

CALEDONIA CHARTER TOWNSHIP

LAND USE PLAN

UPDATE

2004 – 2024

**CALEDONIA CHARTER TOWNSHIP
LAND USE PLAN
UPDATE**

Prepared by the Caledonia Township Planning Commission with the information and assistance of the following agencies.

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JOE JANCA, Trustee (Elected November 2002)
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RESOLUTION OF ADOPTION

WHERE AS the Township Board of Caledonia Charter Township established a Township Planning Commission to prepare plans for the development of the Township Planning Act, PA 168 of 1959 as amended, and

WHERE AS the Township Planning Act allows for the adoption of amendments and extensions of existing plan, and

WHERE AS the Caledonia Township Planning Commission has prepared a plan update for the future development of the township, and

WHERE AS that plan update has been reviewed at an open meeting to gather public comments of the residents of the township, now

BE IT RESOLVED that the Caledonia Township Planning Commission adopt the Caledonia Township 2004 – 2024 Land Use Plan update.

Moved by: _____ Yeas _____

Supported by: _____ Nays _____

Planning Commission Chairperson

Planning Commission Secretary

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SECTION 1 - INTRODUCTION

INTRODUCTION

In 1979 the Caledonia Township Planning Commission adopted the 1980 – 2000 Township Land Use Plan. The plan was used as the basis for work on a new zoning ordinance, which continued from 1983 until final adoption in 1991. From 1979 to 1992 the township saw greater changes than any other area in Shiawassee County. Included in these changes were the widening of M-21 from 3 to 5 lanes, and the resulting dramatic commercial growth. Residential development, which almost came to a standstill in the early 80's, rebounded somewhat but was not as active as the commercial sector. Agriculture throughout the county continued to slump, with prices for both crops and agricultural land remaining below the levels set in the 70's.

These changing conditions were the principal reason that the Township Planning Commission decided to update the 1980 - 2000 plan. The general outline adopted by the planning commission as the basis for the update process began with an update of the base information in the existing plan including existing land use, geology, housing, agriculture and population. Added to that information were special studies including such areas as housing quality, water vulnerability, and surrounding land uses, to allow the planning commission to address potential issues that were not part of the existing plan. A survey of township resident's attitudes regarding township services and land use policies was also conducted.

Based on the information included in that base data, the existing goals and policies were analyzed and changes were made through addition, deletion and modification of those goals and policies. In some cases those changes were based on changes in relevant base information such as land use and population projections. In other cases the changes are more of a reflection of changes in general attitudes of the planning commission towards basic plan goals (agriculture vs. rural residential development or concentration of commercial development vs. protecting existing land uses for example).

The revised goals and policies were used as the framework for the new land use plan map, the creation of which resulted in the commission revisiting some goals and policies again. Once agreement was reached between the goals and policies and the map, an implementation plan was adopted which was designed to permit the planning commission to use the plan to more effectively make decisions on both rezoning and special land use requests and to work to maintain and regularly update the plan.

This plan was adopted in 1994 and served as the basis for a rewrite of the Township Zoning Ordinance began in 1999. In 2001, it became obvious that the current Township Planning Commission had concerns for the farmland and open space provisions outlined in the plan. This update to a large extent was intended to review existing policies on these issues and establish a new frame work for future development of the rural portions of the township. This update also includes revisions of various information including population, existing land use and wetlands data.

Location Map

SECTION 2 - DATA BASE

TOPOGRAPHY - GEOLOGY

The Caledonia landscape is level to nearly flat for the northern two-thirds of the township. The southern third is divided from the north by the Shiawassee River. South of the river the township is a gently rolling upland area. The township's nearly level topography is evident by the small vertical relief for the entire area. The highest point is about 845 feet above sea level in Section 33 and the lower part is 720 feet where the Shiawassee River flows into Owosso City. Therefore, the township relief is only 125 feet. On a very local scale, there are very few steeply sloped areas, only gentle grades to the Shiawassee River from the north and south.

Drainage of the township is nearly all to the Shiawassee River. Only a small portion of the edge of Hibbard Road area is drawn by the Maple River, and some drainage leads to the Misteguay Creek system on the northeastern border of the township.

Map 2 shows the geological surface deposits. Six different glacial deposition situations are located in the township.

- | | | | |
|----|------------------|----|------------------|
| 1. | Ground Moraines | 4. | Moraine |
| 2. | Lake Plain | 5. | Swamps |
| 3. | Glacial Spillway | 6. | Outwash Deposits |

Most of the northern half of the township is defined by the level ground moraine. Here the glacier deposited water-saturated clay materials in sheets over the landscape. In the southern third of the township moraines add diversity and some relief to the landscape. These areas are broad and more flat than ridge like. They are generally composed of silt, clay, sand and gravel deposited at the glacial front. Refer to the map for a preferred visual picture of the setting for the ground moraines and moraines. Another large area glacial feature is the glacial spillway. This is a county-wide band of sandy and gravel particles along a level, major sluice-way where large streams of glacial melt waters laid down sorted deposits. The spillway flanks both sides of the Shiawassee River and averages a mile in width.

A lake plain deposit is located in the east central portion of the township. A lake plain is probably the flattest topographic land form that exists. It is underlain by clays and silts that were the earth materials deposited from the lake waters.

A small outwash deposit in Section 35 and 36 represents an area of sandier earth materials that washed away from an adjacent moraine.

This brief outline of glacial land forms is the beginning of an understanding of the Caledonia Township Land Use Plan. Soils, the upper layer of these glacial earth materials have been derived from these land forms. The next chapter on soils emphasizes that the land use should respect the different capabilities of the soils to support the use.

Geologic Surface Deposits

General Soil Map

SOILS

The township soil base is an important growth management tool. The future use of vacant lands should respect the capabilities of the soil to support some uses better than others. So at this point the township soil base is described and a procedure is outlined for the use of that information in planning.

An excerpt from the 1970 County Sewer and Water Plan provides a general description of the Caledonia Township soil base.

"Most of the soils are poorly drained barns and clay loams. The southern third of the township has small areas of soils that are sandy and well drained."

Map 3 on the next page outlines four soil associations; the map legend describes the drainage characteristics. The Planning Commission works with a detailed soil map and a related soils map that show limitations to residential land use.

These maps are an important part of the land use plan so the manner in which they were prepared is explained in detail.

Each soil type is rated with a capability unit. This capability unit is developed around the soils drainage, fertility and textural characteristics. Soils with similar capabilities are placed into management groups. The management groups are part of a state-wide system to relate soils to the limitations of uses on them. For example, a common soil of Caledonia Township is the Brookston Loam. This soil is usually located in depressions, in swales, and on broad flats. It is a poorly drained soil. The Brookston soil management unit is a symbol of numbers and letters, 2.5bA. unit, a sample of the chart displays the guidelines for the Brookston Loam.

Table 1			
Example of Soils Limitations Guidelines			
BROOKSTON LOAM – LIMITATIONS FOR USE			
SOIL MANAGEMENT UNIT	RESIDENTIAL	DEVELOPMENT USE	CROPLAND USE
	w/ Public Sewers	w/o Public Sewer	
2.5bA	Severe	Severe	Slight

*NOTE: Limitations for residential development with public sewer also apply to foundations for low buildings.

Map 4 was prepared to portray the township's capability for residential settlement. The map was coded with "hatching" patterns to identify the various soils limitations.

The map is nearly all blank, i.e., there are severe limitations to residential developments in the township without sewer but moderate limitations with sewer. Most of this area is not likely to be served with urban style sewer installations. The southern third of the township contains several areas where residential development would be in line with the soil capabilities. Other considerations may lessen the possibility of growth in these areas.

The soils maps will also be used to identify long-term agricultural lands in a later chapter of this plan.

The Soil Conservation Service has used essentially the same process to identify prime agricultural soils in the county. A detailed explanation of this system and the resulting map can be found in the "Agriculture" subsection. The map shows an area in the northern half of the township that is almost uniformly prime agricultural soils. Prime soils are less frequent in the southern half of the township, but still appears to consist of approximately half the area.

Soil Use Limitations

GROUNDWATER

Groundwater is the primary source of water for Caledonia Township residents and businesses. Some areas adjacent to the City of Owosso are connected to the City's water system. The township is currently discussing the possibility of expansion of the city water system into the township; but assuming agreement can be reached on a mechanism to do that, extensions are assumed to reach only into the unserved areas adjacent to the city, or at a maximum, to an area equivalent to that area currently serviced by the sewer. The remainder of the township will continue to rely on private wells.

This study builds upon the analysis of groundwater supplies conducted as part of the 1979 Land Use Plan. Its purpose is to attempt to characterize groundwater supply, dependence, vulnerability and threats and to review general groundwater protection options. This study is not intended as an in-depth hydrogeological study.

Groundwater Supply

The 1979 plan includes a general description of the groundwater aquifer recharge in the township. The plan estimated that of 29.5 inches of average annual precipitation received by the township, 17 inches will return to the atmosphere through evaporation and evapotranspiration before it can reach a body of water, about 6.5 inches will flow directly into streams, rivers or other surface water bodies, and 6 inches will percolate down into the groundwater. The plan estimated that these six inches of water spread out over the township results in an annual recharge of 3.6 billion gallons per year. However, as development increases the amount of impervious surface in the township the percentage of water returned to the groundwater decreases.

The plan also notes that the availability of this groundwater varies substantially throughout the township. A sandstone valley called the Owosso Channel located in Shiawassee, Bennington and Caledonia Townships serves as an area for groundwater to collect and the groundwater supplies are adequate for many water users. Other areas such as along Vandekarr Road have problems with adequate supplies. Table 2 shows an update of the well log information included in the 1979 plan. It shows the original well logs and information from the deepest and shallowest wells drilled in each section between 1980 and 1992. The gallon per minute column illustrates the variation in the quantity of groundwater from aquifer to aquifer.

Dependence on Groundwater

As noted earlier, much of the township is dependent on groundwater. According to the 1990 Census, 70% of the residents get their water from private wells. When you add to that the fact that the source of the City of Owosso's municipal water is also wells, the dependence of the community on groundwater is plain.

**TABLE 2
CHARACTERISTICS OF PRIVATE WATER SUPPLY WELLS PRE 1980 / 1980-1993**

	SECTION	WELL DEPTH	NATURE OF AQUIFER	DEPTH OF CLAY	GPM
Pre 1980	1	48'	Sand		20
		480'	Sandstone		10
1980-1993		75'	Gravel	67'	20
		180'	Sandstone	52'	10
Pre 1980	2	210'	Sandstone		60
1980-1993		260'	Shale		1
Pre 1980	3	61'	Sand & Gravel		12
		165'	Shale		6
1980-1993		35'	Gravel	30'	20
		260'	Shale	78'	3
Pre 1980	4	50'	Sand & Gravel		10
		105'	Sand & Gravel		30
1980-1993		68'	Sand & Gravel	45'	50
		210'	Sandstone	30'	9
Pre 1980	5	59'	Gravel-Mobile Home Park		150
		85'	Sand & Gravel		15
1980-1993		180'	Shale	94'	6
		255'	Sandstone/Shale	75'	8
Pre 1980	6	103'	Sand & Gravel		30
		315'	Sandstone		9
1980-1993		120'	Shale	85'	25
		231'	Sandstone / Shale	17'	30
Pre 1980	7	66'	Gravel		40
		290'	Shale		5
1980-1993		58'	Gravel	8'	20
		220'	Sandstone	140'	10
Pre 1980	8	58'	Sand & Gravel		5
		130'	Sandstone		6
1980-1993		122'	Sandstone	35'	7
		220'	Sandstone	62'	10
Pre 1980	9	60'	Sand & Gravel		30
		193'	Sandstone		15
1980-1993		50'	Sand	30'	15
		215'	Sandstone	35'	10
Pre 1980	10	90'	Sand & Gravel		20
		190'	Shale		15
1980-1993		47'	Gravel	35'	30
		180'	Sandstone	12'	15
Pre 1980	11	60'	Sand		12
		220'	Sandstone		7
1980-1993		51'	Gravel	51'	5
		65'	Sand	42'	20

	SECTION	WELL DEPTH	NATURE OF AQUIFER	DEPTH OF CLAY	GPM
Pre 1980	12	82'	Shale	34'	30
1980-1993		180'	Shale		5
		40'	Sand	20'	6
		180'	Sandstone		15
Pre 1980	13	36'	Sand & Gravel	7'	5
1980-1993		158'	Sandstone		15
		35'	Sandstone	25'	40
		200'	Shale		5
Pre 1980	14	116'	Sand & Gravel	15'	15
1980-1993		165'	Sandstone		15
		142'	Shale	18'	10
		200'	Sandstone		6
Pre 1980	15	60'	Shale	53'	20
1980-1993		110'	Sandstone		10
		60'	Sand/Gravel	50'	20
		220'	Sandstone		5
Pre 1980	16	40'	Sand & Gravel	21'	20
1980-1993		200'	Shale		4
		220'	Shale	7'	75
		48'	Sand		17
Pre 1980	17	115'	Sandstone	20'	12
1980-1993		173'	Shale		60
		100'	Sandstone	15'	30
		270'	Sandstone		12
Pre 1980	18	76'	Sand & Gravel	40'	15
1980-1993		120'	Sandstone		30
		130'	Sandstone	57'	30
		300'	Sandstone		35
Pre 1980	19	60'	Sand & Gravel	31'	20
1980-1993		210'	Shale		6
		94'	Sand & Gravel	12'	15
		142'	Sandstone		15
Pre 1980	20	48'	Sand & Gravel	20'	60
1980-1993		100'	Sandstone		10
		45'	Sand & Gravel	30'	15
		220'	Shale		20-30
Pre 1980	21	90'	Sandstone	9'	15
1980-1993		200'	Shale		20
		100'	Sandstone	40'	10
		120'	Sandstone		60
Pre 1980	22	65'	Sandstone	20'	13
1980-1993		100'	Sandstone		18
		200'	Shale	N/A	200
Pre 1980	23	42'	Sandstone	28'	41
1980-1993		38'	Gravel		20
		200'	Shale	10'	40

	SECTION	WELL DEPTH	NATURE OF AQUIFER	DEPTH OF CLAY	GPM
Pre 1980	24	110'	Sandstone		15
1980-1993		120'	Shale		6
		82'	Shale	10'	100
		270'	Sandstone & Shale	27'	5
Pre 1980	25	82'	Sandstone		41
1980-1993		165'	Sandstone		10
		142'	Sandstone	12'	30
		180'	Sandstone	N/A	15
Pre 1980	26	192'	Sandstone		25
1980-1993		142'	Sandstone	N/A	10
		182'	Sandstone	65'	20
Pre 1980	27	152'	Sandstone		9
1980-1993		90'	Sandstone	15'	40
		190'	Sandstone	40'	15
Pre 1980	28	120'	Sandstone		10
1980-1993		210'	Shale		5
		70'	Gravel	64'	8
		220'	Sandstone	130'	10
Pre 1980	29	100'	Sandstone		30
1980-1993		225'	Sandstone		11
		270'	Shale		8
		46'	Gravel	36'	30
		270'	Sandstone	45'	10
Pre 1980	30	80'	Gravel		30
1980-1993		130'	Sandstone		10
		250'	Shale		7
		52'	Gravel	25'	20
		250'	Shale	75'	4
Pre 1980	31	60'	Sand & Gravel		15
1980-1993		300'	Shale		3
		57'	Gravel	53'	5
		242'	Sandstone	242'	4
Pre 1980	32	80'	Sand & Gravel		20
1980-1993		290'	Shale		3
		60'	Gravel	40'	13
		230'	Sandstone	80'	10
Pre 1980	33	144'	Sandstone		25
1980-1993		210'	Sandstone		8
		65'	Sand & Gravel	60'	15
		260'	Sandstone	60;	13
Pre 1980	34	60'	Sand & Gravel		12
1980-1993		135'	Sandstone		20
		140'	Sandstone	70;	25
		195'	Sandstone	55'	25
Pre 1980	35	90'	Sand		15
1980-1993		122'	Shale		15
		50'	Gravel	43'	15
		285'	Sandstone	140'	20

	SECTION	WELL DEPTH	NATURE OF AQUIFER	DEPTH OF CLAY	GPM
Pre 1980	36	140'	Sandstone & Shale		10
		270'	Sandstone		20
1980-1993		45'	Gravel	27'	30
		160'	Sandstone	15'	30

Potential alternatives to groundwater are the Shiawassee River and Lake Huron. Significant treatment would be necessary in order to use the Shiawassee River as a water source, and public acceptance would probably be low. Connection to the Lake Huron water distribution system is available near the Genesee County line but water main sizes might need to be increased to provide the quantities of water that would be needed by the township. In any case, this alternative would be more expensive than the current system and it is not known if an adequate supply would be available through Genesee County. In general, any contamination of major aquifers serving the township resulting in a need for alternative water sources could impose substantial costs on the community.

Groundwater Vulnerability

The vulnerability of groundwater to pollution as a result of improper disposal of material on the surface is a function of the depth of wells, the depth of non-porous material overlaying the aquifer and the extent to which aquifers are interconnected. The information in Table 2 shows that the depth of wells throughout the township varies substantially. Wells in the 40' to 60' range are relatively common. These aquifers are normally located in gravel or sand and gravel deposits. Other wells are located 200'+ below the surface. These wells are normally located in sandstone or shale. The significant variation in well depths prevents us from generalizing on the average well depth in the township.

Table 2 also identifies the depth of the clay over the aquifer for wells drilled since 1980. Again, there is a large variation in this protective layer that serves to help shield an aquifer from contamination above ground. However, a majority of the logs looked at showed clay layers under 50' in depth.

There is not enough data to determine the extent to which the aquifers in Caledonia Township are interconnected.

In summary the data indicates a moderate to moderate/high level of vulnerability with some relatively shallow wells and thin layers of non-porous materials overlaying the aquifers.

Threat to Groundwater

The primary threat to groundwater supplies that this report is considering is due to the disposal of material on the surface or discharge into a drain as it relates to land use.

The publication Community Planning and Zoning for Groundwater Protection in Michigan - A Guidebook for Local Officials, ranks land uses by the hazard they pose to groundwater. By comparing the communities current land uses with the list of uses ranked of High or Medium High, an idea of the current threat posed by the community's mix of land uses can be evaluated. Using the list of businesses in the township compiled as part of the economic development section of the plan, 9 very high hazard businesses were identified; 1 junkyard, 7 auto repair shops and Johnson Controls battery plant Other facilities could be added such as the 4 car dealerships (assuming they do auto repair). Many uses in the township are included in the

medium-high category including certain home occupations, storage of agricultural supplies such as pesticides and herbicides, fuel oil dealers and transportation terminals. In general, the mix of very high and medium-high risk land uses appears average.

To summarize, this analysis indicates that the township is highly dependent on its groundwater supply, the vulnerability of the groundwater is moderate, and the threat of contamination of the groundwater is average.

Groundwater Protection

The township should use this analysis to determine an appropriate level of groundwater protection. Community Planning & Zoning for Groundwater Protection in Michigan proposes a five tier protection system. They are listed below from the simplest to the most comprehensive:

1. Link state regulations to local permits
2. Site plan review requirements
3. Overlay zone
4. Hazardous substance control ordinance
5. Regional interjurisdictional permit program

The linking of state regulations with local permits is accomplished through a form such as an environmental review check list in which an applicant for a zoning permit indicates either that his operation does not require any state or local environmental permits or that he has acquired the ones that he does need.

Site plan review requirements are a protection method that adds specific environmental standards to site plan review.

An overlay zone prohibits certain very high and medium high hazard land uses from areas sensitive to groundwater such as wellhead or an aquifer recharge area. It assumes that these sensitive areas have been identified and mapped.

A hazardous substance control ordinance regulates that transportation handling and storage of specified hazardous material.

A region interjurisdictional permit program is the most elaborate protection method identified and tries to address the regional impact of groundwater protection.

The planning commission considered these protection methods and concluded that the appropriate protection system for the township would consist of linking state regulations to local permits while adding the specific site plan requirements to the current zoning ordinance dealing with groundwater protection.

HOUSING

Housing is one of the principle non-agricultural uses of land in Caledonia Township. It is also a basic necessity and provision of sites for adequate, affordable housing is an important public policy.

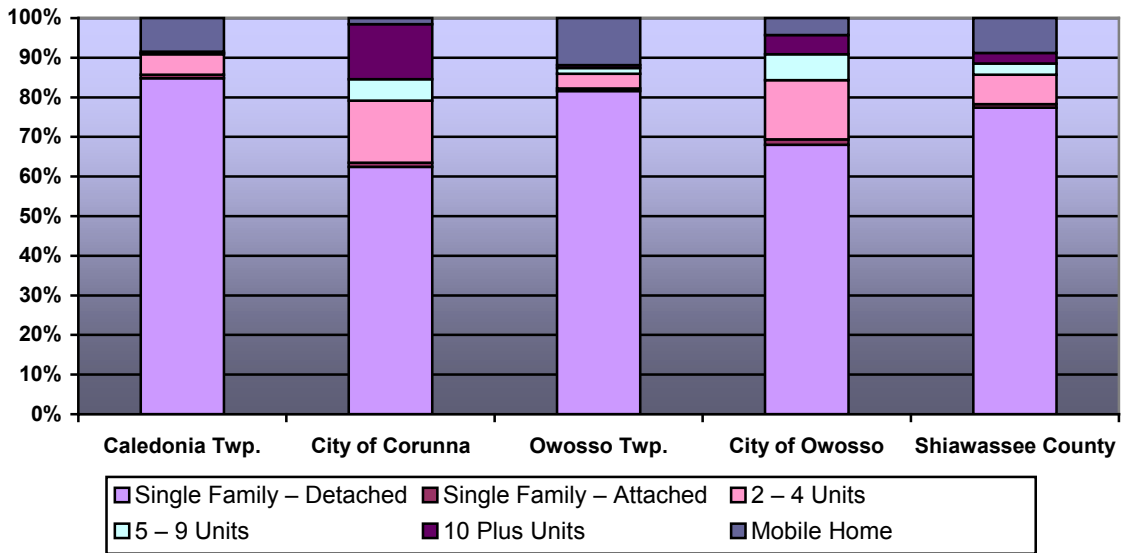
Housing Types

Table 3, Housing Types, shows the breakdown of housing in the mid-county area, and for the county as a whole. Caledonia Township and Owosso Township have significantly higher proportions of single family detached housing. This is normal for a rural township on the fringe of an urban area. However, as the township urbanizes, it can expect the demand for apartment type residential dwellings to increase, particularly larger developments that cannot find suitable large parcels in the cities. Continued demand for mobile home development can be expected over the long term, although current demand for sites is satisfied by an Owosso Township development currently zoned for approximately 350 additional sites. It can be expected that over the 20 year planning period the percentage of single family detached homes will drop.

Over the ten year period from 1990 to 2000, the proportion of single family residences in the township remained the same, in comparison with the surrounding municipalities that experienced a drop in this category. This has been due primarily to the development of Non-single family residential developments in the other units of government including mobile home park and apartment units.

Table 3a					
Housing Types - 1990					
	Caledonia Twp.	City of Corunna	Owosso Twp.	City of Owosso	Shiawassee County
Single Family – Detached	84.7%	66.0%	81.2%	68.0%	77.4%
Single Family – Attached	0.9%	1.1%	0.6%	1.4%	0.9%
2 – 4 Units	5.2%	16.6%	3.7%	14.9%	7.4%
5 – 9 Units	0.2%	5.7%	1.5%	6.6%	2.8%
10 Plus Units	0.4%	14.7%	.7%	4.8%	2.7%
Mobile Home	8.5%	1.6%	11.8%	4.3%	8.8%

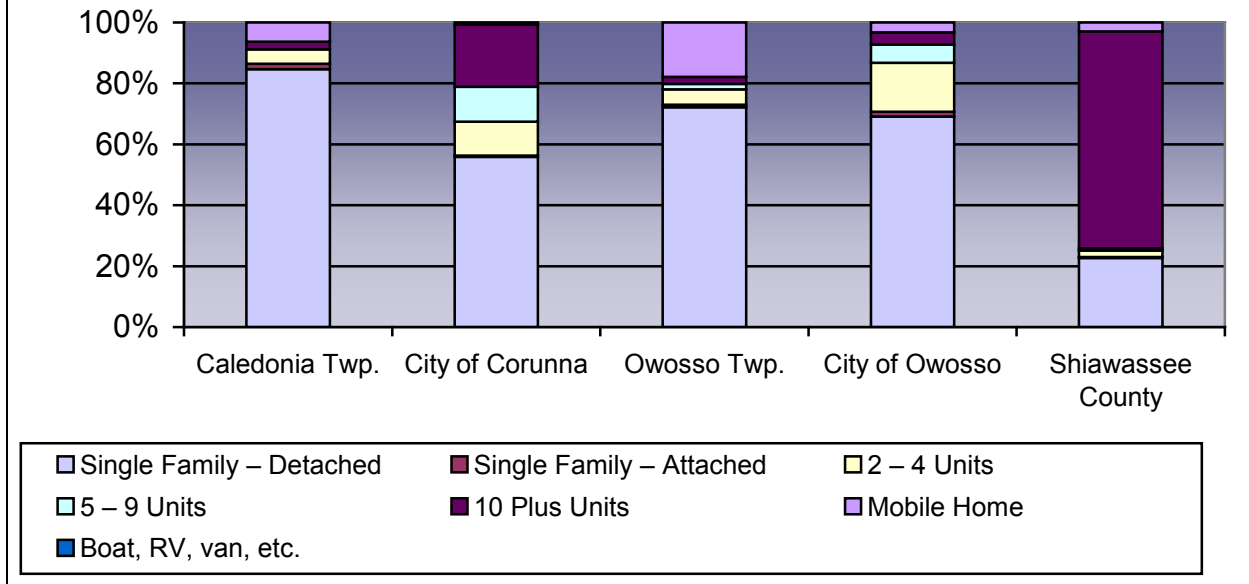
**Figure 1a
Housing Types - 1990**



**Table 3b
Housing Types - 2000**

	Caledonia Twp.	City of Corunna	Owosso Twp.	City of Owosso	Shiawassee County
Single Family - Detached	84.7%	55.9%	72.2%	69.2%	76.4%
Single Family - Attached	1.7%	0.4%	0.8%	1.6%	0.9%
2 - 4 Units	4.8%	11.1%	5.0%	16.1%	7.0%
5 - 9 Units	0.0%	11.5%	1.8%	5.9%	2.7%
10 Plus Units	2.5%	20.4%	2.3%	4.0%	239%
Mobile Home	6.3%	0.7%	17.9%	3.3%	9.9%
Boat, RV, van, etc.	0%	0%	0%	0%	0.1%

**Figure 1b
Housing Types - 2000**

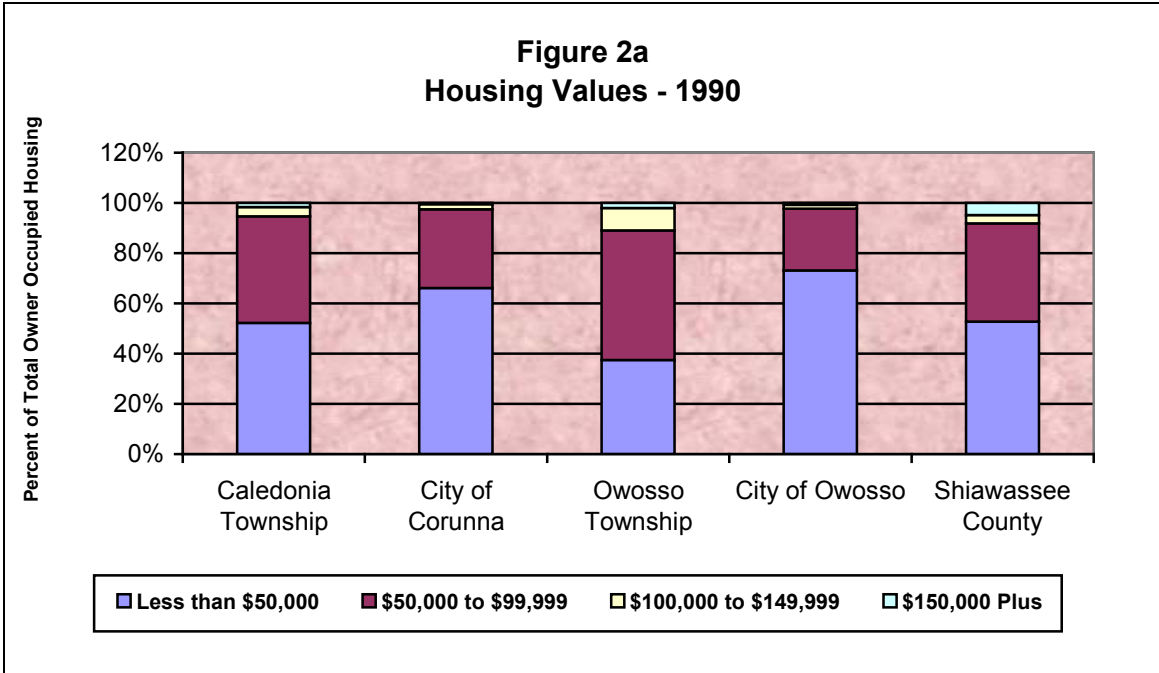


Housing Values

Housing value is a reflection of many factors including age of the housing stock, the housing type, mix, and environmental factors affecting the desirability of living in a given area such as employment opportunities, crime, the educational system, etc. Housing values affect the ability of individuals to purchase a home and affect the revenues of local jurisdictions which get some of their revenue from property taxes.

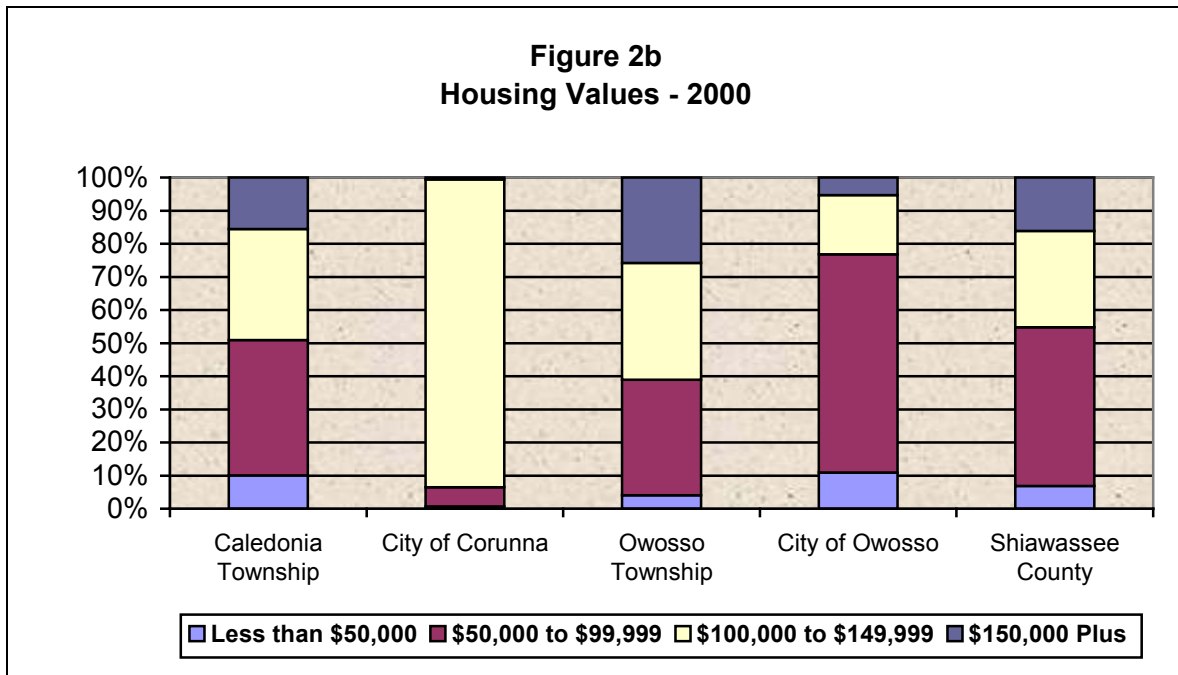
Table 4a and 4b, Housing Values, reflect the 1990 and 2000 census information regarding owner occupied housing values in the mid-county area. It shows a significant increase in housing values over that period. In 1990 over half the homes in the township were valued by their owner at less than \$ 50,000. By 2000 only 10.1% estimated the value of their home as less than \$50,000. In general, the entire county experienced this increase in housing value. The cost of housing in the township is not abnormally higher or lower than the county as a whole.

Table 4a Housing Values - 1990					
	Caledonia Township	City of Corunna	Owosso Township	City of Owosso	Shiawassee County
Less than \$50,000	51.5%	65.7%	37.5%	73.1%	54.8%
\$50,000 to \$99,999	41.7%	31.2%	51.6%	24.5%	40.6%
\$100,000 to \$149,999	3.7%	2.0%	9.0%	1.6%	3.5%
\$150,000 Plus	1.6%	0.5%	2.0%	0.7%	5.0%



**Table 4b
Housing Values - 2000**

	Caledonia Township	City of Corunna	Owosso Township	City of Owosso	Shiawassee County
Less than \$50,000	10.1%	8.0%	4.1%	10.9%	6.9%
\$50,000 to \$99,999	40.9%	73.0%	34.8%	66.0%	47.8%
\$100,000 to \$149,999	33.5%	11.6%	35.3%	17.9%	29.1%
\$150,000 Plus	15.6%	7.5%	25.8%	5.3%	16.1%

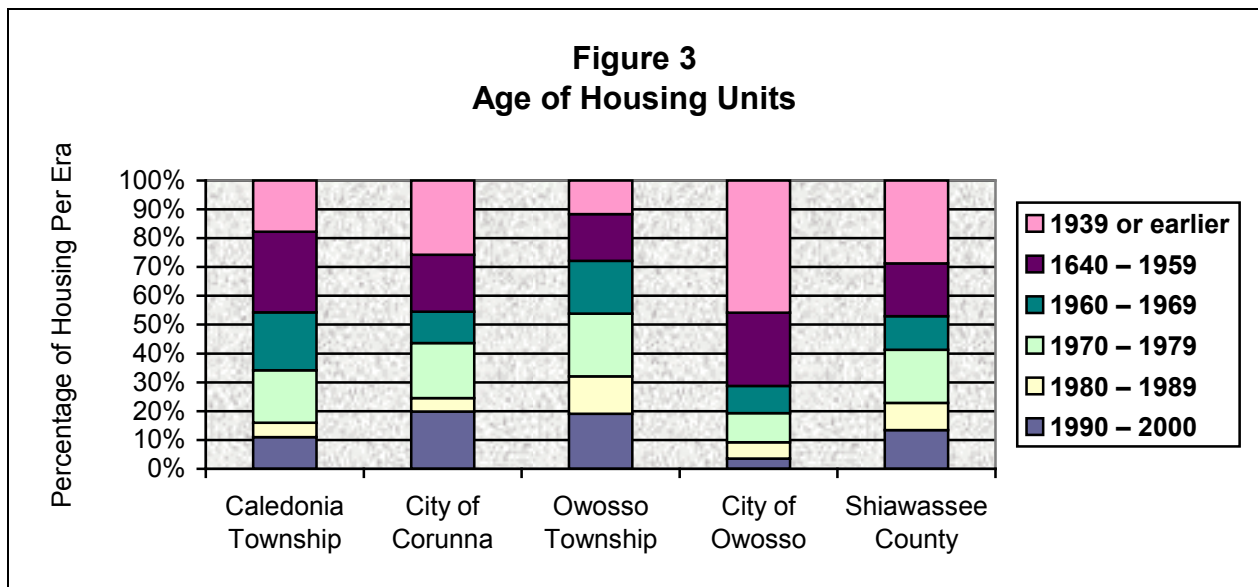


Age of Housing

One of the factors that can affect the quality and price of housing is its age. This is not to suggest that all old homes are worth less than new homes or that communities with a high concentration of old homes can't have nice neighborhoods and good tax base. But generally speaking, older housing will be less costly and more likely to have been converted into multiple family residences.

Caledonia Township's housing stock appears to be about average in its range of housing age based on the 2000 census figures illustrated in Figure 5. In comparison with the City of Owosso the township has much newer housing. However, Owosso Township and the City of Corunna have a higher percentage of newer dwelling units than Caledonia. Corunna's increase was primarily the result of the construction of the River Walk Apartments. In all three communities over 60% of their homes are 40 years or less in age. The slow down in the 80's affected Caledonia Township more than Owosso Township, but Caledonia has bounced back with a more than 100% increase in new home construction in the 1990's

Year Built	Caledonia Township	City of Corunna	Owosso Township	City of Owosso	Shiawassee County
1990 – 2000	201	274	349	234	3917
1980 – 1989	91	63	239	385	2728
1970 – 1979	332	263	399	675	5375
1960 – 1969	368	150	335	626	3384
1640 – 1959	509	272	297	1702	5315
1939 or earlier	325	354	214	3062	8368



Total Number of Single Family Starts (1963-1992)

The calculation of total single family housing starts for Caledonia Township from 1963 to 1988 were based on interpretations of 1963, 1975 and 1988 aerial photos and land use surveys due to incomplete building permit data for that time frame. From 1988 to 1992 building permits were used to determine necessary information. In Caledonia Township from 1963 to 1975 there were 398 new single family homes built, from 1975 - 1984, 104 new homes were built, and from 1988 - 1992 46 new homes were built.

Based on this information, from 1963 to 1975 there was a 47% increase in the total number of single family homes built, with an average of 33.2 homes built per year over 12 years. From 1975 to 1988, the new homes rate slowed to 8.4% with an average of 8 homes built per year over 13 years. This time frame includes the period from 1979 - 1984 when housing starts in the county were extremely low. From 1988 to 1992 the rate dwindled to 3.4% with an average of 11.5 new homes over 4 Years.

This data suggests that the number of single family starts over the past 29 years experienced a decline, but that new construction has rebounded and continued in a limited way. Future trends will be dependent on improvements in the area economy.

Table 6							
Total Number of Single Family Homes from 1963-1992							
	1963	Change from '63 to '75	1975	Change from '75 to '88	1988	Change from '88 to '92	1992
Single Family Homes	846	47%	1244	8.4%	1348	3.4%	1394

Housing Quality

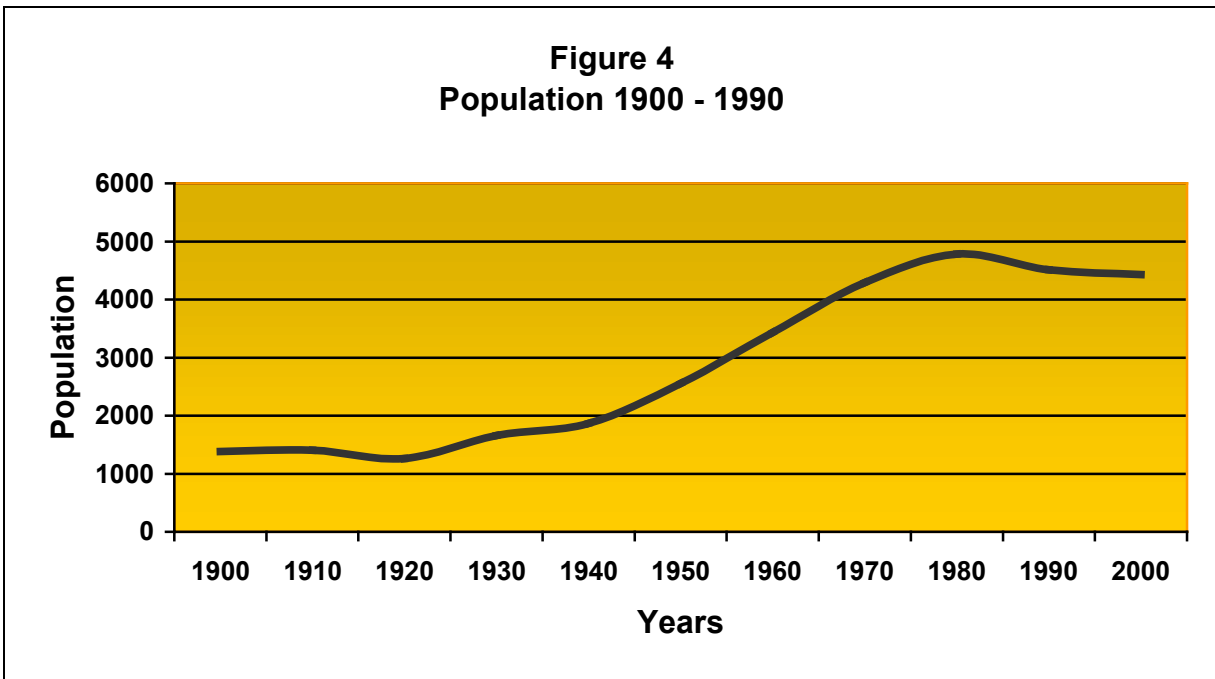
POPULATION

It is important to consider the characteristics of a community's population in determining its land use needs. These include the changes in total population, household size, household composition, median age and population density. A study of the population also leads to a rational basis for projecting future changes in the population.

Population Change

Figure 4 and Table 7; show the change in the total population of the township over the past 90 years. These show that the trend in the township over the past 100 years.

Year	Population	Year	Population
1900	1383	1960	3434
1910	1404	1970	4292
1920	1264	1980	4785
1930	1660	1990	4514
1940	1870	2000	4427
1950	2557		



The drop in population between 1980 and 2000 was generally consistent throughout the area, although the City of Corunna did see a net increase in population. The previous growth in Caledonia Township and the rest of the "mid-County" area has appeared to be tied more to the growth of the Flint metropolitan area, and reflects the drop in population in Genesee County.

Rate of Population Change

Household Size

Changes in household size are often linked to the population's median age. As the population gets older, children reach adulthood and move out to form their own households. The results are that one household that consisted of two parents and three children may, over several years become one household consisting of the parents and three additional households of one child each. The population is the same but there are now four households. The average household size has dropped from 3.11 persons/household to 2.58 persons/household over the past 20 years.

Other factors that effect household size including economic conditions and general society values. In difficult economic times children tend to live at home longer, keeping household size up, but generally as the country has evolved from an agricultural to an industrial society, most of the advantages of a large family have disappeared, while the pressure to keep families small in order to provide each child with the good education needed to compete in today's society increases. This has caused a steady decline in the average household size in the country as a whole since the turn of the century.

	Caledonia Township	City of Corunna	Owosso Township	Shiawassee County	State of Michigan
1980	3.11	2.94	2.83	3.04	2.84
1990	2.8	2.54	2.72	2.78	2.66
2000	2.58	2.33	2.56	2.64	2.56

The affect of this drop in household size has been an increase in the number of dwelling units in the township over the past 20 years even though there has been a drop in population.

Household Composition

The term household composition is used to describe the general make-up or structure of households. The Bureau of the Census divides households into several categories.

- Married Couple Families composed of both spouses, with or without children.
- Single Head of Household Families composed of one parent, with children or other relative.
- One Person Household, 65+ years old.
- One Person Household under 65 years old.
- Other Non-Family Households composed of unmarried couples and people sharing housing.

Table 9 illustrates that both Caledonia and Owosso Township's have household compositions weighted more towards married-couple households, while the cities house a larger percentage of single person households and single parent households. This can be explained to a large degree by the fact that most of the housing in the townships is composed of single family homes, which are unsuitable or too expensive for single person and single parent households. The cities on the other hand have a large stock of traditional low cost housing including mobile home parks and apartments. This has been appropriate because urban areas are often more convenient for the elderly and those unable to afford to maintain a private automobile with their mixture of uses and pedestrian scale. Urban areas also had the municipal services that the mobile home parks and apartment complexes needed to develop. Another source of housing in the cities has been the number of older single family homes divided into apartments or simply

available at a lower price than the comparable new single family home built out in the country or subdivisions on the edge of the urban area.

It should be noted however that the percentage of Married Couple Families has dropped in both townships, and can be expected to increase as a result of divorce, delayed marriage and an aging population

Table 9a Composition of Households – 1990					
	Caledonia Township	City of Corunna	Owosso Township	Shiawassee County	State of Michigan
Married Couple Families	69.9%	49.9%	68.7%	50.2%	63.8%
Single Head of Household	11.4%	19.3%	9.3%	17.1%	13.2%
One Person Household over 65	7.8%	12.8%	9.6%	14.1%	9.1%
Other One Person Households	7.3%	14.1%	8.2%	14.0%	10.3%
Other Non-Family Households	3.6%	3.9%	4.2%	4.6%	3.6%

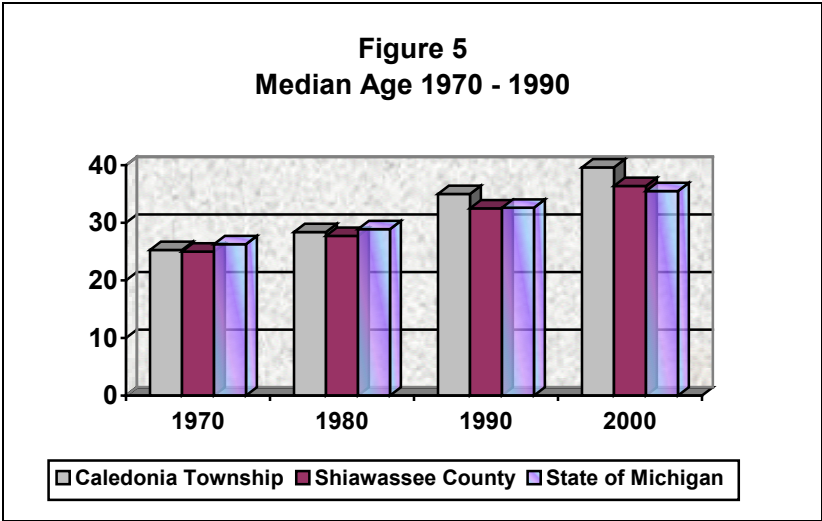
Table 9b Composition of Households – 2000					
	Caledonia Township	City of Corunna	Owosso Township	Shiawassee County	State of Michigan
Married Couple Families	63.4%	43.4%	62.7%	59.1%	51.4%
Single Head of Household	11.8%	18.7%	10.8%	14.7%	16.6%
One Person Household over 65	10.1%	11.7%	11.9%	9.1%	9.4%
Other One Person Households	10.8%	20.4%	11.0%	12.6%	16.8%
Other Non-Family Households	3.9%	5.8%	3.6%	4.5%	5.8%

Median Age

In 1970 Caledonia Township recorded a median age of 25.3 years. In 1980 it was 28.4 years, in 1990 it was 35.0 years and in 2000 it was 39.6 years. Shiawassee County's median age in 1970 was 25 years, in 1980 27.7 years, and in 1990 32.5 years and in 2000 was 36.4. The State of Michigan's median age in 1970 was 26.3 years, in 1980 28.9 years, in 1990 32.6 years and in 2000 it was 35.5 years.

This data suggests that the township's increase in median age parallels the state and county's pattern of an aging population. This trend will result in greater demand for services and housing arrangements for decreasing the demand for school services. In fact, with a drop in population and an aging population, the Corunna Public Schools are being hit twice, which is reflected in their school enrollment counts.

Table 10 Median Age				
	1970	1980	1990	2000
Caledonia Township	25.3	28.4	35.0	39.6
Shiawassee County	25.0	27.7	32.5	36.4
State of Michigan	26.3	28.9	32.6	35.5



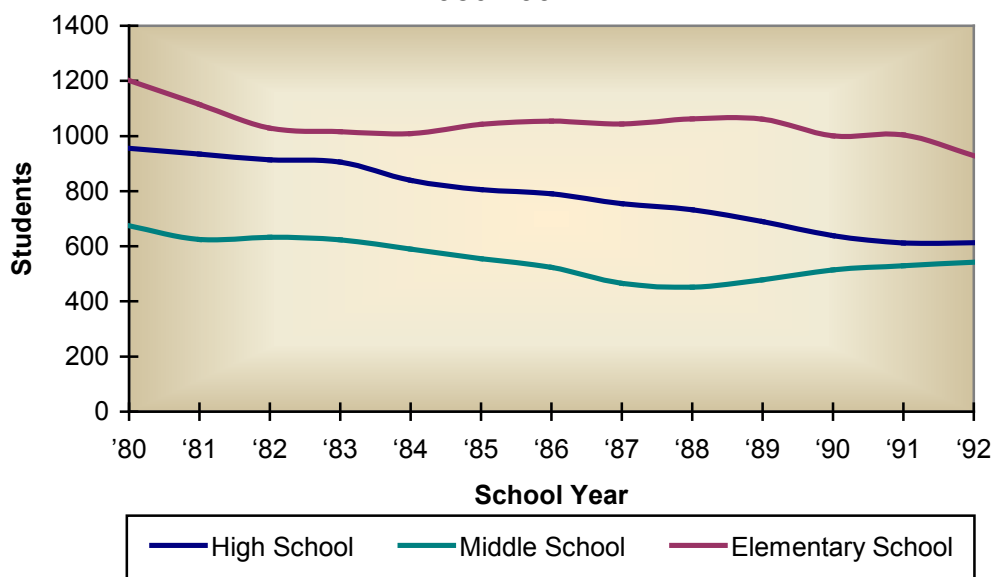
Corunna Public Schools total enrollment has decreased steadily from 2,879 in 1980 to 2,165 in 1992. High school enrollment has fallen from 955 in 1980 to 613 in 1992, middle school enrollment has fallen from 675 in 1980 to 542 in 1992, and the elementary school student enrollment has decreased from 1,201 in 1980 to 929 in 1992.

Corunna Public Schools currently run on an "in-formula" finance base in which the state government guarantees a fixed amount of funding per student based on the tax rate levied by the school district for operating expenses. Thus, with a decrease in the total enrollment from 1980-1992 of 714 students or 24.8%, Corunna Public Schools have experienced a decrease in funding from the "in-formula" system that they otherwise would have received if enrollment had remained stable. Even though funding for the school system fluctuates with student enrollment, "fixed costs" such as bus transportation services for the schools still remain, and generally increase over time leaving school budgets for these programs vulnerable to elimination. This system will continue under the recently passed school finance reforms, making student population of critical importance to the local school systems.

This data suggests that the drop in Corunna Public Schools enrollment count over the past 12 years coincides with a township, county and state trend of an aging population. This pattern of increasing age may be counter balanced with an increase of child bearing parents and live births over a period of time.

Table 11 Corunna School Enrollment 1980-1992													
	'80	'81	'82	'83	'84	'85	'86	'87	'88	'89	'90	'91	'92
High School	955	935	914	905	839	806	791	755	733	690	639	612	613
Middle School	675	625	633	623	590	555	523	465	452	478	514	529	542
Elementary School	1201	1115	1028	1016	1009	1042	1054	1044	1062	1061	1001	1004	929

**Figure 6
Corunna School Enrollment
1980-1992**



Population Projection

Preparing population projections can be a useful tool in the preparation of land use plans by providing a base from which to estimate future demands for housing and land. However, preparing projections for a community with a population the size of Caledonia Township has only limited value. That is because of the relatively small amount of growth that occurs, and the dramatic effect that the decisions of a few key property owners or developers can have on the overall growth rate. Any type of subdivision development or mobile home park expansion can easily double the normal growth rate. For that reason, projections should be monitored over the planning period to watch for unexpected trends.

Two methods for projecting the townships population and housing growth were used. The first is based on the recent average housing construction rate. It is based on the assumption that housing growth has been relatively stable over the past 18 years, and that the decrease in population growth has been a result of the decrease in the household size. By using the number

of housing units as the basis for the projections, any variation in household size will not affect the housing unit estimate.

The second method is more conventional. It uses an average of the previous two decades population growth rates to establish a future population growth rate. These are then used to calculate future housing demand.

Housing Based Projections

The township has been averaging 11.5 additional dwelling units over the past four years according to the township's land use survey. Using a figure of 12 units/ year over the next 18 years and assuming:

- 1) The average number of persons per household will drop from 2.8 in 1990 to 2.7 in 2000 to 2.6 in 2010.
- 2) The occupancy rate will remain 97% for all types of housing combined.
- 3) There will be an average of one housing unit demolition per year.

The following housing and population projections are made.

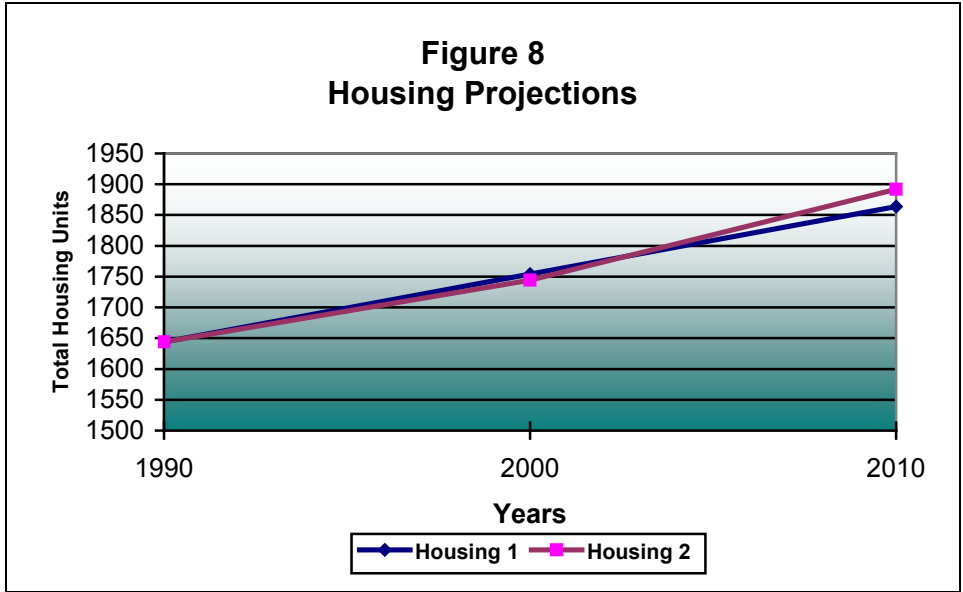
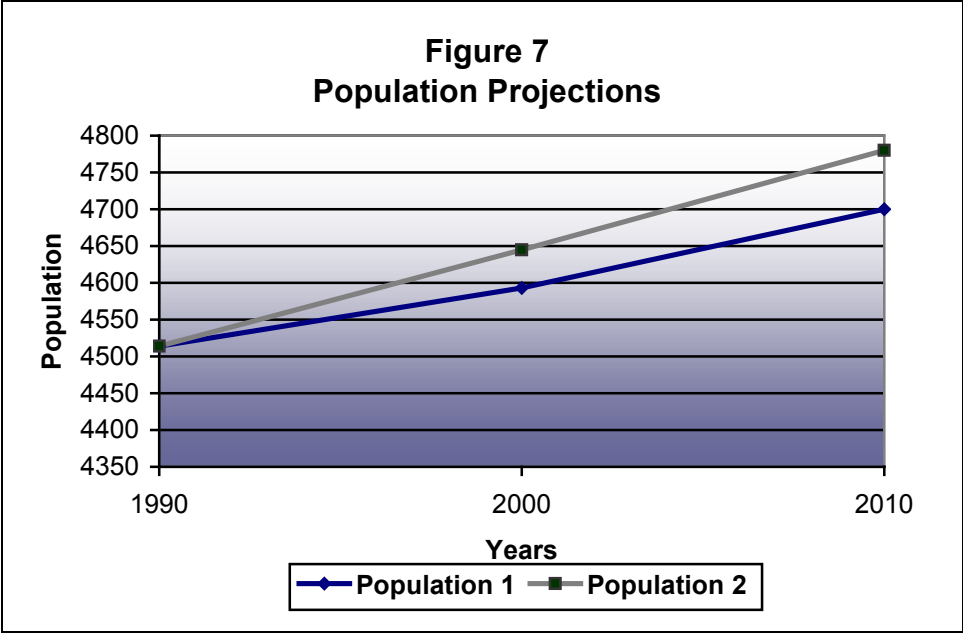
Table 12 Projections – Housing Based		
Year	Housing	Population
1990	1644	4514
2000	1754	4593
2010	4864	4700

Average Population Growth Rate Method

Using this method, the growth rate for the population from 1970 - 1980 and from 1980 - 1990 is averaged, to arrive at a rate of 2.9% and this is then applied to the 1990 population to get a 2000 population and then applied to that figure to arrive at a 2010 projection. Housing growth is then estimated using these figures and the assumptions listed above under the housing based projections. This method tends to inflate housing projections because it is based on a figure that is not initially adjusted for changes in household size.

Table 13 Projections – Average Growth Rate		
Year	Housing	Population
1990	1644	4514
2000	1744	4645
2010	1895	4780

For the purposes of this plan, the assumption will be made that the townships population and housing growth will fall somewhere within this range.



AGRICULTURE AND OPEN SPACE

The preservation of agricultural land is a major theme of the 1979 township land use plan. The preservation of open space and a rural style of life is also a theme, although a secondary one.

When the township land use plan was adopted in 1979, the township already had a zoning ordinance in place. That ordinance, based on a model used by many Genesee County municipalities, contained no provisions for any of the agricultural preservation techniques recommended in the township plan (quarter/quarter, sliding scale, forty case minimum with a case by case evaluation, thirty-five acre minimum based on corn suitability rating, purchase of development rights). The ordinance permitted development in the agricultural district at a density of one home per 1 1/4 acre lots. The result was that the agricultural protection provisions of the ordinance were not implemented. At that time, many of the surrounding townships adopted the quarter/quarter zoning method to preserve their agricultural property, either through county zoning (Rush, New Haven and Hazelton) or through adoption of their own ordinance (Owosso and Venice). The result was that there was no protection of agricultural areas from residential development in Caledonia Township. The fact that the township did not see a dramatic increase in residential development in rural areas was probably due to the down turn in residential construction that occurred in the state from the early to mid 80's.

In 1990 the township adopted a new zoning ordinance that included a quarter/quarter zone that encompassed approximately 1/6 of the township. Recent requests to rezone A-1 property to the less restrictive A-2 zone sparked controversy and prompted the planning commission to conduct a detailed analysis of the various agricultural and open space options for their communities future development. In 1994 the Township Land Use Plan was updated, and in place of a relatively small prime farmland area along with a larger agricultural/residential area designated on the map, the plan called for a much larger portion of the township to fall under an agricultural/open space designation that was intended to be regulated by a new open space zoning district. The new district was not created until 1999, and has since been used to address requests to rezone parcels in the current A-1 zoning district area.

In 2001, as the Planning Commission was completing work on the zoning ordinance update, disagreement arose over the proper way of implementing the 1994 plan's recommendations for an agricultural/open space district covering a majority of the Township. It was decided to undertake this plan update, primarily to consider alternative approaches to farm land and open space preservation. The Planning Commission reviewed the material in this section along with updated information on changes in land use, utility extensions, participation in PA 116 and revised wetland mapping.

Cause and Effect of Farmland Conversion

What are the major causes for farmland conversion to non-agricultural uses? As outlined in the township's current plan, the causes include:

- 1) The inability of agricultural land to compete with other uses in the free market.
- 2) The use of agricultural zoning districts as merely "holding zones" for future non-agricultural land uses.
- 3) The high cost of the subdivision process which discourages the development of residential areas at greater densities.
- 4) High tax assessments a; a result of the sale of surrounding property for residential purposes increases the cost of land to farmers, reduces their profit margin and makes sale of property for residential purposes very attractive to farmers.

- 5) Difficulty for new farmers to afford getting into farming results in the conclusion of families' involvement in the farm and sale of land to the highest bidder.
- 6) The Subdivision Control Act's effect in encouraging the development of 10.01+ acre parcels.
- 7) The development of "raised bed" engineered septic systems that permit the siting of homes in areas of heavy clay soils.

The effects of the conversion of farmland to non-agricultural uses include:

- 1) Increase in public costs as development stirs a demand for road improvement, water and sewer extensions, and expanded fire and police coverage. Education costs are increased as more students must be "bused" in from areas of the school district beyond walking distance.
- 2) Loss of part of a "base" industry that exports goods outside the community and generates income for the community.
- 3) Increase in energy costs as crop production is transferred from prime to non-prime soils requiring more investment in fertilizers, farm machinery, etc. Energy costs are also increased as residents move out into the country, increasing the length of their trip to work and shopping.
- 4) Increases in conflicts between agricultural operations and non-farm residences.
- 5) Reduction in open spaces which detracts from the rural character of the area.

Farmland Fragmentation and Conversion of Farmland to Non-Agricultural Uses

The existing land use survey and housing count show that the pace of conversion of farmland has slowed over the past decade, as the demand for additional housing units dropped, although the pace of farmland fragmentation has not dropped significantly. This is due to the fact that almost all new construction has occurred on rural residential lots split off larger agricultural parcels with frontage on county roads rather than development in platted subdivisions. If this trend continues, an upsurge in new home construction could result in significant losses in farmland.

As noted in the housing section of the report, the township has had approximately 11 new homes built per year over the period 1988 - 1992. This represents an increase over the average of 8 units per year for the period 1975 - 1988, which included several years in the early 1980's during which new residential construction dropped dramatically county-wide.

Map 7, Caledonia Township Parcel Splits, shows all of the parcels added to the Caledonia Township plat map between 1980 and 1990 that were 20 acres or smaller. The map illustrates the fact that while the number of dwelling units being built was relatively low, the acreage being converted to residential use was relatively large.

During this time no new subdivisions show up. Because this data is taken from plat maps, some room for error due to parcels in existence in 1980 that don't show up on the map until 1990 should be given. There are also splits in the agricultural areas that are simply farmsteads being split off from the original farm, with no actual increase in the number of residences. This would help to explain why the number of residential parcels grew at a rate of 15 parcels per year while only 11 homes per year on average were built. But in general, there was significant growth in non-agricultural parcels in the township.

The Agricultural Sector of the Township Economy

In many areas, agriculture is important because it serves as the base for the local economy. This is not as much the case for Caledonia Township as it was 20 or 30 years ago. The township's industrial and commercial base has increased substantially over the past few decades. Commercial development along M-21 over the past five years in particular has had a significant impact on the overall character of the township's economy.

This analysis is based generally on the visual and the anecdotal evidence available. Few economic statistics are available at the township level to use to prove the statement:

- Agriculture was the primary source of employment for 1.4% of the population (32 of 2,253 persons employed) according to the 1990 census, down from 2.8% (53 out of 1918 persons employed) in the 1980 census.
- Agricultural land accounted for 18.9 % of the 1990 township State Equalized Value compared with 24.9% in 1980.

Other indirect evidence of the reduced prominence of agriculture in the local economy is the fact that only 2% of the local bank loans are made to farms or other agricultural operations according to a survey of local lenders.

Public Perception of the Need for Protection of Agricultural Land

The attitude survey conducted by the township as part of the preparation of the 1994 plan included questions regarding agricultural policies. This part of the survey took the form of several sets of two diametrically opposed policy statements. The survey respondent was asked to select the policy statement they agreed with the most. This method was selected to provide the planning commission with an idea of the direction residents felt that the plan should take in several key policy areas. Each area was addressed in several ways, to reduce the effect of one or two poorly worded statements, or situations where the respondent seemed to have a choice between two bad options.

Three sets of policy statements dealt directly with the issue preservation of farmland. In all three cases the respondents strongly supported the policy that promoted preservation of farmland over the policy permitting development in agricultural areas, as shown in Table 14.

Parcel Splits 1980-1992

Table 14	
Agricultural Policy Question Responses – Attitude Survey	
Policy Statements	Total Responses / Percentage
14A – Agriculture should continue to be the primary land use in the township and any other type of use (residential commercial industrial) should only be permitted as exceptions	389 / 77%
14B – Agriculture should no longer be the primary land use in the rural areas of the township and agricultural land should be opened up to other types of development	114 / 22.7%
21A – Nonagricultural development in areas of prime agricultural soils should be prohibited	390 / 65.3%
21B – Nonagricultural development should be permitted in areas of prime agricultural soils	103 / 20.9%
27A – Residential development should be limited in rural areas to prevent conflicts with agricultural operations that create dust and odors	395 / 79.7%
27B – Agricultural operations should be regulated to prevent creating noise dust and odors that are a nuisance to residents	81 / 17%

Prime Farmland

When the township prepared their original plan in 1979 and identified their long-term agricultural land, one of the factors in determining if it should be so classified was if the area was classified as "prime farmland" by the Soil Conservation Services Prime Farmland Map. This map was prepared using the SCS's soil survey of Shiawassee County. Certain soil types were classified as prime agricultural soils. Areas where these soils predominated and were at slopes less than 6%, the land was classified as "prime farmland". Map 8 shows the prime farmland areas identified as part of the 1979 plan.

In the mid-1980's the SCS refined their prime farmland designation, listing some soils as prime only if drainage tiles are installed on the land. Much of the land in the township is considered prime only if tiled under the new designation. The township planning commission considered basing their long-term agricultural designation on the new system.

The primary advantage in using the new classification system were that with a more detailed system, the township could feel more confident that areas then identified as "prime" were in fact high quality agricultural soils.

The principle disadvantages were:

- 1) The new system would require an extensive survey of the existing status on farm fields (tiled-untiled).
- 2) Land could change status at any time by having tile installed or by existing tile falling into disrepair. This would be difficult to track. Also it would call into question when land use designations should be changed. The changeable nature of the status would not lead to good long-term planning.
- 3) The old system identified the lands potential as prime farmland, and that potential is the valuable resource being protected.

The planning commission made the decision to keep the existing classification system.

Prime Farmland

Designation of Long-Term Agricultural Land

Other considerations made in designation of land as long-term agricultural in the 1979 plan besides its classification as prime farmland were land:

- 1) Having continued capital investment to sustain productive farming.
- 2) Not affected by existing or planned urban development.
- 3) Not planned for extension of municipal utilities or other urban investments.
- 4) Being large enough parcel size for economical farm units, and in ownership that will be interested in perpetuating the agricultural use.

The first criterion is related to the question regarding the new prime soils classification system, and like it is difficult to measure and it is a characteristic that is variable over time. Perhaps the current owner does not invest in the farm land enough to generate the maximum yield. Couldn't the next farmer be able to make the investments to make it more productive? And does this criterion encourage farmers who wish to rezone their property to neglect their farm so that it does not meet these criteria?

Identifying existing urban development is not difficult, but this second criteria is also based on knowledge of short term development plans in a community. The idea is that if a person has already made plans and possibly already spent money to undertake a development project, the township should not, if possible, interfere with these "investment based" expectations by placing it in a restrictive zoning district. A judgment must be made as to what constitutes adequate existing plans. Is just having the idea adequate? What if plans have been drawn up or surveys been prepared for the development? On the other hand a land owner may have laid plans that adequately meet the definition of a development but the proposed development is obviously not appropriate for the area based on other criteria.

The criteria regarding the existing or planned extension of utilities are relatively straight forward. These utilities normally would consist of road upgrades (widening or hard surfacing it) municipal water lines or sewer lines. This criterion emphasizes the importance of having a capital improvements plan in place so that the township knows the areas that these services are planned to be extended into.

The fourth criterion has two parts. The first is that the parcel be large enough to be economically farmed. The suitability of a particular site is dependent not only on its size but that of the other lots in the area. A relatively small parcel among large parcels may be more economical to farm than the same parcel among several small lots. It should also be understood that this criteria is not suggesting that if you have three one acre lots in an area of forty acre lots that the large lots could be classified as prime but the smaller lots could not. That rational would eventually result in spot zoning. Areas should be designated based on the characteristics of most of the parcels.

The other part of the fourth criteria is the most subjective and the least useful in using this criterion when reviewing a rezoning request. When establishing the planning districts, how is the interest of the property owner in continuing in farming to be measured? Participation in PA 116 could be one way, but it is not representative of those farmers who prefer not to enroll in PA 116 because they prefer not to become contractually tied to the state, nor is it representative of those people who enroll in the act for ten years or so but whose long term goals are to develop the property. And is not a request for a rezoning itself notification that the property owner no longer is interested in perpetuating its agricultural use?

P.A. 116 Lands

PA 116

One indicator of the interest by farmers in maintaining their property in farming is the level of participation in PA 116. This act permits farmers to obtain certain tax credits in return for agreeing to temporarily give up their right to develop their property for non-farm uses. While there are all types of reasons why a property owner may not wish to enter the program even though they intend to keep it as farmland, enrollment in the program is a definite indication of the intent to preserve it as such at least for the mid-term. The PA 116 agreements can span from 10 to 99 years.

Map 9 shows the parcels in Caledonia Township currently enrolled in PA 116. It shows that some of the parcels in PA 116 are not in the areas designated as prime under the old SOS classification system, but the vast majority is. However, much of the land shown as prime farm land is not enrolled in PA 116. This illustrates why the PA 116 program cannot substitute for the zoning district regulations such as quarter/quarter. The program is voluntary, and in areas where development potential exists, participation is normally quite "patchy". While it still will preserve as agricultural that land enrolled, it will not prevent sprawl development in between or prevent the extension of municipal utilities and services that the sprawl entails. Once the non PA 116 parcels begin to develop and utilities are extended, the long-term viability of all farmland is reduced and property owners in PA 116 will tend to drop out of the program when their enrollment period expires.

Zoning Techniques to Protect Farmland¹

The particular zoning technique that a community selects for protecting farmland should be based on a variety of factors including land development patterns, parcel sizes and unique local concerns. Following are descriptions of five different agricultural zoning techniques, and the circumstances under which they are most likely to succeed.

Point/Numerical Approach

The point system or numerical approach permits nonfarm uses on a case-by-case basis, relying on specific standards to gauge the impact of the proposed land use on farmland.

No especially noteworthy cases involving a state or federal Supreme Court decisions on this type of approach have been identified. Nevertheless, this approach is statutorily authorized in Michigan under the name special land uses. Special land uses, also known as conditional uses, are permitted when the standards for review and approval listed in the ordinance have been met. These standards must be reasonable and necessary to achieve legitimate public objectives. No Michigan community has been identified which has adopted this approach, although Eaton County has given it consideration.

The Soil Conservation Services, USDA, has developed a decision-making tool which resembles this technique called the Land Evaluation and Site Assessment (LESA) system.

Conditional Use

This more typical approach permits nonfarm uses on a conditional basis relying on discretionary standards (rather than nondiscretionary as in the above example). It is also a special land use permit approach. Nonfarm uses may or may not be permitted by the zoning authority whose decision is typically based on whether the use meets the purposes of the

¹ This section is taken from Planning and Zoning for Farmland Protection: A Community Base Approach by Mark Wycoff and Carol Misseldine Point/Numerical Approach

zone; whether it is compatible with surrounding uses; whether it adversely affects environmental areas; and how much it would add to public service costs. The conditional use aspect of this technique sets it apart from techniques such as sliding scale and quarter/quarter where nonfarm dwellings are permitted uses as of right.

A significant problem with this technique is the difficulty in ensuring that in the application of discretion, appropriate care would be given to a full consideration of all relevant factors, and to equal treatment of all applicants. Examples of this approach can be found in various townships in Allegan County and other jurisdictions in Michigan.

Sliding Scale

The number of buildable lots allowed under the sliding scale approach is set by a scale which considers the total size of the parcel owned. Smaller parcels are actually allowed more lot splits proportionate to total acreage than are larger parcels.

This approach works best in areas with a wide range of parcel sizes and when landowners participate in setting the dimensions of the scale.

Further refinement of this technique is achieved by establishing a minimum and maximum building lot size. Establishing a maximum lot size (usually one or two acres) and encouraging nonfarm development on less productive land helps to keep prime farmland in agricultural use.

Table 16 Schedule of Density Max # of Additional Lots Permitted	
Area of Lot of Record	# Lots
1 to 10 acres	1
10.1 to 20 acres	2
20.1 to 40 acres	3
40.1 to 80 acres	4
80.1 to 160 acres	5
160.1 to 320 acres	6
Over 321 acres	7

The sliding scale technique received a significant legal boost in April 1985 when the Pennsylvania Supreme Court upheld a sliding scale ordinance prohibiting more than 3 dwellings on a 43 acre farm parcel because of its farmable size and the fertility of its soils. The case is Boundary Drive Association V. Shrewsbury Township, 491 A.2d 86 (1985). Most important is the fact that this case came after an earlier case involving a slightly different sliding scale approach which the Pennsylvania Supreme Court had rejected.

In a related case in Pennsylvania, an appellate court reversed the trial court's decision which had concluded that "a municipality cannot require minimum lot sizes greater than 10 acres, in reference to a private landowner's challenge of a sliding scale ordinance. The case is Cordorus Township v. Rodgers, 492 A.2d 73 (1985). The appeals court concluded that "preservation of agricultural land is a legitimate zoning purpose and that the ordinance provisions are rationally related to that goal."

Saline Township in Washtenaw County uses the sliding scale zoning technique.

Quarter/Quarter

Quarter/Quarter is the zoning technique currently used by Caledonia Township. Under quarter/quarter zoning, each landowner is entitled to one lot per 40 acres of farmland. Once the farmer has converted the lot or lots he or she is entitled to, it becomes a matter of record and no further nonfarm development on the parcel is permitted.

This approach works best in rural areas with large farming operations and where the average parcel size exceeds 40 acres. Further refinement of this technique is achieved by the use of a set of standards which govern setbacks and lot size.

Quarter/quarter zoning is being used throughout Michigan due to the ease of development and administration. Administering this technique can be as easy as laying a quarter/quarter grid over a township map and marking the location of each nonfarm residential building permit. In addition, the farmer may house farm laborers on his land by special permit and still be within the zoning standards. Other areas using quarter/quarter include the counties of Branch, Ingham, Kent, Shiawassee and Wayne.

Exclusive Agricultural Zoning

This technique prohibits all nonfarm dwellings in the agricultural zone, and severely restricts other nonfarm uses. Cass, Manistee and Marquette Counties have some townships currently using exclusive agricultural zones.

The most significant exclusive agricultural district litigation involved the case of *Wilson v. County of McHenry*, 416 NE2d. (1981). In this case, the Illinois court upheld a 160 acre minimum lot size in an agricultural zone that was prepared pursuant to a comprehensive county plan that sought to protect important farmlands.

Large Lot Zoning - Some Drawbacks

So called large lot zoning is one of the oldest and is the most widely used technique to protect farmlands. It is supposed to work by establishing what is considered to be a large minimum acreage requirement (usually 10+ acres) for a nonfarm rural residence.

A major problem with this technique is that it has actually encouraged the unnecessary and premature conversion of thousands of acres of Michigan farmland. The reason for this is that many Michigan townships which adopted large lot zoning in the 1970's established a minimum lot size for a nonfarm rural residence for only ten acres.

Planning and zoning officials theorized that such a high initial investment would discourage would-be rural dwellers from moving to agricultural areas. In fact, this theory often backfired and merely encouraged people to purchase more acreage than they would have preferred. A land use pattern based on ten acre lots results in the idling of a large amount of land. A home and large lawn often occupy one acre and the balance of the lot is frequently left vacant and unused, since nine acres is not a viable agricultural unit in most areas.

Additionally, the application of this approach is rarely based on a thorough knowledge of which lands are prime or unique. Instead, the large lot technique often is used in conjunction with long "permitted by right" use lists that treat agricultural zones merely as holding zones rather than as important agriculture industry zones worthy of special protection from incompatible uses.

However, the large lot technique can be a successful farmland protection tool if it is used in conjunction with the conditional use approach and a sufficiently large minimum lot size is

established. In fact, both the quarter/quarter and exclusive agricultural districts could be considered large lot approaches. The minimum lot size selected should be large enough to support a viable agricultural operation.

For a cash crop operation in Michigan, the lot size should not be less than 40 acres. Truck farms and specialty crop operations may however, succeed with somewhat less acres.

Below is a table that compares the number of non-farm residences that would be created in comparison with the number of division allowed in the first ten years under the Land Division Act.

Maximum Non-farm residences in each approach						
Original Parcel Size	Land Division *	Sliding Scale	Quarter/Quarter	Tuscola Twp system*	Exclusive Ag	10 acre large lot
80	13-15	4	2	4-6	0	8
40	7-9	3	1	2-3	0	4
20	5-7	2	1	1-2	0	2

* Depending on bonus density allowed

Buffer Zoning Districts

Including an additional buffer zoning district in the zoning ordinance may be beneficial in preserving the long-term integrity of the agricultural production district, particularly if the quarter/quarter or exclusive technique has been chosen. Buffer districts provide country living opportunities while minimizing incompatibilities between commercial agricultural production and urban land uses.

The number and placement of buffer districts will vary according to the preferences and circumstances of individual communities. A simple buffer district could be situated adjacent to the exclusive agricultural district on farmlands that are productive, but not classified as prime, unique or essential. This buffer district could then allow single family homes on specified lot sizes while still permitting continued agricultural production. The townships A-2 Agricultural Zoning District can be used as a buffer district.

Open Space Protection

An issue that has garnered a lot of recent discussion is the concept of "Open Space Protection". Although often discussed in connection with farmland preservation, the two concepts are not the same. Open space Protection's aim is to preserve the rural atmosphere, but not necessarily the agricultural economy. The system encourages developers to preserve scenic views, to buffer developments from view along the public right-of-way and retain natural open spaces. Many times these open spaces consist of farmland, but they can just as easily consist of wetlands, woodlots or vacant fields.

In turn open space zoning is not exactly the same as much of the cluster zoning concepts incorporated into most zoning ordinances. Open space zoning concentrates on the quality of the open spaces that will be preserved and how they contribute to the rural atmosphere of the area. Most cluster zoning concentrates on the cluster of the residential dwellings and how that clustering improves the quality of the development. However, both concepts result in the

clustering of development on a portion of a site, with the remaining area left open, either through the granting of a scenic easement, or through some type of deed restriction.

Cluster zoning has been available under township zoning since 1976 and under county zoning since 1982, but has never been used by a developer. There are several reasons. First of all, clustering is always optional. There are no zoning districts that require clustering. Secondly, there are no incentives built into the cluster option other than the design freedom given the developer because they do not need every site to be a certain minimum size, and the potential cost savings that can be realized from shorter roads and utility extensions in a cluster development. Thirdly, there is enough open, easily developable land in the township that most developers do not feel a need to bother with hard to develop sites that are ripe for cluster development. Finally, the scale of development in most parts of the township have not impacted property owners "rural quality of life", and called for developments that protect it.

Open space zoning has two applications within the township. In areas the township wishes to protect farmland, a modified version of open space zoning that provides incentives for people to preserve prime farmland could be incorporated into the A-1 district. If more flexibility were provided to property owners within the A-1 district to develop their property; the demand to rezone to A-2 should be reduced. Care should be taken however that the level of development that is permitted is not so great that it alters the area from an agricultural to a rural residential area.

A second option would be to combine the A-1 and A-2 zoning districts and incorporate open space preservation concepts throughout the agricultural areas. The advantages of this are the elimination of the boundary line between the two districts which has grown quite contentious, and the fact that when these types of provisions are formulated so that they only apply to large parcels (10+ or 20+ acres) they prevent the need for gerrymander district lines while providing protection for all of the large tracts of farmland.

Open space preservation provisions normally include the following.

- 1) A classification system determining which parcels must comply with the open space requirements and which do not. This normally is a minimum lot size requirement, the idea being that no real public good is realized by requiring owners of small lots to reserve a portion of their land for open space.
- 2) An open space percentage. This can be a fixed figure such as 50% or can be on a sliding scale based on the size of the original parcel.
- 3) Uses permitted in the open space areas. This listed normally includes at a minimum normal agricultural operation and passive recreation uses but can include other uses that comply with districts intent
- 4) Density regulations that limit the number of total dwelling units based on the original parcel size. This requirement is what limits total development density.
- 5) Minimum lot size requirements. These should not be confused regulations. These requirements permit the development at a size that is keeping with the rural character of the area and adequate to provide sites for septic systems and wells.
- 6) Residential development standards. These standards are designed to result in developments that blend in with the rural landscape and can include such things as preservation of scenic easements, construction of homes within wooded areas of sites screened by tree lines, and use of interior streets to get development off the county road to protect the rural character of the area and reduce the number of curb cuts on the county road. These requirements can be mandatory or can be encouraged by the use of density bonuses if the developer provides them.

The easiest way to consider these alternatives is to start out with some typical sites and see what type of developments result from various combinations of requirements. Section 4 was used as a basis for preparation of examples. The section is bisected by two county roads with frontage along two additional roads on the north and south sides of the section. There are currently 21 parcels in the Section, 15 of which are over 10 acres in size.

Example 1 - Current Regulations. Assuming development only along existing road frontage, current regulations will permit 137 additional lots. Until recently, the only way to divide the property into those many lots in a relatively short period of time would be through the lengthy process required by the Subdivision Control Act. Now, however, property owners can subdivide their parcels under the Condominium Act, which can permit division in a matter of a couple of months. This option should make it easier for property owners to create residential lots.

Example 2 - Open Space Preservation. One parcel per five acres density limitation for all parcels 10 acres or more. This option would permit the development of additional 110 lots.

Example 3 - Open Space Preservation. One parcel per 10 acres density limitation for all parcels 10 acres or more. This option would limit potential development to 61 additional lots.

In each example, a 50% open space preservation requirements for all lots over 10 acres in size resulted in 345 acres being preserved.

As can be seen from this example, the restrictiveness of development under Open Space Preservation Zoning is dependent on the standards the community adopts. The higher density permitted, the lower open space percentage required, the larger the minimum lot size for applicability of the regulations, then the greater the amount of development allowed. The lower the density permitted, the greater the open space percentage required or the smaller the lot size for applicability of regulations, the more restrictive the overall effect will be.

In determining the eventual regulations to establish, the Community must decide what the goals are that they are attempting to achieve and balance those with the rights of the property owners.

LAND USE

A major Component of any land use plan is an inventory of current land use and comparison with surrounding communities and with the Communities previous land use patterns. This assists the planning Commission in projecting future land use trends in the area.

Land Use Patterns

In order to identify recent and long term trends in land use development in the township, a series of existing land use maps were created, showing existing land uses in 1963, 1975, 1988 and 1992. The dates used were based on available photography that could be used to interpret land uses. The change in land use patterns from year to year could then be identified.

Method of Land Use Survey

Aerial photography was obtained from the MSU Center for remote sensing and the Shiawassee County Planning Department. Each set of photos were interpreted using the MIRIS land use classification system. These were field checked and a 1992 map prepared by conducting a "windshield" survey of the township in December of 1992.

Land Use Categories

MIRIS uses a land use classification system developed by the DNR in 1973. It is a four-level hierarchical system using a number Code up to four numbers long. The first digit in the number identifies the general land use (urban & built up, agricultural, rangeland, etc.) The second, third and fourth numbers increase the level of detail as shown below in Table 17.

1	Urban & Built Up
11	Residential
113	Single Family / Duplex Residential
1132	Medium Density Single Family / Duplex Residential

Most of the data provided by MIRIS was broken down to the second or third level. Depending on the importance of breaking particular types of land use/cover down, some of the sub-categories were combined. An example of this was forest land. In the MIRIS data, most of these land uses were broken down to the third level, with classifications such as lowland conifers or upland hardwoods and pine associations. For the purpose of this land use survey, all forest land was lumped into one "Forest" category. Below are the various land use classifications used in the survey, an explanation of the type of land use/Cover that they include and the Code number used by the DNR classification system.

Agricultural/Open Space - Code 2,3,4,6

This category is a combination of agricultural, vacant forest land and wetlands.

Agriculture may be broadly defined as land used primarily for production of farm commodities and includes cropland, pasture, orchards, livestock feeding areas, greenhouses, and non-commercial racetracks. Farmsteads are listed under this category.

This is the area classified under MIRIS as rangeland, which is defined as areas supporting grasses or shrubs. It does not include areas that are seeded, fertilized or otherwise maintained.

Forest lands are lands that are at least 10 percent stocked by trees producing an influence on the climate or water regime. Lands from which trees have been removed to less than 10 percent stocking but which have not been developed for other use are also included.

Wetlands are those areas where the table is at, near, or above the land surface for a significant part of most years. Examples of wetlands include marshes, mudflats, wooded swamps, and floating vegetation situated in the shallow margins of bays, lakes, rivers, ponds, etc. They include wet meadows and seasonally wet or flooded basins or potholes with no outlet. Shallow water areas with submerged aquatic vegetation are classed as Water. Wetland areas drained for any purpose belong to other land use categories.

Farmsteads - Code 291

This category consists of the farm residences and the associated out buildings such as farms, grain silos, etc. The category is based on the physical layout of the site and is not determined by whether or not the family living in the home does in fact farm.

Single-family/duplex - Code 113

This category includes areas having detached single and two-family structures used as a permanent dwelling. Associated structures may include tool sheds, garages, garden sheds, etc.

Multi-Family - Code 112

This category includes all multi-family and apartment structures of 3 units or greater under four stories in height.

This category is made up of a Combination of MIRIS categories covering schools, churches, government facilities and recreational facilities.

These land uses are located throughout the built-up portions of the township around the city and along the highways.

Commercial - Code 12

The uses in this class include those dealing primarily with the sale of product and services. The main building, secondary structures and areas supporting the basic use are all included. Office buildings, warehouses, driveways, sheds, parking lots, landscaped areas and waste disposal areas. The educational, religious and government uses normally included in this category have been separated out and included in the public/semi-public classification. Industrial uses are also included in this category.

Mobile Home Park - Code 115

This class includes land used for the grouping of mobile homes. Usually these areas will include mobile homes in numbers over three. Related services and recreational spaces are to be included. Single mobile homes will be classed as part of 113.

Industry - Code 13

This class includes a wide array of uses from light manufacturing and industrial parks to heavy manufacturing plants.

Airport - Code 141

This class identifies the Owosso Airport.

Utility - Code 146

This classification includes areas associated with the transport of oil, gas, water or electricity including pumping stations and electric substations.

Mining - Code 17

Extractive land encompasses both surface and subsurface mining operations, such as sand and gravel pits, stone quarries, etc. Industrial Complexes where the extracted material is refined, packaged or further processed are included in the industrial category even if they are adjacent to the mine. Areas of future reserves are included in the current use category, agricultural or forest land, regardless of the expected future use. Unused pits or quarries that have been flooded are placed in the water category if the water body is greater than 40 acres in size. Abandoned pits, areas of tailings and strip-mined areas that are barren of vegetation remain in the extractive category.

Cemetery - Code 194

This class includes all lands currently used or laid out for use as a cemetery including accessory buildings and drives.

**Table 17
Existing Land Use 1963-1992**

Land Use	1963	1975	% Chg '63-'75	1988	% Chg '75-'88	1992	% Chg '88-'92	2002	% Chg '92-'02
Farmsteads	300.0	315.7	5.2	320.2	1.43	320.2	1.4	320.2	0
Single Family Residences	599.2	947.9	58.2	1082.9	14.2	1126.8	4.1	1307.8	16.1
Industrial	59.1	65.1	10.2	65.1	0	65.1	0	65.1	0
Commercial	118.7	171.3	44.3	219.1	27.9	238.2	8.7	263.0	10.4
Cemetery	.96	.96	0	.96	0	.96	0	.96	0
Airport	29.6	31.8	7.4	91.5	187.7	91.5	0	91.5	0
Utility	7.8	7.8	0	7.8	0	7.8	0	19.2	146.1
Mobile Home Park	0	12.9	100	21.7	68.2	21.7	0	21.7	0
Mining	0	0	0	34.9	100	34.9	0	34.9	0
Multi-Family	0	0	0	0	0	3.1	100	3.1	0
Ag/Open Space	18929	18491.5	-2.3	18200.8	-1.6	18134.7	-.036	17916.6	-2.2

Existing Land Use Map 1963

Existing Land Use Map 1975

Existing Land Use 1988

Existing Land Use 1992

Existing Land Use Map

NATURAL FEATURES

Natural features should serve as a basis framework for future development by identifying areas where constraints limit development or identify resources that should be preserved.

Flood Plains

A flood plain is an area of land including and adjacent to a river where excess water flows when the capacity of the normal river channel is exceeded.

The township's flood plain is identified by a map prepared through the National Flood plain Insurance Program administered by the Federal Emergency Management Administration.

The map prepared by FEMA identified the "100 year' flood plain for the Shiawassee River. This term causes some confusion among the public regarding its meaning. A "100 year' flood does not mean it occurs only once over any 100 year period. It is a flood that has a 1% chance of occurring any given year. A "100 year' flood plain is the area that would be Covered with water during that flood. The study also identifies the 500 year flood plain.

Publication of the Flood Insurance Rate Map (FIRM) and study provides the township with a basis upon which to regulate development in the flood plain by accurately defining its boundaries. In order to participate in the National Flood Insurance Program the township was required to adopt a flood plain ordinance. The ordinance required the lowest habitable level of any residence be built in the flood plain be above the elevation of the 100 year flood and that no construction be allowed to take place in the floodway (that portion of the flood plain which carries the water down stream). Map 14, Floodplain Map, shows the flood plain areas in the township as identified by the preliminary FEMA map.

Wetlands

Wetlands as separated from flood plains were not identified in the 1979 plan, probably because the Goemaere - Anderson Wetland Protection Act was not enacted until 1979. This act defined a wetland as "land characterized by the presence of water at a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp or marsh and which is any of the following:

- Contiguous to the Great Lakes or Lake St. Clair, an inland lake or pond, or a river and stream.
- More than 5 acres in size.
- Five areas of less in size if the Department of Natural Resources determines that protection of the area is essential to the preservation of the natural resources of the state from pollution, impairment or destruction and the department has so notified the owner.

The act prohibits filling, dredging, draining or Construction in wetlands.

The DNR has begun mapping wetlands through the MIRIS program for a number of years. The MIRIS wetland maps for Shiawassee County were made available in 1990. In addition, the US Fish and Wildlife Service (USF&WS) prepared even more detailed wetlands maps for the State of Michigan in the mid 1990's. Map 15, Wetland Map shows the wetlands identified on the USF&WS maps, However, while they use the MIRIS and USF&WS maps in making initial determinations on wetlands, the DNR does not rely solely on the these maps for identification.

This means that other areas that meet the definition of wetlands may exist in other parts of the township not shown on the map

Protection of wetlands are important because of the benefits they provide the community including flood and storm control through their ability to absorb and store excess water, recharge of ground water supplies, pollution treatment by serving as a biological and chemical oxidation basin, erosion control by serving as a sedimentation area and filtering basin, and protection of wildlife by providing breeding, nesting and feeding grounds and cover for many forms of wildlife.

The Goemaere - Anderson Wetland Protection Act entrusts statewide enforcement to the DNR, but also permits local municipalities to adopt ordinances with more stringent definition and regulation of wetlands and requires the DNR to coordinate enforcement of the act with those communities.

Steep Slopes

Caledonia Township is generally flat, the primary exception being that area around the Shiawassee River and some isolated knolls and ridges south of Corunna. Development in areas of steep slopes can result in increased flooding and erosion problems by stripping the land of its natural vegetative cover and increasing the velocity of run-off. Ian McHarg, in his book, *Design With Nature* suggests that areas with slopes in excess of 12% be developed as forest or recreational land, with scattered very low density residential permitted on occasion.

Map 16, Steep Slope Map, identifies those areas in the township with a slope in excess of 12%.

Floodplain Map

Wetland Map

Areas of Severe Slope

TRANSPORTATION

Street Inventory

Caledonia Township's road system was analyzed in July and August 1993. The roads were inventoried based on their width, surface type, and road classification. A summary of the information is provided in the attached "Street Inventory" table, as well as the map of the township. The Shiawassee County Road Commission and the Michigan Department of Transportation were also consulted concerning Caledonia Township's roads.

The street inventory table was developed using two types of analysis. The width, pavement type, shoulder type, and general condition were determined by visual inspection. The pavement condition ratings are a subjective rating based on visual inspection and experience. An explanation of the rating scale is attached to the end of the table. The second type of analysis summarized in the street inventory table was the level of service, (L.O.S.). The level of service is related to a roads capacity using a "capacity factor". The following table indicates the relationship of the capacity factor to the level of service.

A Capacity Factor of 0.00 to 0.50 receives a Level of Service "A"
A Capacity Factor of 0.51 to 0.75 receives a Level of Service "B"
A Capacity Factor of 0.76 to 1.00 receives a Level of Service "C"
A Capacity Factor of 1.01 to 1.25 receives a Level of Service "D"
A Capacity Factor of 1.26 to 1.50 receives a Level of Service "E"
A Capacity Factor of 1.51 or above receives Level of Service "F"

The capacity factors for this analysis were determined using the Genesee County Metropolitan Planning Commission's "Project Evaluation Procedures" for the Federal Aid Urban System Program. These capacity factors were translated to the corresponding level of service using the table above and input to the street inventory table. Some of Caledonia Township's major roads are either currently being impacted by new development, or have the potential to be impacted in the near future. All major roads were evaluated, including 1) Gould Street, 2) North Street, east of Hickory, 3) M-21 from Geeck to Gould, 4) M-71 south east and north west of Corunna, 5) Shipman, 6) Shipman form Gould to State, 7) Geeck, from M-21 to Cronk, 8) Lytle, and 9) Paramenter. Each of these roadway segments was analyzed to determine their current level of service. To determine each of the above stated road segments' capacity factor, the following characteristics were analyzed:

A representative vehicle count
Lane widths
Number of lanes
Shoulder type and width
Vertical and horizontal alignment
Number of driveways
Allowed roadside parking
Bus routes/stops
Train crossings per day
Nearby fire stations

A description of each level of service is provided at the end of the street inventory table.

The roadway segments in Caledonia Township that have a relatively poor level of service were M-71 northwest of Corunna (L.O.S.F.), M-21 from Hintz to Gould (L.O.S.F.), M-21 from State to

Hintz (L.O.S.F.), M-21 from State to Escott (L.O.S.F.), M-21 from Escott to Kerby (L.O.S.F.) and M-21 from Kerby to Geeck (L.O.S.F.).

The Shiawassee County Road Commission's general role in the Township's road system is to provide yearly recommendations for improvements to roads they feel are in need of repair. Traffic county information was also obtained from the road Commission for use in this study.

If a specific development is proposed for a certain road in Caledonia Township, a more refined capacity analysis can be performed to determine the size and type of roadway that would be necessary to handle the traffic generated by the new development

- 1) The roads' pavement conditions were rated visually using a scale of 1 to 5. A description of each rating is as follows:
 - a. Excellent condition, life expectancy 10-15 years.
 - b. Good condition, life expectancy 6-10 years.
 - c. Average condition, a few patches, declining ride quality, life expectancy approximately 4-6 years.
 - d. Expectancy approximately 4-6 years.
 - e. Poor condition, some patches, settling, potholes, poor ride quality, life expectancy 1-3 years.
 - f. Needs repair, many patches, potholes, virtually no life left in pavement.
- 2) L.O.S. stands for the roadways' "Level of Service". A few of Caledonia Township's main roads adjacent to commercial or industrial property were analyzed using this level of service concept. L.O.S. is a measurement of the ratio of the road's current traffic volume to its traffic capacity. Below is a description of each level's operating conditions.

Level A. Free flow; speed controlled by driver's desires, speed limits or physical roadway conditions.

Level B. Stable flow; operating speeds beginning to be restricted; little or no restrictions on maneuverability from other vehicles.

Level C. Stable flow; speeds and maneuverability more closely restricted.

Level D. Approaches unstable flow; tolerable speeds can be maintained but temporary restrictions to flow cause substantial drops in speed, little freedom to maneuver, comfort and convenience low.

Level E. Volumes near capacity; speed typically in neighborhood of 30 mph; flow unstable; stoppages of momentary duration; ability to maneuver severely limited.

Level F. Forced flow; low-operating speeds, volumes below capacity; queues formed.

M-21 Land Access Study

In 1986 GLS Region V Planning and Development Commission undertook a study of the M-21 corridor in Caledonia Township from State Road to Gould Street. The study reviewed five issues:

- Land Use
- Access and Circulation
- Visual Distractions

- Parking
- Roadway Configuration

The study reviewed the existing trends in commercial and industrial development and made the projection that the corridor shall be totally developed by the year 2000. It identified one of the major projects in that development as creation of an industrial park at the airport and recommended that the City of Owosso annex a portion of the airport property to facilitate its development.

The study considered several alternatives to access and circulation problems. To reduce the number of traffic conflict points, it suggested limiting the number of second driveways based on the frontage of commercial parcels and mentioned the possibility of frontage roads. To separate conflicting traffic flows it suggested "channelization" of those flows through the use of dedicated left and right turn lanes in the driveways of businesses generating a large amount of business. To limit deceleration requirements for traffic and remove turning vehicles from through lanes the study proposed requiring all major developments to provide acceleration and deceleration lanes. To provide access options to business traffic, the study recommends a series of strategies, including the use of side streets where available, shared or connected parking, frontage roads, and shared driveways as well as the provision of sidewalks to encourage pedestrian and bicycle traffic as an alternative to auto traffic.

The study identified the proliferation of business signs and other visual clutter that has come with the commercial development along M-21 as another factor decreasing traffic flow and increasing traffic hazards in the area. It suggested encouraging the reduction in sign size or the sharing of signs by several businesses through a zoning bonus system. It also suggested a provision in the zoning ordinance that would require a clear vision zone at all intersections of driveways and M-21 including the restriction of mail boxes near driveways.

The report found that parking was not a problem for businesses along M-21 and was not a factor in traffic conflicts along the corridor.

The report concluded that the new five lane configuration of M-21 would provide an adequate level of service for traffic over the foreseeable future.

Owosso Airport

Owosso Airport is located between Owosso and Corunna, north of the Shiawassee River and south of M-21. It is the only public use airport in Shiawassee County. It is used by local resident flyers, for limited transport work and by a local flight school. In 1989 there were 38 single engine and 5 twin engine planes based at the airport.

The airport was originally purchased by the county in 1940. The City of Owosso acquired it in 1951 and in 1982 ownership was transferred to the Shiawassee Community Airport Board, with representatives from the City of Owosso, City of Corunna, Caledonia Township, Owosso Township, Shiawassee County, the airport management, the Farm Bureau and the county pilots association.

In 1990 a master plan for the airport was developed. The plan has several proposals that impact future land use along the M-21 corridor. In order to improve the approach on Runway 18, the plan calls for the purchase and removal of two single family homes along M-21, the purchase of two existing commercial businesses and the purchase of additional vacant property on the north

side of M-21 with commercial development potential. The plan also calls for the development of an industrial park that would cater to the needs of businesses that use the airport facilities.

**Table 19
Level of Service**

Street	Width (ft.)	Type of Pavement	Shoulder Type	Pavement Condition	L.O.S.	Classification
Gould	31	Asphalt	Curb & Gutter	2	A	Primary
North (E. of Hickory)	36	Asphalt	Curb & Gutter	2	A	Primary
M-21 (Kerby to Geeck)	22	Asphalt	Asp. 3', Gra. 8'	1	F	State Hwy.
M-21 (State to Kerby)	22	Asphalt	Asp., 3', Gra. 8'	1	F	State Hwy.
M-21 (Gould to State)	55	Asphalt	Curb & Gutter	1	F	State Hwy.
M-71 (SE of Corunna)	22	Asphalt	Gravel 10 feet	2-3	C	State Hwy.
M-71 (NW of Corunna)	23	Asphalt	Asp. 9', Gra. 2'	2-3	F	State Hwy.
Shipman	21	Asphalt	None	203	A	Primary
Copas (State to Kerby)	19	Asphalt	None, Gra. In spots	3-4	A	Local
Copas (Gould to State)	20	Asphalt	None, Gra. In spots	2-3	A	Primary
Geeck (Lytle to M-21)	20	Asphalt	None	2	A	Local
Geeck (Wilkinson to M-21)	20	Asphalt	None	1	A	Primary
Geeck (Cronk to Wilkinson)	20	Asphalt	None	1	A	Primary
Lytle	21	Asphalt	None	203	A	Primary
Parmenter (N. of Escott)	20	Asphalt	Gravel 2'	4	A	Primary
Parmenter (S. of Escott)	20	Asphalt	None	1-2	A	Primary
Vandekarr	21	Asphalt	None	3	A	Primary
Hibbard (Cook to State)	20	Asphalt	Gravel 2'	2	A	Primary
Hibbard (M-71 to State)	20	Asphalt	Gravel 2'	2	A	Primary
State (Hibbard to M-71)	20	Asphalt	Gravel 2'	3	B	Primary
State (M-21 to Wilkinson)	27	Asphalt	Asp. 2', Gra. 3'	1	B	Primary
State (Wilkinson to Cronk)	20	Asphalt	Gravel 2'	3-4	B	Primary

Road Capacity/Level of Service

WATER AND SEWER

Sanitary Sewer

Municipal water and sewer service have a significant effect on land use in a community. Certain land uses generate a large quantity of waste water or demand for water (such as some industrial uses or high density residential uses). Availability of these services permits these types of developments to occur. At the same time, those types of developments are restricted to areas currently serviced by water and sewer lines unless the community is willing to extend them.

Portions of Caledonia Township are serviced by a sanitary sewer system which is maintained by the Caledonia Township Sewer Authority. This sewage is treated at the Owosso wastewater treatment plant. Caledonia Township currently owns approximately 16% of the capacity of the Owosso wastewater treatment plant. The township has worked with the city and provided funding for upgrading and maintaining the plant in order to meet existing demands.

The average daily capacity of the plant is six million gallons per day and approximately 960,000 gallons/day is owned by the township. The township is currently using only 1/3 of its current capacity or about 320,000 gallons/day.

As a part of this investigation, we needed to determine how much of the township is being serviced by the sanitary system as well as to perform an analysis of extending the existing sewer lines in order to serve more households within the township.

A map of the township and all existing sewer lines is provided in Map 18, Sewer Map. Portions of the township which are currently being served and the sizes of the sewer lines are shown on the figure. Sewer lines range in sizes of 27, 21, 18, 15, 10 and 8 inches in diameter. The major trunk line runs east to west along M-21 and south to north along Hintz Road to Middleton where it extends west to join the system for the City of Owosso. After examination of the sewer lines, their sizes and their depth below the ground it was determined that the following lines, see Map 18, could be extended to varying extents without requiring force mains or lift stations:

- Hintz Road north of Middleton
- M-21 at Sylvia Street
- Copas Road
- State Road north of M-21

Further analysis would be required in order to determine exactly how far these lines could be extended within the township.

The capacity of the current lines was examined to determine if further development in the areas of the township that is being serviced was reaching its maximum capacity. This was done by counting the number of houses that were being serviced on a particular line and then comparing these numbers with the carrying capacity of the pipes based on their size. It was determined that the existing lines could meet the demands of further development without any changes being made to the system.

Sewer Lines Map

Water Distribution Study

Portions of Caledonia Township are connected to the City of Owosso water distribution system. Areas of the township being serviced include Middletown and parts of the township north and south of M-21 near the airport, see Map 19, Water System Map. Sizes of the water lines are 1 1/4, 1 1/2, 4, 6, 8, 10, 12 and 16 inch pipes. The township is currently in discussions with the City of Owosso to investigate the possibility of the Township purchasing water from the City and establishing their own water system. Alternatively, the Township may consider development of a separate system, possibly in conjunction with one or more of the area municipalities based on a Prein & Neuhoff water study.

Existing Water Lines Map

SURROUNDING LAND USES

Consideration of the current and future land uses of adjacent municipalities is and important consideration when preparing a future land use map. It is important if future land use conflicts are to be prevented and it is important in so that area wide future land use needs can be more accurately projected.

Caledonia Township is directly adjacent to four townships (Venice, Shiawassee, Owosso and New Haven) and two cities (Owosso and Corunna). Four other townships touch the township at its corners (Hazelton, Vernon, Bennington and Rush). At the time that the township prepared the 1994 Land Use Plan, seven of the eight township land use plans were being updated as part of the Shiawassee County Land Use Plan update. Two of those had made preliminary decisions on what their updated township maps will look like, while the other five had only begun the review process. Owosso Township had recently adopted an update to their land use plan. The City of Owosso does not currently have a "city only" land use plan although the Mid-County plan, prepared in the early to mid 70's does include the city. The City of Corunna recently updated their land use plan.

All of the surrounding municipalities are zoned, with seven of the eight townships falling under the county zoning ordinance and the remaining three municipalities have their own zoning ordinances.

The cities of Owosso and Corunna have the greatest potential of impacting Caledonia Township over the short and medium term planning periods. Most of the land in the City of Owosso that borders the township is already developed, but some of it has redevelopment potential. In particular, the conversion of residential structures into office uses along M-21 from Gould Street to the west has been an ongoing redevelopment process. The property is currently zoned for a mix of multi-family, local business and office development. Some of the residential property near Corunna Avenue has also seen conversion to non-residential uses. That area is currently zoned for a mix of local commercial, two family residential and industrial. Undeveloped areas near the boundary between the city and township includes a "finger" of land approximately 10 acres between Oliver Street and M-21 sticking out from the city into the township. This property is zoned for low-rise multi-family residential development but is currently vacant. Environmental considerations may prevent the sites development as currently zoned. Another vacant parcel is north of the city's southeast industrial park. This area is designated as light industrial.

The City of Corunna is located near the center of the township and the township borders it on all sides. Its development will probably have the greatest impact on the township. The city recently completed work on its land use plan. That plan proposes shopping center style commercial development along the south side of M-21, auto based commercial development east along Corunna Avenue from the west edge of the city, and a residential/office district west along M-71 from the southeastern edge of the city. In the first two proposals, the cities plan appears in line with the current township plan, while the rural residential land use to the southeast of the city is not significantly less intensive than the residential/office district within the city.

The existing future land use maps for seven of the eight surrounding townships were those prepared with the help of the county planning department in the late 1970's. Efforts were made at that time to coordinate the work of each of the township planning commissions, so most planning districts flow relatively uniformly from township to township. Under the county land use plan, the row of townships comprising Middlebury, Owosso, Caledonia and Venice were seen as transition townships between the rural residential/developing area to the south and the prime agricultural areas to the north. All of the sections bordering the township to the north are

classified as long term agricultural, with the exception of the section 36 of Rush Township, which touches the township at its southeastern corner. The east half of that section is long term agricultural and the western half is low density residential. Most of the parcels that border the township to the east in Venice Township are also classified as long term agricultural with the exception of the area south of the Shiawassee River and the area between Serr Road and M-21. The land bordering the township to the west on the north side of Owosso is planned for a mix of low density and medium density residential development and on the south it is planned for rural residential development. The townships to the south have the areas bordering Caledonia Township planned for rural residential development. The zoning districts follow the land use planning district boundaries very closely.

In general, the development planned for the areas adjacent to the township fit in well with the proposed land uses in the Future Land Use map adopted in 1979. Any changes in that map should take into account their affect on the land uses in adjacent municipalities.

Future coordination of planning and zoning among the municipalities is important so that the township's interest in changes in land use in adjacent areas may be taken into consideration and so the interests of bordering communities can be considered by the township when it makes a decision on land uses. We recommend that all of the mid-county municipalities adopt a policy of notifying an adjacent community when ever they are considering a rezoning request or special use permit request within a mile of the adjacent municipality.

Surrounding Zoning/Future Land Use

Future Land Use Plan Map – City of Corunna

ATTITUDE SURVEY

As part of the development of the township's 1994 Land Use Plan, an attitude survey was conducted to gauge the communities' feelings regarding certain development issues. Approximately 1700 surveys were mailed out to households in the township as identified on the tax roll. This limited the survey to property owners only although attempts were made to distribute the survey to the mobile home park in the township. However, with an 85% home ownership rate in the township, the survey still would have reached a large cross section of the township.

The survey consisted of some general questions concerning the road system, recreational facilities, fire protection and ambulance service, followed by a series of policy statements. The respondent was asked to mark which of the two diametrically opposed viewpoints they agreed with the most. The results of the survey were then analyzed to determine general attitudes of the residents.

There were 526 respondents to the survey. The policy issues were grouped into four general categories:

- 1) Requiring provision of municipal services before development can occur.
- 2) Identifying agriculture as the primary land use in the township.
- 3) Regulating development.
- 4) Permitting mixture of land uses.

There were six questions (14, 18, 25, 30, 31, 23) that asked in one form or another if development should only be permitted when adequate facilities exist. In every case the answer was yes, from a high of 85.7% who said industrial development should only be permitted in areas where adequate utilities are provided, to a low of 59.8% when the same questions was asked regarding multi-family developments.

Three (15, 21, 27) questions were asked regarding development in agricultural areas and by margins of 77% to 83%, the residents indicated that they felt that agricultural development should be the primary use in the township and protected from all other uses.

Seven questions were presented to gauge the public attitude regarding regulation of development. While 90% of the respondents felt that commercial developments should be required to provide parallel access drives and other improvements and 80% felt that development should be prohibited in areas with inadequate soils, they did not agree with policies that put the burden of proof on the developer to prove they have adequate water (87.1% opposed) or are not in a floodplain (55% opposed).

There were four questions regarding the mixture of various land use types. Again, the results were mixed. There was support for mixing various types of residential land uses together (65.3%) and allowing home occupations (67%), but there was substantial opposition to mixing industrial and non-industrial uses (75.2%) and permitting convenience level commercial uses in residential areas (61.3%).

The breakdown on survey results follow on the next pages:

CALEDONIA TOWNSHIP ATTITUDE SURVEY

1. WOULD YOU RANK THE QUALITY OF LIFE IN THE TOWNSHIP?
 39/7% EXCELLENT 13/3% INADEQUATE
 299/58% GOOD 9/2% POOR
 154/30% ADEQUATE
 Total Responses = 514

2. WOULD YOU RANK THE QUALITY OF LIFE IN THE TOWNSHIP?
 ___ EXCELLENT ___ INADEQUATE
 ___ GOOD ___ POOR
 ___ ADEQUATE

3. WOULD YOU RATE THE AFFORDABILITY OF HOUSING IN THE TOWNSHIP?
 4/1% VERY INEXPENSIVE 131/27% EXPENSIVE
 14/3% INEXPENSIVE 14/3% VERY EXPENSIVE
 328/69% AVERAGE
 Total Responses = 491

4. HOW LONG HAVE YOU LIVED IN CALEDONIA TOWNSHIP?
 ___ YEARS
 0-9, 115/23% 10-19, 109/21% 20-29, 125/25% 30-39, 74/15% 40-49, 49/10%
 50-59, 18/4% 60-69, 8/1.5% 70-79, 11/2% 80-89, 1/0.01% 90-99, 0/0%
 Total Responses = 510

5. WHAT ZONE DO YOU LIVE IN? (1-6. See Map Insert)
 ___ Zone 1, 40/8% 2, 103/20% 3, 78/16% 4, 71/14% 5, 96/19% 6, 106/21%
 Total Responses = 494

- 6a. HOW WOULD YOU RANK THE TOWNSHIP ROAD SYSTEM?
 3/5% EXCELLENT 78/15% INADEQUATE
 99/20% GOOD 108/21% POOR
 220/43% ADEQUATE
 Total Responses = 508

- 6b. WHAT ROAD SEGMENTS DO YOU THINK NEED TO BE IMPROVED?
 (EX. Wildernuith Rd. from Hintz Rd. to State)
(See Comment Sheet)

- 7a. WOULD YOU RANK THE CONDITION OF THE TOWNSHIP ROADS IN YOUR AREA?
 12/2.3% EXCELLENT 75/15% INADEQUATE
 102/19% GOOD 112/22% POOR
 212/41% ADEQUATE
 Total Responses = 513

7b. HOW CAN THEY BE IMPROVED?

36/11.5% WIDEN
207/66% PAVED
74/15% SPEED ZONES
24/7.6% STOP SIGNS/LIGHTS
Total Responses = 314

8. DOES YOUR HOME HAVE

205/40% MUNICIPAL SEWER SERVICE?
297/58% SEPTIC SYSTEM?
7/1.3% OTHER? (See Comment Sheet)
Total Responses = 509

9. IF YOU HAVE A SEPTIC SYSTEM, HAS IT BEEN REPLACED OR HEAVILY REPAIRED IN THE PAST 5 YEARS?

53/10% YES 473/90% NO Total Responses = 526

10. WHAT TYPES OF RECREATION DO YOU FEEL ARE NEEDED IN CALEDONIA TOWNSHIP (CHECK AS MANY AS YOU FEEL ARE NEEDED)?

19/6.4%	PICNIC AREA
23/11%	HIKING, NATURE TRAILS
2/0.7%	BASKETBALL COURTS
0/0%	BALL FEILDS
10/3.4%	SWIMMING POOLS
1/0.3%	FOOTBALL/SOCCER FEILDS
0/0%	STATE PARK COMPLEX
4/1.3%	SNOWMOBILE TRAILS
9/3%	SHOOTING RANGES
21/7.1%	OTHER (See Comment Sheet)
196/66%	NONE OF THE ABOVE

Total Responses = 295

11. DO YOU FEEL THERE IS A NEED FOR UNDEVELOPED RECREATION AREAS IN THE TOWNSHIP?

182/34.6% YES
344/66.4% NO
Total Responses = 526

12. DO YOU FEEL THE LEVEL OF FIRE PROTECTION IN YOUR AREA IS

65/12.9%	EXCELLENT?
213/42.2%	GOOD?
202/40%	ADEQUATE?
14/2.7%	INADEQUATE?
11/2.2%	POOR?

Total Responses = 505

13. DO YOU FEEL THE LEVEL OF AMBULANCE SERVICE IN YOUR AREA IS

- 72/14.3% EXCELLENT?
- 219/43.5% GOOD?
- 187/37.1% ADEQUATE?
- 19/3.8% INADEQUATE?
- 6/1.2% POOR?
- Total Responses = 503

BELOW ARE PAIRS OF POLICY STATEMENTS DEALING WITH LAND USE AND THE PROVISION OF SERVICES. FOR EACH SET CHECK THE POLICY YOU AGREE WITH MOST STRONGLY.

- 14. A. 357/72.4% RESIDENTIAL DEVELOPMENT SHOULD OCCUR IN AN ORDERLY SEQUENCE WITH THE PROPER PROVISION OF PUBLIC SERVICES.
- B. 136/27.6% RESIDENTIAL DEVELOPMENT SHOULD BE PERMITTED TO OCCUR WHEREVER A PROPERTY OWNER DETERMINES IT FEASIBLE
- Total Responses = 493

- 15. A. 389/77% AGRICULTURE SHOULD CONTINUE TO BE THE PRIMARY LAND USE IN THE TOWNSHIP AND ANY OTHER TYPE OF USE (RESIDENTIAL, COMMERCIAL, INDUSTRIAL) SHOULD ONLY BE PERMITTED AS EXCEPTIONS.
- B. 114/22.7% AGRICULTURE SHOULD NO LONGER BE THE PRIMARY LAND USE IN THE RURAL AREAS OF THE TOWNSHIP AND AGRICULTURAL LAND SHOULD BE OPENED UP FOR OTHER TYPES OF DEVELOPMENT.
- Total Responses = 503

- 16. A. 65/12.9% ANY LARGE DEVELOPMENT PROPOSING TO TAP INTO THE UNDERGROUND WATER SUPPLIES MUST SHOW SOME PROOF OF WATER SUPPLIES BEFORE DEVELOPMENT CAN BE APPROVED.
- B. 438/87.1% ADEQUATE WATER SUPPLIES ARE ASSUMED TO EXIST AND DEVELOPMENT CAN ONLY BE PROHIBITED IF THE LOCAL GOVERNMENT CAN PROVE A WATER SUPPLY PROBLEM.
- Total Responses = 503

- 17. A. 307/61.3% CONVENIENCE-LEVEL COMMERCIAL FACILITIES (GAS STATIONS, CONVENIENCE STORES, ETC.) SHOULD NOT BE PERMITTED IN RESIDENTIAL AREAS.
- B. 194/36.7% LIMITED CONVENIENCE-LEVEL COMMERCIAL FACILITIES SHOULD BE PERMITTED IN RESIDENTIAL AREAS FOR USE BY THE RESIDENTS.
- Total Responses = 501

- 18. A. 438/85.7% INDUSTRIAL DEVELOPMENT SHOULD BE LIMITED TO AREAS

IN OR NEAR THE CITIES WITH WATER AND SEWER AVAILABLE.

- B. 731 14.3% INDUSTRIAL DEVELOPMENT SHOULD BE PERMITTED WHEREVER A DEVELOPER CAN FIND AN ADEQUATE SITE.

Total Responses = 511

19. A. 376/74.9% COUNTY/TOWNSHIP ROAD MAINTENANCE MONEY SHOULD BE SPREAD AROUND SO ALL ROADS GET SOME WORK

- B. 126/25.1% A MAJORITY OF COUNTY/TOWNSHIP ROAD MAINTENANCE MONEY SHOULD BE EXPENDED ON REPAIR OF THE PRIMARY ROADS WITH SOME FUNDS GOING TO OTHER ROADS.

Total Responses = 502

20. A. 309/65.3% RESIDENTIAL DEVELOPMENT SHOULD BE ENCOURAGED TO PROVIDE HOUSING FOR ALL ECONOMIC AND SOCIAL GROUPS.

- B. 164/34.7% HIGH VALUE SINGLE-FAMILY RESIDENTIAL DEVELOPMENT SHOULD BE ENCOURAGED TO THE EXCLUSION OF ALL OTHER TYPES OF HOUSING.

Total Responses = 473

21. A. 390/79.1% NONAGRICULTURAL DEVELOPMENT IN AREAS OF PRIME AGRICULTURAL SOILS SHOULD BE PROHIBITED.

- B. 103/20.9% NONAGRICULTURAL DEVELOPMENT SHOULD BE PERMITTED IN AREAS OF PRIME AGRICULTURAL SOILS.

Total Responses = 493

22. A. 224/45% INDIVIDUALS WISHING TO BUILD IN SUSPECTED FLOODPLAINS MUST PROVIDE ENGINEERS REPORT SHOWING THEY ARE NOT IN A FLOODPLAIN BEFORE DOING PERMITTED TO BUILD.

- B. 274/55% THE LOCAL GOVERNMENT MUST PROVE THAT AN INDIVIDUAL IS IN A FLOODPLAIN BEFORE THEY CAN DENY HIM THE RIGHT TO BUILD.

Total Responses = 498

23. A. 441/88.9% COMMERCIAL DEVELOPMENT SHOULD BE LOCATED IN EXISTING BUSINESS AREAS IN CITIES AND VILLAGES TO SUPPORT THEIR CONTINUED GROWTH.

- B. 55/11.1% COMMERCIAL DEVELOPMENT SHOULD BE LOCATED OUTSIDE EXISTING BUSINESS AREAS.

Total Responses = 496

24. A. 363/75.2% NONINDUSTRIAL USES (COMMERCIAL, RESIDENTIAL)

SHOULD NOT BE PERMITTED IN AREAS SET ASIDE FOR INDUSTRIAL USES.

- B. 120/24.6% NONINDUSTRIAL USES SHOULD BE PERMITTED IN AREAS SET ASIDE FOR INDUSTRIAL USES.

Total Responses = 483

25. A. 101/20.3% MUNICIPAL WATER AND SEWER LINES SHOULD BE EXTENDED INTO RURAL AREAS WHENEVER REQUESTED BY PROPERTY OWNERS IN THOSE AREAS.

- B. 397/78.7% MUNICIPAL WATER AND SEWER LINES SHOULD ONLY BE EXTENDED GRADUALLY INTO AREAS CLOSE TO EXISTING URBAN AREAS WITH A RELATIVELY HIGH CONCENTRATION OF BUSINESSES AND RESIDENCES.

Total Responses = 498

26. A. 234/47% RESIDENTIAL DEVELOPMENT ALONG STATE HIGHWAYS AND MAJOR COUNTY ROADS SHOULD BE LIMITED TO SUBDIVISIONS WITH LIMITED ACCESS TO THESE ROADS.

- B. 249/53% RESIDENTIAL DEVELOPMENT ALONG STATE HIGHWAYS AND MAJOR COUNTY ROADS SHOULD PERMIT INDIVIDUAL LOTS WITH ACCESS DIRECTLY ON THESE ROADS.

Total Responses = 483

27. A. 395/83% RESIDENTIAL DEVELOPMENT SHOULD BE LIMITED IN RURAL AREAS TO PREVENT CONFLICTS WITH AGRICULTURAL OPERATIONS THAT CREATE NOISE, DUST AND ODORS.

- B. 81/17% AGRICULTURAL OPERATIONS SHOULD BE REGULATED TO PREVENT CREATING NOISE, DUST AND ODORS THAT ARE A NUISANCE TO RESIDENTS.

Total Responses = 476

28. A. 301/62.3% DEVELOPMENT IN HIGHLY LIKELY GROUNDWATER RECHARGE AREAS (AREAS THAT PERMIT WATER TO RAPIDLY FLOW THROUGH THE GROUND INTO THE GROUNDWATER) SHOULD BE RESTRICTED OR PROHIBITED.

- B. 182/37.7% GOVERNING BODY MUST PROVE THERE IS A THREAT TO LOCAL GROUNDWATER BEFORE PROHIBITING OR RESTRICTING DEVELOPMENT.

Total Responses = 483

29. A. 247/51.7% STRIP COMMERCIAL DEVELOPMENT ALONG M-21 SHOULD BE DISCOURAGED, BUT DEVELOPED IN CLUSTERS (CONCENTRATED AREAS).

- B. 231/48.3% COMMERCIAL DEVELOPMENT SHOULD BE PERMITTED WHERE BUSINESSMEN FEEL THEY CAN OPERATE THE BEST.
Total Responses = 478
30. A. 293/59.8% HIGH DENSITY RESIDENTIAL DEVELOPMENT SHOULD BE LOCATED IN OR CLOSE TO CITIES.
B. 197/40.2% HIGH DENSITY RESIDENTIAL DEVELOPMENT SHOULD BE PERMITTED ANYWHERE THE DEVELOPER CAN PROVIDE AN ADEQUATE SITE.
Total Responses = 490
31. A. 309/65.1% MOBILE HOME PARKS SHOULD BE LOCATED IN OR CLOSE TO CITIES WHERE MUNICIPAL SERVICES CAN BE PROVIDED.
B. 166/34.9% MOBILE HOME PARKS SHOULD BE LOCATED IN RURAL AREAS AWAY FROM OTHER RESIDENTIAL LAND USES.
Total Responses = 475
32. A. 401/78.7% DEVELOPMENT SHOULD BE DISCOURAGED IN AREAS WITH SOILS THAT ARE CLASSIFIED AS HAVING HIGH WATER TABLES, POOR SUPPORT FOR FOUNDATIONS OR OTHER PROBLEMS SO AS TO REDUCE THE POTENTIAL FOR PROBLEMS IN THE FUTURE.
B. 102/20.3% AN INDIVIDUAL SHOULD BE PERMITTED TO BUILD ON ANY LAND HE WISHES.
Total Responses = 503
33. A. 448/90% STRIP COMMERCIAL DEVELOPMENTS SHOULD BE REQUIRED TO PROVIDE COMMON DRIVEWAYS, ACCELERATION/DECELERATION LANES AND PARALLEL DRIVES TO INCREASE TRAFFIC SAFETY.
B. 50/10% COMMERCIAL DEVELOPMENT SHOULD NOT BE BURDENED WITH ADDITIONAL ZONING REQUIREMENTS.
Total Responses = 498
34. A. 412/81.4% COMMERCIAL BUSINESS SHOULD BE CONCENTRATED IN EXISTING COMMERCIAL AREAS.
B. 82/16.6% COMMERCIAL BUSINESSES SHOULD LOCATE WHEREVER THEY NEED TO IN THE TOWNSHIP.
Total Response = 494
35. A. 165/33% HOME BUSINESSES SHOULD BE STRICTLY REGULATED AND LIMITED.

- B. 335/67% A PERSON SHOULD BE ABLE TO DO WHAT THEY WANT IN THEIR OWN HOME UNLESS THEY POSE A DANGER TO THE SURROUNDING RESIDENCES.

Total Responses = 500

36. WHICH OF THE FOLLOWING WOULD YOU AGREE TO PAY TO IMPROVE OR ESTABLISH IN YOUR AREA?

90/23.8%	ROADS
19/5%	SEWER SYSTEM
5/1.3%	FIRE SERVICE
8/2.1%	AMBULANCE SERVICE
21/5.6%	RECREATIONAL FACILITIES
235/62.2%	NONE OF THE ABOVE

Total Response = 378

COMMENTS:

IF YOU HAVE ANY ADDITIONAL COMMENTS FOR THE PLANNING COMMISSION REGARDING COMMUNITY SERVICES OR GROWTH AND DEVELOPMENT POLICIES, PLEASE LIST THEM BELOW OR ON AN ATTACHED PIECE OF PAPER.

(See Comment Sheet)

ECONOMIC DEVELOPMENT

Economic development causes changes in land use as vacant and other non-commercial sites are developed for commercial and industrial uses. A general understanding of a communities economy is necessary in order to predict the need for commercial and industrial land.

Commercial

Caledonia Township is part of a mid-county market. The township has become the focus of most commercial development in that market for several years, primarily along M-21 from Gould Street to State Road. In 1987 that growth began to gain tremendous momentum with the widening of M-21. By 1994 the area saw the expansion of two shopping plazas and the construction of two new major retailing outlets (Wal-Mart and Meijer), and in 2002 the redevelopment of a motel and mini-storage business for a Home Depot, as well as the expansion of Young Chevrolet Cadillac. This means that by 2002, most of the land zoned commercial by township under their 1991 zoning ordinance had been at least partially developed. Table 20 identifies the fact that less then a quarter of the land zoned commercial is still undeveloped with another 2% currently used residentially. If the analysis is based on road frontage, the developable land is slightly over (18%).

Development in the market as a whole can expect to slacken as the saturation point for the existing market is met, but continued expansion can be expected along the M-21 corridor as businesses shift from the surrounding commercial districts. Long term growth will remain strong if access control and signage controls can be put in place to mitigate problems that affect the overall quality of the area as a shopping district.

One factor that will affect the demand for future commercial land along M-21 in Caledonia Township will be the scope of development on the south side of M-21 in the City of Corunna. Table 21 identifies 53.1 acres of commercial land fronting M-21 with 1460' of frontage. This represents 2/3 of the acreage currently available in Caledonia Township. However, this property suffers from the same traffic constraints that the property on the north side of M-21 from Escott Road to Sylvia Street would need to address if it were rezoned to commercial.

	Acreage	%	Frontage Along M-21	%
Total Zoned	388.23	100	4,350'	100
Total Used	303.65	84.6	3,554'	81.7
Total Vacant	84.58	15.4	796'	18.3
Total Residential	9.02		200'	

	Acreage	%	Frontage Along M-21	%
Total Zoned	118.51	100	5770'	100
Total Used	65.44	55.2	3190'	56
Total Vacant	53.1	44.8	1460'	25
Total Residential	12.87		1120'	

Industrial Development

While Caledonia township leads the mid county area in new commercial development, it ranks last of the four municipalities in the area in industrial SEV. The primary industrial district in the township is located between M-71 and Cornell Street in the Middletown section. This area contains some vacant land, but only 28% of all of the land zoned in the township is currently vacant. While the township has several sites with potential for future development, most of them have limitations of one type or another. Land adjacent to the City of Owosso's industrial park on Aiken Road has water and sewer lines adjacent to it but is close to existing residences and is located on a local county road. The Owosso Airport has an area designated for industrial/commercial development but the airport wishes to reserve the development for businesses that wish to locate at the site to take advantage of the airport. Property along M-21 north of the U.S. Brick plant is vacant and with good access to a state highway and relatively isolated from residential development, but water and sewer are not currently available. The solution may be to develop multiple small sites, each with its own location advantages: airport related businesses to the airport site, warehousing and light industrial sites that do not require water for processing at the M-21 site and limited heavy industrial development on vacant land in the established industrial area between M-71 and Cornell and adjacent to the city's industrial park.

TABLE 22		
Industrial Land In Caledonia Township		
	Acreage	%
Total Zoned	419.05	100
Total Developed	302.05	72.1
Total Vacant	117.00	27.9

SECTION 3 - GOALS AND POLICIES

PLAN ALTERNATIVES

In considering the development of a future land use plan for the township, it is important to consider alternative concepts in the arrangement in land use rather than simply assuming one alternative is the appropriate one.

Three land use alternatives will be considered as part of this planning process:

- Linear development
- Concentric development
- Satellite development

Linear Development

Linear development proposes a growth pattern based on a river or a main traffic route, such as M-21. Growth moves along the route, spreading out a relatively short distance along either side. Commercial, light industrial and high density residential development mix with some low density residential along the development axis with low density residential spreading out to either side.

This development pattern has a couple advantages. It reinforces existing market pressures that emphasize the development advantage along the corridor. It also limits the need for expansion of roadways and utilities by concentrating them along a single route.

The primary disadvantages of this growth pattern is that it often degrades the development advantage that serves as its initial draw. In the case of a traffic arterial, the development can often lead to excessive curb cuts, increased turning movements by cars wishing to leave or enter parking areas, increases in local traffic and a general reduction in traffic capacity. Because one road serves as the road, even increases in local traffic requires widening or other improvements to the main arterial. Similarly, the water and sewer lines must be relatively large size because the main line serves almost the entire area. Eventually many linear developments decline because their success kills their development advantage.

Concentric Development

Concentric Development involves a growth pattern in which development spreads out in layers from a central point, normally with the most intensive uses near the center (industrial, commercial, multiple family) and less intensive (low density, residential and agricultural) on the fringe. Redevelopment of existing property is an important part of this proves. As growth moves outward from the center, existing residential structures are converted to commercial or multifamily uses or demolished to make room for new buildings.

The advantages of this development pattern is that it maximizes the use of existing infrastructure, it minimizes sprawl and it can promote energy savings by reducing the distances that people and products need to travel. This pattern was generally the norm prior to the mid 20th century.

The principal disadvantage with this development pattern is that it runs counter to current market forces. Transportation costs are relatively low and the mobility of the population is high, with most households having at least one automobile. The results are that there is no need for businesses to locate close to one another, their customers or their workers. And since the cost of redevelopment of a site is often perceived to be greater than development of vacant land, (although this often is not the case if all costs both public and private are calculated) the

incentive is for new development to leap-frog over existing areas and establish themselves in "green-field" sites. Maintaining a concentric development pattern often requires firm resolve on the part of the community not to capitulate to development pressures and market forces. In an actively growing area, this may be possible without stifling growth. But in an area with only marginal development, this approach can be viewed as a no-growth tactic.

Satellite Development

The third development pattern is the satellite pattern. It is characterized by a relatively large area that is the principle focus of development in a municipality, but with several smaller developments separated from it. In communities such as Caledonia Township they often take the form of rural subdivisions, industrial parks, older development patterns around unincorporated communities (i.e.: Judville, Shaftsburg, Carlin, etc.), and commercial developments around transportation centers such as interchanges or major road intersections.

The advantage of this development pattern is that it allows the community the flexibility of developing sites outside the major development area that have some unique characteristic (rivers, lake, highway access, etc.) that make that site preferable for development.

The principle disadvantage of this pattern is that it can result in rural sprawl as the small satellites proliferate and increase in size. Transportation costs increase as well as the costs associated with extension of municipal services.

Discussion of Alternatives

The planning commission discussed the various plan alternatives. It was noted that the current township plan represents a concentric development plan with a focus on the City of Owosso and the City of Corunna. The commission reviewed the recent pattern of development and noted that it is primarily linear along M-21. It also noted while there are several "satellite" developments in the township, there were no recent projects other than the proposed Lake Leslie development.

One concern that the commission expressed was the need to provide adequate room for future development, and to exploit the commercial advantages of development along M-21 without encouraging sprawl.

Selected Alternative

The alternative selected by the planning commission was a combination of the concentric a linear development schemes. In general, the commission decided to keep the concentric development layout adopted in the previous plan, but to include a linear development pattern along M-21 extending out to the center of the Township. Satellite developments will be discouraged. The boundary line for the moderate density residential development will be based primarily on areas served by existing or easily extendable sewer lines.

GOALS AND POLICIES

General Goals

Caledonia Township will work to create a development pattern which respects its soil characteristics, ground water, air, wetlands, and natural features such as the Shiawassee River Flood Plain. Preserving open space and the rural quality of life as well as maximizing the capabilities of the above resources through sound planning and management techniques is a prime goal of the Caledonia Township Planning Commission.

The Land Use Plan promotes:

- A well balanced land use pattern capable of meeting present and future community needs in an efficient, economical and aesthetically pleasing manner.
- Selected growth and diversification of economic activities which will increase the nonresidential tax base without harming the basic residential character of the community.
- The goal of establishing a high quality of life, rather than assuming that all expansion is beneficial.
- The idea that future residential or commercial/industrial development should first concentrate in existing urbanized areas in the mid-county areas. These areas should be developed so as to provide the necessary services and functions to insure future economic, political and social welfare and yet not be beyond the ability of the people to provide for these through taxation.
- Expansion to outlying areas should be considered only when a definite land use inadequacy exists. Residential development in these areas should require the use of open space preservation techniques. This
- Should prevent the occurrence of sprawl and dislocated development so that rural areas retain their character.
- The aim that physical growth should be guided so as to assure a pleasant, safe, and attractive community in which to live, work and play.
- The understanding that many of the soils in the Township provide severe limitations for development with and without sewers and that planning and zoning can do much to prevent problems through misuse.

This plan recognizes:

- The need to develop consistent planning programs across Caledonia Township which are compatible with the planning programs of neighboring townships and cities. The planning commission will encourage discussions with other townships and cities to achieve this goal.
- The trend towards the establishment of regional government areas and takes the position that the most desirable solution lies in the strengthening of local government functions.
- The need to relate local and township planning to federal and state actions.

This Township strives:

- For the attainment of conditions conducive to health and safety throughout the township.
- To ensure adequate housing for all residents in healthful, safe, convenient and attractive neighborhoods.
- To adopt ordinances and financial policies consistent with the community growth objective.
- To encourage a variety of recreational opportunities for all age groups according to current and projected needs of the community.

The Planning Process intends:

- To cooperate with the Owosso, Corunna and Intermediate School Districts to help achieve the best possible educational system.
- To consider public utilities for those portions of the township that need them for reasons of health, safety, efficiency and convenience.
- To encourage the development of an integrated transportation network which provides an efficient, safe and pleasant movement of people and goods within the township and throughout the region.

The existing and future quality of residential neighborhoods in Caledonia Township should be preserved and enhanced.

Residential Policies

Residential Areas should:

- Be separated from inharmonious land uses such as commercial or industrial areas through the use of greenbelts, offices, public or semi-public uses as buffers.
- Be protected against activities which produce excessive noise, dirt and odors, or which generate heavy traffic.

Premature subdivision of vacant rural lands should be discouraged in order that an efficient and economical utilities system can be maintained.

Sound and imaginative land development should be encouraged, which will allow density in areas suited for the same, while providing more usable open space and a more attractive residential environment in other areas.

Strip residential development along county primary roads will be discouraged. Use of interior public roads will be promoted. Private residential roads will be required to be constructed to County Road Commission standards and adequate provision for their maintenance provided by the developer.

Residential Densities:

The township should provide a broad range of residential densities which will accommodate a variety of dwelling types.

- Residential zoning should encourage a range of districts, from small lots to large lots, rather than one standard size.
- Zoning districts should reflect various minimum lot sizes throughout portions of the township which are served by sewers.
- Zoning changes and revisions should reflect the goal of a well-balanced land use pattern.
- New subdivision proposals should be encouraged to include innovative designs with the goal of protecting natural resources and open space by incorporating average lot sizes, rather than a minimum, in the subdivision.

Environmental:

- Residential development should give due consideration to flood plain control along the Shiawassee River and recognize that the flood plain should be protected at all times.
- Non-residential land uses within residential neighborhoods which do not provide neighborhood level services or are not adequately buffered from the residential uses should eventually be eliminated.

Mobile Home Parks/High Density Residential:

- Single-family mobile home parks and other high density residential developments may be permitted only if adequate demand for a site within the mid-county area can be demonstrated.
- These residential developments will be required to be in an area served by public sewer, with access to a county primary road or state highway or other major road. Adequate availability of water supplies will be either through access to municipal water or proven ground water supplies.
- The development should be located adjacent to existing and proposed commercial areas if possible and should be connected to those by sidewalks and bike paths.
- The development shall be at an appropriate scale to the demand for the relevant housing type and appropriate scale to the surrounding land uses.

Commercial Policies

With the anticipated continued growth in commercial areas, Caledonia Township sets forth the following commercial policies to help direct this movement.

Policies:

Caledonia Township encourages growth along the existing commercial corridor of M-21 within areas served by municipal sewer. This development should proceed so that no increase in traffic congestion occurs. Specific proposals for this policy include:

- Parallel Service Drives
- Curbs and Gutters
- Commonly used access points
- Sufficient setback of new development
- Deceleration/acceleration lanes

Commercial development in the township should be related to an overall balanced land use pattern.

It is predicted that the present commercial development area will continue to attract trade from the market area it presently serves.

- Both comparison shopping facilities and neighborhood convenience shopping facilities should be designed to include pedestrian and non-automotive circulation, landscaping, and other amenities which create an attractive shopper environment. These will help generate future business activities.

The above criteria should be used for any development or redevelopment in the township. For all Commercial Development, a design plan shall be developed prescribing a coordinated, streetscape treatment considering elements such as:

- Sign controls and designs
- Color coordination and illumination systems
- Paving materials
- Landscaping

Major commercial developments should be located in proximity to main traffic routes, near high density residential areas, in areas serviced by municipal sewer, and close to other functionally related activities such as professional, financial and personal services without harming adjacent residential areas.

Neighborhood commercial centers should be developed to minimize distance traveled to purchase convenience goods. They should be sized to meet the residential neighborhood they service.

Existing incompatible non-commercial uses within commercial areas should be zoned non-conforming and eventually eliminated.

Industrial Policies

Sites or locations with existing or planned utilities of power, water, sewer, solid waste disposal, and transportation advantages should form the basis for industrial development and expansion.

Industrial Sites and Parks:

- Should be located in areas affording direct access to efficient transportation routes; truck, rail, and air.
- Should not be scattered among other land uses because of greater service costs and harmful effects on adjoining areas.
- Should group industrial plants together in specific areas or belts with attractive site planning, landscaping, building setback and coverage controls.
- Buffer areas formed by some combination of off-street parking, commercial uses, parks, parkways, open space or agricultural uses should separate industrial areas from residential areas.

Expansion of industrial areas outside the current sewer service boundary area will be limited until sewer service can be provided.

Development of an industrial/business park at the Owosso Airport is encouraged. Such development must be designed so as not to interfere with existing or future commercial development along M-21 or increased traffic congestion.

Sensitive Lands and Natural Resources Policies

Environmentally sensitive lands offer environmental value, replenishment of aquifers and atmospheric quality. It provides aesthetic values and can provide economic returns. Natural resource areas are useful and effective tools to shape development and, therefore, should be utilized to achieve this objective. The Township is working with a development strategy that holds that natural resource elements should be recognized as vital parts in the total environmental picture, and should be retained in their basic character as their own highest and best use.

It is also understood that in certain cases, protection of environmentally sensitive lands requires substantial areas to be relinquished from private ownership for the purposes of the general welfare with compensation. Thus, the implementation of this program may at times call for public expenditure in one way or another. But this is not without some potentially compensating financial return. And there are Federal and State programs to be tapped for assistance.

The Caledonia Planning Commission identified five basic categories: woodland areas, wetland areas, flood plain areas, major sloped areas, ponds and streams.

Developers should be encouraged to provide open space and recreation facilities as part of their overall development design.

Flood Plains and Wetlands

The Shiawassee River has a long history of flooding which has proven to be detrimental to structures within the flood plain. The National Flood Insurance program Flood Insurance Rate Map (FIRM) and Flood Way Map have been used for the preparation and enforcement of restricted use regulations for the flood plain.

Enforcement of the state wetlands act will be used to insure that marshy areas serving as important ground water recharge sources should be used for purposes not requiring draining or filling.

Flood control projects on the Shiawassee River should be coordinated with water-based and riverside recreation.

Ground Water

- Indiscriminate tapping of the ground water supply could result in a much deeper cone of depression and possibly adversely affect future water supplies.
- The relatively low flow of wells in certain portions of the Township preclude the development of high capacity wells for intensive uses such as high density residential development. Urbanization of these areas will require a form of public water supply.
- Caledonia should cooperate fully with adjacent political units in the wise use of ground waters.

Extractable Resources

Extractable resources exist in several areas. The recovery of these materials must be handled in a way which does not despoil the environment with unsafe, unsightly, non-useful scars and the erosion of the landscape. Recovery of these areas can take the form of public forests, artificial lakes with park space and/or country residential settings, game preserves, etc.

Parks and Recreation

Valuable and irreplaceable natural resources should be protected through the use of park and open space allocations.

In rapidly urbanizing areas of the township, parks and open space should be preserved for future demand and use.

The township promotes the school-park concept.

Apartment construction is a foreseeable trend and will increase the number of young families in Caledonia; this factor must be taken into account in designing an overall recreation plan.

The development of small public or semi-public open spaces should be encouraged in conjunction with new governmental, institutional, commercial and residential building projects.

Shiawassee River

When a question of development along the Shiawassee River arises, the Township will proceed with these purposes:

Prevention of economic and ecological damages due to unwise development patterns within the river district.

Protection of the Township scenic qualities of the river for present and future generations.

Definition of a river district that comprises the Shiawassee River, its tributaries, its flood plain, and all land lying within 100 feet of the river's edge or the top of the steeply sloping banks as shown in the Land Use Plan Map.

Rural Residential Policies

The Township recognizes the importance of allowing current farmers to reap the economic benefits of residential development of their property. However, the Township wishes to limit the extent of the density of residential development in the portions of the Township that are not planned for municipal water or sewer and allow for areas where agricultural activities may be continued.

Policies

No commercial or industrial uses should be permitted in the agricultural areas except for agri-business facilities needed and normally associated with farm enterprises, and limited neighborhood commercial operations.

Sanitary sewer lines and water mains should not be extended into the agricultural areas.

Farming operations should refrain from creating an unsightly setting on the farm or inoperative machinery on their property.

Industries, such as extractive processes, that are not related to agriculture should be permitted to develop only if their impact is not disruptive in terms of the rural environmental character and social structure. An agricultural buffer zone (as noted in the residential and commercial policies) is recommended where such an industry is adjacent to an existing residential or commercial area.

A percentage of all residential developments in the open space district should be set aside for agricultural or open space uses.

SECTION 4 - LAND USE PLAN

I

LAND USE CLASSIFICATION

The land use plan map designates land use areas. These areas are the Township's interpretation of the favored uses for development to the year 2022. The land use map has a legend that explains the categories on map, but this section provides detailed explanations for each category and defines the location criteria used to determine the preferred land use in various areas of the township. The mapped areas are not meant to be set in stone, but rather as a general guide to preferred land uses. The land use definition and location criteria must also be considered when reviewing a proposed land use, to determine if it is appropriate.

Ten land use areas were used in development of the plan.

Low/Medium Density Residential
Multi-Family
Mobile Home Park
Industrial
Office
Neighborhood Commercial
Commercial
Rural Residential
Reclamation
Airport

The definition and location criteria of each land use is as follows:

Low/Medium Density Residential - These areas exist and desired areas for future single family residential subdivisions, or site condominiums. The anticipated density is 1 to 2.5 dwellings per gross acre. This category corresponds with the R-IA, R-1 B, R-IC and R-1 D zoning districts.

The location criteria include access to municipal sewer (for R-IC and R-ID) and adequate buffering by greenbelts, intervening land uses or natural features from commercial, and industrial land uses. Low density residential land uses should also be buffered from high density residential development.

High Density Residential - These areas are existing and desired areas for future townhouses, garden apartments and planned unit developments. The anticipated density is 2 to 10 dwelling units per gross acre. This category corresponds with the R-MI zoning district.

Appropriate areas for high density residential development would be those with municipal sewer available, municipal water available or a demonstrated capacity to provide adequate water from on-site wells, adjacent to county primary roads or state highways and within the Owosso/Corunna urban area.

Mobile Home - This category consists of the existing mobile home parks. The plan does not identify future mobile home sites due to the determination that currently permitted and planned sites in Owosso Township and the City of Corunna are adequate to meet the areas short range needs for mobile home park sites. Anticipated density is 4 to B units per gross acre. This land use category corresponds with the R-T zoning district.

Should adequate proof be presented of a need for additional mobile home sites in the township appropriate criteria for areas for future mobile home development would

include sites of at least 20 contiguous acres, with municipal sewer available, municipal water available or a demonstrated capacity to provide adequate water from on-site wells, adjacent to county primary roads or state highways.

Industrial - These are areas of existing manufacturing operations or suitable for future manufacturing, servicing, compounding, assembling, warehousing and commercial businesses requiring large open space buffers from adjacent land uses. This land use category corresponds with the M-1 and M-2 zoning districts.

Appropriate location criteria for manufacturing land uses include the availability of municipal sewer and water (adequate ground water supplies for light industrial), adjacent to all weather roads, and adequate buffering from residential uses. In addition, there is one isolated site along Hintz Road identified as an industrial site. It is the intent of this plan to retain this site but not to expand industrial development in the surrounding area.

Office – These areas are designed to serve as appropriate locations for neighborhood office buildings that can serve as a buffer between commercial and residential areas. Two areas are specifically mapped, north of M-71 in the “Middletown area” and north of M-21 in the Gould Acres Subdivision. These areas should be developed in a way compatible with the adjacent residences and traffic onto the residential streets should be minimized. These areas should also be suitable as bufferstrips to the commercial uses adjacent to the south, but should not be used to provide access for those commercial uses to those residential streets. The equivalent zoning district is O-1.

Neighborhood Commercial - This category includes existing neighborhood businesses providing convenience level goods and services as well as sites suitable for future neighborhood businesses. It also may include isolated commercial operations outside the M-21 corridor between Gould and Escott such as Tri County Well Drilling. It is the intent of this plan to retain these commercial sites but not to expand commercial development in the surrounding area. This land use category corresponds with the B-I zoning district, and a new zoning classification is proposed for uses like Tri-County.

Appropriate location criteria include adjacent to county primary road or state highway particularly at intersections, and located to meet the need of a residential area. With appropriate on site buffering, these uses are compatible with adjacent residential development.

Commercial - These are existing areas as well as those planned for general commercial facilities designed for most business, service and retail activities. The corresponding zoning classification is the proposed new B-2, which would combine uses permitted in the current B-2 and B-3 zoning districts.

Location criteria for this land use include adjacent to state highway, sewer available; water available or on site wells determined adequate; buffering by intervening land uses, use of berms or natural features from low density residential development and a minimum of 5 acres for shopping centers. Future extension of commercial development along M-21 between Escott and State is anticipated, but due to drainage problems related to the Wheeler Drain, development of this area will only be appropriate when the drain is improved. Parcels on the south side of M-71 between Owosso and Corunna that are adjacent to industrial are also appropriate.

Rural Residential - This area is designed to provide locations rural residential development at a density of not greater than one unit per acre, while allowing the existing farming activities to continue. Standards should be developed to encourage shared access in rural residential areas along County primary roads, particularly State Road. The category is equivalent to the A-2 zoning district.

Location criteria include all existing farmland and open space in the outlying areas of the Township and areas on the edge of the outside the Caledonia urban area, without municipal services and where those services are not expected to be extended over the planning period. Areas currently designated Rural Residential should be designed low density residential if municipal sewer is extended to it.

Reclamation - This area is designed to identify portions of the US Brick plant that are being mined or have been mined in the past and are subject to future site reclamation activities. These areas may be zoned M-1 or A-2, depending on the proposed reuse of the site and the potential impact on surrounding land uses.

Airport – The Owosso Airport Plan is hereby adopted by reference into this plan. Compliance with that plan should be considered during review of any site plan or rezoning per Section 3A of the Township Planning Act.

LAND USE NEED ANALYSIS

The demand for various land uses is based on several factors, many of them difficult to accurately project over a 20 year period. This analysis is grounded on assumptions regarding those factors. For the analysis to remain valid, these assumptions must be continually rechecked.

Caledonia Township assumes that the township will see moderate population growth over the next 20 years. It assumes that utilities necessary for growth will be available when needed. It assumes the growth in the population over the age of 60 will increase faster than the overall population. It assumes that the overall economy of the mid-county area will experience moderate growth. Keeping those assumptions in mind, the following land areas requirements are anticipated over the planning period.

Residential

The population projections were based in part on the assumption that the Owosso Mobile Home Park would be completely developed by the end of the planning period and that future non-mobile home development would occur at the rate of 20 units per year, which it averaged during the decade of the 1990's. Due to the assumed increase in the elderly population in the Township over the next 20 years, the demand for multi-family units is expected to increase. It is projected that 25% of the total units built in 2003-2013 will be multi-family, to increase to 50% for the period 2002-2012. The density of development is expected to be 5 units per gross acre for multi-family units and 4 units per gross acre for mobile home.

The single-family residences are divided between rural residential development (A-2 development) and the urban residential development. A split of 50% each is anticipated, with a development density of one unit per two acres in agricultural areas and one unit per .5 acres in the residential areas. A factor of 1.5 was added to all of the residential acreage estimates except mobile homes to provide for unbuildable sites and provides flexibility in the real estate market.

Based on these assumptions, the following residential land calculations are projected.

Table 23 Land Use Need Projections 2003 – 2013				
Unit Type	Projected #	Density	Factor	Acres
Multi-Family	50	5/acre	1.5	15.0
Rural Single Family	75	.5/acre	1.5	225.0
Urban Single Family	75	2/acre	1.5	56.3

Table 24 Land Use Need Projections 2013 – 2023				
Unit Type	Projected #	Density	Factor	Acres
Multi-Family	100	5/acre	1.5	30.0
Rural Single Family	50	.5/acre	1.5	150.0
Urban Single Family	50	2/acre	1.5	37.5

Table 25 Land Use Need Projections Total 2003- 2023	
Unit Type	Acres
Multi-Family	45.0
Rural Single Family	375.0
Urban Single Family	93.8

Commercial

The township has been experiencing significant growth in its commercial development over the past six years. Most of this development has been related to the widening of M-21 and are highway service and regional commercial developments. Because the demand for this commercial space is related to the traffic along M-21 and growth of the region as a whole, it is difficult to project future commercial demand with any degree of accuracy. A population based on township population growth is not suitable because it ignores the two major factors for future demand for commercial development.

Rather than project the anticipated acreage of land that will be required for future commercial development, the commission chose to make the statement that currently zoned vacant land will not be adequate to meet the requirements over the 20 year planning period based on the recent rate of commercial growth and additional suitable sites should be made available along M-21 as long as traffic ingress/egress concerns and availability of sewer facilities can be addressed.

Industrial

Demand for future industrial land will be dependent on future economic growth in the Mid-Michigan region, and availability of other competing sites in the mid-county area. Analysis showed 117 acres of vacant land currently zoned industrial. To provide for alternative sites, the township has designated land for the Owosso Airport industrial/commercial park as well as land fronting U.S. Brick as additional sites should the need for such land develop.

Future Land Use Map

SECTION 5 - IMPLEMENTATION PLAN

ZONING

The purpose of an implementation plan is to ensure that the goals policies and plans of the township master plan are implemented and that the plan is kept current and maintained. It does this by the use of tools provided the township by state laws. This plan will outline the appropriate tools that the township planning commission feels would be appropriate in implementing this plan.

One of the preeminent tools used by communities to reach the goals of their master plan is zoning. Zoning is a regulatory power given by the state to local townships through the Rural Township Enabling Act. The act authorizes the local units to establish zoning ordinances controlling the use of property and the height, bulk and location of buildings on that property. In order for an ordinance to be effective in implementing a master plan, it must be tailored to that plan. It follows, that when a plan is updated, the local zoning ordinance should also be updated to take into account those changes. This section will review proposed changes in the township's current zoning ordinance that could assist the township in meeting its stated objectives. The proposed changes will be in the A-1 and A-2 districts, requirements regarding combined access and possible special use permit and site plan review requirements.

Zoning Districts

There is a significant difference between the land use classifications in this plan update and the previous plan. This plan proposes that the Township revert back to the previous philosophy of farmland preservation that marked the 1976-1991 Township Zoning Ordinance. Because the current zoning ordinance was established to provide for farmland preservation zoning, and then modified to provide an open space zoning district, the current zoning ordinance districts will not need to be revised in order to implement this plan. Modifications to the A-2 and R-1A district will be required in order to comply with recent zoning enabling legislation changes dealing with open space zoning.

However, the plan does call for some changes in zoning district boundaries, the most significant of which would be the increase in the area designated for A-2 zoning and the elimination of the and A-O zoning district. This would be accomplished through the adoption of the new Township Zoning Ordinance that the Planning Commission is currently working on. Because of the significant changes in the zoning ordinance changes, it is recommended that anyone whose zoning will change as a result of the adoption of the proposed new zoning ordinance receive a notice prior to the public hearing. The A-1 district is intended to be retained, but anyone requesting rezoning from A-1 to A-2 should be permitted to do so.

Other modifications to the zoning ordinance are currently proposed, including the addition of a new commercial zoning district for uses such as Tri-County Well Drilling, combination of the existing B-2 and B-3 zoning districts, the rezoning of much of M-21 form B-1 to B-2 and the revision of the R-1C and R-1B zoning district dimensional requirements to bring them closer to the existing lot areas and setbacks in those zones.

Except for these exceptions, the land use classification criteria can be used in reviewing rezoning requests to determine their appropriateness under the plan.

SPECIAL USES AND SITE PLAN REVIEW

The one of the most important change to the Rural Township Enabling Act made in general overhaul of all local zoning enabling legislation in 1979, was the confirmation of a community's right to issue special use permits. The special use permit provides a zoning ordinance with the flexibility that it often needs to permit a needed high impact use at an appropriate location while protecting the community's residents.

Several changes can be made in the townships zoning ordinance dealing with special use permits and site plan review that can help to implement the goals and policies of this plan.

One of the principal concerns was the lack of adequate access controls along M-21, and the fear that future development will bring increased problems. The site plan review process can be in order to implement the policies dealing with protection of the natural resources such as ground water and wooded areas, the standards used to consider SUP requests should be expanded to include specific consideration of natural features, including soil suitability in determining suitability of the use.

In order to implement the policy calling for protection of groundwater supplies, the special use permit requirements for uses dealing with hazardous material should be amended to require the applicant show compliance with all state and federal environmental regulations as a condition of permit approval

Site plan criteria should be amended to require or at least encourage the development of common driveways, shared signage and screening of parking areas in the concentrated commercial areas along M-21 and M-52.

Site plan criteria should be amended to encourage bicycle paths and sidewalks in major developments.

Provisions should be added to permit private roads or to clarify that private roads are not allowed.

OTHER ORDINANCES

Besides the zoning ordinance, state law has provided local communities with authority to adopt other specific ordinances that can be used to enforce the goals and policies of a land use plan.

Subdivision Control Ordinance

Although the State's Subdivision Control Act requires the developer of a subdivision to submit a proposed plat before a township for review and approval, it also authorizes a township if it wishes, to prepare a subdivision control ordinance. This ordinance may include stricter standards for subdivision design as long as they do not conflict with the provisions of the state act. It permits the community to establish design standards that conform to the land use plan and are therefore more effective in enforcing the plan. The Township recently adopted a subdivision control ordinance.

One of the problems with a local subdivision control ordinance is that it is often too technical in nature for a local community to administer without technical support from consultants who can review the engineering standards to determine compliance. Another problem is that to the

extent that extensive local review lengthens the review process it encourages developers to use site condominiums as an alternative.

Site Condominium Regulations

A site condominium is a development which may be identical to a conventional subdivision except in the way that property rights are divided and the process by which the site plans are reviewed and approved. Unlike subdivision plats, condominium "master deeds" are not required to under go extensive review by state and local officials nor are they required to have final approval from the Department of Commerce. They are required, however to meet the local zoning regulations and many communities are taking steps to modify their zoning ordinance to require site condominiums to meet the same standards as subdivisions. Caledonia Township was the first municipality in the county to see a non-recreational site condominium project filed when the Condominium Master Deed for Lake Leslie was filed. It can expect more such developments

Wetlands

The Goemaere-Anderson Wetland Protection Act requires the DNR to enforce the act, but permits municipalities to adopt local ordinances. If a local community does decide to establish a local Ordinance as authorized in the state law, the DNR is required to coordinate there enforcement efforts with that community.

The advantage of adopting a local ordinance is that it provides local control over the administration of wetlands and permits the adoption of a more stringent definition of what constitutes a wetland and stricter regulations on their enforcement. The primary disadvantage for the community is the manpower and costs required to enforce an ordinance and the technical expertise needed.

Floodplain Regulations

Caledonia Township enrolled in the National Flood Insurance Program in the late 1970's. As a participant, Caledonia Township property owners are permitted to purchase flood insurance at attractive rates. In return the community adopted a flood management ordinance that restricts development within the floodplain with the aim of reducing future losses from flooding. The ordinance is enforced by the township building inspector/zoning administrator.

PLAN MAINTENANCE AND UPDATE

A plan is not a static document. It must continuously be maintained and updated if it is to remain a valid document. Below are recommendations on methods that the Caledonia Township Planning Commission should adopt to insure that the plan is adequately maintained.

Updating the Database

This plan is based on certain assumptions concerning the growth of the township. These assumptions are contained primarily in the plan's data base. It is important for the township to regularly monitor these assumptions to determine if they are still valid. If they become invalid, the planning commission must determine what the changes in circumstances mean for the plan goals and policies.

Population Growth - The plan is based on the projection of population growth contained in the population section of the data base. As noted in the narrative following the projections, there is always a certain amount of guessing that goes into population projections and they should be continuously monitored.

Housing Growth and Mix - The plan makes assumptions on the growth of housing in the township over the planning period and the mix of single family, multi-family and mobile home units (shown below). The township should monitor housing growth and mix to determine if it is following the projections. Differences in the mix of housing types between what was projected and what is built may mean certain assumptions on market demand for various housing types was incorrect which could impact policies dealing with the provision of varied housing types. Differences in the total housing count will impact the population projections and also the land use need estimates contained in the plan.

Housing Cost - Housing costs should be monitored to see if they are increasing more rapidly than household income during the planning period. A marked increase in housing costs in relation to income may require more aggressive efforts in providing low cost housing, while stable costs may indicate that current strategies are working in providing a broad range of housing costs.

Adjacent Planning and Zoning - Changes in the land use plans or zoning maps of adjacent townships or the City of Owosso should be reviewed to consider their impact on the township's plan, preferably before that community makes a decision regarding the matter.

Agriculture - The land use plan categorized the pressure on agricultural land uses by non-farm development in the township as moderate, and recommended maintaining the existing measures in affect to restrict development in the prime agricultural area. The planning commission may wish to review the indicators of identified in the Community Profile Worksheet that was filled out by the commission as part of the plan development to determine if these development pressures increase. A lack of change in these indicators would suggest that the current policies are adequate while a change in the indicators may suggest a need for review of the policies.

Transportation - The Township should monitor changes and proposed changes in the roads and streets in the township. The Road Commission's road improvement schedule should be reviewed for their impact on the plan. Traffic count data is updated annually by the Road Commission and this information should be compared with capacity figures for various road sections along with accident data from the township police department to determine if traffic congestion is increasing at an unexpected rate or if traffic safety is deteriorating.

Utilities - The plan anticipates limited extension of sewer lines. The sewer service area is then considered the determining factor in expansion of urban density development. Unanticipated expansion of the sewer lines should be reviewed to determine their effect on this type of development in the township.

Commercial Development - The plan anticipates a need for continued commercial development along M-21. Rezoning requests and special use permit requests should be monitored for indications of a need for additional commercial area.

Reviewing the Plan Goals and Policies

After reviewing the updated information on the plan data base, the planning commission should review the goals and policies. Specifically, the commission is looking for goals or policies that are no longer relevant due to changes in conditions or policies that have proven ineffective in addressing a goal. Those items that are identified should be deleted or modified in light of the new information. The plan should be officially amended to incorporate the changes in the goals or policies and the basis for the change should be reflected in public hearing record.

Incorporating Plan Review Into Rezoning Request Review

Although an annual review of the plan is necessary for a comprehensive examination of the plan, many problems with a land use plan will become obvious during consideration of a rezoning or special land use permit request. It is important to incorporate review and amendment of the land use plan as part of the planning commission's consideration of such requests. This is covered in more detail in the subsection on using the land use plan for zoning reviews.

USING THE LAND USE PLAN FOR ZONING REVIEW

As noted earlier, the primary method of enforcing a land use plan is the zoning ordinance. In order for that to be done effectively, the community's rezoning and special land use permit request and site plan review procedure should be structured so land use goals and policies are considered.

Rezoning Requests

In considering a rezoning request, the primary question to ask is; "Does this request conform to our land use plan?". Three subsidiary questions follow that; "Was there an error in the plan?"; "Have there been relevant changes in conditions since the plan was approved?" and "Have there been changes in the goals and policies of the plan?". Answering these questions should answer the question whether or not a rezoning request is appropriate and that should frame the reason within the context of the plan.

This method of analyzing a request rests on the assumption that a request that complies with a valid plan should be approved and that one that does not comply with a valid plan should not be. Further, it assumes that the three circumstances that would invalidate a plan are a mistake in the plan, a change in condition that invalidates the assumptions that the plan was built on or a change in the goals and priorities that the community set for itself.

Mistake - A mistake in a plan can be an assumption made based on incorrect data, an area on a land use map that is incorrectly labeled, or other factors that if known at the time of the plan adoption would have been corrected.

Changes in Conditions - A plan is based on the assumption that certain conditions will exist during the planning period. If those conditions change then goals, policies and land use decisions that made sense when the plan was adopted way no longer be valid and a rezoning that was not appropriate before is appropriate now.

Change in Policy - In the end, a plan is based on the planning commission's vision of what the best future for their municipality is. When that vision changes, the plan should change. When a

zoning issue results in a change in vision, a decision can be made that is contrary to the current plan as long as that changed vision is explicitly incorporated into the plan.

Two points should be made. First of all the three factors for consideration (mistake, change in condition, change in goals or policy) can work in reverse, making a proposal that otherwise seems appropriate, inappropriate. Secondly, these factors should not be used to create excuses for justifying a decision to violate the land use plan, or to change it so often that it loses its meaning.

Special Use Permits

The establishment of special uses in the zoning ordinance is based upon the goals and policies in the land use plan. The plan in turn should be used to determine when it is appropriate to permit a particular special use on a particular piece of property. To use the plan to help in making the determinations, the planning commission should look at the goals and policies that are appropriate to the type of use being proposed. The goals and policies of the plan should indicate the general intent of the plan regarding this activity and may be more specific in detailing what appropriate criteria are for approving the use. In most cases this criteria will be reflected in the zoning regulations. In either case it is important that this connection with the land use plan goals and policies be stated so that the planning basis for the decision is clear.