

V AFFORDABILITY ANALYSIS

This appendix is organized as follows:

- Section V.1: Introduction and Overview of United States Environmental Protection Agency Guidance for Financial Capability Assessment
- Section V.2: Capital Cost Expenditure Schedules
- Section V.3: Application of EPA’s Matrix
- Section V.4: Other Pertinent Socioeconomic Information
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- Section V.7: Measures of Success

V.1 Introduction and Overview of United States Environmental Protection Agency Guidance for Financial Capability Assessment

One of the most fundamental and practical concerns in any planning process is to ensure that the plan can be implemented. To address this concern for the WWMP, the City performed a detailed affordability analysis, presented in this section. This analysis was conducted in collaboration with the Economics Center for Education and Research at the University of Cincinnati.

V.1.1 Purpose/Affordability Goal

The City had a choice in how to approach affordability. One approach would be to start with a schedule, and then determine what projects would be affordable during that time period. This approach would limit the final solutions to those that could be paid for in the time allotted. A second approach would be to determine what projects would best fit the City’s needs, and then determine how long it would take to build the projects, given the limitations of money; in other words, no projects would be screened out simply because they could not be paid for in a short period of time. The City adopted the latter approach. Thus the goal of this analysis was to:

“To ensure that any schedule for improvements is as expeditious as possible while maintaining affordable rates for all consumers.”

Affordability has many dimensions and requires multiple perspectives to adequately arrive at a reasonably acceptable definition from the community’s perspective. This analysis explores affordability from various perspectives and analyzes the impact of implementation schedule on affordability.

V.1.2 Stakeholder Input Process

In order to gain insight from system stakeholders, the City conducted a series of interactive meetings to solicit input on the issue of affordability. This included a session with the Public Advisory Group and a public meeting. The City also had five working sessions with the

Sewer and Water Advisory Board (SWAB). The SWAB was created by Columbus City Council to provide advice on setting sewer rates; it has members representing, low-income residents, businesses, suburban customers, seniors and other stakeholders. **EXHIBIT V.1.1** displays some of the factors identified by the Public Advisory Group (PAG) and the SWAB for consideration in affordability.

EXHIBIT V.1.1 PAG and SWAB Identified Factors for Consideration in Affordability	
▪ Delinquency Rates	▪ Home Sales
▪ HUD Eligibility Criteria	▪ Immigration Impacts
▪ Specific Communities	▪ Costs vs Household Income
▪ Consider More than Median Household Income	▪ Impacts on Renters
▪ Other Debt	▪ Current Delinquency Rates
▪ Cost of Living	▪ Elasticity of Use and Minimum Consumption
▪ Unemployment	▪ Poverty Information
▪ Shelter Burden	▪ Effects of Urban Redevelopment
▪ Effect on Satellites	▪ Impacts on People with Fixed Incomes
▪ Impact on Local Business	

SECTION V.7 of this appendix provides additional detail on how some of these factors were applied. The SWAB provided input which defined a set of “measures of success.” These measures are a series of factors that will be evaluated on an on-going basis to test the affordability of the program. If any of these factors approaches or reaches the established trigger levels, then the implementation schedule will be reconsidered in order to maintain affordability.

V.1.3 Regulatory Framework

The Sanitary Sewer Overflow (SSO) Consent Order requires the City to conduct an affordability analysis if the implementation schedule is impacted solely due to affordability. As discussed below, the City has selected a 40-year implementation schedule due to affordability concerns. The Combined Sewer Overflow (CSO) Order requires that an affordability analysis be conducted. The CSO order specifically refers to the United States Environmental Protection Agency (U.S. EPA) guidance on the subject, “Combined Sewer Overflows – Final Guidance for Financial Capability Assessment and Schedule Development,” February 1997 (U.S. EPA 832-B-97-004).

V.1.4 Overview of United States Environmental Protection Agency (U.S. EPA) Guidance for Financial Capability Assessment

V.1.4.1 Goals of Guidance

U.S. EPA published “Combined Sewer Overflows – Final Guidance for Financial Capability and Schedule Development,” February 1997 to assist communities that were dealing with wet weather challenges in their sewer systems. U.S. EPA presented two goals in the guidance as follows:

- To provide a planning tool for evaluating financial resources.
- To assist with the development of implementation schedules.

The guidance suggests creating a financial capability matrix using the impact to all residential ratepayers and the financial capability of the community. The matrix is presented below. In addition, the guidance states that “...the financial indicators found in this guidance might not present the most complete picture of a permittee’s financial capability...” and “Since flexibility is an important aspect of CSO policy, permittees are encouraged to submit any additional documentation that would create a more accurate and complete picture of their financial capability.”

V.1.4.2 Residential Indicator

As noted, there are two components to U.S. EPA’s matrix, and the first is the residential indicator. According to U.S. EPA’s matrix methodology, this indicator measures the financial impact of the current and proposed wastewater treatment and CSO and SSO control costs on all the residential users in the service territory. As set forth in U.S. EPA’s guidance documents, current and proposed costs are not limited to the costs of the needed improvements. Current costs include annual wastewater system operations and maintenance (O&M) expenses plus current annual debt service payments. Proposed costs include debt service necessary to fund required capital improvements related to the CSO and SSO controls, as well as other needed capital expenditures, and the associated O&M expenses. The portion of current and proposed costs related to the residential component is estimated based on relative flow contribution. This portion of cost is expressed as a percentage of the median household income (MHI) across the entire service area. The calculated percentage is then compared against three levels of financial impact as shown in **EXHIBIT V.1.2**.

EXHIBIT V.1.2 Financial Impact based on Residential Indicator	
Financial Impact	Residential Indicator (% MHI)
Low	Less than 1 percent
Medium	1 percent to 2 percent
High	Greater than 2 percent

V.1.4.3 Permittee Financial Indicator

The second part of U.S. EPA’s matrix is the financial capability of the community. This is measured by examining three groups of indicators as follows:

- Debt – bond ratings and overall debt as a percent of full market property value.
- Socioeconomic – unemployment rate and median household income.
- Financial management – property tax collection rate and tax revenues as a percentage of full market property value.

The benchmarks used in the assessment are contained in **EXHIBIT V.1.3**.

EXHIBIT V.1.3 Financial Capability Benchmarks per U.S. EPA Guidelines			
Indicator	Strong	Mid Range	Weak
Bond Rating	AAA-A or Aaa-A	BBB or Baa	BB-D or Ba-C
Overall Net Debt*	< 2%	2%- 5%	>5%
Median Household Income	>25% above National MHI	+/- 25% National MHI	More than 25% below National MHI
Property Tax Revenues*	<2%	2% - 4%	>4%
Unemployment Rate	More than 1% below National average	+/- 1% National average	More than 1% above National average
Property Tax Collection Rate	>98%	94% - 98%	<94%

* As a percent (%) of full market property value

The residential indicator is considered together with the financial capability indicator to establish an overall economic burden (low, medium or high). This is shown in **EXHIBIT V.1.4**.

EXHIBIT V.1.4 Financial Capability Matrix			
	Low Residential Indicator	Mid Residential Indicator	High Residential Indicator
Weak Financial Capability	Medium Burden	High Burden	High Burden
Mid Financial Capability	Low Burden	Medium Burden	High Burden
Strong Financial Capability	Low Burden	Low Burden	Medium Burden

V.2 Capital Cost Expenditure Schedules

As noted above, the first step in U.S. EPA's matrix requires identification all of the current and proposed costs, including capital costs. Capital costs are not limited to the WWMP projects, but would also include other projects the City will need to construct over the life of the WWMP (for instance, sewer rehabilitation). The total capital costs vary depending on the length of the schedule. This cost differential is principally created by annual rehab/repair/replacement costs for the longer program durations. The City developed three capital cost schedules, for 20-year, 30-year and 40-year implementation schedules.

TABLES V.2.1 through V.2.3 present the capital costs by the three major program category:

- SECAP – Olangtangy Relief Tunnel, Alum Creek Relief Tunnel, Priority Areas, I/I Studies, Specific CIP Projects from the Consent Order.
- LTCP – OARS Transport, CSO Improvements, Wet Weather Improvements at the Wastewater Treatment Plants (WWTP).
- Other Sewer and WWTP Improvements.

There are many elements that do not change from one schedule to another. The most significant elements that remain constant from one schedule to the other are the CSO Long Term Control Plan improvements, as these dates are fixed by the CSO Consent Order, and most of the Priority Areas improvements where the mitigation of SSOs further upstream in the system is proposed early in the program because of the relatively higher benefit to the community. As a result, the differences between the schedules are primarily in the other areas and in the timing of the large tunnel components.

FIGURE V.2.1 compares the total cumulative capital costs for the three schedules.

V.3 Application of U.S. EPA's Matrix

V.3.1 Methodology

The estimated capital costs related to the wet weather management program presented in **SECTION V.2** are used together with existing costs to project future sewer costs. The primary assumptions used in the analysis are contained in **EXHIBIT V.3.1**. The analysis has been conducted in present day (2005) dollar terms.

EXHIBIT V.3.1 Major Assumptions

▪ Capital Costs are Bundled in 5-Year Increments for Financing.
▪ The Bond Interest Rate is 5 percent.
▪ All Costs, unless otherwise noted, are in 2005 dollars.
▪ Bond Term is 20 years.
▪ Incremental Operations & Maintenance Costs for Improvements is 15 percent of Annual Debt Service.
▪ Customer Growth Rate is 0.7 percent per year.
▪ The Residential Share of Total Sewer Costs is 67 percent.
▪ The Escalation Factor, where costs were escalated, is 2.34 percent per year.
▪ Median Household Income for the Service Area was estimated using Census MHI data by tract and developing a weighted MHI based on housing units.

Existing annual costs are based on the adopted Sewer Enterprise Fund budget and are summarized in **EXHIBIT V.3.2**.

EXHIBIT V.3.2 Sewer Enterprise Fund Budget	
Category	Budget Appropriation
Operations & Maintenance	\$38,907,879
Personnel	\$37,029,123
Supplies/Materials	\$5,199,254
Capital Equipment	\$5,354,600
Other	\$880,000
Debt Service	\$72,584,045
TOTAL	\$159,954,901

V.3.2 Median Household Income Impact

The present year (2005) MHI for the DOSD service area was estimated using income data from the 2000 Census (escalated to 2005 by the consumer price index) for the City of Columbus, and 22 municipalities and villages in the service area. The MHI for each jurisdiction was weighted using occupied housing unit data to estimate a service area MHI. The estimated 2005 MHI for the service area is \$49,300.

The projected future costs, stated in 2005 dollars, were developed for the three implementation periods outlined in **SECTION V.2**. The results of this analysis are presented in **EXHIBIT V.3.3**.

EXHIBIT V.3.3 Residential Indicator Analysis Based on Implementation Period

Total Implementation Period (years)	Current Annual Costs (\$/year)	Peak Increase in Annual Costs (\$/yr)	Peak Future Annual Costs (\$/yr)	Peak Percent MHI	U.S. EPA Residential Indicator
20	452	957	1409	2.86	High Impact
30	452	720	1172	2.38	High Impact
40	452	602	1054	2.14	High Impact

The analysis indicates that the peak level of costs result in a “high impact” residential indicator for the short (20-year), mid-term (30-year), and long (40-year) implementation periods when viewed exclusively against the median household income level.

V.3.3 Financial Capability

The second part of U.S. EPA’s matrix is the financial capability of the community using three categories of indicators as follows:

- *Debt Indicators* – Current debt of the permittee or the communities within the service area is assessed to test for the ability to issue additional debt to finance wet weather improvements.
- *Socioeconomic Indicators* – The general economic well being of the residential users in the service area is assessed.
- *Financial Management Indicators* – The community’s ability to manage financial operations is assessed.

V.3.3.1 Debt Indicators

The bond rating for the City of Columbus, the entity that would issue debt to finance the wet weather improvements, was taken from the City’s 2004 *Comprehensive Annual Financial Report* (CAFR). The most recent sewer revenue bond issue was in 2002. This issue was rated by both Standard and Poors Corporation and Moody’s Investor Services, Inc. Both rating agencies rated these bonds AA. This corresponds to a “strong” rating using U.S. EPA’s guidelines.

The second component of debt indicators used in the U.S. EPA matrix is overall net debt as a percentage of full market property value. This parameter is a measure of the existing level of general obligation debt on the residents within the service area and the ability of local government to issue additional debt. For this indicator, the City used data from the Franklin County 2003 *Comprehensive Annual Financial Report*. **EXHIBIT V.3.4** shows the calculation of net debt as a percentage of full market value.

EXHIBIT V.3.4 Net Debt	
Parameter	Value, \$000
Direct Net Debt	\$142,230
Debt of Overlapping Entities	\$2,497,442
Overall Net Debt	\$2,639,672
Market Value of Property	\$60,705,714
Overall Net Debt as a percent of Full Market Value, %	4.35%

The calculated value of 4.35 percent falls in the “mid range” of U.S. EPA’s benchmarks and is near the upper end of the range (5 percent) close to a weak rating.

V.3.3.2 Socioeconomic Indicators

U.S. EPA’s matrix defines socioeconomic indicators narrowly, to only address the unemployment rate and median household income. The City presents a more complete picture of its socioeconomic condition in **SECTION V.4 Other Pertinent Socioeconomic Information**.

V.3.3.2.1 Unemployment

Data from the Bureau of Labor Statistics was used for this analysis from the period of April 2004 through March 2005. During this period, unemployment in the United States averaged 5.4 percent, whereas unemployment in Franklin County averaged 5.2 percent. Additionally, at the end of the period, the unemployment rate in Franklin County slightly exceeded the US rate. These levels correspond to the “mid range” benchmark for U.S. EPA.

V.3.3.2.2 Median Household Income

Data from the US Census Bureau, 2000 Census, the 2003 American Community Survey and the consumer price index was used for this analysis. Using this information the estimated 2004 Franklin County MHI is \$45,123 which is nearly identical to the estimated US MHI of \$44,969. Over the past 5 years, however, incomes in the County have grown at a slower rate than in the nationwide average.

When the median household income for Franklin County is put in the context of the surrounding region and trends over time, however, it fares much worse. Franklin County has a lower MHI than each of the six adjacent counties (Delaware, Fairfield, Licking, Madison, Pickaway, and Union Counties). The estimated 2004 MHI for the six adjacent counties is \$53,248, 18 percent higher than the Franklin County figure. It is also worth noting that the gap between Franklin County and the adjacent counties has increased from only \$1,000, as reported in the 1990 Census, to nearly \$7,000, as reported in the 2000 Census, to over \$8,000 in the 2004 estimates. **EXHIBIT V.3.5 MHI Trends** displays these trends in MHI.

EXHIBIT V.3.5 MHI Trends			
Median Household Income			
	1990	2000	2004
U.S.	\$30,056	\$41,994	\$44,969
Franklin County	\$30,375	\$42,734	\$45,123
Surrounding Counties	\$31,395	\$49,725	\$53,248

Using the U.S. EPA benchmarks, the Franklin County MHI corresponds to a “mid range” rating.

As discussed below, examining only the Franklin County MHI does not present a complete picture. There are a number of communities within the service area that have significantly lower MHIs than Franklin County and where the impact of increased sewer bills will be felt much more acutely. For instance, the City of Columbus’ MHI is estimated to be \$40,075, approximately 11 percent lower than the US. The very low income (per HUD’s definition) grouping of census tracts comprise a combined 26,800 households with a MHI of \$17,400 (estimated 2004) which is approximately 61 percent lower than the US MHI.

V.3.3.3 Financial Management Indicators

The U.S. EPA guidelines examine property tax revenues as a percent of full market value and property tax collection rates. These parameters are used to evaluate the community’s financial management ability.

V.3.3.3.1 Property Tax Revenues as a Percent of Full Market Value

Data for this analysis was obtained from the 2003 Franklin County CAFR. The full market value of property was estimated to be \$60,705,714,286 whereas property tax revenues in that year were \$324,408,000. The resulting property tax as a percent of full market value becomes 0.53 percent. Using U.S. EPA’s benchmarks, this indicator is “strong.”

V.3.3.3.2 Property Tax Collection Rate

The 2003 Franklin County CAFR estimated the property taxes collected as \$324,408,000 versus the property taxes levied of \$342,578,000. These values represent a collection rate of 94.7 percent. This is just slightly in the “mid range” and borders on weak (less than 94 percent) in the U.S. EPA benchmarks.

V.3.3.4 Financial Capability Summary

EXHIBIT V.3.6 Financial Capability Summary, below, summarizes the ratings for financial capability.

EXHIBIT V.3.6 Financial Capability Summary		
Indicator	Actual Value	Score
Bond Rating	AA	3
Overall Net Debt as a Percent of Full Market Value, %	4.35%	2
Unemployment Rate%	5.1%	2
Median Household Income, \$ 2004	\$45,123	2
Property Tax as a Percent of Full Market Value, %	0.53%	3
Property Tax Collection Rate, %	94.7%	2
Average Score		2.33

U.S. EPA guidelines establish three levels for the financial capability measure.

- *Weak* – Average score of below 1.5
- *Mid Range* – Average score between 1.5 and 2.5
- *Strong* – Average score above 2.5

The average score for Columbus is 2.33 which rates “mid range” in U.S. EPA guidelines.

V.3.3.5 Financial Capability Matrix

U.S. EPA’s matrix combines the residential indicator and the financial capability indicator as set forth in **EXHIBIT V.3.7 Financial Capability Matrix**.

Exhibit V.3.7 Financial Capability Matrix			
Financial Capability	Low Impact Residential Indicator	Mid-Range Impact Residential Indicator	High Impact Residential Indicator
Weak	Medium Burden	High Burden	High Burden
Mid-Range	Low Burden	Medium Burden	High Burden
Strong	Low Burden	Low Burden	Medium Burden

For Columbus, the financial capability rating is mid-range. All implementation periods resulted in a high impact residential indicator. Therefore, the program is classified as high burden.

V.4 Other Pertinent Socioeconomic Information

U.S. EPA’s guidance document recognizes that its matrix may not present a complete picture of a community’s financial capability, and therefore it encourages submitting additional information to provide a complete picture. The application of U.S. EPA’s matrix to the circumstances of Columbus does not provide a complete picture of the community’s financial capability. The average MHI across the entire service areas masks the impact on large segments of the population. The average MHI also does not address the impacts of poverty in the area.

In order to adequately analyze the community's ability to pay for the wet weather program, the City compiled and analyzed additional information. That information is presented in this section.

V.4.1 Household Income

The City examined household income using US Census Bureau and the American Community Survey for various subsets. As discussed above, the MHI for the service area was calculated to be \$49,300 for 2005. The MHI in the DOSD service area ranged by census tracts from a low of \$6,136 to a high of \$120,418 (2000 dollars).

For comparison purposes, **FIGURE V.4.1** presents MHI data from 2004 for a variety of entities. MHI for Franklin County was close to the United States as a whole and higher than the City of Columbus. An example of a community within the DOSD service area where the MHI is significantly lower than the City or Franklin County is Whitehall.

As noted, the range of MHI's across DOSD's vast service territory is quite broad. In order to gain a better perspective, the City analyzed specific segments of the community individually.

V.4.2 Impact to Poorest 10 Percent

The City estimated the impacts to the lowest range of income in the service area in order to gain perspective on the potential impacts to this highly vulnerable segment of the population. The upper bound income level of the poorest 10 percent of the service area was used for the calculation. People at this income level have very limited disposable income and every additional cost increment for sewer service directly competes for other necessities such as food and shelter. **EXHIBIT V.4.1** displays the output of this analysis in terms of peak impact as a percentage of household income (HHI).

EXHIBIT V.4.1 Peak Impact versus Implementation Period	
Total Implementation Period (Years)	Peak Impact (Percent HHI)
20	5.6
30	4.7
40	4.2

These results indicate that the impacts to this segment of the population are catastrophic, exceeding 4 percent of HHI for the long schedule and nearly 6 percent for the short schedule. Costs at these levels will have severe impacts to the basic survival of these households.

V.4.3 Impacts to Specific Communities

Specific communities within the DOSD service area will be impacted differently by the increased sewer costs. Three specific communities were used as examples to illustrate this impact differential. The results are displayed in **EXHIBIT V.4.2**.

EXHIBIT V.4.2 Peak Impacts for Selected Communities

Community	Estimated 2005 MHI (Dollars)	Peak Impact 20-Year Implementation (Percent MHI)	Peak Impact 30-Year Implementation (Percent MHI)	Peak Impact 40-Year Implementation (Percent MHI)
Columbus City	\$41,629	3.38	2.82	2.53
Urbancrest Village	\$22,938	6.14	5.11	4.60
Whitehall City	\$36,995	3.81	3.17	2.85

The results for all three communities greatly exceed the U.S. EPA threshold for high impact. Impacts to residents in Urbancrest Village are highly detrimental, approaching 5 percent of HHI at the longest implementation period of 40 years.

V.4.4 Poverty

Median household income alone is inadequate to describe the ability of people to afford new utility costs from the wet weather program. The City also gathered information regarding poverty to understand the current state of economic conditions in the Columbus area. The American Community Survey prepared by the US Census Bureau collected information regarding poverty. **FIGURE V.4.2** presents poverty rates by family grouping type for the City of Columbus, Franklin County, the state of Ohio and the United States. The family grouping types were people 65 and older, all families, children under 18 and female led households. For each, the percentage below the poverty line is presented. Note that the relationship between the different geographic areas remains consistent. That is, the City of Columbus has the highest poverty rates, followed by Franklin County. Poverty rates for the City are consistently higher than Ohio and the US whereas the County is greater than or equal to the state and nation rates. This is an indication that poverty is an important issue in the Columbus area.

FIGURE V.4.3 presents some additional indicators of poverty for the same geographic groupings as the previous figure. The categories portrayed in **FIGURE V.4.3** include households receiving cash public assistance, households receiving food stamps the past 12 months, individuals below the poverty level in past 12 months, renter occupied units and foreign born entering after 1990. Similar to the straight poverty rates in the last figure, these data indicate that the City of Columbus is more impacted by poverty than Franklin County, Ohio and the US. In general, Franklin County is more impacted than Ohio or the US for most measures. This information also supports the notion that the Columbus area is impacted by poverty. This is an indication that a sizable segment of the population will be challenged to pay higher sewer bills without significant and detrimental impacts to their ability to afford other necessities such as food and shelter.

V.4.5 Employment/Unemployment

The level of employment and unemployment in a community is another measure of its financial health. Long term trends in employment numbers are reflective of the economic health and competitiveness of an area. For instance, if the cost of doing business in a given area goes up

dramatically due to increased utility costs, businesses that are sensitive to those costs may elect to relocate to areas of lower cost.

The major source of employment data used in this analysis is the Bureau of Labor Statistics. Data from the period of April 2004 through March 2005 were analyzed to compare US, Ohio, Franklin County and Columbus MSA unemployment rates. **FIGURE V.4.4** displays unemployment rates for these geographies over the specified period. Early in this time period, unemployment rates for Columbus MSA and Franklin County were below or at national rates whereas at the end of the period, unemployment rates for Columbus MSA and Franklin County exceeded national rates. Overall for the period examined, the unemployment rates for Columbus MSA and Franklin County averaged 0.2 percent lower than the national rate. The reversal of this trend at the end of the period is a concern and indicates a potential future trend in employment.

The long-term employment trends were also reviewed. **FIGURE V.4.5** displays labor force and employment for Franklin County for the period 1985 through 2004. The data suggests a growing labor force and job pool through the period up until 2000 when the labor force and employment decreased through 2004. Also, the difference between the size of the labor force and employment levels tightened from 1993 through 2000 representing a period of low unemployment. This gap started to widen in 2000. These trends represent a concern for the future of the area.

V.4.6 Renter Housing Cost Burden

According to US Department of Housing and Urban Development (HUD), a household is considered housing cost burdened if more than 30 percent of the household income goes to rent and utilities. Any program that increases the cost of utilities will place an increased housing cost burden on households.

In the City of Columbus, 30 percent of homeowners with mortgages and 44 percent of renters currently meet the definition of housing cost burdened. In Franklin County, 28 percent of homeowners with mortgages and 43 percent of renters are housing cost burdened.

HUD defines two levels of housing cost burdened – burdened at 30 percent of income for rent and utilities and severely burdened at 50 percent. The “2005 – 2009 Consolidated Plan for Franklin County and the City of Columbus,” November 2004 presented information regarding the number of households that met these housing cost burden levels at two income thresholds. The income thresholds were extremely low income (households with less than or equal to 30 percent of area MHI) and low income (households with more than 30 percent but less than or equal to 50 percent of area MHI). **EXHIBITS V.4.3 and V.4.4** present cost burden information for overall levels and levels amongst elderly households.

EXHIBIT V.4.3 Overall Housing Cost Burden		
	Percentage of Extremely Low Income Households	Percentage of Low Income Households
Cost Burdened	75	67
Severely Cost Burdened	59	17

EXHIBIT V.4.4 Elderly Housing Cost Burden (percent of low and extremely low income households)		
	City of Columbus	Franklin County
Cost Burdened	63	59
Severely Cost Burdened	37	31

The City has calculated the impact of increased utility rates on the number of households that are considered housing cost burdened. The increase in annual sewer costs from 2005 levels were used to calculate an income increment using the 30 percent value to determine the households that are not currently housing cost burdened but would become housing cost burdened as a result of the increased sewer costs. The DOSD service area HHI distribution will be the source for determining the number of households that fall in this increment. A sample calculation follows:

Average City rent is \$660 per month or \$7,920 per year. At a 30 percent income ratio, this means a household must have an income of more than \$26,400 per year to not be housing cost burdened. If the annual residential share of sewer cost increase over 2005 is \$900 per year, this is equivalent to an incremental income loss of \$3,000 per year at the 0.30 income ratio. Therefore, the new threshold for housing cost burden is \$29,400 (\$26,400 + \$3,000). Using the HHI distribution graph, we find the number of households in the service area that are between \$26,400 and \$29,400. This answer is 24,000 households.

An analysis of the effect of increased sewer bills on the number of housing cost burdened renters was conducted for the capital expenditure schedules presented in **SECTION V.2**. The results are presented in **EXHIBIT V.4.5**.

EXHIBIT V.4.5 Increase in Housing Cost Burdened Renters versus Implementation Period	
Schedule	Number of Potentially Impacted Households
Short (20-year)	17,600
Mid (30-year)	12,500
Long (40-year)	11,300

V.4.6.1 Homeowner Impacts

The expected increase in sewer costs will be used to estimate the potential number of households that were previously able to meet the qualifying criteria for a mortgage that would no longer be able to meet the criteria. For the purpose of this calculation, the sale price of the home will be the average for Columbus City in the year in question. The interest rate will be the current average fixed rate for a 30-year term in the area. The cost impact will be based on the adopted DOSD Sewer Enterprise Fund Budget in the year of the analysis.

The calculation will be the annual increase in sewer cost over year 2005 divided by 0.28 to calculate the income impact increment. The 0.28 ratio is the same metric used by lenders as a maximum mortgage payment to monthly income ratio. The mortgage eligibility level will be the estimated annual principal and interest (P&I) payments times 1.2 to account for taxes and insurance for the average house cost in Columbus City divided by 0.28. The number of households affected will be taken from an income distribution graph developed using US Census Bureau HHI data for the Service area. A sample calculation follows.

If the average house sale price for the City of Columbus is \$125,000 and the interest rate is 5 percent, then the 30-year monthly P&I plus taxes and insurance will be \$1,045. At the eligibility threshold of 0.28 (monthly payment to income) this equates to a monthly income level of \$3,732 or an annual income level of \$44,800.

If the annual residential share of sewer cost increase over 2005 is \$975 per year, this is equivalent to an incremental income loss of \$3,482 per year at the 0.28 eligibility ratio. From the household income cumulative distribution graph, the number of households in the service area that are between \$44,800 and \$48,282 ($\$44,800 + \$3,482$) is 12,500 households.

An analysis of the potential effect of the increase in sewer costs on mortgage eligibility was performed for the three different capital expenditure schedules presented in **SECTION V.2**. The results are contained in **EXHIBIT V.4.6**.

EXHIBIT V.4.6 Mortgage Eligibility Impact versus Implementation Period	
Schedule	Number of Potentially Impacted Households
Short (20-year)	30,900
Mid (30-year)	25,800
Long (40-year)	22,600

Thus, the 20-year schedule may result in more than 30,000 families being unable to afford a home, due solely to the cost of the WWMP.

The cumulative household income distribution curve derived from the 2000 Census for the DOSD service area is displayed in **FIGURE V.4.6**.

V.4.7 Delinquency Information

Another measure of the current economic status of ratepayers and their ability to pay for sewer services is the delinquency rates. DOSD defines four steps of delinquency as displayed in **EXHIBIT V.4.7**.

EXHIBIT V.4.7 DOSD Delinquency Steps	
Delinquency Step	Timing, days
1 – Notice and Penalty	7
2 – Turn-off Notice	28
3 – Door Tagged	49
4 – Service Terminated	52

Analysis of recent delinquency data was conducted to determine if a 9.5 percent rate increase in 2004 had any measurable effect on delinquency rates. Delinquency rates by zip code were compared from 2003 and 2004 for all steps as a function of owner median household income. **FIGURE V.4.7** displays the results of this analysis. These data indicate an overall increase in delinquency rates between 2003 and 2004 of approximately 6 percent. In addition, the increase in delinquency rates increased as median household income fell.

FIGURE V.4.8 shows the correlation of delinquency rates and poverty rates using the same information. As expected, delinquency rates increased with increasing poverty. When the percent of owners below the poverty line in a given zip code rose to 16 percent, the cumulative 2-year delinquency rate was approximately 57 percent.

This analysis indicates that DOSD ratepayers are currently challenged to pay their utility bill on time which will only increase with increases in rates. The delinquency rate response is an indication that some ratepayers find current rates unaffordable and future increases will increase the number of customers in this situation. In addition, there is a negative impact to DOSD revenues from increases in uncollectible bills and increased administrative and operations costs due to shut-offs and collections.

V.5 Financial Impacts Due to Schedule Compression

Throughout the affordability analysis, the City considered three potential schedules, 20-year, 30-year, and 40-year. However, the City does not consider the 20-year schedule practical for a number of reasons. First, it is doubtful that the City could accomplish that much construction, especially the deep tunnels, in such a short period of time. Second, the economic impact of such a schedule would be catastrophic, especially on the communities most vulnerable members (5.6 percent MHI for the poorest 10 percent). In addition, the City has determined that compressing the schedule will negatively impact the costs of the program. This last point is discussed in this section.

While there are relatively minor impacts in compressing the schedule from a 40- to 30-year period, compressing the schedule from 30 to 20 years could result in significant impacts. A 20-year program could significantly increase the costs of the program as defined in this report.

Compression of the program schedule to a 20-year time frame will likely result in program cost increases due to the following factors:

- Surety Bonding & Insurance.
- Utility/Sewer Contractor Availability/Competition.
- Tunnel Contractor Availability/Competition.
- Construction Labor Import.
- Disruption/Congestion/Truck Traffic.
- General Public Health & Safety.
- City Bond Rating/Impact on Economic Development.
- Tunnel Construction Overlap/Coordination.
- WWTP Operations Disruption/Accelerated Staffing.
- Bond Administration.
- Increased Risk/Claims & Change Orders.
- Design/Project Management.
- Increased Reliance on Consultants vs. In-House Staff.

A complex program of this magnitude will require average expenditures of \$150 to \$200 million per year. Evaluation of similar wastewater programs around the country, with comparable population base, indicates that annual expenditures average \$75 to \$100 million per year. Columbus DOSD's historical wastewater CIP expenditures have generally ranged from \$50 to \$75 million. As such, by the sheer enormity of this program, DOSD will be required to significantly ramp up to conduct a long term program that will result in annual expenditures of 2 to 4 times its usual/normal pace. Compression of the schedule will only exacerbate an already tentative situation, which could impact the City's ability to afford the program even more significantly.

V.5.1 Competition/Contractor Availability

The primary construction components of the proposed DOSD wet weather program are: (1) tunnels, (2) WWTP expansions, (3) sewer rehabilitation/upgrade, (4) new relief sewers, and (5) CSO connections. There will be numerous projects concurrently under construction, even in a 30- or 40-year construction period. Compressing the schedule to 20 years will put enormous pressure on the contracting community in terms of material/equipment availability, access to skilled workforce and adequate supply of general contractors with bonding capacity to ensure a competitive bidding environment.

For instance, there are six tunnel projects proposed, each with a construction value of around \$200 million. In a 30- or 40-year program build-out period there is adequate time to ensure proper sequencing, such that no more than two tunnel projects are ongoing at any one time. However a 20-year build-out period would result in sequencing such that four tunnel projects may be ongoing at various times.

For large tunnel projects, there are a limited number of contractors skilled and large enough to consider submitting bids. When there are two or three such projects going on at once, it is conceivable that there could be no firm available or willing to bid on a third or fourth project. Bonding capacities and overall resources within organizations make it necessary to pursue these super-projects as a joint venture. Simultaneous construction will, without a doubt, eliminate certain firms from bidding other work, thus reducing the competitive nature of the market. With so much tied up in single projects, contractors must incorporate significant contingencies to reduce their risk.

Currently, there are perhaps six firms who traditionally work in the area who are capable of performing the type of tunnel work that is proposed. This number would reduce if joint ventures are formed. Two \$200 million tunnel projects would be about all the local market could handle, considering that there are several other similar projects ongoing in the region and nationally. Should a third or fourth project be bid during the construction of the first two, it is very likely that costs would be at a premium.

A 20-year plan would be characterized by a rapid ramping, peaking and falling of activity. The marketplace would trail in its reaction to this and additional costs, disruptions and delays would be experienced as the contracting community tries to keep pace. A minimum 30-year plan would be required to adequately flatten out the peaking nature and offer a more linear approach as the market would be set up for consistency. A reasonable estimate of impact for a third project bidding simultaneously with two ongoing projects, during a 20-year and 30-year program, would be 10 percent of the total cost over a more competitive situation. An additional 15 percent might be expected if a fourth project were to be bid with three others under construction. In this case, competition would be virtually eliminated.

V.5.2 Congestion/Traffic Disruption

It is estimated by several recent research studies that traffic congestion costs the U.S. public \$100 billion per year. Columbus, OH is currently ranked 30th worst in the nation in traffic congestion, with an annual cost to the local economy of \$350 million per year, associated with the cost of wasted fuel, air pollution impacts and lost time. The Mid Ohio Regional Planning Commission projects a 375 percent increase in the level of congestion in Franklin County over the next 20 years.

In addition to the numerous conventional sewer and treatment plant expansion projects, there will be six tunnel projects, as part of the overall program. These tunnels will produce approximately \$1.5 million cubic yards of spoils which translate to approximate 150,000 truck tips, each likely to average about 50 miles round-trip. As such, this program will add hundreds of truck-trips per day onto already congested streets.

Adding to the congestion, pollution, and irritation for the community will be a greater volume of concrete trucks for grouting, material delivery trucks and equipment haulers. This problem will be exacerbated by the Ohio Department of Transportation's (ODOT) work as it maintains road surfaces and implements an aggressive construction program of its own.

ODOT considers State Route (SR) 33 one of the top congested and high-crash roads in the state. Congestion on SR 33 routinely backs up onto I-270. Aggressive road improvements are

planned in the coming years and will only add to the congestion and concerns about safety while the wastewater program is being constructed. Another project in the planning stages is the reconstruction of the I-70/I-71 interchange. This \$250 million project will provide its share of market impact and draw upon the region's labor and material resources, as well as impact the traveling public. The intersection of S.R. 315 and U.S. 23 is slated for modifications estimated to cost \$100 million, and I-270 will be widened from Cooper Road to Dempsey Road at a cost of \$120 million. ODOT currently has a \$5 billion CIP over the next 5 years, of which \$1 billion is planned in Franklin County.

When developing bids for sewer and tunnel work, the contractors must factor in the impact of traffic congestion as it has a direct impact on the quantity of trucks, drivers, and related equipment that must be accounted for in project bids. It is estimated that this factor could add 2 to 4 percent to the program cost if the schedule is compressed from 30 to 20 years.

V.5.3 Increased Risk, Change Orders, and Claims

A 20-year program of constructing large tunnels and numerous ancillary projects poses a tremendous challenge with respect to management and coordination of the multiple entities that must interact and successfully produce projects precedent to many that must follow. If such a program is accelerated and the schedule is compressed, many activities must occur concurrently causing several projects to overlap.

Since portions of four separate tunnel projects must occur simultaneously under the 20-year plan it would probably be necessary to have two ongoing construction contracts going simultaneously along one or both of the tunnels. This means that contractors would probably have to rely on each other for certain elements of the projects. Unforeseen delays on active jobs could ripple into the forthcoming projects potentially adding costs and/or change orders and would be very disruptive to the program plan. Contrarily, a more linear, segmented approach offered by a 30- to 40-year plan would ensure completion of prior activities and allow follow-on work to start and proceed without dependence on the timing of the previous job. This approach also gives the management team the time to thoroughly inspect and review the constructed products without hastily accepting it. This is an important quality issue.

The acquisition of real estate poses a daunting task to the City. The City of Atlanta has been under a CSO consent decree since 1999 and, though it has kept up with two major tunnel projects occurring simultaneously, other projects have suffered and have been delayed. On one major project it failed to meet the consent decree deadline due to the city's internal resources being stressed. The necessary easements were not acquired in a timely manner.

Such delays will cause ripple effects on the cost side too, when follow-on work is impacted. Delays always result in costly change orders. Inherent within an accelerated program, not only is the program time compressed, the individual construction projects will have to be shortened. This fact alone will force contractors to build in costly contingencies to cover the potential impacts of coordination with other projects and the unforeseen conditions that would be the responsibility of the contractor to deal with.

There is a significant real cost in dealing with these impacts. Reviewing the issues and the resolution of the inevitable disputes will be expensive. Dealing administratively with these

matters will cause the attention of the management team to be diverted away from ongoing activity. Litigation is possible. Depending on the market climate and final approach, contingencies could be effected 5 percent to 10 percent by the acceleration.

V.5.4 Engineering/Management

It is estimated that planning, engineering, construction management and overall management oversight will represent 20 percent of the program budget, or about \$800 million, most of which is professional labor. Compressing the schedule will have the following major impacts:

- Accelerated Design/Land Acquisition.
- Strain of DOSD management staff.
- Increased reliance on outside consultants.
- Required staffing/labor import.
- Potential issues with inspection and quality assurance/quality control (QA/QC).

The resultant financial impact will be a 10- to 20-percent increase in engineering / management costs.

V.5.5 Operation and Maintenance

As with any major wastewater construction program, regardless of the disruption caused by construction of new facilities, the existing assets and facilities must remain operational and receive the required maintenance. Successful O&M during heavy construction periods, particularly at the treatment plants will require extra resources to maintain proper coordination and to address the inevitable problems.

V.5.6 Cost Impact Summary

An objective evaluation of the above potential impacts which would be a result of schedule compression is summarized in **EXHIBIT V.5.1**.

EXHIBIT V.5.1 Estimated Range of Impacts		
	Range (\$ million)	
	Low	High
Surety Bonding	0	15
Disruption/Congestion/Trucks	50	70
Contractor Competition	100	150
Bond Administration	0	5
Risk/Change Orders	50	100
Engineering/Management	80	160
O&M	50	75
Total	\$330	\$575

The analysis shows a potentially significant increase to the costs shown in the report. While the estimate is admittedly speculative, the issue of the impact of a compressed schedule is real and cannot be overlooked.

V.6 Conclusions and Recommendations

V.6.1 The 30-Year Plan vs. the 40-Year Plan

The analysis to this point confirms that a 30-year schedule is more detrimental to the community than a 40-year schedule. The 30-year schedule will result in an U.S. EPA matrix that is the high burden range. More importantly, it will have a significant impact of the most vulnerable segments of the community. The 30-year schedule will mean that, for the poorest 10 percent of the community, sewer bills will equate to a staggering 4.7 percent of their household income. It will drive many renter household into being housing-cost burdened, and will prevent many families from being able to afford a home.

The question then becomes are these catastrophic economic impacts off-set by a commensurate environmental benefit? In order to answer that question, the City conducted an analysis of the environmental benefits of the 30- and 40-year implementation periods. Specifically, the City used modeling to define the differences between the two periods in untreated discharges over time. The assumptions used by the City in these calculations are discussed in **SECTION 10.6.6. FIGURE V.6.1** displays total untreated discharges for the 30- and 40-year implementation periods. **FIGURE V.6.2** presents the cumulative reduction of total untreated discharges over the two periods. These figures illustrate that the difference in untreated discharges over this period is a modest 2 percent. Additionally, due to the fact that the City is “front-loading” many projects with a significant environmental benefit, the majority of environmental benefits are achieved on the same time frame under both. For instance, there is a projected reduction in untreated discharges of approximately 60 percent from 2005 to 2010 and an estimated 85 percent reduction from 2005 to 2025. These reductions are identical in both implementation periods.

FIGURE V.6.3 displays the estimated untreated CSO discharge volumes. Both implementation periods result in an estimated 70 percent reduction in CSO volumes from 2005 to 2010 and approximately 85 percent reduction from 2005 to 2025.

FIGURE V.6.4 presents the estimated untreated discharges (SSOs) from the designed sanitary reliefs (DSR) in the priority areas. The estimated reduction in untreated discharges in this category is approximately 45 percent from 2005 to 2010 and approximately 85 percent from 2005 to 2025. There is a minor difference in the timing of complete mitigation between the 30- and 40-year schedule that occurs in the 2033 to 2040 time frame.

FIGURE V.6.5 displays the number of DSRs mitigated. Projects under design and/or construction are addressing 24 DSRs currently. By 2025, approximately 77 DSRs are expected to be mitigated. There are minor differences between the 30- and 40-year implementation periods from 2025 to 2045.

Overall, the difference in environmental benefits between the 30- and 40-year schedule is very minor. Significant progress in reducing untreated volumes is made on either schedule

during the period from present to 2025. Critical components of the untreated discharges are addressed either identically or with minor differences.

V.6.2 Conclusions

The City reached the following conclusions from the affordability analysis:

- The financial impact of the wet weather management program on ratepayers for all implementation periods examined is determined to be substantial and detrimental.
- The financial impact for all implementation periods to the most vulnerable segments of the population from the increase in costs due to the wet weather management program is severe and will significantly compromise the quality of life to people in this category.
- Data relating delinquency response to rate increases in Columbus suggests that a portion of the rate base is having difficulty paying sewer bills on time now, and future rate increases will affect a larger segment of the ratepayers. This will have negative impacts on DOSD operations and administrative costs and will reduce revenue.
- The financial capability of the community to deal with the increased cost is in the mid range, but the effects of the increased cost could erode that standing in the future.
- All implementation periods (20, 30, and 40 years) analyzed create a high burden outcome using U.S. EPA benchmarks.
- Impacts to housing cost burden and the ability of homeowners to afford mortgages is projected to be substantial and may impact the desirability of living in the Columbus area.
- The environmental benefit that accrues from more rapid implementation of improvements, when comparing the 30- and 40-year schedules, is minor and not commensurate with the increased financial impact. Significant progress towards reduction of untreated discharges is made on both schedules.
- The City's schedule for important improvements is aggressive and results in substantial reductions in untreated discharges in the early years of the program.
- All the prescribed schedule requirements of the CSO Consent Order are fully met under the recommended plan.
- The effects to the local economy and business health resulting from the increased costs of implementing this program have the potential to be substantial.

V.6.3 Recommendations

The City is therefore adopting the following recommendations:

- Implement the proposed wet weather management program improvements over a 40-year implementation period including the aggressive early year improvements presented in the plan.
- Monitor the measures of success (see **SECTION V.7**) recommended by the SWAB on an annual basis to determine if any trigger levels are being approached or reached.

- If any of the trigger levels for the measures of success are reached, review the pending implementation schedule and propose adjustments to bring the measure back within the specified range.
- If grant funding of any kind is secured to support the wet weather capital program, the monies would be split 50/50 between offsetting local capital funding and acceleration of sewer improvements until total sewer costs are less than 1 percent MHI. If grant funding is received when total sewer costs are less than 1 percent of the MHI the money secured would be used to accelerate construction of improvements.

V.7 Measures of Success

V.7.1 Concept Description

Affordability is something that should be measured on an on-going basis to test whether the sewer rates which result from the wet weather program remain affordable. This will allow for adjustments in the implementation pace to maintain affordability. The challenge is to define a discrete set of measures that capture the many dimensions of affordability and that are reliable over relatively long time periods.

The SWAB, through a series of facilitated workshops, recommended to the City, and the City agreed to adopt and use, a set of “measures of success” that are believed to be reliable and reflect the multiple dimensions of affordability for the Columbus community. SWAB identified four categories of Measures of Success for affordability of the Wet Weather Program. Each of the four categories contains components that describe affordability for that category. Each component will have a prescribed maximum adverse impact level or minimum desired level depending on the nature of the measurement. To keep within the prescribed definition of affordability through the various stages of the program the City will measure the actual levels of these components on an ongoing basis and compare those levels with the maximum or minimum defined values (triggers).

V.7.2 Major Categories

The four major categories identified by SWAB include the following:

- Overall Impacts – global impacts across the service area with broad applicability.
- Vulnerable Populations Impacts – impacts specifically on populations that are ill equipped to cope with increased costs because they are economically challenged.
- Local Economy/Business Health – impacts to the local economy and businesses resulting from higher cost of doing business and decreased personal disposable income and reduced purchasing power.
- Housing Impacts – impacts to renters, homeowners and prospective homeowners due to increased sewer costs.

EXHIBIT V.7.1 lists the major categories and the associated component measures of success.

EXHIBIT V.7.1 Measures of Success by Category	
Major Category	Components
Overall Impacts	<ul style="list-style-type: none"> ○ Maximum Aggregate Sewer Bill Increase ○ Percent of Customers in Step 3 or 4 Delinquency
Vulnerable Populations Impacts	<ul style="list-style-type: none"> ○ Maximum Percent HHI for Vulnerable Population
Local Economy/Business Health	<ul style="list-style-type: none"> ○ Housing Starts ○ Employment
Housing Impacts	<ul style="list-style-type: none"> ○ Number of Households Mortgage Eligibility Impacted ○ Number of Renters Driven Over Housing Cost Burden Threshold

V.7.3 Overall Impacts

The overall impacts of the wet weather program affordability will be judged using the maximum aggregate bill increase and the percentage of customers in steps 3 and 4 delinquency. These two measures capture the widespread effects of the increases in sewer bills related to the wet weather management program.

V.7.3.1 Maximum Aggregate Sewer Bill Increase

The maximum aggregate sewer bill increase will be measured by comparing the average bill, adjusted for inflation, at 10 hundred cubic feet (CCF) consumption per month. The benchmark year for the analysis is 2005. A sample calculation is as follows:

- Future rate is \$11.84 / CCF in 2015.
- Consumer Price Index Adjustment is 2.5 percent / yr.
- Present Day (2005) Equivalent Rate is $\$11.84/1.2801 = \$9.25 / \text{CCF}$.
- Future Bill (adjusted for inflation) = $\$9.25 \times 10 \text{ CCF} = \$92.50 / \text{month}$.
- Current Bill = $\$3.70 \times 10 = \$37 / \text{month}$.
- Aggregate increase = $(\$92.50 / \$37) \times 100 = 250 \text{ percent}$.

The maximum adverse impact level is 250 percent. If the calculation in any given year shows a maximum aggregate increase adjusted for inflation less than 250 percent, this measure of success will be satisfied. If the calculated value is greater or equal to 250 percent, then the measure of success will not be achieved and the program will not meet the affordability standard. The 250 percent maximum adverse level approximates the predicted impact from the 40-year implementation period.

V.7.3.2 Percentage of Customers in Steps 3 and 4 Delinquency

SECTION V.4 presented information regarding the delinquency structure for Columbus and the current level of delinquent accounts. This measure will be the percentage of customers reaching step 3 and/or 4 in a given calendar year. A sample calculation is as follows:

- Number of Accounts in Step 3 = 5500.
- Number of Accounts in Step 4 = 2500.
- Total Number of Accounts = 425,000.
- Percentage of Accounts in Steps 3 and/or 4 = $(5500+2500/425,000 \times 100 = 1.9$ percent.

The maximum adverse impact level for this measure is 7 percent. This is the estimated effect from a 250 percent rate increase using data extrapolated from the delinquency history related to the rate increase in 2004.

V.7.4 Vulnerable Population Impacts

Lower income households have a more difficult time accommodating increases in necessities such as utility bills. These households have lower disposable personal incomes and therefore less discretion regarding reallocation of scarce income and are most impacted by rate increases.

The 2000 census was used to identify the most vulnerable populations within the DOSD service area. An income level of 50 percent of service area MHI was selected to identify those census tracts that are most vulnerable. This income level corresponds to the “very low income” standard used by HUD to determine eligibility for various housing programs such as Section 8 for public housing, Section 202 for elderly housing and Section 811 for handicapped housing.

FIGURE V.7.1 displays the census tracts, as of the 2000 census, that meet the less than or equal to 50 percent of service area MHI criteria - \$21,959 (2000 dollars). The median household income within this set of census tracts is \$17,034 (2000 dollars). Approximately 31,526 households are contained within these tracts.

This measure will be calculated as the incremental increase in sewer costs calculated from the affordability model, stated as a percentage of income. A sample calculation follows.

- Total increased sewer costs = \$1054 / yr (2005 dollars).
- MHI in census tracts less than or equal to 50 percent of service area MHI = \$19,100 (2005 dollars).
- Percent Impact = $(\$1054/\$19,100) \times 100 = 5.5$ percent.

The maximum adverse impact level for this measure is 5.5 percent. This corresponds to the predicted maximum impact from the 40-year schedule.

V.7.5 Local Economy/Business Health

Research on the impact of rising costs on businesses indicates that increases in expenses such as sewer rates can have an adverse impact on the health of the business. In general, reduced profit margins lead to lower levels of production, which result in fewer jobs and lower incomes in local communities. Econometric models suggest that energy costs, state taxes, and value added all are related to employment growth. Related research on tax policy has found that higher commercial property tax rates are associated with lower employment and firm growth.

Higher sewer rates can be expected to have a similar negative effect on business output and employment. Utility expenses are typically such a small part of business costs that they do not usually affect business decisions. However, those that are sensitive to such issues are usually very sensitive. If water and sewer costs increase rapidly and substantially, they are likely to become a more significant element of total production costs for more industries, leading to negative impacts. Research indicates that large businesses are able to shift some costs, abandon outdated production methods or move production facilities to other areas in response to these rate increases.

More spending on sewers can be expected to constrain spending in other areas, thus dampening employment and firm growth. Other researchers have found that increased highway and education spending increases employment and firm growth, but if spending on sewers is increased locally, this will reduce resources available for investment in areas that promote economic development. Most studies that suggest taxes have a negative effect on economic activity do so only when public spending is held constant as taxes increase. This is very similar to what will happen when sewer rates rise, because charges increase while the amount of service remains the same.

The connection between increased sewer rates and negative economic development impacts is both direct and indirect. A massive sewer project will not only require increases in sewer use fees, but will also necessitate growth in local government expenditures and debt levels. This will have effects on economic variables such as employment and personal income. It will also affect community demographics (population, households, labor force), and this will also produce adverse impacts on the local economy, since the size of labor force is positively related to employment and firm growth.

Large increases create problems for local economic development regardless of initial rate levels. In some cases, sewer rate increases eliminate a community's competitive advantage, leading to the loss of both existing and potential new industries. In other cases, increases put communities at a competitive disadvantage, which will produce the same effects.

An increase in current sewer rates to 2.0 percent of MHI is predicted to produce a 1.5-percent decline in employment in the Service Area. Based on research and econometric models employed elsewhere to assess the impact of similar projects, a 0.4-percent increase (e.g., from 0.8 percent to 1.2 percent) in the cost per household as a percentage of MHI would result in a 0.5-percent decrease in employment, all other things being equal.

This suggests that an increase to 2.4 percent of MHI would result in a loss of 13,600 jobs in Franklin County, with a combined income of over \$500 million, as shown in **EXHIBIT V.7.2**.

EXHIBIT V.7.2 Income and Job Loss Resulting From an Increase in Sewer Costs

Sewer Percent of MHI	Employment	Job Loss	Income Loss
0.8%	685,000		
1.2%	681,575	3,425	\$130,670,000
1.6%	678,167	6,833	\$260,690,000
2.0%	674,776	10,224	\$390,070,000
2.4%	671,402	13,598	\$518,790,000

This research was an analysis of Onondaga County NY, performed by Syracuse University. Because Onondaga County is more heavily oriented toward Manufacturing than is Franklin County (14.6 percent v. 8.6 percent in 1998), and manufacturers tend to be heavier sewer users, the economic impact in Franklin County is likely to be less severe; these numbers are probably at the high end of the likely range.

In addition, according to a senior member of the Greater Columbus Chamber’s business attraction staff, they have worked very hard to eliminate elements of the state’s tax structure that keep the region from being competitive with communities elsewhere in the country. The imposition of dramatically higher sewer rates would be likely to have the effect of wiping out these economic development gains.

The measures in this category are intended to monitor the relative strength of the overall local economy to ensure that it is not adversely affected by the proposed wet weather program. To monitor trends in this area, employment and housing starts in Franklin County will be compared with those in similar areas. Three such areas have been identified for these measures: the balance of the Columbus MSA, Marion County, IN (metropolitan Indianapolis), and the Cincinnati-Hamilton Consolidated Metropolitan Statistical Area (CMSA).

V.7.5.1 Housing Starts

Housing starts are one measure of the economic vitality of an area. Housing starts are affected by many variables external to the cost of utilities and the general economic health of the community, such as interest rates. To remove these external effects, Columbus used a comparison in the growth rates between Franklin County and another area.

During the 1990s, Franklin County experienced an average annual housing growth rate of 1.97 percent. The County’s housing growth was compared with that of the Indianapolis, Cleveland, and Cincinnati metropolitan areas and central Ohio counties to identify an area with similar growth trends. This comparison revealed that Franklin County’s housing growth very closely approximated, yet consistently exceeded, the 1.85 percent annual rate of the Cincinnati-Hamilton CMSA. This relationship should continue to hold for the foreseeable future.

EXHIBIT V.7.3 displays the historical information for Franklin County and the Cincinnati-Hamilton MSA.

EXHIBIT V.7.3 Annual Average Change in Housing Starts			
Time Period	Franklin County (Percent)	Cincinnati-Hamilton MSA (Percent)	Ratio
1991 -1994	1.85	1.78	1.04
1995 – 1998	2.11	1.92	1.10
1999 – 2000	1.99	1.87	1.06
Overall	1.97	1.85	1.06

Source: 2000 Census

The ratio shown in the column on the right will be calculated as the ratio of annual average housing start growth rates between Franklin County and the Cincinnati-Hamilton MSA. A sample calculation follows:

- Annual Housing Start Growth Rate in Franklin County = 1.92 percent.
- Annual Housing Start Growth Rate in Cincinnati-Hamilton MSA = 1.89 percent.
- Ratio = 1.92/1.89 = 1.02.

The minimum desired level for this measure is 1.0. This would indicate that the change in housing starts in Franklin County was at least as great as the change in Cincinnati-Hamilton MSA.

V.7.5.2 Employment

Levels of employment are an indicator of the economic vitality of an area. As sewer costs increase, the cost of doing business in the Columbus area will also increase and this may prompt employers to relocate and new prospective employers to locate to areas outside of Franklin County. In order to separate external effects, this measure will be a ratio with other geographic areas to test the relative health of the Columbus area.

Franklin County’s employment was compared with that of the Indianapolis, Cleveland, and Cincinnati metros and central Ohio counties to identify an area with similar trends. As demonstrated in **FIGURE V.7.2**, this comparison revealed that, over the past 8 years, Franklin County employment has been consistently equivalent to 87.5 percent of the sum of employment in the other counties of the Columbus MSA plus Marion County, IN (plus or minus 1.5 percent, using either of two standard federal sources). This combination should continue to closely approximate Franklin County’s employment, since Marion County is a comparable Midwestern state capital and the balance of the Columbus MSA will provide an adjustment to compensate for any minor differences in the local economy. The balance of the Columbus MSA includes Delaware, Fairfield, Licking, Morrow, Pickaway and Union counties. These counties have an approximate combined population of 586,700 (2003). Employment growth can be measured using covered employment from the Quarterly Census of Employment and Wages, published by the US Bureau of Labor Statistics, or total full-time and part-time employment from the US Bureau of Economic Analysis.

This measure will be calculated using the total employment numbers from the respective geography. A sample calculation follows:

FORMULA V.7.1:

$$\frac{\text{Franklin County employment}}{\text{Columbus MSA employment} - \text{Franklin County employment} + \text{Marion County employment}}$$

The minimum desirable level for this measure is a ratio of 0.85 (85 percent) which corresponds to the low end of the recent history in these areas.

V.7.6 Housing Impacts

As discussed previously, increases in sewer bills will impact existing and potential homeowners and renters by increasing their housing cost burden and decreasing their personal disposable income for other purposes. For homeownership, increases could result in defaults on existing mortgages and inability to qualify or afford new mortgages.

V.7.6.1 Homeowner Impacts

The City has calculated the number of households that were previously able to meet the qualifying criteria for a mortgage that would no longer be able to meet the criteria. The City has determined that the trigger for this measure should be 23,000 households, which corresponds to predicted impact from the 40-year implementation schedule.

V.7.6.2 Renter Housing Cost Burden Impact

The City will also monitor renter housing cost burden as a separate measure. The methodology for calculation of renter housing cost burdens is set forth earlier in this appendix. The trigger selected by the City is 11,000, which corresponds to the long range (40-year) schedule for implementation.

V.7.7 Summary

Seven components falling into four categories have been identified as Measures of Success for the City of Columbus Wet Weather Management program. For each measure, a maximum adverse level or minimum desired level (trigger level) has been established. These measures, along with the corresponding trigger level, are summarized in **EXHIBIT V.7.4**. An annual analysis of each measure will be conducted to test whether the trigger value has been reached. If any measure approaches or reaches the trigger value, the City will evaluate the implementation schedule and propose changes to bring the measure back within the specified range.

EXHIBIT V.7.4 Measures of Success Summary			
Major Category	Component	Trigger Level	Maximum or Minimum
Overall Impacts	Maximum aggregate sewer bill increase	250%	Max
	Percent customers in Step 3 or 4 delinquency	7%	Max
Vulnerable Population Impacts	Maximum percent HHI for vulnerable population	5.5%	Max
Local Economy / Business Health	Housing starts change vs. reference area (ratio)	1.0	Min
	Employment change vs. reference area (ratio)	0.85	Min
Housing Impacts	Number of households mortgage eligibility impacted	23,000	Max
	Number of renters driven over housing-cost burden threshold	11,000	Max

TABLE V.2.1 20-Year WWMP Project Budget Schedule Distribution (Cost in \$1,000s & rounded to nearest \$1,000)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	TOTAL	
SECAP Improvement Projects																								
ORT			\$82,216	\$15,500			\$5,000	\$500	\$199,122	\$115,000	\$5,000		\$207,473		\$5,000		\$200,799							\$835,611
ART		\$3,000	\$3,000	\$5,000			\$225,774			\$26,495		\$3,000		\$163,020	\$3,000		\$211,505							\$643,794
Priority Areas		\$37,964	\$39	\$572	\$307	\$610	\$1,458	\$3,356	\$1,915	\$6,634	\$13,406	\$7,744	\$5,079	\$10,246	\$8,049	\$1,083	\$9,067	\$951	\$5,346	\$464		\$319		\$114,609
I/I Studies		\$12,710	\$5,300	\$3,128	\$1,210	\$13,215	\$13,215																	\$48,778
Specific CIPs Addressed in Consent Order	\$16,269	\$9,772	\$7,259																					\$33,300
SECAP YEAR TOTALS	\$16,269	\$63,446	\$97,814	\$24,200	\$1,517	\$13,825	\$245,447	\$3,856	\$201,037	\$148,129	\$18,406	\$10,744	\$212,552	\$173,266	\$16,049	\$1,083	\$421,371	\$951	\$5,346	\$464	\$0	\$319		\$1,676,092
LTCP Improvements																								
OARS Transport	\$23,775	\$11,365		\$55,475	\$9,157		\$14,851	\$13,160	\$42,920	\$75,077	\$780	\$104,346		\$43,867			\$1,820	\$14,000						\$410,592
CSO Improvements		\$49	\$280	\$7,397	\$774	\$10,000	\$9,956	\$30,622	\$4,365	\$4,358	\$28,082	\$8,399	\$27,119	\$25,081			\$13,497	\$2,201						\$172,180
Wet Weather WWTP Hydraulic Improvements	\$5,973	\$13,402	\$171,015			\$533	\$1,934	\$3,496	\$26,567	\$13,763	\$49,899	\$15,928					\$1,500		\$11,500					\$315,510
LTCP YEAR TOTALS	\$29,748	\$24,816	\$171,295	\$62,872	\$9,931	\$10,533	\$26,741	\$47,278	\$73,852	\$93,198	\$78,761	\$128,673	\$27,119	\$68,948	\$0	\$0	\$16,817	\$16,201	\$11,500	\$0	\$0	\$0		\$898,282
Other Projects																								
Sewer Projects	\$41,470	\$48,414	\$39,155	\$40,144	\$20,650	\$56,525	\$5,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$951,358
WWTP Projects	\$104,070	\$25,139	\$53,688	\$10,794	\$10,538	\$57,623	\$26,130	\$17,130	\$5,968	\$8,475	\$9,954	\$69,922	\$66,213	\$7,032	\$20,447	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$26,272		\$550,755
Other YEAR TOTALS	\$145,540	\$73,553	\$92,843	\$50,938	\$31,188	\$114,148	\$31,130	\$67,130	\$55,968	\$58,475	\$59,954	\$119,922	\$116,213	\$57,032	\$70,447	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$76,272	\$0	\$1,502,113
YEAR TOTALS	\$191,557	\$161,815	\$361,952	\$138,010	\$42,637	\$138,506	\$303,317	\$118,264	\$330,857	\$299,801	\$157,121	\$259,338	\$355,884	\$299,246	\$86,496	\$57,355	\$494,460	\$73,424	\$73,118	\$56,736	\$76,272	\$319		\$4,076,486

TABLE V.2.2 30-Year WWMP Project Budget Schedule Distribution (Cost in \$1,000s & rounded to nearest \$1,000)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	TOTAL	
SECAP Improvement Projects																																		
ORT						\$5,000			\$25,972	\$15,500				\$32,562		\$314,122			\$31,191		\$207,473			\$5,000		\$200,799								\$837,620
ART		\$3,000	\$3,000	\$5,000			\$205,394								\$20,380					\$29,495		\$163,020			\$3,000		\$211,505							\$643,794
Priority Areas		\$37,964	\$39	\$572	\$307	\$561	\$1,458	\$3,405	\$710	\$6,634	\$14,141	\$6,450		\$7,668	\$13,128	\$228	\$6,924	\$2,005	\$2,088		\$5,358	\$2,624		\$2,083	\$30			\$232				\$1,009	\$115,618	
I/I Studies		\$12,710	\$5,300	\$3,128	\$1,210	\$13,215	\$13,215																											\$48,778
Specific CIPs Addressed in Consent Order	\$16,269	\$9,772	\$7,259																															\$33,300
SECAP YEAR TOTALS	\$16,269	\$63,446	\$15,598	\$8,700	\$1,517	\$18,776	\$220,067	\$3,405	\$26,682	\$22,134	\$14,141	\$6,450	\$0	\$40,230	\$33,508	\$314,350	\$6,924	\$2,005	\$33,279	\$29,495	\$212,831	\$165,644	\$0	\$7,083	\$3,030	\$200,799	\$211,505	\$232	\$0	\$0	\$0	\$1,009	\$1,679,110	
LTCP Improvements																																		
OARS Transport	\$23,775	\$11,365		\$55,475	\$9,157		\$14,851	\$13,160	\$42,920	\$75,077	\$780	\$104,346		\$43,867			\$1,820	\$14,000																\$410,592
CSO Improvements		\$49	\$280	\$7,397	\$774	\$10,000	\$9,956	\$30,622	\$4,365	\$4,358	\$28,082	\$8,399	\$27,119	\$25,081		\$13,497	\$2,201																	\$172,180
Wet Weather WWTP Hydraulic Improvements	\$5,973	\$13,402	\$171,015										\$533	\$1,934	\$3,496	\$26,567	\$13,763	\$49,899	\$15,928			\$1,500		\$11,500				\$150	\$1,500				\$317,160	
LTCP YEAR TOTALS	\$29,748	\$24,816	\$171,295	\$62,872	\$9,931	\$10,000	\$24,807	\$43,782	\$47,285	\$79,435	\$28,862	\$112,745	\$27,652	\$70,882	\$3,496	\$26,567	\$29,080	\$66,100	\$15,928	\$0	\$0	\$1,500	\$0	\$0	\$0	\$0	\$0	\$0	\$150	\$1,500	\$0	\$0	\$0	\$899,932
Other Projects																																		
Sewer Projects	\$41,470	\$48,414	\$39,155	\$40,144	\$20,650	\$56,525	\$5,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$1,451,358
WWTP Projects	\$104,070	\$25,139	\$53,688	\$10,794	\$10,538	\$57,623	\$26,130	\$17,130	\$5,968	\$6,809	\$6,067	\$6,067	\$16,213	\$7,032	\$20,447	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$7,938	\$10,159	\$70,127	\$56,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$613,475	
Other YEAR TOTALS	\$145,540	\$73,553	\$92,843	\$50,938	\$31,188	\$114,148	\$31,130	\$67,130	\$55,968	\$56,809	\$56,067	\$56,067	\$66,213	\$57,032	\$70,447	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$76,272	\$57,938	\$60,159	\$120,127	\$106,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$0	\$2,064,833
YEAR TOTALS	\$191,557	\$161,815	\$279,736	\$122,510	\$42,637	\$142,924	\$276,003	\$114,317	\$129,935	\$158,377	\$99,070	\$175,261	\$93,865	\$168,144	\$107,451	\$397,189	\$92,276	\$124,377	\$105,479	\$85,767	\$289,103	\$225,082	\$60,159	\$138,710	\$109,302	\$257,071	\$267,777	\$56,654	\$57,772	\$56,272	\$56,272	\$1,009	\$4,643,874	

TABLE V.2.3 40-Year WWMP Project Budget Schedule Distribution (Cost in \$1,000s & rounded to nearest \$1,000)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
SECAP Improvement Projects																									
ORT											\$5,000			\$25,972	\$15,500				\$5,500		\$341,184				
ART		\$3,000	\$3,000	\$5,000			\$205,394																	\$20,380	
Priority Areas		\$37,964	\$39	\$572	\$307	\$561	\$1,458	\$3,405	\$710	\$6,634	\$14,141	\$6,450		\$7,668	\$13,128	\$59	\$6,924	\$1,340	\$794		\$2,984	\$2,793			
I/I Studies		\$12,710	\$5,300	\$3,128	\$1,210	\$13,215	\$13,215																		
Specific CIPs Addressed in Consent Order	\$16,269	\$9,772	\$7,259																						
SECAP YEAR TOTALS	\$16,269	\$63,446	\$15,598	\$8,700	\$1,517	\$13,776	\$220,067	\$3,405	\$710	\$6,634	\$19,141	\$6,450	\$0	\$33,640	\$28,628	\$59	\$6,924	\$1,340	\$6,294	\$0	\$344,168	\$2,793	\$0	\$20,380	
LTCP Improvements																									
OARS Transport	\$23,775	\$11,365		\$55,475	\$9,157		\$14,851	\$13,160	\$42,920	\$75,077	\$780	\$104,346		\$43,867			\$1,820	\$14,000							
CSO Improvements		\$49	\$280	\$7,397	\$774	\$10,000	\$9,956	\$30,622	\$4,365	\$4,358	\$28,082	\$8,399	\$27,119	\$25,081			\$13,497	\$2,201							
Wet Weather WWTP Hydraulic Improvements	\$5,973	\$13,402	\$171,015														\$533	\$1,934	\$3,496	\$26,567	\$13,763	\$49,899	\$15,928		
LTCP YEAR TOTALS	\$29,748	\$24,816	\$171,295	\$62,872	\$9,931	\$10,000	\$24,807	\$43,782	\$47,285	\$79,435	\$28,862	\$112,745	\$27,119	\$68,948	\$0	\$0	\$15,850	\$18,135	\$3,496	\$26,567	\$13,763	\$49,899	\$15,928	\$0	
Other Projects																									
Sewer Projects	\$41,470	\$48,414	\$39,155	\$40,144	\$20,650	\$56,525	\$5,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
WWTP Projects	\$104,070	\$25,139	\$53,688	\$10,794	\$10,538	\$57,623	\$26,130	\$17,130	\$5,968	\$6,809	\$6,067	\$6,067	\$16,213	\$7,032	\$20,447	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$26,272	\$7,938	\$10,159	\$70,127
Other YEAR TOTALS	\$145,540	\$73,553	\$92,843	\$50,938	\$31,188	\$114,148	\$31,130	\$67,130	\$55,968	\$56,809	\$56,067	\$56,067	\$66,213	\$57,032	\$70,447	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$76,272	\$57,938	\$60,159	\$120,127	
YEAR TOTALS	\$191,557	\$161,815	\$279,736	\$122,510	\$42,637	\$137,924	\$276,003	\$114,317	\$103,963	\$142,877	\$104,070	\$175,261	\$93,332	\$159,621	\$99,075	\$56,331	\$79,046	\$75,747	\$66,062	\$82,839	\$434,203	\$110,630	\$76,087	\$140,507	

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TABLE V.2.3 (CONTINUED) 40-Year WWMP Project Budget Schedule Distribution

	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	TOTAL	
SECAP Improvement Projects																				
ORT		\$5,000	\$26,191	\$207,473				\$5,000		\$200,799									\$837,620	
ART					\$3,000		\$189,514				\$3,000		\$211,505						\$643,794	
Priority Areas	\$1,324			\$232		\$665		\$1,009	\$2,374		\$7,735	\$2,083							\$123,353	
I/I Studies																			\$48,778	
Specific CIPs Addressed in Consent Order																			\$33,300	
SECAP YEAR TOTALS	\$1,324	\$5,000	\$26,191	\$207,705	\$3,000	\$665	\$189,514	\$6,009	\$2,374	\$200,799	\$10,735	\$2,083	\$211,505	\$0	\$0	\$0	\$0	\$0	\$1,686,845	
LTCP Improvements																				
OARS Transport																			\$410,592	
CSO Improvements																			\$172,180	
Wet Weather WWTP Hydraulic Improvements				\$150	\$3,000		\$11,500												\$317,160	
LTCP YEAR TOTALS	\$0	\$0	\$0	\$150	\$3,000	\$0	\$11,500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$899,932	
Other Projects																				
Sewer Projects	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$1,951,358	
WWTP Projects	\$56,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$6,272	\$676,195	
Other YEAR TOTALS	\$106,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$56,272	\$0	\$2,627,553
YEAR TOTALS	\$107,596	\$61,272	\$82,463	\$264,127	\$62,272	\$56,937	\$257,286	\$62,281	\$58,646	\$257,071	\$67,007	\$58,355	\$267,777	\$56,272	\$56,272	\$56,272	\$56,272	\$0	\$5,214,329	

FIGURE V.2.1 Cumulative Capital Costs for WWMP Project Budget Schedule Distribution

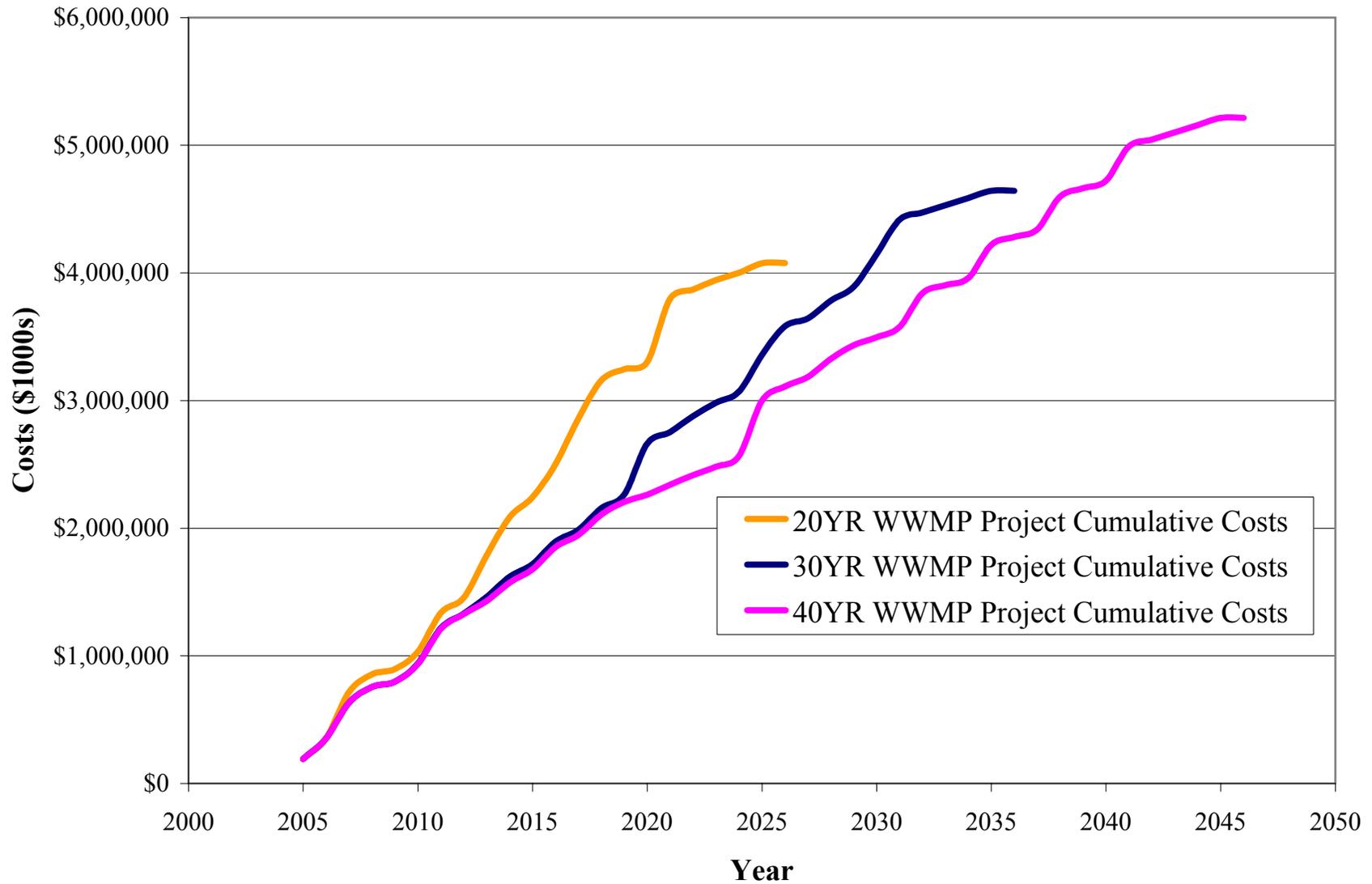


FIGURE V.4.1 Comparative Median Household Incomes

2004 Median Household Income

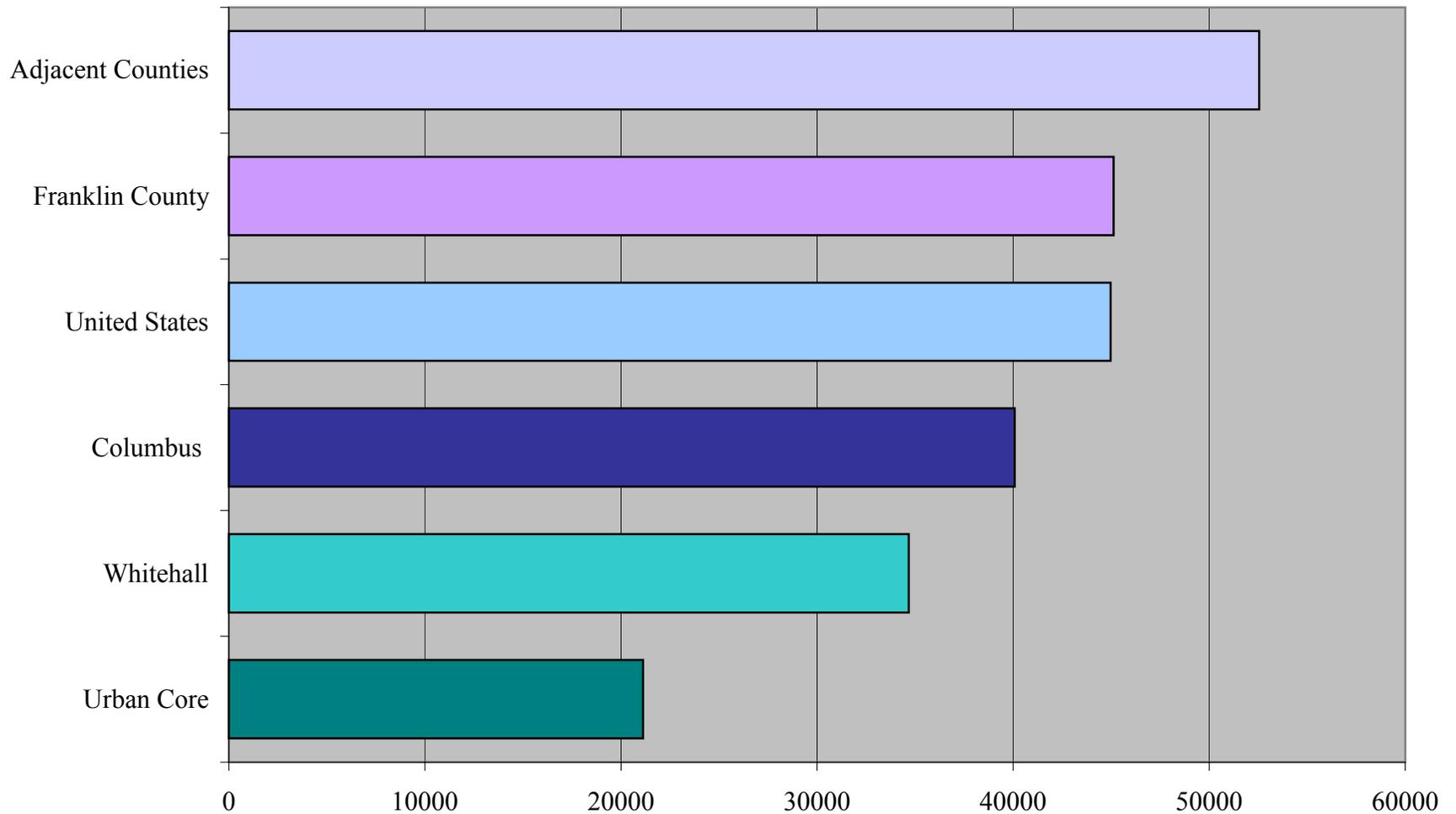


FIGURE V.4.2 2003 Poverty Rates
 American Community Survey

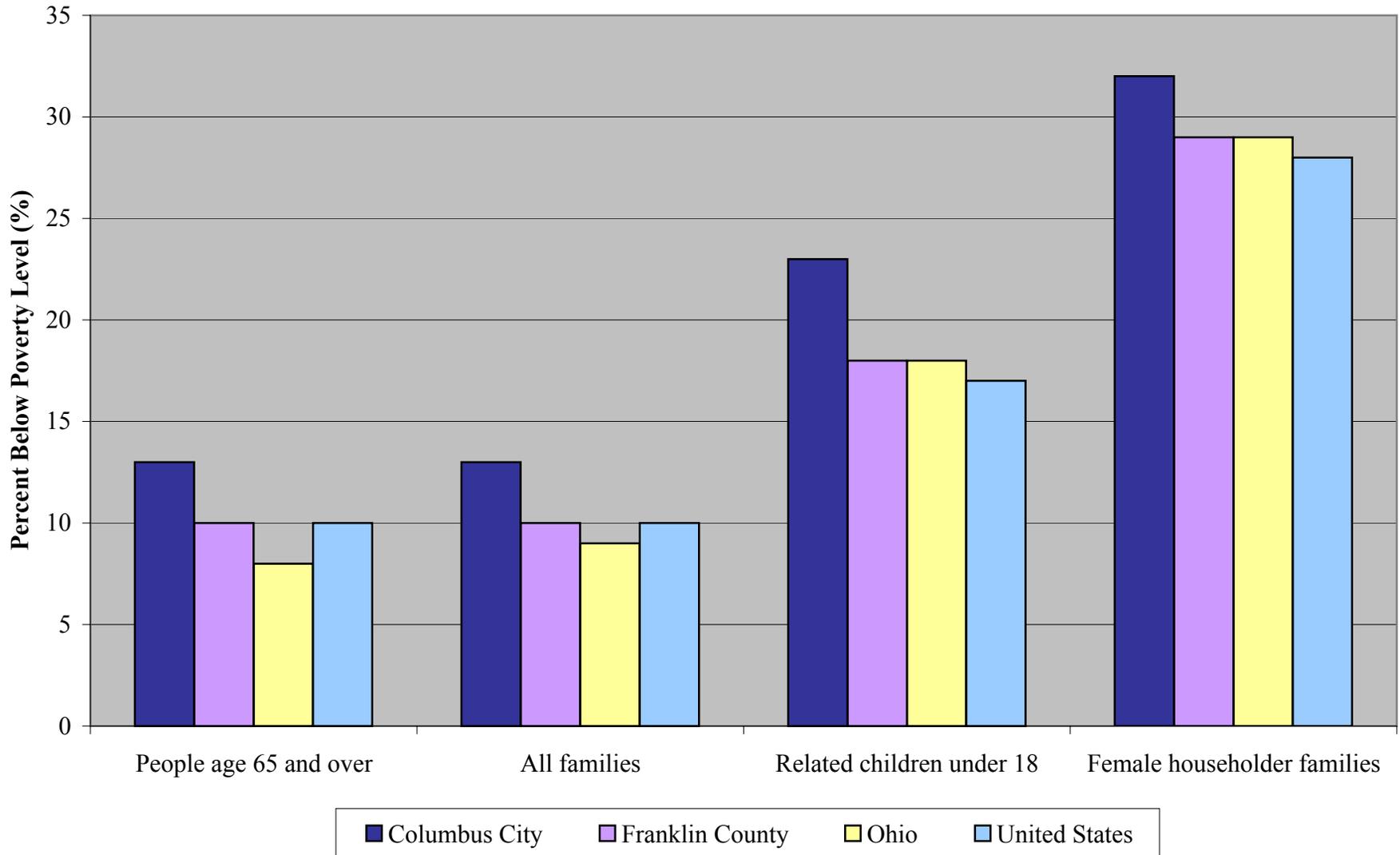


FIGURE V.4.3 Possible Poverty Indicators

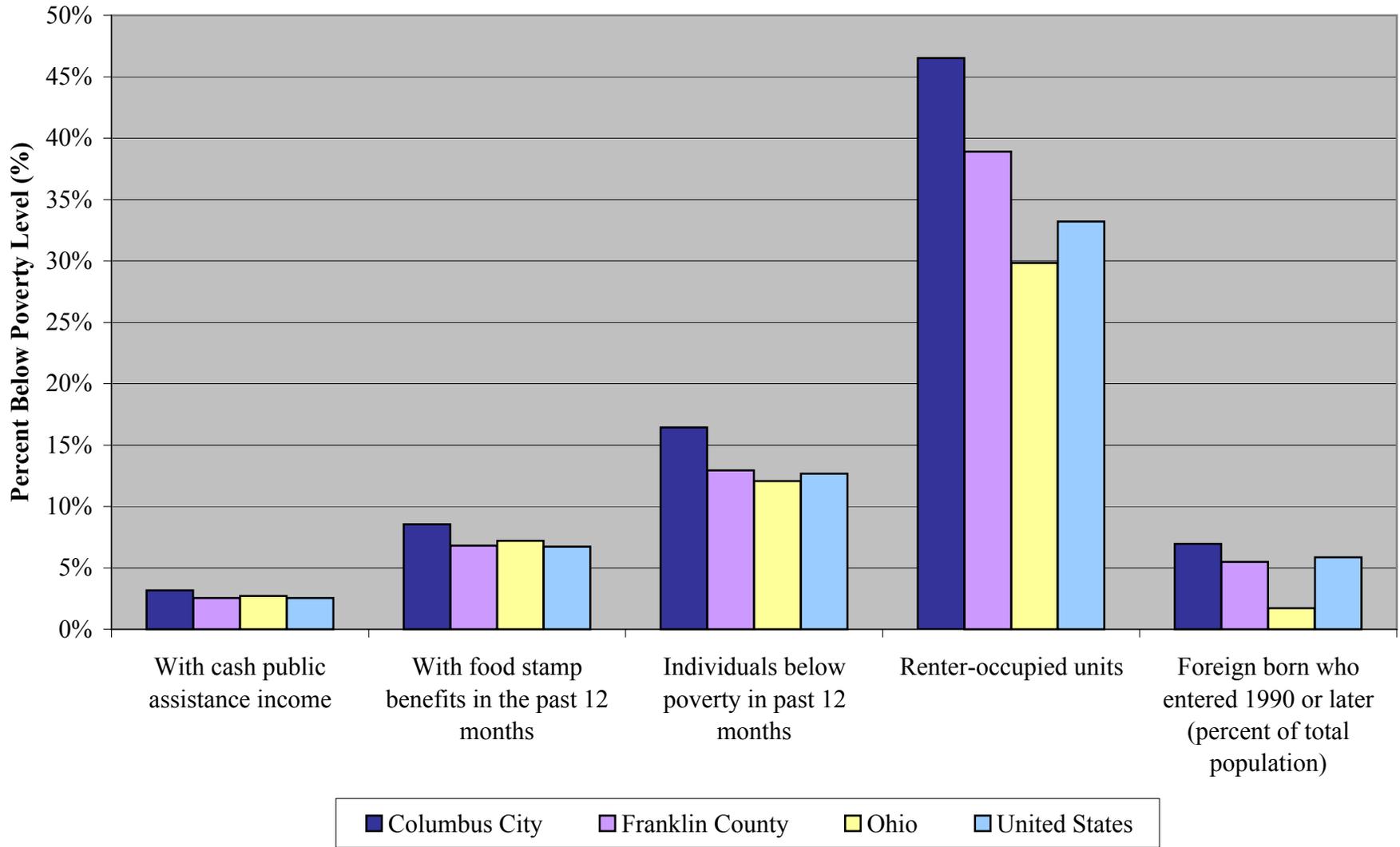


FIGURE V.4.4 Unemployment Rates for April 2004 - March 2005

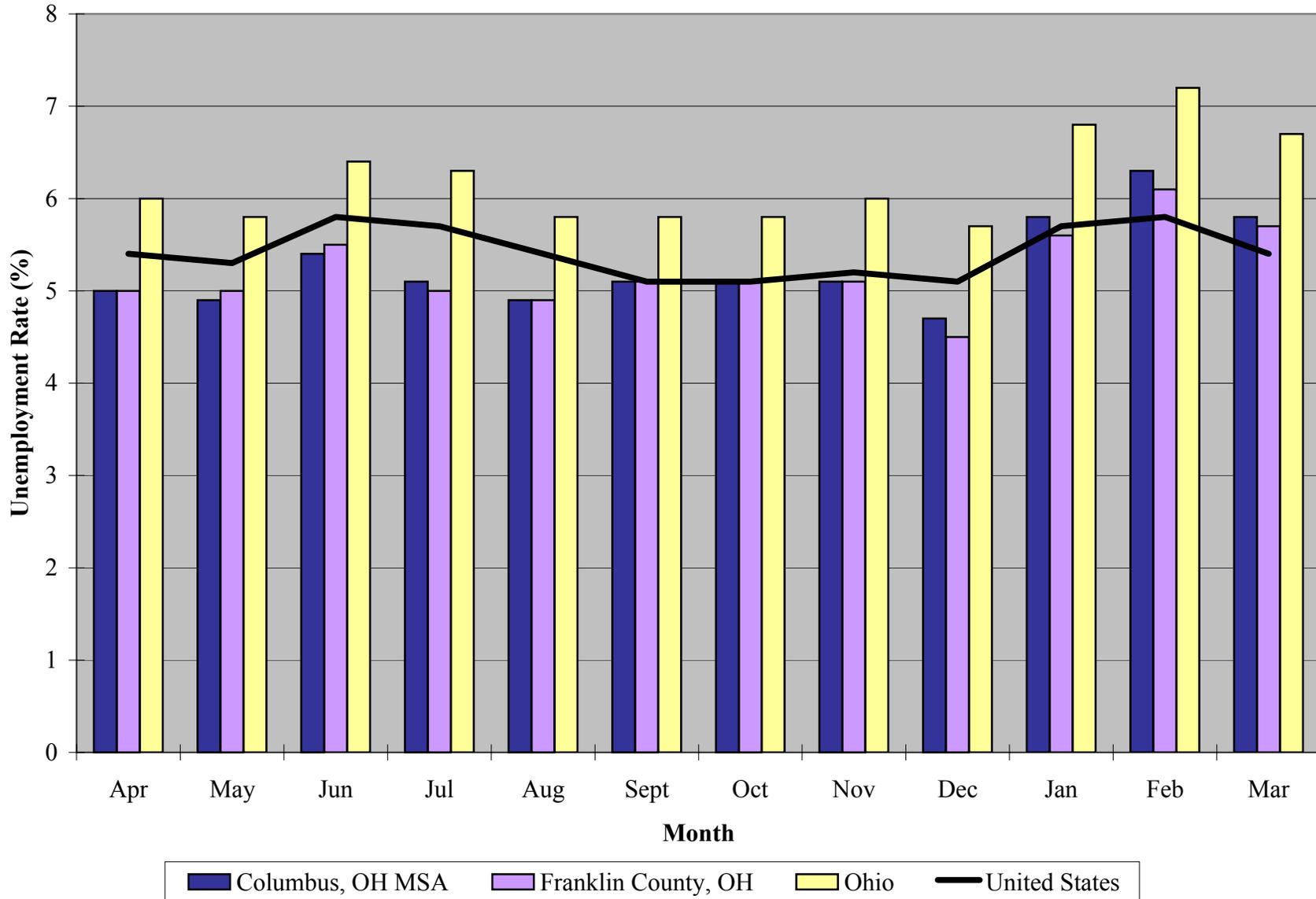


FIGURE V.4.5 Employment Trends

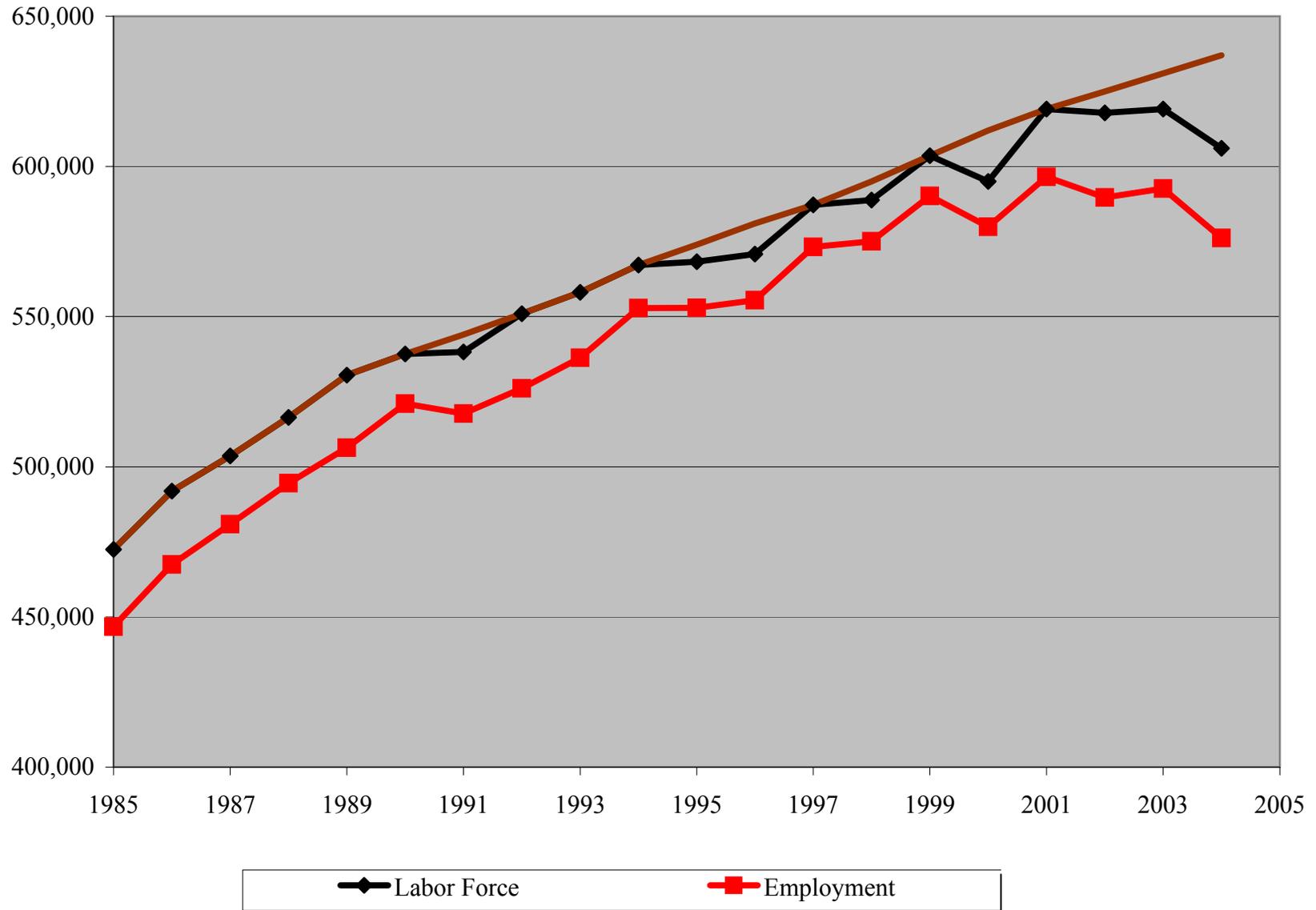


FIGURE V.4.6 Cumulative Income Distribution for DOSD Service Area

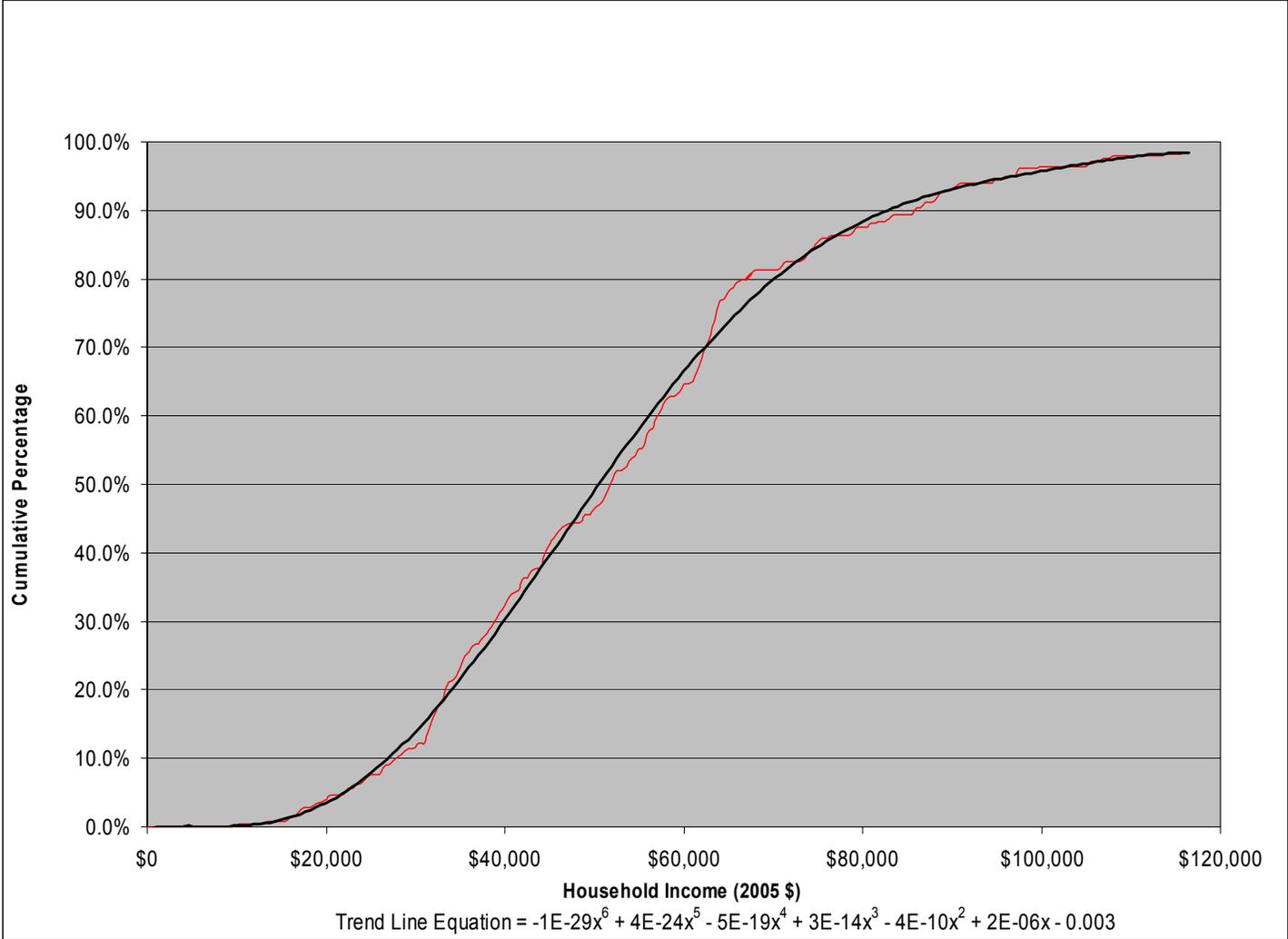


FIGURE V.4.7 Delinquency Rates Have Risen From 2003 to 2004

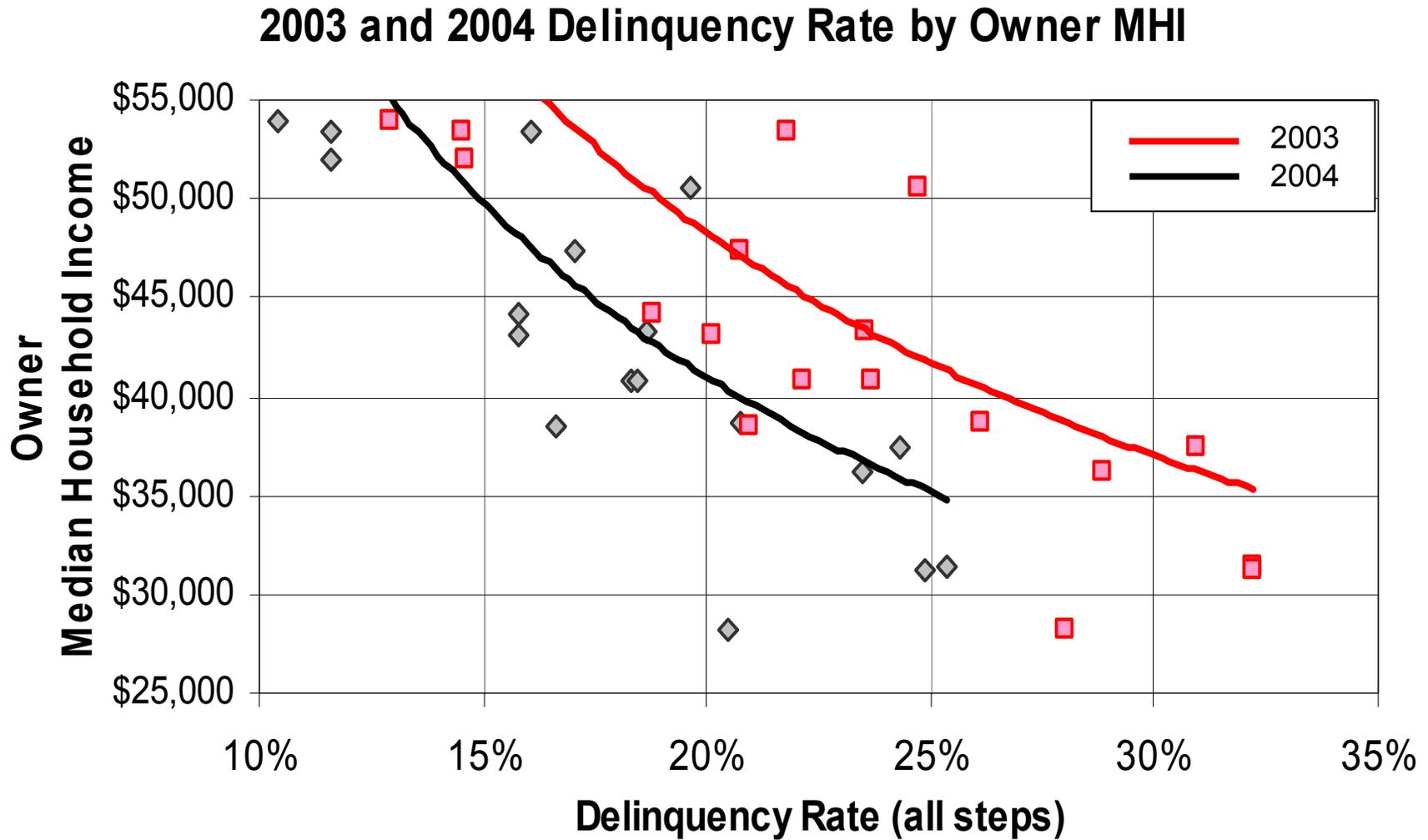


FIGURE V.4.8 Delinquency Rates Rise as a Function of Poverty

Delinquency Percentage by Owner Poverty Rate

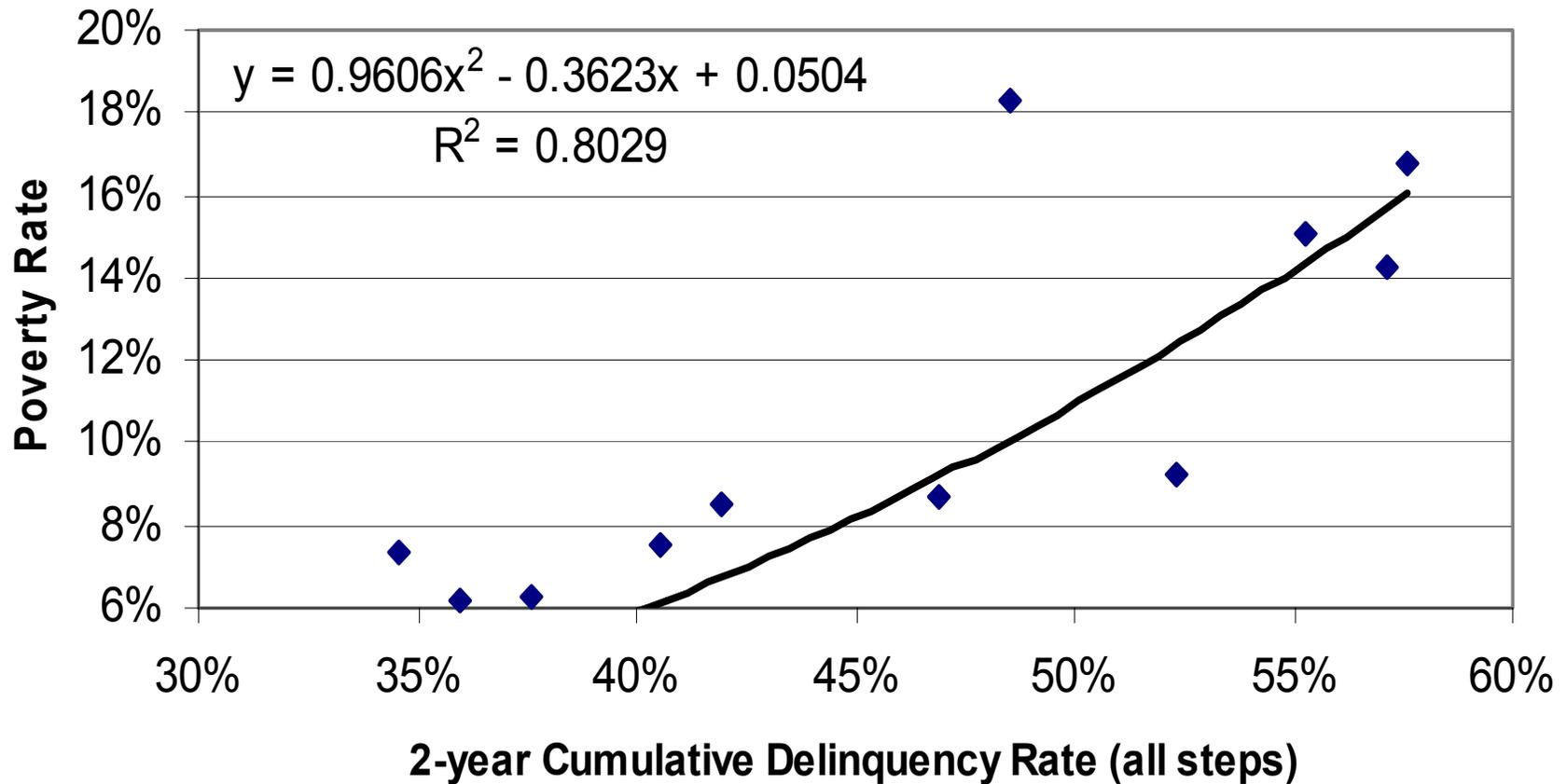


FIGURE V.6.1 Total Untreated Discharges over 30- and 40-year Implementation Periods

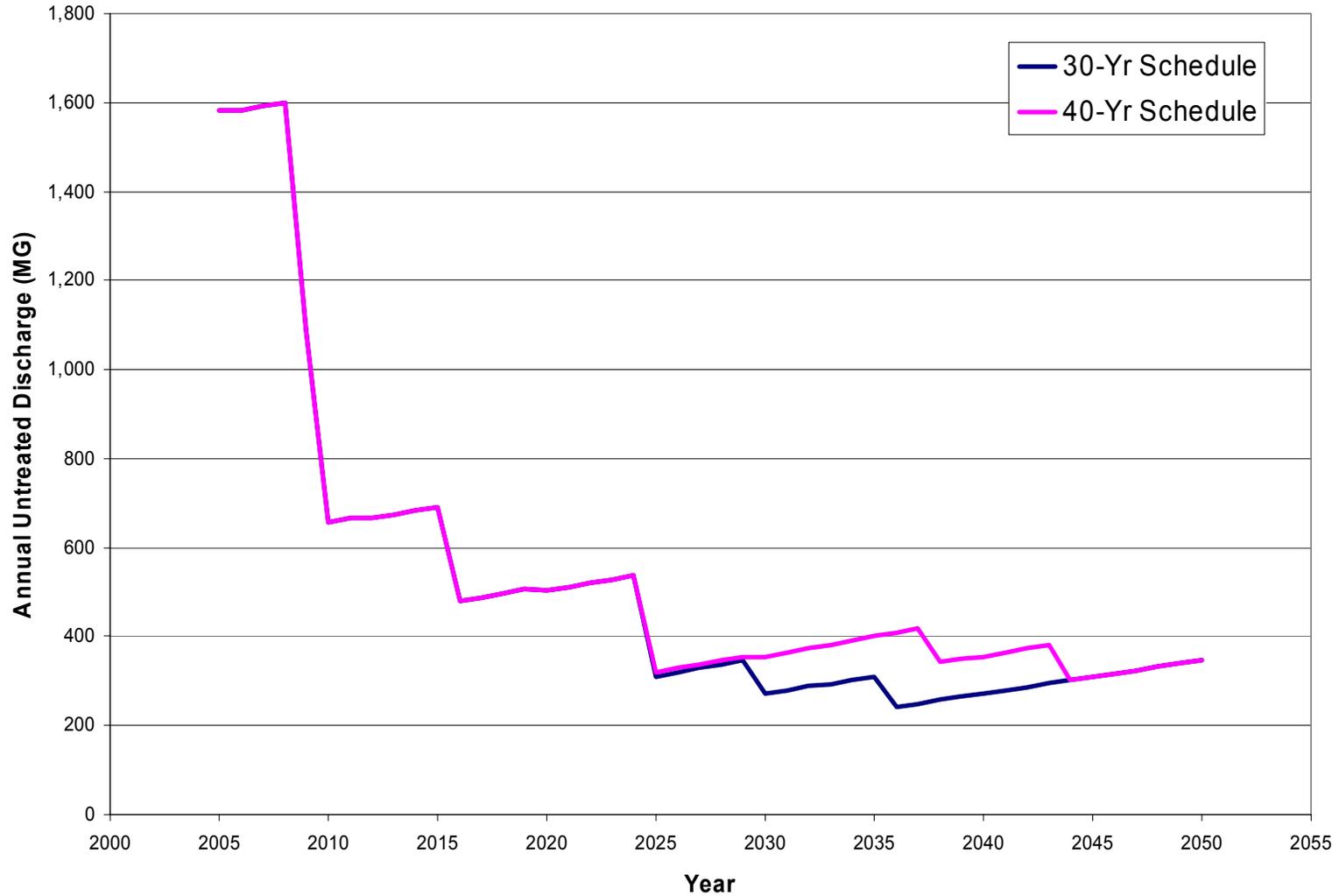


FIGURE V.6.2 Cumulative Reduction of Untreated Discharges over 30- and 40-year Implementation Periods

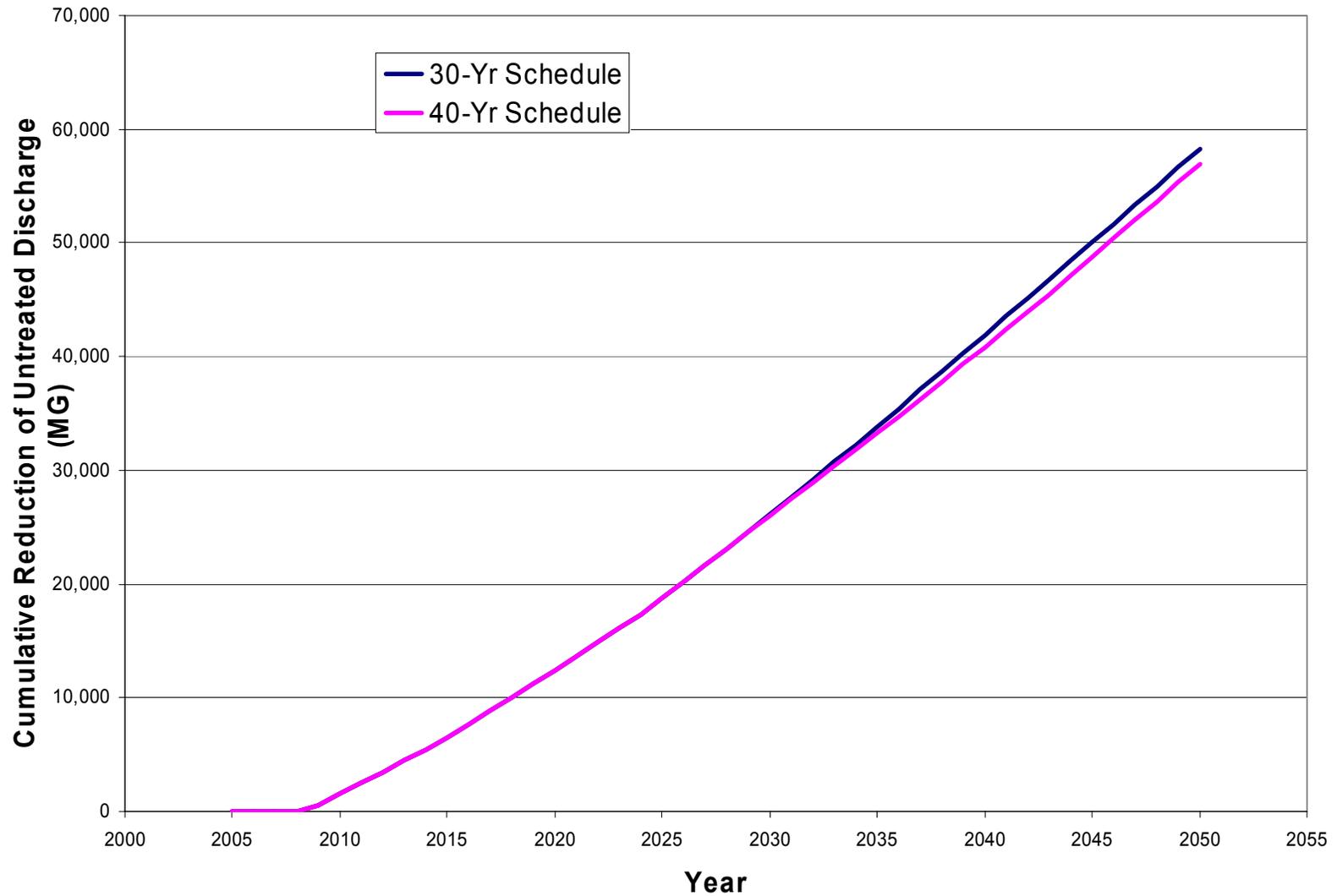


FIGURE V.6.3 Estimated Untreated CSO Discharge Volumes

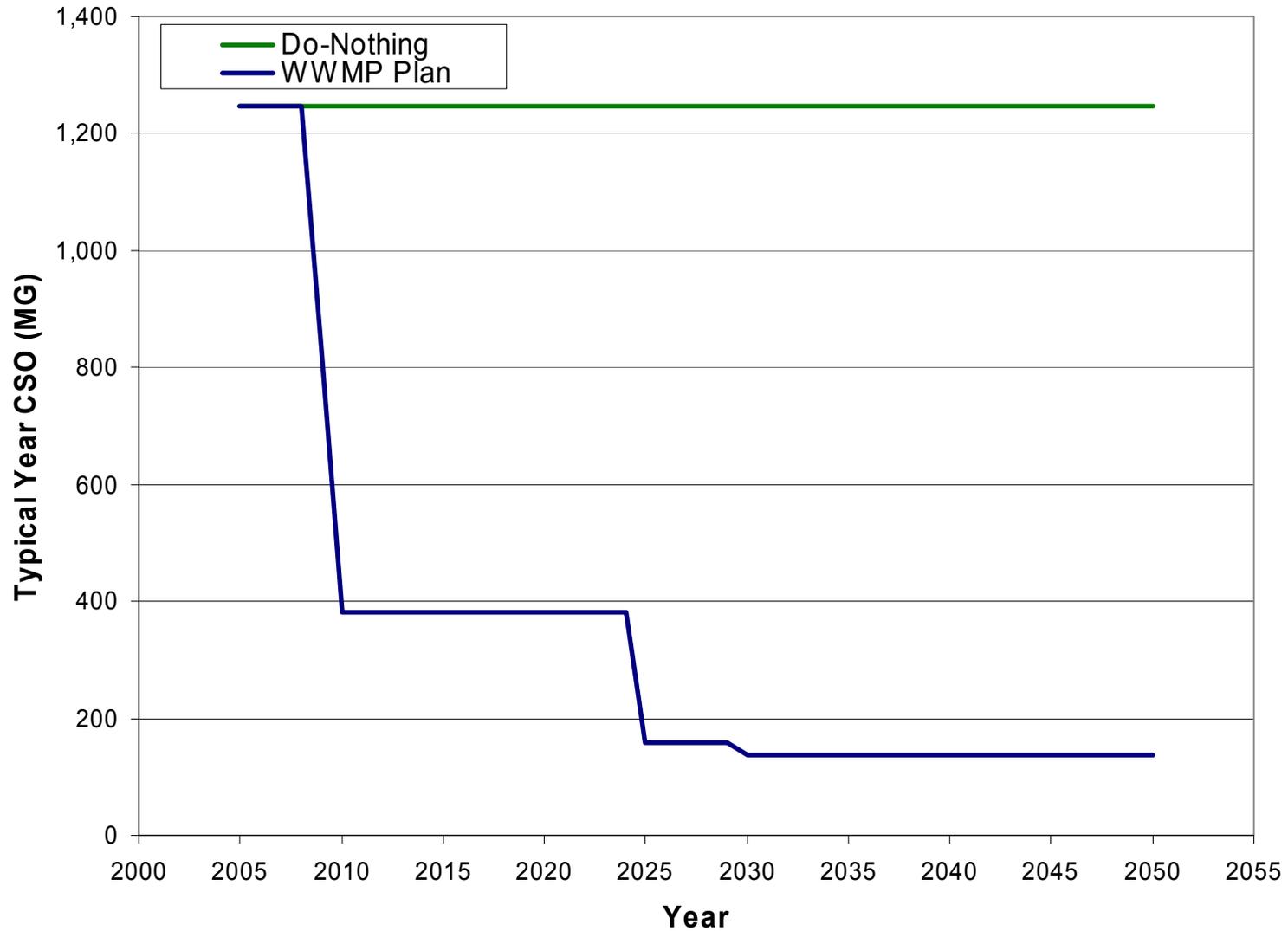


FIGURE V.6.4 Estimated Untreated Discharges (SSOs) from the Designed Sanitary Reliefs (DSR) in the Priority Areas

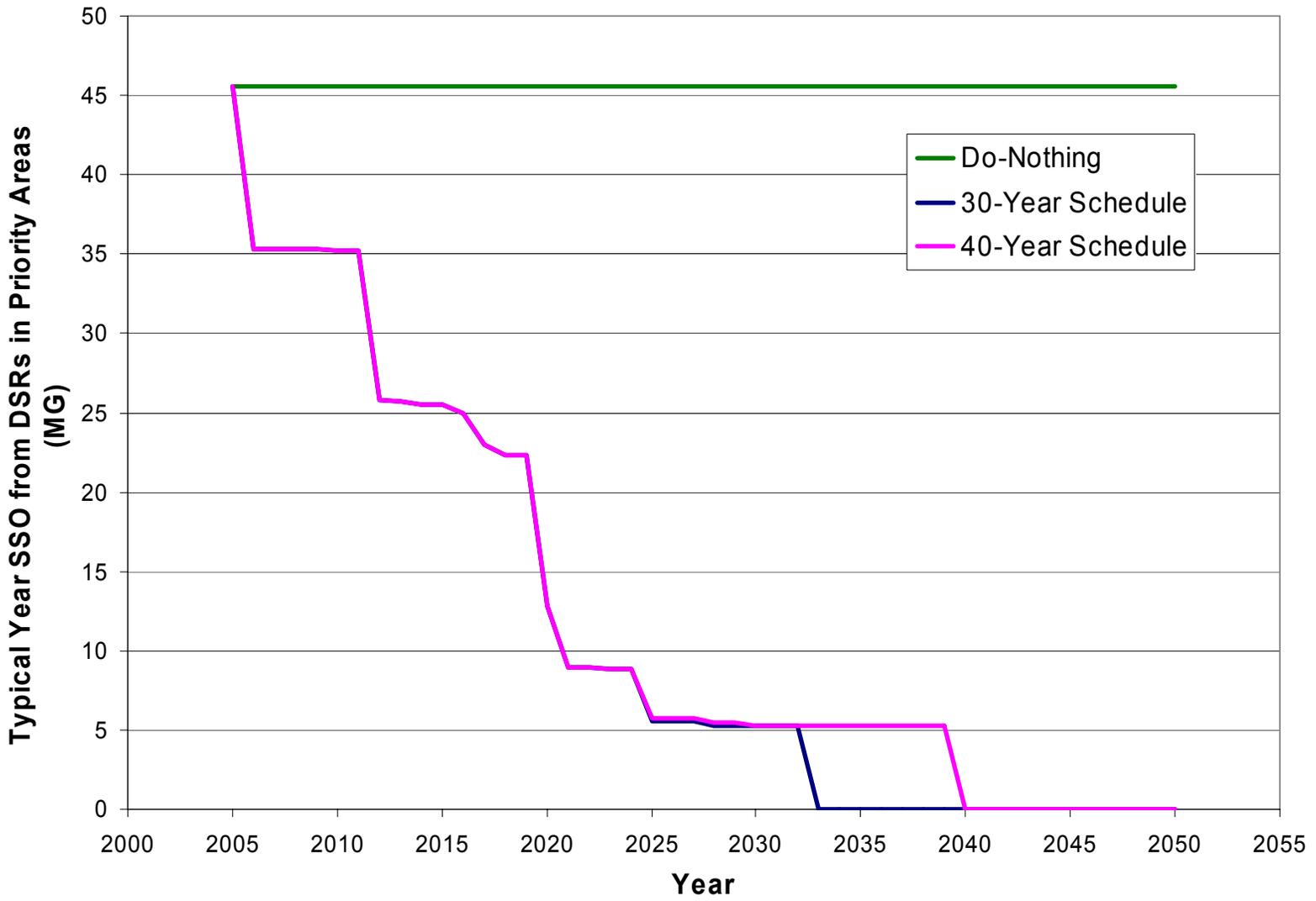


FIGURE V.6.5 Number of Designed Sanitary Reliefs (DSR) Mitigated

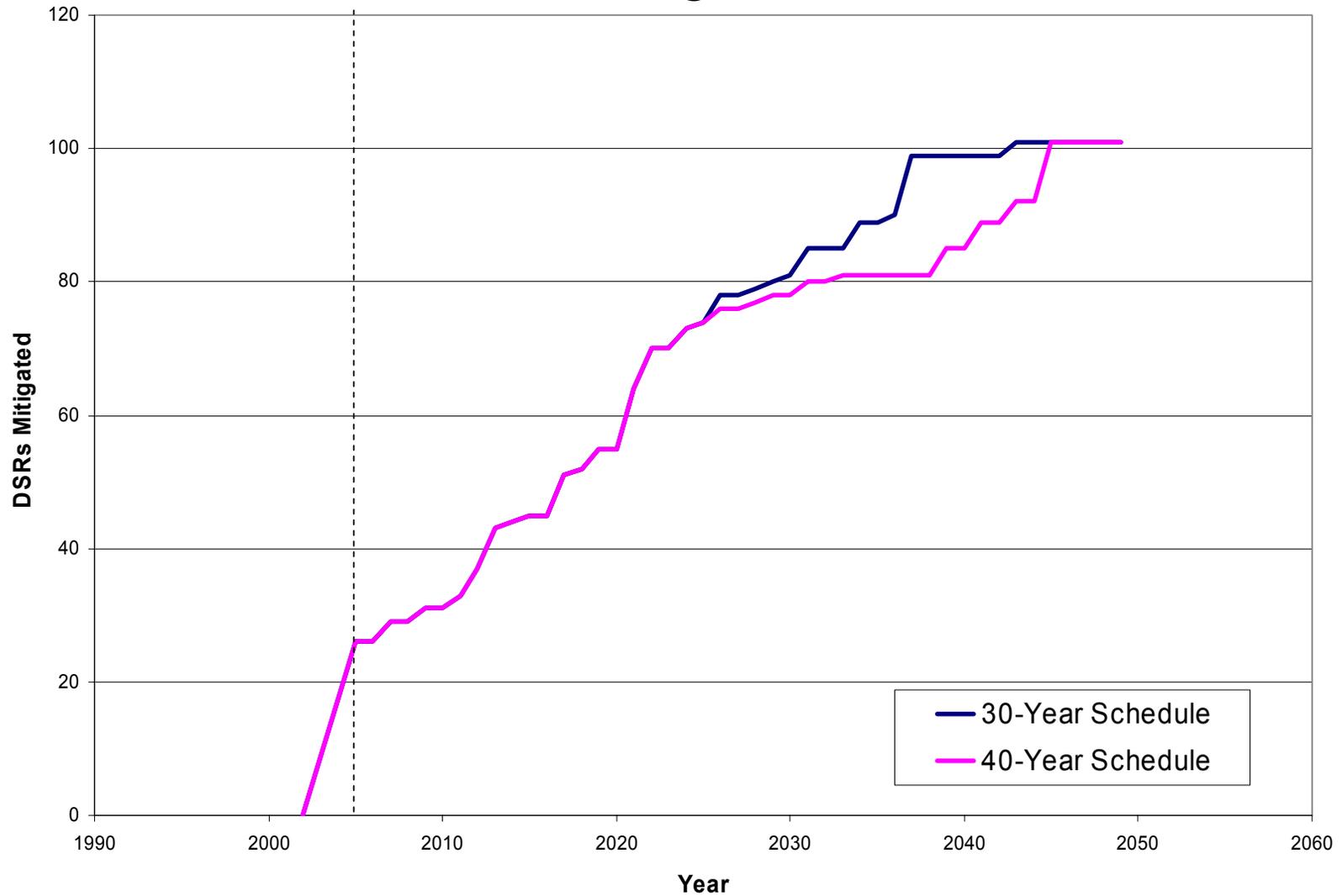


FIGURE V.7.1 Census Tracts at or Below 50% of Service Area MHI

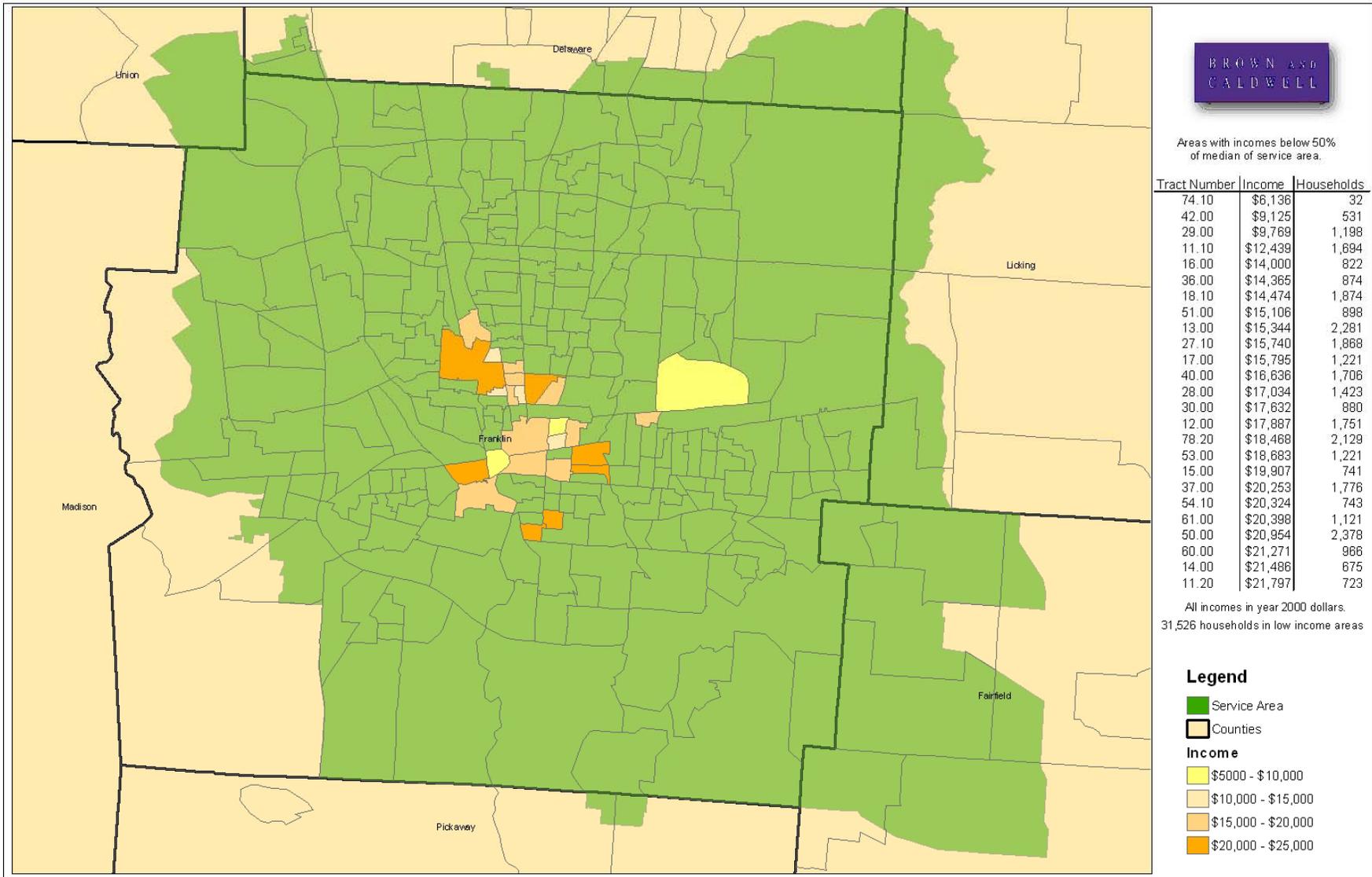


FIGURE V.7.2 Employment Information

**Employment: Franklin County
as % of Comparison Area**

