Portsmouth Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections

Service Area Data: Portsmouth Township

	Population	Developed Acres
2000 Base:	3,619	1,334
2020 Scenario 1:	4,324	2,069
2020 Scenario 2:	3,509	1,220

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 19A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 19A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Portsmouth Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	1,334	5.0	*	*
2001 - 2020	735	2.7	*	*
Year 2020 Build-Out	2,069	7.7	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	1,334	5.0	*	*
2001-2020	-114	-0.4	*	*
Year 2020 Build-Out	1,220	4.6	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 2.7 jail beds for Scenario 1 compared to a reduction of 0.4 for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Portsmouth Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center; Bay County 911 Central Dispatch; and Bay County 2002 Budget

Service Area Data: Portsmouth Township

	Population	Developed Acres

2000 Base:	3,619	1,334
2020 Scenario 1:	4,324	2,069
2020 Scenario 2:	3,509	1,220

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 19B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 19B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Portsmouth Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	1,334	366	1.0	*	*
2001 - 2020	735	201	0.6	*	*
Year 2020 Build-Out	2,069	567	1.6	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	1,334	366	1.0	*	*
2001-2020	-114	-31	-0.1	*	*
Year 2020 Build-Out	1,220	335	0.9	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 201 annual calls for service for Scenario 1 compared to a reduction of 31 for Scenario 2, resulting in the need for an additional 0.6 sworn officers in Scenario 1 and 0.1 fewer sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix A for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Portsmouth Township

	Population	Developed Acres

2000 Base:	3,619	1,334
2020 Scenario 1:	4,324	2,069
2020 Scenario 2:	3,509	1,220

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 19C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 19C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Portsmouth Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	1,334	1,027	*	*
2001 - 2020	735	566	*	*
Year 2020 Build-Out	2,069	1,596	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	1,334	1,027	*	*
2001-2020	-114	-88	*	*
Year 2020 Build-Out	1,220	939	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 566 square feet for Scenario 1 compared to a 88 fewer square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 19D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 19D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Portsmouth Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	1,334	7,142	*	*
2001 - 2020	735	3,935	*	*
Year 2020 Build-Out	2,069	11,077	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	1,334	7,142	*	*
2001-2020	-114	-610	*	*
Year 2020 Build-Out	1,220	6,532	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 3,935 collection items for Scenario 1 compared to 610 fewer items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 35.29 miles of local roads in Portsmouth Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Portsmouth Township

	Population	Developed Acres
2000 Base:	3,619	1,334
2020 Scenario 1:	4,324	2,069
2020 Scenario 2:	3,509	1,220

Demand for Service

As stated above, the local road system within Portsmouth Township totals of 35.29 miles. This equates to 9.75 miles per 1,000 population and 26.4 miles per 1,000 developed acres. Column 3 of Table 19E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 26.4 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 19E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 26.4 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Portsmouth Township Developed Acres	(3) Miles Required (26.4 per 1,000 Acre)	(4) Portsmouth Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	1,334	35.29	35.29	0.00
2001 - 2020	735	19.44	0.00	-19.44
Year 2020 Build-Out	2,069	54.73	35.29	-19.44
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	1,334	35.29	35.29	0.00
2001-2020	-114	-3.02	0.0	-3.02
Year 2020 Build-Out	1,220	32.27	35.29	-3.02

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 19.44 miles of roads for Scenario 1 compared to a 3.02 fewer miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Portsmouth Township

	Population	Residential Developed Acres
2000 Base:	3,619	1,132
2020 Scenario 1:	4,324	1,866
2020 Scenario 2:	3,509	1,017

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165 This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 19F shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 19F BAY CITY PUBLIC SCHOOLS CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Portsmouth Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	1,132	345	12.9	*	*
2001 - 2020	734	224	8.4	*	*
Year 2020 Build-Out	1,866	569	21.3	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	1,132	345	12.9	*	*
2001 - 2020	-115	-35	-1.3	*	*
Year 2020 Build-Out	1,017	310	11.6	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 224 K-12 students and 8.4 more classrooms for Scenario 1 compared to a 35 fewer students and 1.3 less classroom for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

- Bangor Township
- Beaver Township
- Frankenlust Township
- Fraser Township
- Kawkawlin Township
- Merritt Township
- Monitor Township
- Pinconning Township
- Portsmouth Township
- Williams Township
- City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Portsmouth Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Portsmouth Township

	Population	Developed Acres
2000 Base:	3,619	1,334
2020 Scenario 1:	4,324	2,069
2020 Scenario 2:	3,509	1,220

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Portsmouth Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 19G shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 19G
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Portsmouth Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	1,334	0.136	*	*
2001 - 2020	735	0.075	*	*
Year 2020 Build-Out	2,069	0.211	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	1,334	0.136	*	*
2001 - 2020	-114	-0.012	*	*
Year 2020 Build-Out	1,220	0.124	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.075 MGD required for Scenario 1 compared to 0.012 less MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

PORTSMOUTH TOWNSHIP

FIRE PROTECTION

Provider and Service Area

The Portsmouth Township Fire Department provides fire and rescue services to Portsmouth Township, serving a total population of 3,619 and 1,334 developed acres. The Fire Department operates out of one station (Station 18). During 2000 and 2001 the Fire Department was dispatched to an average 229 incidents per year.

Basis for Analysis

Source: Bay County 911 Central Dispatch

Service Area Data: Portsmouth Township

	Population	Developed Acres
2000 Base:	3,619	1,334
2020 Scenario 1:	4,324	2,069
2020 Scenario 2:	3,509	1,220

Demand for Service

As stated above, the Fire Department was dispatched to an average 229 incidents per year. This equates to 63.3 annual incidents per 1,000 population and 172 per 1,000 developed acres. Column 3 of Table 19H shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 172 annual incidents per 1,000 developed acres).

TABLE 19H
PORTSMOUTH TOWNSHIP FIRE DEPARTMENT
CURRENT LOS = 172 DISPATCHED INCIDENTS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D		
(1)	(2)	(3)
Time Frame	Portsmouth Township Developed Acres	Annual Incidents 172 per 1,000 Acres)
Year 2000	1,334	229
2001 - 2020	735	126
Year 2020 Build-Out	2,069	355
SCENARIO 2: Scenario 1 Adjusted For 2000 census Projections		
Year 2000	1,334	229
2001-2020	-114	-20

Year 2020 Build-Out	1,220	209

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 126 annual incidents for Scenario 1 compared to 20 fewer annual incidents for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

20. WILLIAMS TOWNSHIP
ANALYSIS OF PUBLIC FACILITIES AND SERVICES

COUNTY-WIDE FACILITIES AND SERVICES:

Central Dispatch

Provider and Service Area

Bay County 911 Central Dispatch provides centralized services for police, fire and other emergency services providers operating within Bay County including the Bay County Sheriff and Williams Township Fire Department

Basis for Analysis

Source: Bay County 911 Central Dispatch and Bay County 2002 Budget

Service Area Data: Williams Township

	Population	Developed Acres
2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

During the year 2000 the Bay County Central Dispatch Authority processed 120,139 Computer Aided Dispatch (CAD) events. This equates to 1,093 events per 1,000 population and 2,089 events per 1,000 developed acres. See analysis for Law Enforcement and Fire in this section for projection of CAD events for Williams Township. The county-wide analysis is included in Chapter 2.

Capital and Other Cost Implications

The Bay County Central Dispatch operation is primarily funded through a 0.7 mill voter approved property tax. As new development enters the tax rolls it contributes to the property tax revenue that the voted millage will generate. According to the Central Dispatch Director the capacity of the system is unlimited; frequencies are added as needed. Based on the current (2002) operating budget the cost per CAD event is approximately $13.71.

JAIL

Provider and Service Area

The Bay County Sheriff provides jail services to the entire County serving a population of 109,935 and 57,507 developed acres. The jail facility consists of 215 beds (State certified capacity). During the year 2001 the jail was operating at a 96% utilization rate

(including prisoners "boarded in" from other jurisdictions) with an average daily population of 207 inmates. (According to the Michigan Department of Corrections a utilization rate of 95% or better is considered a highly efficient use of the facility.)

Basis for Analysis

Source: Michigan Department of Corrections Office of Community Corrections and Bay County 2002 Budget

Service Area Data: Williams Township

	Population	Developed Acres
2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

As stated above the Jail's State certified capacity is 215 beds. This equates to 1.95 jail beds per 1,000 population and 3.7 jail beds per 1,000 developed acres. Column 3 of Table 8A shows the number of additional jail beds the two land use scenarios would require through the year 2020 (based on 3.7 jail beds per 1,000 developed acres), and calculates the surplus or deficiency of jail beds to serve the additional development (Column 5).

TABLE 20A BAY COUNTY JAIL CURRENT LOS = 3.7 JAIL BEDS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Williams Township Developed Acres	(3) Jail Beds Required (3.7 per 1,000 Acre)	(4) Jail Beds Available	(5) Surplus/ Deficiency Col 4-Col 3
Year 2000	4,361	16.3	*	*
2001 - 2020	7,236	27.1	*	*
Year 2020 Build-Out	11,597	43.4	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,361	16.3	*	*
2001-2020	363	1.4	*	*
Year 2020 Build-Out	4,724	17.7	*	*

* See Bay County analysis in Chapter 2

The analysis in the table assumes providing the same level of service for jail beds to future development as is currently provided to existing development. The result of the analysis shows the need for an additional 27.1 jail beds for Scenario 1 compared to 1.4 beds for Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Jail is $3,935,700 or $18,305.58 per certified bed. Refer to Appendix A for jail construction cost information.

LAW ENFORCEMENT

Provider and Service Area

The Bay County Sheriff is the primary law enforcement agency for all areas of Bay County that do not have their own police departments such as Beaver Township. The Sheriff's primary service area for law enforcement area includes 47,715 developed acres and a population of 56,053. The Sheriff provides law enforcement services with 37 sworn officers (year 2000)

Basis for Analysis

Source: Michigan State Police Criminal Justice Information Center ; Bay County 911 Central Dispatch; and bay County 2002 Budget

Service Area Data: Williams Township

	Population	Developed Acres

2000 Base:	3,375	4,776
2020 Scenario 1:	4,225	3,431
2020 Scenario 2:	3,254	8,207

Demand for Service

During the year 2000 the Bay County Sheriff's office responded to 13,079 emergency call for service that were dispatched from Bay County 911 Central Dispatch. This equates to 233.3 calls for service per 1,000 population and 274 per 1,000 developed acres. Column 3 of Table 20B shows the number of additional annual calls for service the two land use scenarios would generate through the year 2020 (based on 274 per 1,000 developed acres). Column 4 calculates the number of sworn officers needed to serve development through the year 2020. This calculation assumes that each sworn officer can handle a maximum of 353.5 emergency calls for service per year (the current workload based on statistics provided). This number (353.5 per officer) does not represent an officers total workload because of other types of activities a sworn officer performs such as non-emergency calls, pro-active patrols, report writing, and court time. The current number of sworn officers is shown in Column 5 and the surplus or deficiency of sworn officers to serve the additional development is calculated in Column 6.

TABLE 20B LAW ENFORCEMENT: BAY COUNTY SHERIFF CURRENT LOS: 274 EMERGENCY CALLS PER 1,000 DEVELOPED ACRES					
SCENARIO 1: Build-out Analysis Scenario D					
(1) Time Frame	(2) Williams Township Developed Acres	(3) Annual Dispatch Calls (274 per 1,000 Acre)	(4) Sworn Officers Required (Col 3÷353.5)	(5) Sworn Officers Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,361	1,195	3.4	*	*
2001 - 2020	7,236	1,983	5.6	*	*
Year 2020 Build-Out	11,597	3,178	9.0	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections					
Year 2000	4,361	1,195	3.4	*	*
2001-2020	363	99	0.3	*	*
Year 2020 Build-Out	4,724	1,294	3.7	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an annual additional 1,983 calls for service for Scenario 1 compared to 99 for Scenario 2, resulting in the need for an additional 5.6 sworn officers in Scenario 1 and 0.3 sworn officers in Scenario 2.

Capital and Other Cost Implications

The 2002 operating budget for the Bay County Sheriff Secondary and Township Road Patrol is $2,109,535 or $161.29 per dispatched call for service. Refer to Appendix __ for capital cost information.

LIBRARY

Provider and Service Area

The Bay County Library System provides library services out of 5 library branches and one bookmobile for all of Bay County serving a population of 109,935 and 57,507 developed acres. The Library System has an annual circulation rate of nearly 780,000 and offers over 800 programs serving approximately 29,000 attendees.

Basis for Analysis

Source: Library of Michigan as reported by the Bay County Library System and Bay County 2002 Budget

Service Area Data: Williams Township

	Population	Developed Acres

2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

Library Buildings:
The Bay County Library system consists of 5 library buildings and 1 bookmobile totaling 44,269 square feet. This equates to 400 square feet of library building per 1,000 population and 769.8 square feet per 1,000 developed acres. Column 3 of Table 20C shows the number of building square feet the two land use scenarios would require through the year 2020 (based on 769.8 per 1,000 developed acres. The current inventory of square feet is show in Column 4 and the surplus or deficiency of square feet to serve the additional development is calculated in Column 5.

TABLE 20C
LIBRARY BUILDINGS
CURRENT LOS = 769.8 SQUARE FEET PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Williams Township Developed Acres	(3) Square Feet Required (769.8 per 1,000 Acre)	(4) Square Feet Available	(5) Surplus/ Deficiency (Col. 5 - Col. 4)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,361	3,357	*	*
2001 - 2020	7,236	5,570	*	*
Year 2020 Build-Out	11,597	8,927	*	*
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,361	3,357	*	*
2001-2020	363	279	*	*
Year 2020 Build-Out	4,724	3,636	*	*

* See Bay County analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 5,570 square feet for Scenario 1 compared to 279 square feet for Scenario 2.

Library Collection
The Bay County Library collection consists of books, audio, video, subscriptions and electronic collections totaling 307,882 items. This equates to 2,800 items per 1,000 population and 5,354 per 1,000 developed acres. Column 3 of Table 20D shows the number of collection items the two land use scenarios would require through the year 2020 (based on 5,354 per 1,000 developed acres). The current inventory of the

collection is show in Column 4 and the surplus or deficiency of the collection to serve the additional development is calculated in Column 5.

TABLE 20D LIBRARY COLLECTION CURRENT LOS = 5,354 ITEMS PER 1,000 DEVELOPED ACRES				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Williams Township Developed Acres	(3) Collection Required (5,354 per 1,000 Acre)	(4) Collection Items Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
Year 2000	4,361	23,349	*	*
2001 - 2020	7,236	38,742	*	*
Year 2020 Build-Out	11,597	62,091	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	4,361	23,349	*	*
2001-2020	363	1,944	*	*
Year 2020 Build-Out	4,724	25,293	*	*

* See Bay County analysis in Chapter 2

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The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 38,742 collection items for Scenario 1 compared to 1,944 items for Scenario 2.

Capital and Other Cost Implications

The Bay County Library operation is primarily funded through a voter approved property tax. The 2002 operating budget for the Bay County Library System is $3,770,379 or $85.17 per square foot of library building or $12.25 per collection item. Refer to Appendix A for capital cost information.

ROADS

Provider and Service Area

County Road Commissions are responsible for all township roads (except private roads) plus any major streets that have not bee released to city or village jurisdiction. The Bay County Road Commission has responsibility for a 1,023 mile road system of which approximately 15% (153 miles) are gravel surface roads and 85% (870 miles) are paved roads . The Road Commission also maintains 202 miles of state highways within the County. There are 36.23 miles of local roads in Williams Township.

Basis for Analysis

Source: Bay County Road Commission

Service Area Data: Williams Township

	Population	Developed Acres
2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

As stated above, the local road system within Williams Township totals of 36.23 miles. This equates to 8.0 miles per 1,000 population and 8.3 miles per 1,000 developed acres. Column 3 of Table 20E shows the number of miles of roads the two land use scenarios would require through the year 2020 (based on 8.3 miles per 1,000 developed acres). The current inventory of roadway miles is show in Column 4 and the surplus or deficiency of miles to serve the additional development is calculated in Column 5.

TABLE 20E
BAY COUNTY ROAD COMMISSION
CURRENT LOS = 8.3 MILES PER 1,000 DEVELOPED ACRES

(1) Time Frame	(2) Williams Township Developed Acres	(3) Miles Required (8.3 per 1,000 Acre)	(4) Williams Township Miles Available	(5) Surplus/ Deficiency (Col. 4 - Col. 3)
SCENARIO 1: Build-Out analysis Scenario D				
Year 2000	4,361	36.23	36.23	0.00
2001 - 2020	7,236	60.11	0.00	-60.11
Year 2020 Build-Out	11,597	96.34	36.23	-60.11
SCENARIO 2: Scenario 1 Adjusted for 2000 Census Projections				
Year 2000	4,361	36.23	36.23	0.00
2001-2020	363	3.02	0.00	-3.02
Year 2020 Build-Out	4,724	39.25	36.23	-3.02

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development, as measured in miles of roadway. It does not attempt to conduct a more detailed analysis of the capacity and volumes on the existing roadways that would measure the roadway systems ability to accommodate more trips.

The result of the analysis shows the need for an additional 60.11 miles of roads for Scenario 1 compared to 3.02 miles for Scenario 2.

Capital and Other Cost Implications

Refer to Appendix A for capital cost information.

FIRE DISTRICTS

AUBURN/WILLIAMS FIRE DISTRICT

Provider and Service Area

The Auburn/Williams Fire Department provides fire and rescue services to the City of Auburn and Williams Township, serving a total population of 6,503 and 4,758 developed acres. The Fire Department operates 4 fire and rescue vehicles out of one station (Station 12). During 2000 and 2001 the Fire Department was dispatched to an average of 430 emergency incidents per year.

Basis for Analysis

Source: Auburn/Williams Township Fire Department and Bay County 911 Central Dispatch

Service Area Data: Williams Township

	Population	Developed Acres
2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

As stated above, the Fire Department is dispatched to an average of 430 emergency incidents per year. This equates to 66 emergency incidents per 1,000 population and 90.4 per 1,000 developed acres. Column 3 of Table 20D shows the annual incident rate the two land use scenarios would generate through the year 2020 (based on 90.4 emergency incidents per 1,000 developed acres). In Column 4 the number of required fire and rescue vehicles (apparatus) is calculated based on the current ratio of 107.5 annual emergency incidents per apparatus (430 incidents divided by 4 primary fire and rescue vehicles). The current inventory of fire and rescue apparatus is show in Column 5 and the surplus or deficiency of apparatus to serve the additional development is calculated in Column 6. Note that the analysis is based on primary response vehicles and does not include reserves).

TABLE 20F
AUBURN/WILLIAMS FIRE DISTRICT
CURRENT LOS = 90.4 EMERGENCY INCIDENTS PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1) Time Frame	(2) Williams Township Developed Acres	(3) Annual Incidents (90.4 per 1,000 Acres)	(4) Primary Fire & Rescue Apparatus Required (Col. 3÷107.5)	(5) Primary Apparatus Available	(6) Surplus/ Deficiency (Col. 5 - Col. 4)
Year 2000	4,361	394	3.7	*	*

2001 - 2020	7,236	654	6.1	*	*
Year 2020 Build-Out	11,597	1,048	9.8	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	4,361	394	3.7	*	*
2001 - 2020	363	33	0.3	*	*
Year 2020 Build-Out	4,724	427	4.0	*	*

* See Auburn/Williams Fire District analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. It also assumes that the current workload per apparatus represents optimum utilization of the vehicles. The result of the analysis shows an additional 654 annual emergency incidents and 6.1 additional apparatus for Scenario 1 compared to 33 additional annual incidents and 0.3 additional apparatus for Scenario 2.

Capital and Other Cost Implications

The current operating budget for the District is $178,250 or $414.53 per emergency incident. Refer to Appendix A for capital cost information.

SCHOOL DISTRICTS

BAY CITY PUBLIC SCHOOLS

Provider and Service Area

The Bay City Public School District provides school instruction for grades K-12 out of 18 school sites for the following areas in Bay County:

Bay City	Kawkawlin Township
Beaver Township	Merritt Township
Frankenlust Township	Monitor Township
Fraser Township	Portsmouth Township
Garfield Township	Williams Township

This area includes 38,779 developed acres and a total population of 72,065 (2000 Census). Approximately 14.1% of the total population of the areas served attended Bay City Public schools in the year 2000.

Basis for Analysis

Source: Bay City Public Schools

Service Area Data: Williams Township

	Population	Residential Developed Acres
2000 Base:	4,492	3,152
2020 Scenario 1:	29,135	10,142
2020 Scenario 2:	4,903	3,269

Demand for Service

The Bay City Public School K-12 enrollment for the year 2000 was 10,165 This equates to 141 K-12 students per 1,000 population and 305 per 1,000 developed residential acres. (Note: residential acres rather than total developed acres, are used in the schools analysis because it is the growth pattern for residential development that impacts school enrollments). Column 3 of Table 20G shows the annual enrollment the two land use scenarios would require through the year 2020 (based on 305 K-12 students per 1,000 developed acres). In Column 4 the number of required K-12 Regular classrooms is calculated based on the current average size per classroom for the District of 26.7 students. The current inventory of K-12 regular classrooms is shown in Column 5 and the surplus or deficiency of regular classrooms to serve the additional development is calculated in Column 6.

TABLE 20G
BAY CITY PUBLIC SCHOOLS
CURRENT LOS= 305 K-12 STUDENTS PER 1,000 DEVELOPED RESIDENTIAL ACRES

SCENARIO 1: Build-out Analysis Scenario D

(1)	(2)	(3)	(4)	(5)	(6)

Time Frame	Williams Township Developed Residential Acres	Annual K-12 Enrollment At 305 Students per 1,000 Residential Acres	Regular Classrooms Required (Avg. 26.7 Students Per Classroom)	Regular Classrooms Available	Surplus/ Deficiency of Regular Classrooms (Col. 5 – Col. 4)
Year 2000	3,152	961	36.0	*	*
2001 - 2020	6,990	2,132	79.8	*	*
Year 2020 Build-Out	10,142	3,093	15.8	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections					
Year 2000	3,152	961	36.0	*	*
2001 - 2020	117	36	1.3	*	*
Year 2020 Build-Out	3,269	997	37.3	*	*

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 2,132 K-12 students and 79.8 more classrooms for Scenario 1 compared to 36 students and 1.3 additional classroom for Scenario 2.

Capital and Other Cost Implications

See Bay City Public schools analysis in Chapter 2

SEWER

WEST COUNTY WASTEWATER TREATMENT PLANT

Provider and Service Area

The Bay County Department of Water and Sewer operates the West County Wastewater Sewer Treatment Plant providing wastewater treatment for the following areas in Bay County which include a total population of 39,721 and 20,011 developed acres:

Auburn	Kawkawlin Township
Bangor Township	Monitor Township
Frankenlust Township	Williams Township

The wastewater treatment plant has a design capacity of 10.25 MGD (million gallons per day) and an average daily demand of 4.11 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Williams Township

	Population	Developed Acres
2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

As stated above, the average daily flow for the areas served for the 2 year period 2000-2001 was 4.11 MGD. The daily demand varies from user to user. The average daily flow for Williams Township for 2000 and 2001 has been 0.14 MGD. This equates to 32.1 GPD (gallons per day) per capita for the total population within Williams Township and 33 GPD per developed acre for all developed acres within Williams Township. (Note: these GPD measurements represent a ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system within Williams Township. Projection of need assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 20H shows the MGD the two land use scenarios would require through the year 2020 (based on 33 GPD per developed acre). The current capacity of the wastewater treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 5.

TABLE 20H WEST BAY COUNTY WASTEWATER TREATMENT PLANT CURRENT LOS = 33 GPD PER DEVELOPED ACRE				
SCENARIO 1: Build-out Analysis Scenario D				
(1) Time Frame	(2) Williams Township Developed Acres	(3) MGD Required (33 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
Year 2000	4,361	0.14	*	*
2001 - 2020	7,236	0.24	*	*
Year 2020 Build-Out	11,597	0.38	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	4,361	0.14	*	*
2001 - 2020	363	0.01	*	*
Year 2020 Build-Out	4,724	0.15	*	*

* See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.24 MGD required for Scenario 1 compared to 0.01 MGD for Scenario 2.

Capital and Other Cost Implications

See West Bay County Wastewater Treatment Plant analysis in Chapter 2.

WATER

BAY METROPOLITAN WATER

Provider and Service Area

Bay Metropolitan Water provides water treatment services for a number of areas within Bay County including Bay City, Essexville, Hampton Township and Bay County Department of Water and Sewer. As a wholesale customer, Bay County Department of Water and Sewer has the following areas as it's water customer base:

- Bangor Township
- Beaver Township
- Frankenlust Township
- Fraser Township
- Kawkawlin Township
- Merritt Township
- Monitor Township
- Pinconning Township
- Portsmouth Township
- Williams Township
- City of Pinconning

Together these areas of Bay County include a total population of 103,499 within 42,526 developed acres.

The water treatment plant has a design capacity of 40 MGD (million gallons per day) and an average daily demand of 10.9 MGD with a peak flow of approximately 22.0 MGD. Customers that are served through Bay County Department of Water and Sewer, including Williams Township account for 3.423 MGD of the daily demand.

It should be noted that although the design capacity is 40 MGD existing intake problems limit the capacity to approximately 20 MGD.

Basis for Analysis

Source: Bay County Department of Water and Sewer

Service Area Data: Williams Township

	Population	Developed Acres
2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

As stated above, the average daily demand for customers served by Bay County Department of Water and Sewer is 3.423 MGD. This equates to 102 GPD (gallons per day) per developed acre or 64 gallons per day per capita for the total developed acres and population of Williams Township. (Note: the GPD represents the ratio of daily demand to total population or total developed acres rather than for the actual population/acres utilizing the system. The analysis assumes the same current ratio of persons/acres utilizing the system through the year 2020 as is currently hooked up to the system).

Column 3 of Table 20I shows the MGD the two land use scenarios would require through the year 2020 (based on 102 GPD per developed acre for Bay County Customers). The current available capacity of the water treatment plant is show in Column 4 and the surplus or deficiency of capacity to serve the additional development is calculated in Column 6.

TABLE 20I
BAY METROPOLITAN WATER
CURRENT LOS = 102 GPD PER DEVELOPED ACRE

(1) Time Frame	(2) Williams Township Developed Acres	(3) MGD Required (102 GPD per Acre)	(4) MGD Available	(5) Surplus/ Deficiency (Col 4-Col 3)
SCENARIO 1: Build-out Analysis Scenario D				
Year 2000	4,361	0.445	*	*
2001 - 2020	7,236	0.738	*	*
Year 2020 Build-Out	11,597	1.183	*	*
SCENARIO 2: Build-out Analysis Scenario D Adjusted For 2000 Census Projections				
Year 2000	4,361	0.445	*	*
2001 - 2020	363	0.037	*	*
Year 2020 Build-Out	4,724	0.482	*	*

* See Bay Metropolitan Water analysis in Chapter 2

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 0.738 MGD required for Scenario 1 compared to 0.037 MGD for Scenario 2.

Capital and Other Cost Implications

See Bay Metropolitan Water analysis in Chapter 2

WILLIAMS TOWNSHIP

COMMUNITY PARKS

Provider and Service Area

Williams Township provides community parks for the Township serving a population of 4,492 and 4,361 developed acres. The community park inventory consists of 18 acres of park land.

Basis for Analysis

Source: Williams Township

Service Area Data: Williams Township

	Population	Developed Acres
2000 Base:	4,492	4,361
2020 Scenario 1:	29,135	11,597
2020 Scenario 2:	4,903	4,724

Demand for Service

As shown above, the Williams Township park system consists of 18 acres of park land. This equates to 4.0 park acres per 1,000 population and 4.1 acres per 1,000 developed acres. Column 3 of Table 20J shows the number of community park acres the two land use scenarios would require through the year 2020 (based on 4.1 acres per 1,000 developed acres). The current inventory of community park acres is show in Column 4 and the surplus or deficiency of acres to serve the additional development is calculated in Column 5.

TABLE 20J
COMMUNITY PARK LAND
CURRENT LOS = 4.1 ACRES PER 1,000 DEVELOPED ACRES

SCENARIO 1: Build-out Analysis Scenario D				
(1)	(2)	(3)	(4)	(5)
Time Frame	Williams Township Developed Acres	Community Park Acres (4.1 per 1,000 acres)	Community Park Acres Available	Surplus/ Deficiency Col 4-Col 5
Year 2000	4,361	18.0	18.00	0.00
2001 - 2020	7,236	29.8	0.00	-29.8
Year 2020 Build-Out	11,597	47.8	18.00	-29.8
SCENARIO 1: Build-out Analysis Scenario D Adjusted for 2000 Census Projections				
Year 2000	4,361	18.0	18.00	0.00

2001 - 2020	363	1.50	0.00	-1.5
Year 2020 Build-Out	4,724	19.50	18.00	-1.5

The analysis in the preceding table assumes providing the same level of service to future development as is currently provided to existing development. The result of the analysis shows an additional 29.8 community park acres for Scenario 1 compared to 1.5 for Scenario 2.

Capital and Other Cost Implications

The 2002 parks and recreation operating budget is $29,800 or $1,656 per park acre. Refer to Appendix A for capital cost information.

The following cost estimates of various types of facilities are for use as guidelines only. They can be applied, as applicable, to the analysis of need in this report to calculate an estimate of capital costs for the two land use scenarios for planning purposes.

FIRE PROTECTION

CAPITAL ITEM	COST PER UNIT
Source: Auburn/Williams Fire Department	
Station (6 bays)	$ 80.00 per square foot
Pumper	$ 330,000
Engine	$ 250,000
Source: Bangor Township	
Aerial	$562,432 (2004 dollars)
Engine	$ 302,661 (2008 dollars)
Source: Data Provided by Jane Fitzpatrick Consulting	
Aerial Ladder Truck	$751,550 (2002 dollars) *
Aerial Quint	$ 437,500 (2002 dollars) *
Engine or Pumper	$257,000 – 420,000 (2002 dollars) *
Tanker	$183,750 (2002 dollars) *
ALS Equipment Package	$ 50,000 (2002 dollars)
Public Safety Bldg: low estimate **	$ 110 per sq ft construction; $148.50 per sq ft project cost
Public Safety Bldg: high estimate **	$ 160 per sq ft construction; $216.00 per sq ft project cost
* Cost includes vehicle, radios and equipment (excludes BLS or ALS equipment) ** Zimmerman Design Group	

JAIL

CAPITAL ITEM	COST PER UNIT
Source: data Provided By Jane Fitzpatrick Consulting	
County Jail	$ 52,480 average per certified jail bed (2002 dollars)

LAW ENFORCEMENT

CAPITAL ITEM	COST PER UNIT
Source: City of Auburn	
Patrol Car	$27,000 (2003 /04 dollars)
Source: Bay County 2002 Budget	
Patrol Car	$22,000
Criminal Investigations Car (used)	$ 15,000
Source: Data Provided by Jane Fitzpatrick Consulting	
Patrol Car	$37,100 - $42,900 (2002 dollars) *
K-9 Unit	$36,000 – $43,000 (2002 dollars) *
Criminal Investigations Car (new)	$ 23,600 - $33,100 (2002 dollars) **
Public Safety Bldg: low estimate ***	$ 110 per sq ft construction; $148.50 per sq ft project cost
Public Safety Bldg: high estimate ***	$ 160 per sq ft construction; $216.00 per sq ft project cost
* Cost includes vehicle, radios and equipment (excludes BLS or ALS equipment) ** Cost includes vehicle, radios and some equipment *** Zimmerman Design Group	

LIBRARY

CAPITAL ITEM	COST PER UNIT
Source: Bay County Library System	
New Central Library	$209.90 project cost per square foot
New Pinconning Branch Library	$ 197.63 project cost per square foot
Source: The Bowker Annual Library and Book Trade Almanac 46th Edition	
Books (average for all types)	$60.80 per book (2000 dollars) or $ 36.48 per book with average 40% discount
Source:*Library Journal*, December 2001	
New Library Buildings In Michigan	$ 144.00 average construction cost per square foot; $ 202.75 average project cost per square foot
Library Additions in Michigan	$ 109.37 average construction cost per square foot; $ 147.73 average project cost per square foot
Source: Data Provided by Jane Fitzpatrick Consulting	
Branch Library: new/expansion	$ 215 - $300 per square foot (2002 dollars)
Reference Center Expansion	$200 – 400 per square foot

ROADS

CAPITAL ITEM	COST PER UNIT
Source: Bangor Township	
Pave With Asphalt	$ 65,000 - $100,000 per mile
Source: Bay County Road Commission	
Widen 2 lanes to 5 lanes	$2,000,000 per mile
Upgrade base and pave gravel road	$ 110,000 per mile
Resurface 2 lane asphalt road	$ 88,000 per mile
Apply 2” of new gravel	$ 15,225 per mile
Right Turn Lane	$65,000 per lane

PARKS

CAPITAL ITEM	COST PER UNIT
Source: Bay County	
Park Acres (Pinconning Park)	$ 1,170 per acre
Park Acres (Keit Wetlands)	$ 25,000 per acre
Soccer Fields	$ 10,000 per field
Source: Williams Township	
Soccer Fields	$10,000 - $40,000 per field
Baseball Diamond	$ 25,000 - $35,000 per diamond
Source: Jane Fitzpatrick Consulting (other various sources)	
Community Park Land	$ 3,000 - $10,000 per acre
Community Park Land with Amenities*	$ 12,000 – 36,000 per acre
Basketball/Volleyball Courts	$ 26,600
Bicycle Trails	$ 30,700 per mile
Racquetball Courts	$26,600
Tennis Courts	$ 26,600 - $48,000
* Amenities include a range of items including site lighting, landscaping, sidewalks, infrastructure, concession areas, signs and restrooms.	

PUBLIC SCHOOLS

CAPITAL ITEM	COST PER UNIT
Source: Bay City Public Schools	
New West Bay Middle School	$28,734 per student station
New East Bay Middle School	$28,734 per student station
Land Acquisition for Middle School	$412.50 per student station
Source: Jane Fitzpatrick Consulting (Public Schools of Petoskey	
Grades K—12 Average Cost	$9,750 per student station (2001 dollars)*
Source: Jane Fitzpatrick Consulting (other various sources)	
Elementary Schools	$13,042 per student station (2003 dollars)*
Middle Schools	$ 14,659 per student station (2003 dollars)*
High schools	$ 19,182 per student station (2003 dollars) *
* Cost guidelines including construction, site development, furniture and equipment; excludes land	

Numerous studies have been conducted which document the fiscal impacts of growth and development in a variety of communities and situations. The results of some of these studies are shown in the following tables This information is included in this Appendix to demonstrate the type of analysis that should be done at a local level in conjunction with land use decisions. Table B1 compares the cost of providing services to residential and farmland compared to the revenue generated from these two types of land uses.

Table B1
Cost Of Community Services Required
Vs.
Local Tax Revenue Generated

(1) City and State	(2) Residential (cost per $1.00 Collected)	(3) Farmland (cost per $1.00 collected)
Scio Township, Michigan *	$1.40	$0.62
Hebron, Connecticut	$1.06	$0.43
Agawam, Massachusetts	$1.05	$0.31
Deerfield, Massachusetts	$1.16	$0.29
North East, New York	$1.36	$0.21
Beekman, New York	$1.12	$0.48
Farmington, Minnesota	$1.02	$0.77
Lake Elmo, Minnesota	$1.07	$0.27
Independence, Minnesota	$1.03	$0.47
Madison Village, Ohio	$1.67	$0.38
Madison Township, Ohio	$1.40	$0.30

* Washtenaw County
Source: American Farmland Trust and the University of Michigan

A recent study entitled ”Per Capita Costs of Population Growth to Local Communities” was conducted by the Carrying Capacity Network, Washington DC. In this study the results of research from the State of Oregon regarding infrastructure costs was extrapolated to metropolitan areas across the United States. A summary of the results are shown in Table B2. Please note that the infrastructure costs relate to a single-family dwelling unit and are the gross costs rather than the net costs (i.e., total cost of the development less revenues generated by the development, such as impact fees or levys for debt service, which may be used to pay for the costs).

Table B2
Gross Cost of Public Facilities and Services
per Added Person
(Infrastructure Only)

(1)	(2)

Community	Gross Cost* per Added Person
San Francisco, California (highest cost)	$18,700
Lakeland, Florida **	4,700
Youngstown, Ohio **	4,700
Williamsport, Pennsylvania **	4,700
Communities in Michigan:	
Ann Arbor	9,000
Detroit	7,700
Benton Harbor	6,200
Muskegon/Holland	5,800
Lansing/East Lansing	5,800
Kalamazoo/Battle Creek	5,200
* Cost for school facilities, sanitary sewer, transportation, water service, parks and recreation, storm water drainage, fire protection and EMS facilities ** Three communities tied for lowest cost nationally	

As shown in Table B2, the cost per capita to provide public facilities and services will vary from location to location, depending on numerous variables including the amenities provided and the type of development which predominates in that community.

1. Type of Facility: _____
2. Unit of Capacity: _____
3. Demand (check one): Developed Acres _____ Population _____
   3a. Current demand: _____ as of _____
   3b. Additional Demand: _____ as of _____
   3c. Total Demand to Be Analyzed: (3a + 3b): _____
4. Available Capacity (inventory): _____
   (Enter Amount From Capacity Worksheet)
5. Level of Service (numerical standard): _____
   (Enter Standard From Level of Service Worksheet)

6. Calculation of Required Facilities or Services:

6a: Current Required Amount Facilities or Services:

Demand	x	Standard	=	Requirement
_____	x	_____	=	_____
(from 3a)		(from 5)		

6b: Additional Required Amount Facilities or Services:

Demand	x	Standard	=	Requirement
_____	x	_____	=	_____
(from 3b)		(from 5)		

6c: Total Required Amount Facilities or Services:

Demand	x	Standard	=	Requirement
_____	x	_____	=	_____
(Sum of 3a + 3b)		(from 5)		(Sum of 6a+ 6b)

7. Calculation of Surplus or Deficiency of Capacity

Requirement	-	Capacity	=	Surplus or Deficiency
_____	-	_____	=	_____
(from 6c)		(from 4)		

8. Capital Cost Per Unit of Capacity: _____
   (Enter Amount From Typical Cost Worksheet)

9. Calculation of Estimated Capital Cost Of Needed Facilities or Services

Surplus or Deficiency	x	Cost per Unit	=	Capital Cost Estimate
_____	x	_____	=	_____
(from 7)		(from 8)		

INSTRUCTIONS: CALCULATING DEMAND & COSTS FOR FACILITIES & SERVICES

The purpose of this worksheet is to determine an estimate of the impact of proposed growth (i.e., population or development) on the need for public facilities and services that serve your Community.

1. Type of Facility: Enter the specific public facility or service to be analyzed such as fire protection, law enforcement, potable water or parks and recreation, etc.
2. Unit of Capacity: Enter the name of the unit of capacity that will be the basis for the analysis. The unit of capacity must be something quantifiable such as park acres, fire apparatus, school classrooms or student stations.

3. Demand: Identify the measure of demand you will be using: developed acres such as a future land use plan or a development request, or population projections. Either choice may be used as long as you have the means to establish a base for your analysis:
    3a. Current Demand: enter the current year population or developed acres for your Community and the "as of" date for the population or acres.
    3b. Additional Demand: enter the projected growth increment (either additional population or additional development) and the projected date (timeframe for growth to occur).
    3c. Total Demand To Be Analyzed: Enter the sum of 3a and 3b. This is the projected population or development to be analyzed.
4. Available Capacity: Enter the total available capacity from the Capacity Worksheet Step 6.
5. Level of Service: Enter the recommended numerical standard from the Level of Service Worksheet Step 7.
6. Calculation of Required Facilities or Services: In each of the three boxes the demand is multiplied by the numerical standard to calculate the required amount of facilities or services analyzed. The calculation is done in three separate steps in order to identify what impact existing demand (population or developed acres) has on the facility or service analyzed (6a), the additional impact the projected demand will have (6b), as well as what the total impact will be (6c). The worksheet is set up this way so that the user can see the results of different level of service standards when applying the standards to both existing development and anticipated development.
7. Calculation of Surplus or Deficiency of Capacity: The available capacity (inventory from Step 4) is subtracted from the total requirement (from Step 6c) to determine the remaining available capacity. This calculation can also be divided into three steps (as in Step 6 above) to identity a capacity surplus or deficiency (based on the level of service used) for existing population/development as well as the projected growth. The result will show either that (a) the demand and capacity are equal or (b) there is a surplus of capacity or (c) there is a capacity deficiency. If the results show that capacity is adequate to serve both existing development and projected growth there is no need to continue with the next step because there is no need to add capacity. If the results show a capacity deficiency proceed with steps 8 and 9.
8. Capital Cost Per Unit of Capacity: Enter the cost per Unit of Capacity from the Typical Cost Worksheet Step 5.
9. Calculation of Estimated Capital Cost of Required Facilities or Services: Enter the deficiency of capacity from Step 7 and multiply it by the cost per unit from step 8 to determine the estimated capital cost of the required facility or service.

1. Type of Facility: _____
2. Unit of Capacity: _____
3. Time Period: In place as of _____
   (date)
4. Available Capacity (inventory)

(1) Facility Name	(2) Capacity
Total	

5. Budgeted Capacity (but not in place)
   5a. Budgeted as of _____
   (date)
   5b. Budgeted Capacity:

(1) Facility Name	(2) Capacity
Total	

6. Total Available Capacity: _____ _____
   (4 + 5b totals) (Unit of Capacity)

INSTRUCTIONS:

The purpose of this worksheet is to calculate the current available capacity of the facility or service analyzed.

1. Type of Facility: Enter the specific public facility or service to be analyzed such as fire protection, law enforcement, potable water or parks and recreation, etc.
2. Unit of Capacity: Enter the name of the unit of capacity that will be the basis for the analysis. The unit of capacity must be something quantifiable such as park acres, fire apparatus, school classrooms or student stations.
3. Time Period: record the date that the "in place" inventory represents.
4. Available Capacity (inventory): In Column 1 list the name of each facility in place based on the date in Step 3. Include the capacity of each facility in Column 2, totaling the capacity at the bottom of the list. For example, if park land is the facility being analyzed and acres is the unit of capacity the name of each park would be listed in Column 1 and the respective park acres would be listed in Column 2.
5. Budgeted Capacity (but not in place): If additional capacity is fully budgeted but not yet in place identify the budgeted date in 5a and list the additional facilities and capacity in 5b. (Note: for the purpose of determining the cost impact of growth a capital project that is already paid for or funded is considered available capacity because no additional capital costs need be budgeted).
6. Total Available Capacity: The total capacity from Step 4 and Step 5b (if applicable) is combined here to calculate total available.

1. Type of Facility: _____
2. Unit of Capacity: _____
3. Time Period: (check one): In place as of: _____
4. Available Capacity (inventory): _____
   (Enter Amount From Inventory Worksheet)
5. Calculation of Current Level of Service (numerical standard)

Available Capacity		Current Demand		Current Standard Per Unit of Demand
_____	÷	_____	=	_____
(from 4)		(from 3a)		

<u>Note</u>: for water and sewer plants: the actual current flow (MGD) would be used instead of the available capacity.

6. Other Standards and Guidelines for Levels of Service:

(1) Numerical Standard Or Guideline	(2) Unit of Capacity	(3) Source of Standard or Guideline

7. Recommended Standard for Analysis:

(1)		(2)	per	(3)
_____		_____		_____
Quantity (from 5 or 6)		Unit of Capacity (from 2)		Unit of Demand (from 3)

INSTRUCTIONS:

The purpose of this worksheet is to summarize the standards and guidelines for levels of service for the facility being analyzed and to determine which standard to use in the analysis.

1. Type of Facility: Enter the specific public facility or service to be analyzed such as fire protection, law enforcement, potable water or parks and recreation, etc.
2. Unit of Capacity: Enter the name of the unit of capacity that will be the basis for the analysis. The unit of capacity must be something quantifiable such as park acres, fire apparatus, school classrooms or student stations.
3. Demand: Identify the measure of demand you will be using: developed acres such as a future land use plan or a development request, or population projections. Either choice may be used as long as you have the means to establish a base for your analysis:
    3a. Current Demand: enter the current year population or developed acres for your Community and the "as of" date for the population or acres.
4. Available Capacity: Enter the total available capacity from the Inventory Worksheet Step 6.
5. Calculation of Current Level of Service: This is a calculation of the current ratio of capacity to demand (development or population). The available capacity (from Step 4) is divided by the current demand (from Step 3a) to determine the current level of service being provided per developed acre or per capita. *Note: you may wish to express the standard as per 1,000 developed acres or per 1,000 population. Make sure that when doing the calculation of required facilities or services the demand and standard both reflect the same measure: 1 acre or person or 1,000 acres or persons.*
6. Other Standards and Guidelines for levels of Service: Review local documents (i.e., studies, plans, ordinances, codes, regulations, etc.) and identify standards or guidelines for levels of service. The standards/guidelines must be quantitative measures of the amount of facility capacity per unit of demand (i.e., acres of park per thousand population, or gallons of water per day per household, etc.) Record the amount of the standard in Column 1, the unit of capacity and/or the demand in Column 2 and the source document in Column 3. You can also include a standard that your Community would like other than the current standard or a standard or guideline from another source.
7. Recommended Standard for Analysis: Select the standard to be analyzed in the Worksheet for Calculating Demand and Costs of Facilities and Services and record it here: the quantity (from either Steps 5 or 6) in Column 1; the unit of capacity (from Step 2) in Column 2; and the name of the unit of demand (from Step 3) in Column 3.

1. Type of Facility: _____
2. Cost Base: _____
3. Cost of Facility:
   Source of Cost (check one): Recent experience _____
   Replacement Cost _____
   Other _____ (identify)

(1) Cost Item	(2) Cost
Engineering or Architect	
Legal	
Permits	
Sub-total: Pre-Construction	
Appraisals	
Land Acquisition	
Sub-total: Land	
Site Preparation	
Construction/Renovation	
Landscaping	
Construction Supervision/Management	
Sub-Total: Construction	
Equipment or Furniture (for new facility)	
Police/Fire/Rescue Vehicles	
Library Collection	
Other	
Sub-total: Other	
Grand Total Facility Cost	

4. Capacity of Facility: _____
5. Calculation of Cost per Unit of Capacity:

Grand Total Cost per Facility	÷	Capacity	=	Cost per Unit of Capacity
_____ (from 3)	÷	_____ (from 4)	=	_____

INSTRUCTIONS:

The purpose of this worksheet is to calculate a typical cost of a facility to determine a cost per unit of capacity in order to calculate an estimate of additional capital costs of growth.

1. Type of Facility: Enter the specific public facility or service to be analyzed such as fire protection, law enforcement, potable water or parks and recreation, etc.
2. Cost Base: A "cost base" is a complete public facility that may have many units of capacity (i.e., a park is a "cost base" regardless of how many acres it has.
3. Cost of Facility: Identify the "source" for the cost information. The costs can be from a recent similar transaction or an average of several recent similar transactions; or a benchmark, target or typical cost provided by an architect, engineer, contractor, or other professional who is familiar with the cost of similar capital facilities. Enter the applicable costs for the facility or service and calculate the sub-totals and total.
4. Capacity of Facility: Enter the amount of capacity for the facility cost estimate in Step 3 (i.e., acres of park; school student station; millions of gallons per day of water treatment; square feet of building).
5. Calculation of Cost per Unit of Capacity: Divide the total facility cost (from Step 3) by the facility capacity (from Step 4) to determine a typical cost per unit of capacity.