

**ANN ARBOR TOWNSHIP  
FARMLAND ANALYSIS**

**Prepared for the Ann Arbor Township Board of Trustees**

**Washtenaw-Potawatomi Land Trust**

**November, 1999**

## ACKNOWLEDGEMENTS

The production of this analysis would not have been possible but for the following people: Cathy Braun, Ann Arbor Township Clerk, who provided the list of properties with tillable acreage and much other pertinent information; Joelle Laura, Ann Arbor Township assessor, who provided valuations of the properties under consideration; John Allison, Ann Arbor Township trustee, who provided the original framework as well as many insights and comments throughout the course of study; and Kara Roggenkamp, WPLT Summer 1999 intern, who tracked down the vast majority of the many facts and figures used herein, compiled and organized them so as to be useful in determining costs of development and preservation and wrote several sections of the final report.

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## EXECUTIVE SUMMARY

There are currently 2,820 acres of tillable farmland located on properties totalling 3,926 acres in Ann Arbor Township. The assessments for eight property owners, covering 1,087 acres, were analyzed to determine whether their valuations were in line with the current actual value of farmland. Assessments averaged over \$2,000/acre, whereas farmland values are likely no more than \$1,600 per acre. Reducing assessments on farmland would decrease the tax burden paid by those landowners.

Costs to support residential development were determined for three housing densities: one dwelling unit for ten acres, for three acres and for one-half acre. Added population would be 707, 2,333 and 10,600, respectively, with the total new capital required totalling \$21 million, \$80 million and \$344 million. Shortfalls of \$1 million, \$4 million and \$17 million would be encountered, resulting in perpetual tax increases of 0.2, 1.35 and 4.45 mills and costs to the average existing Township household of \$25, \$167 and \$552, respectively.

The cost of purchasing agricultural conservation easements was determined based on recent appraisals for state and private farmland preservation efforts. An average easement cost per acre of \$2,600 multiplied by the number of tillable acres would result in a cost of \$7.2 million and a rate of 1.16 mills for 20 years (\$144 per existing household) if no matching funds were available. If the maximum of \$5,000 per acre paid by the State of Michigan for its program were applied to the tillable acreage, the cost would be \$13.5 million, the tax rate 2.14 mills and the cost per household \$265 a year. Targeting 25% of the tillable acreage would reduce these figures correspondingly.

Finally, a survey of Township residents was performed to ascertain their interest and support for preserving farmland. Of the 1,821 surveys mailed with the Township newsletter, 249 (14%) were returned. Of those responses, 152 (61%) said they would support a farmland preservation program in Ann Arbor Township. Respondents also stated their willingness to pay for such a program, with 126 (51%) of all respondents willing to pay \$100 per year or more. In contrast, respondents were generally less willing to pay for support services for residential development, with only 71 (29%) willing to pay \$50 per year or more.

## SUMMARY OF COST COMPARISON

COST OF RESIDENTIAL DEVELOPMENT								
Lot Size (Acres)	Number of New Households	Number of New Residents	Number of New School Children	Number of Additional Vehicle Trips per day	Total New Capital Required	Annual Shortfall	Required Millages	Average Cost per Township Household (annual)
10	314	707	210	3,140	\$21M	\$1M	0.2	\$25
3	1,037	2,333	695	10,370	\$80M	\$4M	1.35	\$167
0.5	4,711	10,600	3,157	47,110	\$344M	\$17M	4.45	\$552

COST OF PURCHASING AGRICULTURAL CONSERVATION EASEMENTS				
Estimated cost per acre	Tillable Farmland Acres		Required Millage (20 years)	Average Cost per Household (annual)
	Protected	Total		
\$2,600 (WPLT)	2,820	\$7.2M	1.16	\$144
\$2,600 (WPLT)	705	\$1.8M	0.29	\$36
\$5,000/acre (State of MI max.)	2,820	\$13.5M	2.14	\$265
\$5,000/acre (State of MI max.)	705	\$3.4M	0.54	\$67

## **Introduction**

The northern part of Ann Arbor Township has been home to farms and farm families since the mid-1800s. Three properties in the Township are designated Centennial Farms by the State Historic Preservation Office, having been in the same family ownership for over one hundred years. These farms feature historic houses and barns dating back to when this area was first settled and cultivated. One barn on Whitmore Lake Road near Warren Road was built in 1881 and is still in the same family.

Many people are surprised to learn that just north of the City of Ann Arbor lie almost three thousand acres of tillable farmland. Though this part of the Township is only four or five miles away from downtown, most of the roads are unpaved. Roughly 70 percent of this land is considered prime farmland by the U.S. Department of Agriculture, with rich soils suitable for growing corn, soybeans and hay.

Although the farmland in Ann Arbor Township is the agricultural area closest to Ann Arbor, there is still a great deal of farmland in neighboring townships. The surrounding townships of Northfield, Salem, Webster and Superior all have a sizable number of working farms. These areas form a nearly contiguous zone of agricultural production that totals many thousands of acres, despite the conversion of farmland to residential uses in recent years.

Currently, farmland makes up 31% of the land base in Ann Arbor Township but comprises only 1.4% of the SEV (State Equalized Value) for all property in the Township. In contrast, residential property covers only 8% of the land but makes up 71.4% of the SEV (SEMCOG, 1995), as open land is generally assessed at a lower value than land that has been built upon. Most of the land in agricultural use in Ann Arbor Township is currently zoned A-1, General Agricultural, which requires land divisions to be a minimum of ten acres in size. Residential zoning allows for smaller splits, and therefore denser development. In Ann Arbor Township, residential zoning ranges from Agricultural Residential, which allows five-acre splits, to Single Family Urban, which allows half-acre splits. Denser residential development brings in more tax revenue than undeveloped land, but it also requires more services such as police and fire protection, paved roads and schools.

As development encroaches on Ann Arbor Township, it is incumbent for the Planning Commission and Board of Trustees to weigh available options for facilitating the development or preservation of farmland. In a developing area like Washtenaw County, it is unlikely that new taxes will not be assessed of residents, for people demand services and services cost money. This analysis endeavors to ascertain the costs of development, as well as the cost of preservation, and is intended to provide some critical information for the Township's decision-makers as they determine the best course of action.

### **Farmland Acreage, Location and Zoning**

There is currently just over 2,800 acres of tillable farmland in Ann Arbor Township, on properties that total nearly 4,000 acres. The remaining areas of these properties are woods, wetlands, stream corridors, road rights-of-way and other landscape features that are not used for crop production. All of the tillable land considered in this study is located north of the M-14/U.S-23 freeway corridor. A list of these properties with their tax identification number, owner, total acres and tillable acres can be found in Table 1; a depiction of their location can be found in Figure 1.

Table 1 also shows the existing zoning for these properties. With few exceptions, these lands are zoned A-1, General Agriculture. Other zoning categories are R-C, R-6 and R-2. The future zoning of the properties varies considerably, with some agricultural, some residential and some "developmental."

### **Farmland Assessments**

One of the most commonly heard complaints from farmland owners is that they are being taxed too highly, in some cases even "off their land." The Michigan Constitution states that all lands in the state should be assessed on their "true cash value," which is then to be determined by the legislature. In practice this policy has translated to assessing property at its "highest and best use," that is, its maximum return when sold on the open real estate market. In Ann Arbor Township, as with most places within an hour's automobile drive of a major employment center, "highest and best use" is what the land will generate for residential housing development. Nevertheless, officials with the

**Table 1: Farm Properties and Estimated Conservation Easement Values**

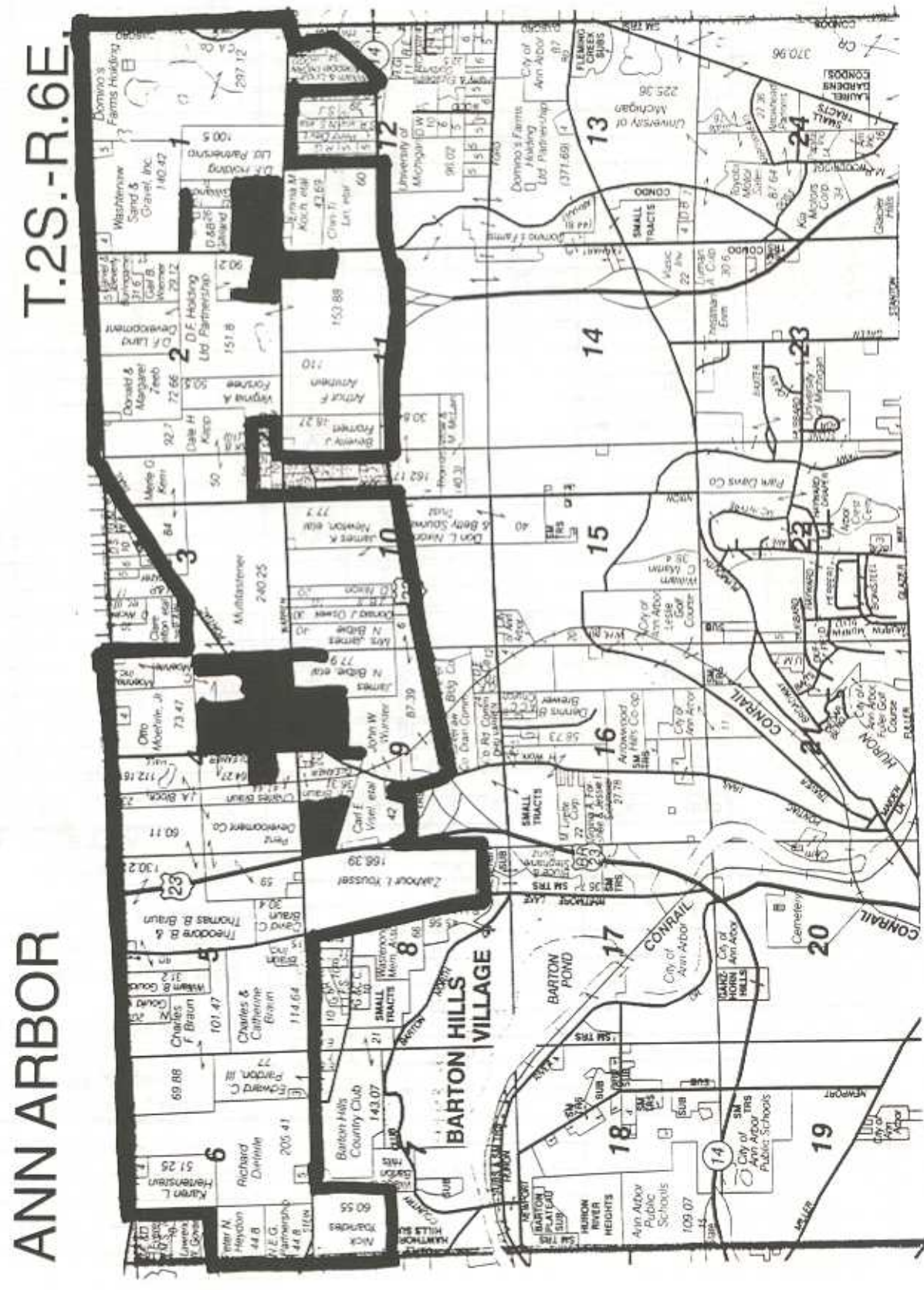
*Italics indicate estimated tillable acreage.*

Tax ID	Owner	Total Acres	Tillable	Zoning	Rating	Total CE value
01-100-04	Dominos	80.8	43.0	A-1	2	\$107,500.00
01-100-05	Dominos	81.3	7.0	A-1	2	\$17,500.00
01-200-02	Wash Sand	140.4	20.5	A-1	1	\$41,000.00
01-300-07	Dominos	25.0	23.7	A-1	3	\$71,100.00
01-300-08	Dominos	75.5	64.5	A-1	2	\$161,250.00
01-300-13	Gilliland	16.1	12.1	A-1	2	\$30,187.50
01-300-14	Gilliland	19.4	15.5	A-1	1	\$30,992.00
01-400-07	Dominos	114.7	51.0	A-1	2	\$127,500.00
02-100-02	Dominos	66.0	52.9	A-1	2	\$132,350.00
02-100-03	Wiemer	29.1	11.0	R-C	2	\$27,500.00
02-100-06	Burlingame	31.6	11.3	R-C	2	\$28,250.00
02-200-04	Kapp	43.2	34.7	A-1	2	\$86,750.00
02-200-06	Zeeb	62.7	48.5	A-1	2	\$121,250.00
02-300-01	Kapp	49.5	32.5	A-1	2	\$81,250.00
02-300-05	Forshee	40.0	23.2	R-C	2	\$58,075.00
02-300-06	Dominos	40.0	11.3	R-C	1	\$22,680.00
02-400-07	Dominos	24.2	24.2	A-1	2	\$60,575.00
02-400-08, -09	Dominos	81.0	27.4	A-1	2	\$68,620.00
03-100-03	Kern	84.0	60.0	A-1	3	\$180,000.00
03-300-01	Multifast	80.3	67.8	A-1	3	\$203,250.00
03-300-02	Multifast	80.0	56.1	A-1	3	\$168,210.00
03-400-01	Multifast	80.0	51.0	A-1	3	\$153,000.00
03-400-04	Kapp	50.0	48.8	A-1	2	\$121,875.00
04-100-02	Moehrle	20.2	13.6	A-1	2	\$34,000.00
04-100-04	Moehrle	73.5	70.6	A-1	3	\$211,890.00
04-100-05	Moehrle	20.6	20.6	A-1	1	\$41,240.00
04-200-01	Penz Dev.	33.4	27.3	A-1	2	\$68,250.00
04-200-02	J.A. Block	23.2	10.4	A-1	1	\$20,800.00
04-200-03	T. Braun	60.1	52.0	A-1	2	\$130,000.00
04-300-01	Penz Dev.	78.8	54.4	R-6	1	\$157,520.00
04-300-02	C. Braun	30.4	30.0	A-1	2	\$75,100.00
04-300-03	C. Braun	11.0	10.0	A-1	1	\$20,000.00
04-300-09	Moehrle	19.6	19.6	A-1	2	\$49,100.00
04-400-02	Moehrle	24.2	24.1	A-1	2	\$60,250.00
05-100-01	T. Braun	29.7	29.7	A-1	3	\$89,040.00
05-100-04	T. Braun	66.8	63.6	A-1	3	\$190,665.00
05-200-01	Gould	31.2	31.2	A-1	1	\$62,400.00
05-200-02	Gould	20.0	20.0	A-1	1	\$40,000.00
05-200-03	C. Braun	54.7	54.7	A-1	1	\$109,440.00
05-300-01	C. Braun	46.8	43.9	A-1	2	\$109,750.00
05-300-03	C. Braun	114.6	80.1	A-1	3	\$240,240.00
05-400-01	T. Braun	33.8	16.1	A-1	3	\$48,300.00
05-400-05	Penz Dev.	35.4	35.3	A-1	1	\$70,500.00
05-400-07	Penz Dev.	23.8	23.8	A-1	1	\$47,500.00
06-100-01	C. Braun	69.9	30.7	A-1	2	\$76,750.00
06-100-02	Dieterle	25.0	8.0	A-1	2	\$20,000.00





Figure 1: Location Map of Ann Arbor Township Farmland Properties



Washtenaw County Equalization Department have been stating a sensitivity to the farmland tax issue and claiming to assess land according to current use rather than potential use.

As part of this analysis, the holdings of eight farmland property owners (1,087 total acres) were reviewed to determine whether their assessments reflected the land's current use. The results of this review are presented in Table 2. The properties were chosen to be representative of farmland parcels in the Township and stretch across the region north of the freeways. All of them except the 56 acre parcel owned by Mr. Youssef are zoned A-1; that one (08-400-001) is zoned R-2.

If assessments on farmland are supposed to reflect the actual value of the land were one owner to sell it to another for agricultural pursuits, then the average assessed value for these eight properties is significantly high. While very little farmland anywhere in Washtenaw County is being sold as farmland these days—and that which is, is done by private sale, i.e., friendly agreements between neighbors and not placed on the open market for sale—the general perception in the farming community is that the best land (sandy-loamy soils, well-drained, flat) is worth a maximum of \$1,600.00 per acre. Lands that are more marginal would sell for less, say \$1,000.00 per acre. In the absence of a market for preserved farmland, this discussion is admittedly conjecture. Nevertheless, it appears that assessments on Ann Arbor Township farmland are on average higher than their “current use” and could be reduced to provide some measure of tax relief to those landowners. With such a small amount of the Township's total SEV coming from farmland (1.4%), even eliminating taxes on farmland would not produce a substantial burden on the remaining taxpayers.

## **Community Cost Comparison**

### **A. Cost of Residential Development**

A second element of this analysis relates to the cost of supplying public services to land once it becomes developed with residential housing, versus the cost of acquiring interests in land via conservation easements that would limit its development to farming. Other studies dealing with the impacts of development—fiscal impact, cost of community services, build-out and others—have been produced to present decision-makers with

<b>Table 2: Selected Assessments for Farm Properties</b>				
Owner's Name	ID#	Total Acres	Value	Value/acre
Richard Dieterle	06-100-002	25.0	\$30,490	\$1,219.60
	06-100-002	25.0	\$30,490	\$1,219.60
	06-300-001	52.2	\$78,212	\$1,499.18
	06-300-004	43.2	\$61,429	\$1,420.65
	06-400-001	60.0	\$100,134	\$1,668.90
Zakhour Youssef	08-100-001	110.3	\$341,792	\$3,100.15
	08-400-001	56.1	\$186,480	\$3,321.70
Thomas Braun	05-100-001	29.7	\$65,620	\$2,210.92
	05-100-004	66.8	\$130,744	\$1,957.10
	04-200-003	60.0	\$109,808	\$1,830.13
	05-400-001	33.8	\$42,642	\$1,263.47
Otto Moehrle	04-100-002	20.2	\$33,582	\$1,660.01
	04-100-004	73.5	\$148,692	\$2,023.85
	04-100-005	20.6	\$43,526	\$2,110.86
	04-300-009	19.6	\$44,454	\$2,263.44
	04-400-001	13.4	\$35,966	\$2,694.08
	04-400-002	24.2	\$51,038	\$2,110.75
Dale Kapp	02-300-001	49.5	\$60,980	\$1,231.92
	03-400-004	50.0	\$82,334	\$1,646.68
Arthur Amrhein	11-200-001	110.0	\$224,229	\$2,038.45
Emma Koch	12-200-012	43.7	\$91,867	\$2,102.70
DF Holdings	01-300-007	25.0	\$47,500	\$1,900.00
	01-300-008	75.5	\$184,318	\$2,441.30
	<b>TOTAL</b>	<b>1,087.2</b>	<b>\$2,226,327.00</b>	<b>\$2,047.73</b>
Source: Ann Arbor Township Assessor				

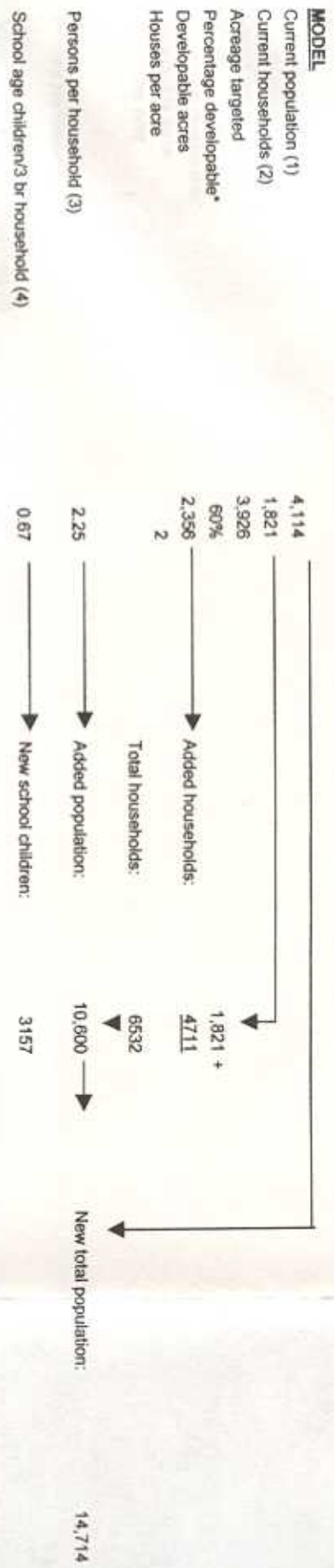
pertinent information as they consider future land uses. This comparison of costs has, to our knowledge, never before been attempted, and so the phrase "Community Cost Comparison" has been coined to describe it.

The first step in the comparison is to determine the cost of providing services for residential development. When less developed land (farmland, natural areas and open space) is replaced with houses, the residents of those dwellings require certain public services to be available. The increase in demand for services has a calculable cost associated with it, and while the new residents pay taxes on their property, in most cases the costs exceed the new revenues generated. In the short term the community is often able to absorb these costs, but if the type or extent of development is substantial, eventually the new costs require additional revenues to be generated, usually through tax increases.

While the demand for most services in a municipality like Ann Arbor Township is borne by the local government, the greatest cost for development comes from having to house and instruct school-age children. The entity that supplies those services for the Township—Ann Arbor Public Schools—is separate from the Township, but when tax increases are instituted to construct new facilities, Township residents pay as part of their overall property tax burden. Some have suggested that the break-even point for residential housing to pay its way is on the order of \$350,000.00 units; anything less than that having bedrooms will likely have children that need schooling, and ultimately the entire community pays more to underwrite the development.

For Ann Arbor Township, three development scenarios were examined: ten acre lots, which is the current minimum lot size in the A-1 district; three acre lots; and one-half acre lots. Results of the analysis are presented in Tables 3, 4 and 5; comments on the limitations of the model and sources for the calculations can be found in Appendices A and B, respectively. In each case, the increase in population was determined based on current household size estimates for the Township. Those numbers were then used to determine the number of additional police, fire and public service personnel based on current staffing for those services; the cost of those personnel is based on current salaries and benefits being paid by, or projected for, the Township. The number of new households was also used to determine the number of new school-aged children that

**Table 5: Cost/Revenue Projection for Half Acre Lots**



PROJECTED NEW COSTS		Cost/mile (10)	Total additional cost	Annual Cost	Cost per unit (estimated)	Total additional cost
Police FTE personnel	2	0.5	\$ 210,000.00	\$ 10,500.00	\$ 600,000.00	\$ 600,000.00
Fire FTE personnel	1.65	1.71	\$ 462,000.00	\$ 520,000.00	\$ 600,000.00	\$ 600,000.00
Public service FTE personnel	3.8	1	\$ 16,500,000.00	\$ 825,000.00	\$ 50,000.00	\$ 250,000.00
<b>Subtotal New Personnel Costs</b>				<b>\$ 1,450,000.00</b>		
<b>Government Costs</b>		<b>Miles unpaved (9)</b>	<b>Total additional cost</b>	<b>Annual Cost</b>		
Fire engine (small eng-rescue/20 years) (8)	-	-	\$ 210,000.00	\$ 10,500.00		
Roads (5.5% interest/20 years)	13.5	\$ 462,000.00	\$ 10,400,000.00	\$ 520,000.00		
Water/Wastewater Capacity (12, 13)		\$ 16,500,000.00	\$ 825,000.00			
General Fund (% pop. increase)\$100K/2)						\$ 128,830.82
Fire Fund (% pop. increase)\$200K/2)						\$ 257,661.64
<b>Subtotal New Government Costs</b>				<b>\$ 1,741,992.46</b>		

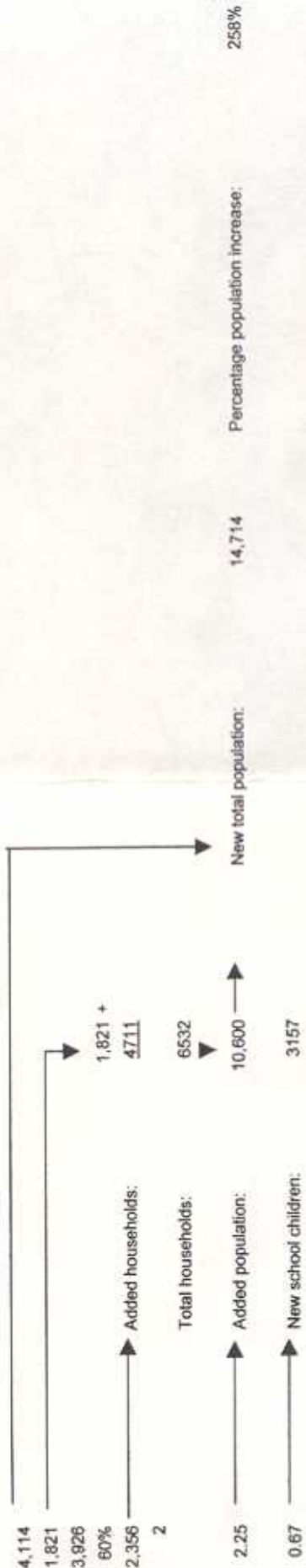
PROJECTED NEW REVENUES	
New Households	4,711
Taxable value per household (SEV)	\$ 125,000.00
Additional Taxable Value	\$ 588,900,000.00
Township millage rate (11)	2.811 (not including fire debt)
<b>NEW TAX REVENUES</b>	<b>\$ 1,655,397.90</b>

<b>TOTAL ANNUAL COST</b>	<b>\$ 3,191,992.46</b>
<b>NEW TAX REVENUES</b>	<b>\$ 1,655,397.90</b>
<b>TOTAL ANNUAL SHORTFALL</b>	<b>\$ 1,536,594.56</b>
Total SEV (existing)	\$ 315,949,928.00
Additional Taxable Value	\$ 588,900,000.00
Total SEV (new)	\$ 904,849,928.00
<b>REQUIRED NEW MILLAGE</b>	<b>1.8962</b>
Average Current Residential SEV	\$ 123,958.00
<b>ANNUAL NEW TAX</b>	<b>\$ 210.50</b>

\*Undevelopable land such as wetland, swamp, ditches, roads, and woodlands total 679 acres  
 \*\*Additional Personnel is not necessarily assumed to be a direct function of population increase  
 \*\*\*Assumes creation of Township Police Department  
 Numbers in parentheses refer to sources listed in Appendix B

**TOTAL NEW MILLAGE**  
**TOTAL NEW TAX**

**Allocation for Half Acre Lots**



New total population: 14,714

Std/1,000 pop. (5-7)	Current/1,000 pop.	Additional**	Total Projected	Cost per unit (estimated)	Total additional cost
2	0.5	12	14***	\$ 50,000.00	\$ 600,000.00
1.65	1.71	12	19	\$ 50,000.00	\$ 600,000.00
3.8	1	5	9	\$ 50,000.00	\$ 250,000.00
				<b>Subtotal New Personnel Costs</b>	<b>\$ 1,450,000.00</b>

Miles unpaved (9)	Cost/mile (10)	Total additional cost	Annual Cost
-	-	\$ 210,000.00	\$ 10,500.00
13.5	\$ 462,000.00	\$ 10,400,000.00	\$ 520,000.00
		\$ 16,500,000.00	\$ 825,000.00
		<b>Subtotal New Government Costs</b>	<b>\$ 1,741,992.46</b>

<b>TOTAL ANNUAL COST</b>	<b>\$ 3,191,992.46</b>
<b>NEW TAX REVENUES</b>	<b>\$ 1,655,397.90</b>
<b>TOTAL ANNUAL SHORTFALL</b>	<b>\$ 1,536,594.56</b>
Total SEV (existing)	\$ 315,949,928.00
Additional Taxable Value	\$ 588,900,000.00
Total SEV (new)	\$ 904,849,928.00
<b>REQUIRED NEW MILLAGE</b>	<b>1.6882</b>
Average Current Residential SEV	\$ 123,958.00
<b>ANNUAL NEW TAX</b>	<b>\$ 210.50</b>

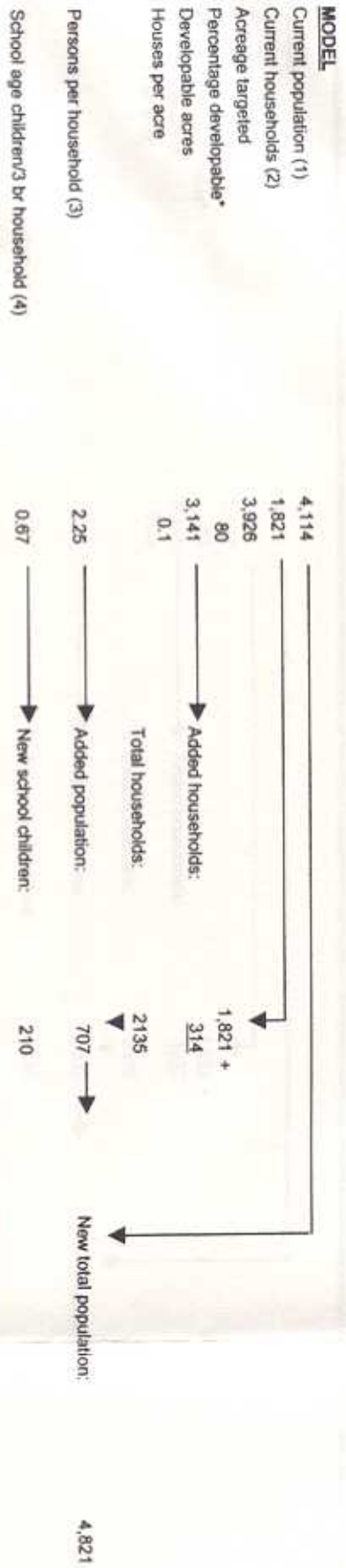
SCHOOLS		
Cost per new elementary school	\$	30,000,000.00
Number of children per school		300
Number of new schools		10
Cost per new school child	\$	100,000.00
	x	
New school children:		3157
Total capital required	\$	315,650,400.00
/20 years =		
Total annual cost (shortfall)	\$	15,782,520.00
AAPS SEV	\$	5,728,111,961.00
<b>REQUIRED NEW MILLAGE</b>		<b>2.7553</b>
Average Current Residential SEV	\$	123,958.00
<b>ANNUAL NEW TAX</b>	\$	<b>341.54</b>

<b>TOTAL NEW MILLAGE</b>	<b>4.4535</b>
<b>TOTAL NEW TAX INCREASE</b>	<b>\$ 552.04</b>

4,711  
\$ 125,000.00  
\$ 588,900,000.00  
2.811 (not including fire debt)  
\$ 1,655,397.90

d, ditches, roads, and woodlands total 679 acres  
to be a direct function of population increase  
partment  
d in Appendix B

**Table 3: Cost/Revenue Projection for 10 Acre Lots**



PERSONNEL	Std/1,000 pop. (5-7)	Current/1,000 pop.	Additional**	Total Projected	Cost per unit (estimated)	Total additional cost
Police FTE personnel	2	0.5	1	3	100,000.00	\$ 300,000.00
Fire FTE personnel	1.65	1.71	0	7	50,000.00	\$ 350,000.00
Public service FTE personnel	3.8	1	0.5	4.5	50,000.00	\$ 225,000.00
<b>Subtotal New Personnel Costs</b>						<b>\$ 1,275,000.00</b>

Government Costs	Miles unpaved (9)	Cost/mile (10)	Total additional cost	Annual Cost	
Fire engine (small 12-5/20 years) (8)	-	-	\$ -	\$ -	
Roads (5.5% interest/20 years)	13.5	462,000.00	\$ 6,237,000.00	\$ -	
General Fund (% pop. increase X \$100K/2)				\$ 8,589.27	
Fire Fund (% pop. increase X \$200K/2)				\$ 17,178.54	
<b>Subtotal New Government Costs</b>					<b>\$ 25,767.81</b>

PROJECTED NEW REVENUES	Amount	TOTAL ANNUAL COST	Amount
New Households	314	NEW TAX REVENUES	\$ 150,767.81
Taxable value per household (SEV)	\$ 200,000.00	TOTAL ANNUAL SHORTFALL	\$ (25,819.21)
Additional Taxable Value	\$ 62,820,000.00	Total SEV (existing)	\$ 315,949,928.00
Township millage rate (11)	2.811 (not including fire debt)	Additional Taxable Value	\$ 62,820,000.00
<b>NEW TAX REVENUES</b>	<b>\$ 176,587.02</b>	Total SEV (new)	\$ 378,769,928.00

TOTAL ANNUAL COST	\$ 150,767.81
NEW TAX REVENUES	\$ 176,587.02
TOTAL ANNUAL SHORTFALL	\$ (25,819.21)
Total SEV (existing)	\$ 315,949,928.00
Additional Taxable Value	\$ 62,820,000.00
Total SEV (new)	\$ 378,769,928.00
REQUIRED NEW MILLAGE	0.0000
Average Current Residential SEV	\$ 123,958.00
ANNUAL NEW TAX	\$ -

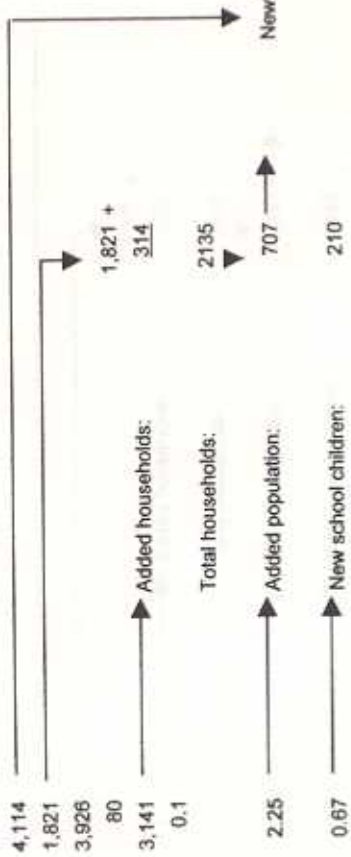
**TOTAL NEW MILLAGE**  
**TOTAL NEW TAX INCREASE**

\*Undevelopable land such as wetland, swamp, ditches, roads, and woodlands total 679 acres  
 \*\*Additional Personnel is not necessarily assumed to be a direct function of population increase  
 Numbers in parentheses refer to sources listed in Appendix B

SCHOOL	Cost per	Number	Number	Cost per
120 year				
Total an				
AAPS S				
REQUIRE				
Average				
ANNUA				



**Section for 10 Acre Lots**



Percentage population increase: 17%

New total population: 4,821

Added population: 1,821

Total population: 4,114

Added households: 314

Total households: 4,240

Added population: 1,821

New total population: 4,821

New school children: 210

Std/1,000 pop. (5-7)	Current/1,000 pop.	Additional**	Total Projected	Cost per unit (estimated)	Total additional cost
2	0.5	1	3	\$ 100,000.00	\$ 100,000.00
1.65	1.71	0	7	\$ 50,000.00	\$ -
3.8	1	0.5	4.5	\$ 50,000.00	\$ 25,000.00
				<b>Subtotal New Personnel Costs</b>	<b>\$ 125,000.00</b>

Miles unpaved (9)	Cost/mile (10)	Total additional cost	Annual Cost
-	\$ -	\$ -	\$ -
13.5	\$ 462,000.00	\$ -	\$ 8,589.27
		<b>Subtotal New Government Costs</b>	<b>\$ 25,767.81</b>

TOTAL ANNUAL COST		\$ 150,767.81
NEW TAX REVENUES		\$ 176,587.02
<b>TOTAL ANNUAL SHORTFALL</b>		<b>\$ (25,819.21)</b>
Total SEV (existing)		\$ 315,949,928.00
Additional Taxable Value		\$ 62,820,000.00
Total SEV (new)		\$ 378,769,928.00
<b>REQUIRED NEW MILLAGE</b>		<b>0.0000</b>
Average Current Residential SEV		\$ 123,958.00
<b>ANNUAL NEW TAX</b>		<b>\$ -</b>

SCHOOLS		\$	\$
Cost per new elementary school		\$ 30,000,000.00	
Number of children per school			300
Number of new schools			1
Cost per new school child		\$ 100,000.00	
		x	
New school children:			210
Total capital required		\$ 21,044,700.00	
720 years =			
Total annual cost (shortfall)		\$ 1,052,235.00	
AAPS SEV		\$ 5,202,031,961.00	
<b>REQUIRED NEW MILLAGE</b>		<b>0.2023</b>	
Average Current Residential SEV		\$ 123,958.00	
<b>ANNUAL NEW TAX</b>		<b>\$ 25.07</b>	

<b>TOTAL NEW MILLAGE</b>	<b>0.2023</b>
<b>TOTAL NEW TAX INCREASE</b>	<b>\$ 25.07</b>

p, ditches, roads, and woodlands total 679 acres  
 assumed to be a direct function of population increase  
 as shown in Appendix B

**Table 4: Cost/Revenue Projection for Three Acre Lots**

**MODEL**

Current population (1)	4,114			
Current households (2)	1,821			
Acreage targeted	3,926			
Percentage developable*	80			
Developable acres	3,141		→	Added households:
Houses per acre	0.33			1,037
				1,821 +
				1037
				2858
				↓
Persons per household (3)	2.25		→	Added population:
School age children/3 br household (4)	0.87		→	695
				↓
				2,333
				↓
				6,447
				↓
				New total population:

**COSTS**

	Std/1,000 pop. (5-7)	Current/1,000 pop.	Additional**	Total Projected	Cost per unit (estimated)	Total additional cost
<b>Personnel</b>						
Police FTE personnel	2	0.5	1	3	\$	100,000.00
Fire FTE personnel	1.65	1.71	0	7	\$	50,000.00
Public service FTE personnel	3.8	1	1	5	\$	50,000.00
						150,000.00
						Subtotal New Personnel Costs
<b>Government Costs</b>						
Fire engine (small 12-5/20 years) (8)						\$ 8,000.00
Roads (5.5% interest/20 years)	13.5	482,000.00	\$ 10,400,000.00	\$ 8,000.00	\$	520,000.00
General Fund (% pop. increase/\$100K/2)						\$ 28,354.40
Fire Fund (% pop. increase/\$200K/2)						\$ 56,708.80
						Subtotal New Government Costs
						\$ 613,063.20

**PROJECTED NEW REVENUES**

New Households	1,037			
Taxable Value per household (SEV)	\$ 150,000.00			
Additional Taxable Value	\$ 155,550,000.00			
Township millage rate (11)	2.811 (not including fire debt)			
<b>NEW TAX REVENUES</b>	<b>\$ 437,251.05</b>			

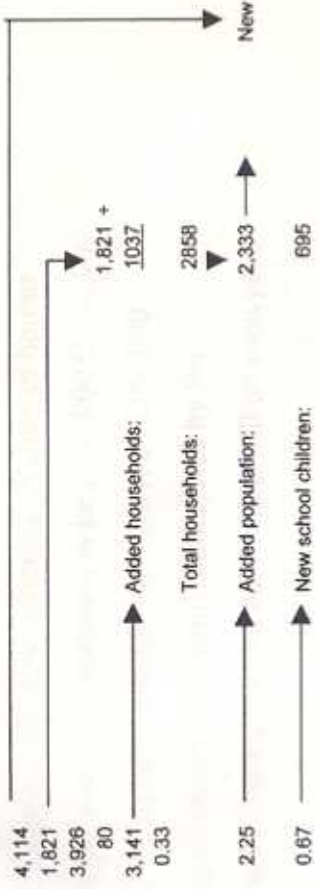
<b>TOTAL ANNUAL COST</b>	<b>\$ 763,063.20</b>
<b>NEW TAX REVENUES</b>	<b>\$ 437,251.05</b>
<b>TOTAL ANNUAL SHORTFALL</b>	<b>\$ 325,812.15</b>
Total SEV (existing)	\$ 315,948,928.00
Additional Taxable Value	\$ 155,550,000.00
Total SEV (new)	\$ 471,498,928.00
<b>REQUIRED NEW MILLAGE</b>	<b>0.6910</b>
Average Current Residential SEV	\$ 123,956.00
<b>ANNUAL NEW TAX</b>	<b>\$ 85.65</b>

\*Undevelopable land such as wetland, swamp, ditches, roads, and woodlands total 679 acres  
 \*\*Additional Personnel is not necessarily assumed to be a direct function of population increase  
 Numbers in parentheses refer to sources listed in Appendix B

**TOTAL NEW MILLAGE**  
**TOTAL NEW TAX INC**

SA  
C  
N  
Nu  
Co  
Ne  
T  
/Z  
To  
AA  
RE  
Av  
AN

### Section for Three Acre Lots



Percentage population increase: 57%

6,447

New total population:

Std/1,000 pop. (5-7)	Current/1,000 pop.	Additional**	Total Projected	Cost per unit (estimated)	Total additional cost
2	0.5	1	3	\$ 100,000.00	\$ 100,000.00
1.65	1.71	0	7	\$ 50,000.00	\$ -
3.8	1	1	5	\$ 50,000.00	\$ 50,000.00
				<b>Subtotal New Personnel Costs</b>	<b>\$ 150,000.00</b>

Miles unpaved (9)	Cost/mile (10)	Total additional cost	Annual Cost
-	\$ -	\$ 160,000.00	\$ 8,000.00
13.5	\$ 462,000.00	\$ 10,400,000.00	\$ 520,000.00
		<b>Subtotal New Government Costs</b>	<b>\$ 613,063.20</b>

<b>TOTAL ANNUAL COST</b>	<b>\$ 763,063.20</b>
<b>NEW TAX REVENUES</b>	<b>\$ 437,251.05</b>
<b>TOTAL ANNUAL SHORTFALL</b>	<b>\$ 325,812.15</b>
Total SEV (existing)	\$ 315,949,928.00
Additional Taxable Value	\$ 155,550,000.00
Total SEV (new)	\$ 471,499,928.00
<b>REQUIRED NEW MILLAGE</b>	<b>0.6910</b>
Average Current Residential SEV	\$ 123,958.00
<b>ANNUAL NEW TAX</b>	<b>\$ 85.65</b>

SCHOOLS		
Cost per new elementary school	\$	30,000,000.00
Number of children per school		300
Number of new schools		2
Cost per new school child	\$	100,000.00
New school children:	x	695
Total capital required	\$	69,479,000.00
/20 years =		
Total annual cost (shortfall)	\$	3,473,950.00
AAPS SEV	\$	5,294,761,961.00
<b>REQUIRED NEW MILLAGE</b>	<b>0.6561</b>	
Average Current Residential SEV	\$	123,958.00
<b>ANNUAL NEW TAX</b>	<b>\$</b>	<b>81.33</b>

1,037
\$ 150,000.00
\$ 155,550,000.00
2,811 (not including fire debt)
\$ <b>437,251.05</b>

p. ditches, roads, and woodlands total 679 acres  
 assumed to be a direct function of population increase  
 ed in Appendix B

<b>TOTAL NEW MILLAGE</b>	<b>1.3471</b>
<b>TOTAL NEW TAX INCREASE</b>	<b>\$ 166.98</b>

would reside in the Township based on national averages for three-bedroom homes, and the cost associated with constructing school facilities for those children based on conversations with personnel from the Ann Arbor Public School District. The additional government costs were calculated based on the need for fire equipment and support services for basic township functions. For three acre and half-acre lots, the cost of paving the remaining 13.5 miles of unpaved road was included, but not the cost of traffic signals or other roadway enhancements. For half-acre lots, additional water and wastewater treatment capacity would need to be generated, and costs for those facilities are included in that scenario. Many of the cost estimates are on the conservative side; the actual costs for services may be higher when actually encountered.

On the revenue side, the model recognizes that the new households will create additional SEV in the Township, and hence provide new revenues. Values of houses vary with lot size: for ten acre lots, house values are assumed to be \$400,000 (\$200,000 of SEV); for three acre lots, \$300,000 (\$150,000); and for half-acre lots, \$200,000 (\$100,000). Total new revenue is then based on those values multiplied by the Township's millage rate of 2.811 mills, excluding the fire debt which will be soon paid off.

Given the broad range of lot size and the corresponding range of new households that would be added, the range of costs associated with the different development scenarios is quite dramatic. For ten acre lots, the population increase is a mere 17%, requiring only small increases in employees and service costs, and no additional capital costs. At the assumed household value, in fact, the new development would pay its way in taxes for Township services. Even this low density, however, could generate a sufficient number of new school-aged children that a new school may need to be constructed. Nevertheless, the total millage required to support this pattern is only on the order of 0.2 mills, costing the average existing household an additional \$25 per year.

For three acre lots, the costs of development are much more substantial. The Township's population would increase 57% to 6,447, with over a thousand new households added. The new residents would necessitate the hiring of a new police officer and an additional Township office employee; they would also necessitate the purchase of a new fire engine, the paving of gravel roads and the occurrence of some administrative

costs. Those costs alone would result in a net annual shortfall causing a new tax of 0.69 mills to cover them, to be paid indefinitely.

Over a thousand new households would also feature nearly 700 new school-aged children, necessitating the construction of two new schools. Ann Arbor Public School officials estimate each new elementary school (the least expensive of elementary, middle and high schools) costs \$30 million; building two would require a new tax of 0.66 mills over 20 years. All told, then, new taxes of 1.35 mills would be needed to cover the cost of three acre lot development, causing an average new tax burden of nearly \$167 to be incurred on existing residents.

The figures for half acre lots are further more dramatic, as the Township's population would increase 258% to add over 10,000 people. The new Township services millage—including water and wastewater treatment facilities, and the formation of a Township police department—would alone be nearly 1.7 mills; with over three thousand new school-aged children, up to ten schools would have to be constructed requiring another 2.75 mills. Under this scenario (unlikely though it may be), the new millages would amount to 4.45 mills, costing the average existing homeowner an additional \$552.

#### B. Cost of Purchasing Agricultural Conservation Easements

The figures associated with services for residential development are contrasted with those for protecting the target properties from alteration by purchasing conservation easements on them. Purchasing easements—or purchasing “development rights”—is a voluntary method of farmland preservation currently used in 16 states. In essence the value of the land for its maximum development potential under current zoning is determined by a real estate appraiser, who then also determines the value of the land were it to be restricted from development for use as an agricultural or open space property. The difference between these two valuations, then, is the value of the rights to be sold in exchange for the easement which, when recorded with the property deed, restricts the land's use in perpetuity.

In order to estimate the value of conservation easements on farmland in Ann Arbor Township, a sliding scale was developed based on recent comparable sales of easements in Washtenaw County. These sales are summarized in Table 6. Each

**Table 6: Comparable Sales of Conservation Easements in Washtenaw County**

State of Michigan Farmland Protection Program

Name	Closing Date	Township	Acreage	Price/Acre	Characteristics
Southeast Michigan Land Conservancy	6/98	Superior	171	\$2,421	Some farmland, ag zoned, frontage on paved road
Robert Schultz	7/98	Superior	360	\$2,375	Farmland, ag zoned, dirt frontage on three sides
Stanley Parker	Pending, 1999†	Scio	148.7	\$5,000+*	Farmland, ag zoned, frontage on busy paved road
Bruce Manny	Pending, 1999†	Scio	42.7	\$5,000+*	Farmland, ag zoned, frontage on busy paved road,
Howard & Kelvin Braun	Pending, 1999†	York	214.5	\$5,000+*	Farmland, frontage on busy paved road, bordering on City of Saline

WPLT Agricultural Conservation Easements

Name	Date	Township	Acreage	Price/Acre	Characteristics
David Braun	Pending, 1999†	Ann Arbor	30.4	~\$3,000/acre	Organic farmland, ag zoned, paved frontage on two sides

\* Note: The State PDR program has a cap of \$5000/acre for the conservation easements it purchases, but the actual easement value on these properties is greater than \$5000/acre.

† Because these sales are pending, we do not have the official sale price.

Township parcel was then given a rating based on three characteristics: zoning, road frontage and proximity to land already developed for residential use. All of the farm properties studied are within two miles of the City of Ann Arbor boundary, so zoning and road frontage were the determining factors in a parcel's rating.

An appraisal performed on David Braun's property is the only valuation available for an Ann Arbor Township landowner. The sale is pending, but the conservation easement value was estimated by a qualified real estate appraiser from Farm Credit Services to be roughly \$3,000/acre earlier this year. (An April, 1998 appraisal documented a value of \$2,200/acre, but the value has increased since then.) The \$3,000/acre figure was used as the highest value on the sliding scale due to the Braun property having fairly high development potential, with paved roads on two sides and a location just outside of Barton Hills Village.

Howard and Kelvin Braun's conservation easement is worth considerably more because their property borders on paved roads and is bordered by residential development with public services in the City of Saline. The easement values on the Parker and Manny farms were substantially higher than estimated in Ann Arbor Township primarily due to Scio Township's master plan for 2.5 acre lots in the agricultural zoning district. The lowest value on the sliding scale was set at \$2,000/acre because some properties might have even less development potential than the lowest comparable sale value, for that of Robert Schultz's farm. The Schultz property has substantial frontage on a dirt road, while some Ann Arbor Township properties evaluated were landlocked or had only a small amount of frontage on a dirt road, making them less valuable for development. The sliding scale ratings, values and characteristics are depicted as follows:

Rating	Easement Value	Characteristics
1	\$2,000/acre	Ag zoning, landlocked or low frontage on dirt road, more than three miles from dense residential development
2	\$2,500/acre	Ag zoning, high frontage on dirt road, 2-3 miles from dense residential development
3	\$3,000/acre	Ag or residential zoning, frontage on paved roads, less than two miles from dense residential development

After assigning each property a rating, the corresponding value of the conservation easement per acre was multiplied by the number of tillable acres. Tillable

acres was used for two reasons: first, the State of Michigan easement purchase program only addresses acreage that is available to be used for agriculture; second, tillable acreage is more likely to be developed, having already been cleared. Therefore, easement value/acre X tillable acreage = Total value of conservation easement.

Table 1 lists the Ann Arbor Township properties with tillable acres, their ratings and the total conservation easement value. Purchasing easements on all 2,820 acres would cost just over \$7.3 million, with an average price per acre of \$2,600. Were no matching funds of any kind—State of Michigan, federal Farmland Protection Program, private contributions, land trusts and landowner donations of value—contributed to meet these costs, a 1.16 mill property tax would generate the necessary funds, resulting in Township households paying an average of \$144 per year for the 20 year duration of the sale part of the program. Targeting 25% of the tillable land base (705 acres) would require 0.29 mills (\$36/year) per household for 20 years at this price per acre.

There will be argument that the price per acre for easements is considerably lower than realistic in the land market today. Certainly the reputed sales of large farm properties in adjacent townships, if accurate, would bump the figure higher once they were included as part of appraisal reports. For additional reference, calculations for purchasing easements at \$5,000/acre—the maximum paid by the State of Michigan in its program—were also generated. For all 2,820 acres of tillable land, the cost would rise to \$13.5 million, requiring a rate of 2.13 mills over 20 years to meet it with no matching funds, costing the average Township household \$265 a year. If 25% of those acres were targeted, the cost would be \$3.4 million, the millage 0.54 and the household cost \$67.

### **Survey of Residents**

The third element of this study was to tabulate and analyze the results of a survey of Ann Arbor Township residents. The survey was included as part of the October, 1999 edition of *Ann Arbor Township News*, which also featured a cover article about farmland in the Township and presented arguments in favor of and opposed to farmland preservation. A copy of the survey instrument is included as Appendix C.

The survey endeavored to ascertain whether residents were aware that farmland existed in the Township, whether it was feasible and important for agriculture to remain



in the Township, what values are placed on Township farmland, their support for farmland preservation and their willingness to pay for preservation or for development. A total of 1,821 surveys were mailed out to Township households, with 249 returned for a response rate of 14%. Raw results of the survey are presented in Table 7.

Respondents were generally supportive of farmland preservation, with 152 (61%) saying they would support a farmland preservation program in Ann Arbor Township. One hundred eighty-one respondents (73%) agreed that it was important to maintain farmland in the Township; the most commonly cited reasons for the importance of farmland were the open space, scenic/aesthetic and environmental quality values. Respondents also stated their willingness to pay for such a program, with 126 (51%) of all respondents willing to pay \$100 per year or more.

In contrast, respondents were generally less willing to pay for support services for residential development, with only 71 (29%) willing to pay \$50 per year or more. Responses were cross-tabulated to determine whether individuals were generally willing to pay a greater or lesser amount for farmland preservation. Out of the total pool of responses, 107 (43%) clearly stated a greater willingness to pay for a farmland preservation program, with 94 respondents stating that they would be willing to pay less than \$50 per year for residential services. Willingness to pay for both farmland preservation and residential services was ranked equally in 63 responses (25% of all respondents), excluding those who left both questions blank. The preference for residential services was clearly stated by 16 respondents (6%). The 23% of respondents that answered both questions with a combination of "zero," "less than \$50 per year," or leaving a question on their willingness to pay blank suggests a strong "no new tax" sentiment.

## **Conclusions**

This analysis seeks to provide information for Ann Arbor Township decision-makers as they grapple with updating the current master plan and consider future land uses in the Township. The study is based on an either/or assumption, that is, either all the remaining properties with farmland would be developed, or they would be preserved. Nevertheless, the exercise is useful to gain insight into the calculable fiscal costs

**Table 7: Summary of Survey Results**

Question	Number of Responses									
	Yes	No	blank	Strongly Agree	Agree	Don't Know	Disagree	Strongly Disagree	blank	Other
Were aware of amount of farmland in Township	126	123	0							
It is feasible for agriculture to remain in Township	79	88	31				25	23	3	
It is important that farmland remains in Township	105	76	9				37	22		
Would support a farmland preservation program	96	56	11				31	48	7	
Why is farmland important	Scenic/ Aesthetic 156	Farm Products 90	Environmental Quality 151	Historic Value 92	Economic Value 48	Open Space 164	Other 21			
Willingness to pay for farmland preservation program	Zero 28	Less than \$50/yr 21	\$50/yr 19	\$100/yr 42	\$150/yr 40	Whatever it takes 44	blank 55			
Willingness to pay for residential services	34	117	19	17	7	28	27			
Location of Residence	On land that is farmed 15	Non-farm N of M-14 36	Inside freeway belt 51	Barton Hills Village 25	N of M-14 & S of Huron R. 29	S of M-14 & E of US23 90	blank 3			

## APPENDIX A: LIMITATIONS OF THIS MODEL

- The model predicts the fiscal costs of development and some capital costs, but does it predict or consider intangible costs such as loss of habitat, scenery, water quality or agriculture as a way of life.
- The model cannot predict the costs incurred relative to different types of development.  
Some studies have shown that clustered or managed development incurs fewer fiscal costs than unmanaged or "sprawl" development. This model assumes an even distribution of development.
- The model assumes all development will be residential, not a mix of commercial and residential or other types of development.
- The cost of water and wastewater treatment facilities does not include the cost of extending water and sewer pipes to homes.  
These costs are difficult to estimate with certainty without specific site plans for both the plant and the developments. These costs might be passed on to homebuyers rather than taxpayers anyway.
- The figure for school-age children per household is taken from the 1990 Census. The other demographic figures are 1999 projections.  
This makes two assumptions: first, that the 1999 projections are accurate; second, that the ratio of children per household has not changed over ten years and would stay the same for new development as it is for current development. Since 1990, several single-family home developments have been built in Ann Arbor Township. These developments might have a greater proportion of school age children than the previous homes.
- The model does not take into account the effect on groundwater quality of increased production of sewage and wastewater from three- and 10-acre lots.
- It is difficult to predict with certainty the cost of building and maintaining roads within subdivisions without a specific site plan, therefore these costs were not taken into account. These costs might be passed on to homebuyers anyway.
- The model does not predict the cost of building and maintaining parks, libraries or other recreational or cultural facilities.
- The model does not account for the costs of public health care, with regard to a change in the number of hospital beds, staff, etc.
- Costs of road paving assumes a two-lane road with gravel shoulders; more lanes, curbs, sidewalks, traffic lights, etc., would cost more. We could not predict with certainty if these costs would be incurred.
- The model does not account for jobs created or lost due to development (i.e., construction, farm labor).
- It is unclear what costs would be incurred by residents of Ann Arbor Township from increased use of County services (e.g., Drain Commission, Road Commission, courts).
- The cost of conservation easement model reflects the maximum cost of purchasing easements from every farmland owner in Ann Arbor Township. If not all farmland owners participated in the program, the total cost would be less.

## Appendix B: Cost/Revenue Projection Sources

- (1) SEMCOG, Population and Household Estimates, September 1999.
- (2) SEMCOG, Population and Household Estimates, September 1999.
- (3) SEMCOG, Community Profile for Ann Arbor Township, September 1999.
- (4) Burchell, Robert W., David Listokin and William R. Dolphin. Development Impact Assessment Handbook, Washington D.C.: The Urban Land Institute, 1993, p. 128.
- (5) Burchell, et al., p. 93.
- (6) Burchell, et al., p. 93.
- (7) Burchell, et al., p. 93.
- (8) Conversation with Ann Arbor Township fire chief Rick Ericson (conducted by Township Trustee John Allison).
- (9) Washtenaw County Road Commission, conversation with Phil Carroll, 9/17/99.
- (10) Carroll conversation, 9/17/99.
- (11) Ann Arbor Township Assessor's office.
- (12) Midwestern Consulting, Inc., Ann Arbor, MI (1997).
- (13) Midwestern Consulting, Inc., Ann Arbor, MI (1997).

## Appendix C

### Ann Arbor Township Farmland Survey

We would like your opinion on farmland and open space in Ann Arbor Township. Please answer the following questions by October 29:

1. Before reading the essays in this newsletter, were you aware of the amount of farmland in Ann Arbor Township? *(Circle one)*  
Yes    No
  
2. It is feasible for agriculture to remain in Ann Arbor Township. *(Circle one)*  
Strongly Agree    Agree    Don't Know    Disagree    Strongly Disagree
  
3. It is important to me that farmland remains in Ann Arbor Township. *(Circle one)*  
Strongly Agree    Agree    Don't Know    Disagree    Strongly Disagree
  
4. If you believe farmland is important to Ann Arbor Township, why? *(Circle all that apply)*  
Scenic/aesthetic value    Farm products    Environmental quality    Historic value  
Economic value    Open space    Other \_\_\_\_\_
  
5. I would support a farmland preservation program in Ann Arbor Township. *(Circle one)*  
Strongly Agree    Agree    Don't Know    Disagree    Strongly Disagree
  
6. If you would support a farmland preservation program in Ann Arbor Township, how much would you be willing to pay each year over the next 20 years to support it? *(Circle one)*  
Less than \$50/year    \$50/year    \$75/year    \$100/year    more than \$100/year
  
7. How much would you be willing to pay each year in new taxes indefinitely to support services (police, fire, schools, roads) for residential development in these areas? *(Circle one)*  
Less than \$50/year    \$50/year    \$75/year    \$100/year    more than \$100/year
  
8. Where do you reside in Ann Arbor Township? *(Check one)*
  - On land that is farmed
  - Non-farm residence north of M-14 and north of Huron River
  - Inside the freeway belt
  - Barton Hills Village
  - North of M-14 and south of Huron River
  - South of M-14 and east of US-23