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GUIDELINES TO ESTIMATING EXISTING AND FUTURE RESIDENTIAL CONTENT VALUES

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This report summarizes a recent series of research efforts by the Institute for Water Resources (IWR) to review and recommend policies and procedures to be used by the U.S. Army Corps of Engineers field offices to estimate the existing and future value of residential household contents. The report summarizes and addresses the problems identified by the Army Audit Agency (AAA) and Corps of Engineers reviewers regarding limited substantiation of base year and forecasted content values in Corps reports.

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GUIDELINES TO ESTIMATING EXISTING AND FUTURE RESIDENTIAL CONTENT VALUES

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PREFACE

This report was completed under the Flood Mitigation, Formulation, Planning, and Analysis research work unit at the Corps of Engineers, Institute for Water Resources (IWR). Mr. Stuart A. Davis is the principal investigator for the research unit. The Flood Mitigation work unit is part of the Planning Methodologies research program, which is under the direction of Mr. Michael R. Krouse, Chief of the Technical Analysis and Research Division at IWR. Mr. Steven R. Cone is the technical monitor of the Flood Mitigation work unit, under the direction of Mr. Robert M. Daniel, Chief of Economics and Social Analysis Branch at the Office of the Chief of Engineers.

The author wishes to acknowledge the considerable assistance in this research from Dr. David A. Moser of the Institute for Water Resources. Mr. William Szymanski of the University of Tennessee made many initial contacts with the insurance industry. Dr. Allan S. Mills of Virginia Commonwealth University assisted in design of the Harris County, Texas, Luzerne County, Pennsylvania and Orange County, California surveys. Dr. Harry H. Kelejian of the University of Maryland provided assistance with the statistical analysis for this research. Dr. Leonard Shadman of the Virginia Polytechnic Institute and State University reviewed this report and provided comments on the recommendations. Ms. Katherine McCleese also prepared several of the tables in this report. Mr. Robert F. Norton provided the technical editing of the document. Ms. Arlene Nurthen was responsible for the document preparation and publication.

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SYNOPSIS

This report summarizes a recent series of research efforts by the Institute for Water Resources (IWR) to review and recommend policies and procedures to be used by the U.S. Army Corps of Engineers field offices to estimate the existing and future value of residential household contents. The report summarizes and addresses the problems identified by the Army Audit Agency (AAA) and Corps of Engineers reviewers regarding limited substantiation of base year and forecasted content values in Corps reports.

POTENTIAL USE OF INSURANCE DATA

Insurance industry sources were contacted for potential sources of content-to-structure (c/s) value data. Those contacts were useful in determining approximate c/s values that the major companies use, based on their experience with total losses. The insurance industry contacts did not produce any analytic empirical report relevant to this research, and only one limited set of data was identified from these contacts. However, the insurance industry contacts did provide a range of c/s ratios which they use for residential policies.

HOUSEHOLD CONTENT SURVEYS

IWR conducted four surveys which produced c/s ratios ranging from 44.2 to 72.7%. The surveys showed that household income, structure value, marital status, size of structure, and tenure are all determinants of content value and all significant in a model that combined cases from the various data bases. The household content surveys also demonstrated that the degree of flood risk, as measured by flood zone, previous flood experience, and the degree of flood threat perception were insignificant in determining the value of household contents. Finally, the surveys tested a methodology that can be readily applied in project specific feasibility studies.

NATIONAL DATA

There has been skepticism over the existence of a residential affluence relationship, which assumes that the real value of residential contents will increase over time with increases in income. However, the U.S. Bureau of Economic Analysis (BEA), in the only National time series data available on content and structure values, shows that over the period from 1958 to 1988, real content values consistently increased at a rate higher than real income. While the BEA data does not demonstrate a predictive relationship between income and content values, it does allow for the possibility of a residential affluence relationship.

RECOMMENDATIONS

It is recommended from this research that:

1. Depreciated replacement values should be generally used for estimates of residential structure values.

2. Based on most insurance company c/s ratios and the results of the surveys done for this research, in the absence of specific information on the study area, a value of 55 percent should be used as the standard c/s value ratio for reconnaissance studies. There is sufficient geographical variation in the data from these survey efforts to warrant that sample surveys generally be done for feasibility studies. In either case, where a standard c/s ratio was used or an area specific survey was conducted, sensitivity analysis should be applied to determine the effect of changes in the c/s ratio on the overall benefit-cost ratio.

3. It should be assumed that flood risk does not affect investment in household contents.

4. The general level of real content value increase is apparent from the BEA data; however, cross-sectional data did not indicate a strong enough relationship between content value and income to produce a reliable forecasting relationship. Further studies are needed to determine if income or other variables might be used to forecast changes in content values.

CHAPTER 1
INTRODUCTION

BASIC DEFINITION

This report is a summary of current research to estimate existing and forecasted residential content values. A valid and consistent definition of contents, which are distinguished from structure and outside property, is fundamental to content value determination. For the purpose of this study, residential contents are defined as items in the home which are not permanently attached to the structure. Any built-in appliances, wall-to-wall carpeting, heating and cooling systems (other than window air conditioners, space heaters, and portable fans), and built-in cabinets and bookshelves, are considered part of the structure. Contents are items kept within the four walls of a home or garage. Any items kept on a porch, patio, shed, or yard are considered outside property. Motor vehicles and boats are also considered outside property, regardless of whether they are kept in or outside of a building.

OBJECTIVES

The research had six major objectives:

1) to summarize and resolve the issues that have been of major concern in making accurate estimates and projections of residential content values.

2) to identify practical sources of secondary data that can be used in making content value estimates.

3) to create an empirical basis for estimating and projecting residential content values.

4) to establish a methodology for Corps districts to use in their own feasibility surveys.

5) to assist in establishing policy guidelines on this issue.

6) to create a series of data bases that can be used to determine existing levels and a long term trend in the growth of residential content values, as well as a greater understanding of the factors that affect the level of content values.

PROBLEM STATEMENT

Content value estimates and projections have been an area of serious contention between Corps field offices and reviewers. At the root of these difficulties has been the dearth of empirical data and lack of localized time series on the change of residential content values over time.

This research was initiated under conditions of limited empirical information and amid many questions regarding the methodologies and resulting numbers to be used in residential content values. The most direct impetus for this study was criticisms by the Army Audit Agency (AAA) of methods found in their review of several Corps projects, where both current and projected content values were questioned.

The issue of residential content values is particularly important because of the generally higher susceptibility of contents to flood damage compared to that of the structure, resulting in a relatively higher contribution of content values to expected annual damages.

CHAPTER 2
TRADITIONAL CORPS METHODS OF CONTENT VALUE ESTIMATING

INTRODUCTION

The Corps methodology has generally consisted of applying a standard percentage to the structure value estimate to determine existing content values. This residential content factor is known as the content-to-structure value (c/s) ratio. Future content values have been determined by using the U.S. Bureau of Economic Analysis (BEA) state and metropolitan projections of income and assuming that the real value of residential contents would continue to increase either at the same rate or at least in proportion to the projected growth in real income. The annual percentage growth rate in real content value, as derived from the projected increase in real income, is known as the "affluence factor", and the resulting benefits from the application of the affluence factor are known as "affluence benefits." Only a small scattering of site-specific empirical work is available to substantiate either the base year content value estimate or the affluence factor. Among these studies are the Passaic River Basin Flood Damage Study (URS Consultants, 1982); the Lake Pontchartrain Hurricane Protection Plan, (U.S. Army Engineer District, New Orleans, 1980); the Pacific Ocean Division's study for Hilo, Hawaii (Environmental Capital Manager, Inc., 1977); and, the post-flood damage survey for Elba, Alabama (Gulf Engineers & Consultants, 1990).

CURRENT CORPS POLICIES ON CONTENT VALUE DETERMINATION

The Corps, like all other Federal water resource development agencies, is subject to the Economic and Environmental Principles and Guidelines for Water

and Related Land Resources Implementation Studies (P&G), U.S. Water Resources Council, 1983. The P&G gives no specific guidance on determining content values, other than determining the value of each structure by flood hazard zone. The P&G does allow for the projection of residential contents based on the regional growth rates for per capita income. The P&G states that: 1) BEA regional growth rate projections of per capita income can be used "as the basis for increasing the real value of residential contents"; 2) contents of new residential units should be projected from the year each unit is added; 3) the projected increase in household contents would be used to project the future increases in content damages; and, 4) projections of the residential c/s value ratio are limited to 75 percent, unless an empirical study indicates otherwise. The projections of c/s ratio, like other projections for flood damage reduction benefits, are limited to a period of 50 years. Any projection made of total content value or anything else for the 50th year would apply to the period beyond the 50th year (ibid, p. 37).

It is important to note that the P&G states that BEA projections of per capita income are to be used as a "basis" for projecting residential content values. It does not indicate that real content values will necessarily rise at the same rate as real per capita income.

The National Economic Development (NED) Procedures Manual-Urban Flood Damage, IWR Report 88-R-2, encourages the use of sampling to determine c/s value ratios for existing conditions. The NED manual indicates how income, among other factors, may significantly influence the ratio and that, at least, a sampling of residences is recommended (pp. V30-V31). The manual details steps used in computing the affluence factor (pp. X10-X11).

In 1990, the Office of the Chief Engineers issued an Engineering Circular, (EC) 1105-2-194, in response to the AAA criticisms. The EC restricted Corps

economists from using baseline estimates or making projections of c/s ratios higher than 50 percent unless an empirical survey of the study area was undertaken. The EC indicated that while the real value of household contents may rise over time as real income increases, there was little evidence to substantiate the affluence factor. The EC indicated that while research and policy initiatives might allow otherwise in the future, "no estimate or projection of content values beyond 50% of structure value could be made without the empirical support of a valid survey in the specific project area." In December 1990, the Corps of Engineers Planning Guidance Notebook (Engineering Regulation 1105-2-100, paragraph 6-180) was revised to include the 50% limit on the estimated base year c/s ratio, unless a higher ratio is documented by a valid survey of the specific project area. The ER also limits any projected increase in the c/s ratio to 50%.

Though not explicitly stated in the regulations, it should be noted that benefits are only applicable to the depreciated value of contents. Claiming benefits for the prevention of damage on total replacement values would be over-counting the benefits. Similarly, contents should only be estimated at their depreciated value. To assume the prevention of contents valued at the undepreciated levels would result in an over-estimation of willingness-to-pay.

CURRENT CORPS POLICIES ON STRUCTURE VALUE DETERMINATION

Engineering Regulation (ER) 1105-2-100 addresses the use of real estate appraisal and assessed value in flood damage reduction studies. Paragraph 6-167 states that depreciated replacement value is the preferred method of valuing residential structures, and that real estate appraisal data and market value data are only to be used if demonstrated to be consistent with the depreciated replacement values.

It is argued in the regulation that because depth-damage functions generally measure the physical loss to a structure as a percentage of the depreciated replacement value, then the "correct measure of structure value, consistent with cost-benefit concepts, is the replacement value less depreciation to the existing (pre-flood) structure." Replacement cost is the cost of physically replacing the structure at that location. Depreciation measures the physical deterioration of the structure and is a function of the remaining useful life of the structure.

INSURANCE INDUSTRY CONTENT-TO-STRUCTURE RATIOS

A commonly accepted practice for determining c/s ratios has been for districts to canvass local insurance agents about the ratio they use in determining total household content values. These ratios were particularly important to insurance companies before the widespread use of replacement value policies, when total content coverage and total content losses were determined almost exclusively as a fixed percentage of structure value. Individual insurance companies established their own c/s ratios.

AFFLUENCE FACTOR

ER 1105-2-351, 13 June 1975, (now rescinded), provided the original background, justification, and authority for the affluence factor. The regulation summarized an investigation which used existing Nationwide sources of data to identify changes in real income, the value of housing stock, and the value of household contents over time. Income and housing stock information was generally available, published by the Bureau of Economic Analysis (BEA) in the Survey of Current Business. A combination of public, including BEA, and private

sources was used to estimate changes in household content stock. Several time series of data were used to determine how residential contents and the national c/s value ratios had changed over time. ER 1105-2-351 shows the average annual growth in the estimated value of stock of residential contents for the United States, categorized by food, clothing, and other non-durables, and furniture and household equipment. These data indicated that the real value of residential content stock per household grew at an annual rate of 3.1 percent during the period from 1955 to 1969. During the same period, average household income grew at an average of 2.4 percent per year. Since the publication of the ER, Corps field offices have often made the assumption that real content values would increase in proportion to income.

Tables 1 and 2 originally appeared as Tables 3 and 4 of ER 1105-2-351. Table 1 indicates the growth of various components of total household contents from the period of 1955-1969, with an annual real increase of 3.1 percent in average household content value. Table 2 shows the increase in the number of households, as well as personal, per capita, household, and family income over the same period. The table shows an increase in real per capita and household income over the same period of 2.5 and 2.4 percent, respectively.

TABLE 1
VALUE OF AVERAGE STOCK OF RESIDENTIAL CONTENTS
PER HOUSEHOLD FOR THE UNITED STATES
1955 - 1969
(1958 constant dollars)

Year	Food	Clothing	Other Non-Durables	Furniture and Household Equipment	Total
1955	46	294	89	2102	2531
1956	47	299	91	2172	2609
1957	46	296	92	2221	2655
1958	48	291	93	2251	2683
1959	49	298	95	2305	2747
1960	47	299	96	2324	2766
1961	47	301	99	2370	2817
1962	48	303	101	2410	2862
1963	47	313	105	2504	2969
1964	48	329	108	2627	3112
1965	49	342	112	2743	3246
1966	50	363	117	2929	3459
1967	51	372	119	3104	3646
1968	50	371	120	3237	3778
1969	49	374	122	3359	3904
Average Annual Percent Change (Rounded to nearest tenth)	.4	1.8	2.3	3.4	3.1

Table is from ER 1105-2-351, 13 June 1975, p. B-7.

Original Data Source: Survey of Current Business, 1965-1973.

TABLE 2
INCREASES IN INCOME AND NUMBER OF HOUSEHOLDS
1955 - 1969

	A	B	C	D	E
Year	Number of Households[1] *(in millions)*	Total Personal Income[2] *(billions of 1958 constant dollars)*	Per Capita Income[3] *(1958 constant dollars)*	Average Income Per Household[4] *(1958 constant dollars)*	Median Family Income[5] *(1972 constant dollars)*
1955	47.9	335.1	1788	6996	6898
1956	48.9	351.3	1831	7184	7357
1957	49.7	359.4	1836	7231	7365
1958	50.5	361.2	1823	7152	7353
1959	51.4	378.6	1873	7366	7769
1960	52.8	389.8	1883	7383	7941
1961	53.5	401.1	1909	7497	8019
1962	54.7	421.9	1968	7713	8247
1963	55.2	438.7	2013	7947	8543
1964	56.0	463.2	2123	8271	8861
1965	57.3	495.4	2235	8646	9221
1966	58.3	526.4	2331	9060	9667
1967	58.8	550.0	2398	9354	9940
1968	60.4	581.3	2480	9624	10381
1969	61.8	607.9	2534	9837	10766
Average Annual percent increase (rounded to nearest tenth)	1.8	4.3	2.5	2.4	3.3

This table is from ER 1105-2-351, 13 June 1975, p. B-8.

Original Sources:

1) A Guide to Consumer Markets, 1971/1972, The Conference Board, p. 46.
2) Computed from Survey of Current Business data, annual July issues.
3) Survey of Current Business, annual July issues.
4) Column B divided by Column A.
5) Economic Report of the President, February 1974, Table C-22, p. 274.

CHAPTER 3
SUMMARY OF MAJOR CONCERNS

The major concerns expressed by AAA and other reviewers include base year content value, including the issues of content value definition: c/s value ratios, real structure values, and the effect of flood risk on content values; and, issues regarding the residential affluence factor: household tenure and succession and changes in insurance industry c/s ratios.

BASE YEAR CONTENT VALUES

Residential content values are particularly difficult to estimate because they are not subject to outward appraisal as are structure values. First, there is no direct method of estimating content values other than an inventory with the cooperation of the resident. Second, while public data sources are available for structure values, such as records of recent home sales and files on the square footage and ages of homes, there are no comparable data on residential contents. Third, it is believed that content values are subject to differences based on socio-economic factors, such as income, tenure, and number and age of residents.

A. Content Definition. This problem was not specifically mentioned by AAA, but it is potentially of major concern. To properly estimate either content or structure value, it is necessary to have valid and consistent definitions for both. Otherwise, even very precise measurements can yield very different results. (See the beginning of Chapter One for a detailed definition.)

B. Content-to-Structure Value Ratios. The standard procedure for estimating residential content values is to multiply structure value by a standard percentage,

or c/s ratio. A district office will often adopt the same c/s ratio for all its flood damage reduction studies regardless of the demographics of the community. Empirical support for these fixed percentages is limited, although there have been a few instances of project- or basin-specific ratios, determined by a survey of the specific area. These empirical studies seldom provide detailed information on the sample, or allow for the application of such factors as income, age, and tenure in determining adjustment factors for content value estimates. The ratios are often the same as the percentages used by local casualty insurance companies for homeowners' policies.

C. Real Structure Values. Whenever a c/s ratio is applied, the accuracy of the content value estimate is dependent on the accuracy of the structure value estimate as well as the accuracy of the c/s ratio. Structure value can be estimated by determining the market value from comparable sales, by determining the capitalized stream of income if the property was rented, and by estimating replacement value minus depreciation. Whatever method is used, land value must be excluded. Ideally, the resulting values from these appraisal methods should be approximately the same, but that is not always the case. Because of these potential differences, it has been recommended that the market value and income approaches only be used when they approximate the depreciated replacement value method.

It was on the basis of structure value estimates that the AAA contested Louisville District's estimate of the current value of residential contents on the South Frankfort Flood Control Project. The AAA argued that, since the real estate values used by the district were overestimated, the resulting project c/s ratios exceeded the 75% limit of the actual value of the structures.

The market values in Frankfort were affected by a downturn in the local economy and a recent severe flood. The effects of both these conditions may

have been temporary. After AAA's initial sampling of market values, subsequent study estimates by Louisville District of depreciated replacement values yielded much higher values (Montgomery, personal communications, 1990).

Market values are also subject to distortions from the other direction. There are areas, such as Orange County and San Francisco, California, where market values, excluding the land, are substantially higher than the depreciated replacement value. ER 1105-2-100 indicates a clear preference for depreciated replacement value as the appraisal method which most closely measures the willingness-to-pay generated by flood damage reduction projects. If real estate appraisal data is used for property values, the process should be verified by comparison with depreciated replacement values (ER 1105-2-100, paragraph 6-167).

D. Flood Risk and Content Values. An uncertain factor in the estimation of residential content values is the extent, if any, that flood risks affect investment in content values. It is possible that risk aversion and incomplete insurance coverage may cause floodplain residents to limit their investments in contents relative to non-floodplain residents. The National Flood Insurance Program (NFIP) does not cover basement items other than washers, driers, and freezers. The NFIP also has coverage limits on total content value and on certain high value items, such as antiques, jewelry, and art work. It might be expected that households would respond by limiting their risk exposure, by reducing the amount of uninsured contents.

RESIDENTIAL AFFLUENCE FACTOR

The affluence factor relates the projected increased value of per unit household contents to the projected increases in real per capita income. Affluence benefits assume that increases in real value of household contents would occur with or without flood protection. Affluence benefits arise as damages are prevented to the amount of expected increased real value of residential contents. The primary criticism AAA had of the selected Corps projects they reviewed was the limited basis for forecasting future household content values. While both P&G and Engineer Regulation 1105-2-100 (prior to the 1990 modifications) allowed the projected household content value to grow to a maximum of 75 percent of structure value, the growth is based on the premise that as income increases household contents increase. The AAA went on to say, "There was no evidence to support the assumption that the value of contents would increase to 75 percent of the structure value."

A. Household Tenure and Succession. In questioning the validity of the affluence factor, AAA quoted an argument made by a consultant to the Assistant Secretary of Army (Civil Works) that "most people would move away as their incomes increase rather than increase the contents of a low value home." The AAA claimed that its insurance industry contacts indicated that the value of contents as a percentage of structure value had not changed appreciably. AAA concluded that "increases in household contents should not be routinely claimed." (Army Audit Agency, Report of Audit: Civil Works Projects, 1989, p. 61.).

B. Insurance Company Content-to-Structure Ratios. AAA claimed that its insurance industry contacts indicated content values as a percentage of structure value had not changed appreciably in quite some time and AAA argued that since the insurance industry has not significantly increased its "Rule-of-Thumb" concerning c/s ratios in a long time, there is no reason to believe the c/s ratio is

changing. One of the projects AAA had reviewed was the Baltimore District's analysis of the Wyoming Valley Levee Raising Project at Wilkes-Barre, Pennsylvania. The Baltimore District had claimed approximately $1,000,000 in annualized benefits, based on projected increases in content values (AAA, Baltimore Report, 1989, p. 11). Content values were projected to increase to the maximum of 75 percent set by the P&G and Corps regulations. In questioning these estimated content value increases, AAA cited insurance industry sources as saying that residential contents as a percentage of structure value had not changed in the previous 10 years (Army Audit Agency, Report of Audit: Selected Civil Works Projects, U.S. Army Engineer District, Baltimore, p. 11).

In review of the Los Angeles projects, AAA also recommended, "When determining flood damages, ensure that a study supports any content value higher than that used by the insurance industry." (Army Audit Agency, Report of Audit: Selected Civil Works Projects, U.S. Army Engineer District, Los Angeles, p. 16.)

CHAPTER 4

REVIEW OF INSURANCE AND OTHER SECONDARY SOURCES

A major goal of this research was to determine whether secondary sources of information could be used to establish either national or regional baseline c/s ratios. If existing sources of information could be used, it would save the Corps the considerable expense of redoing the same work. Insurance companies, research organizations, and government agencies were all contacted during this search of secondary sources.

INSURANCE INDUSTRY

An alternative to the use of individual surveys for each project would be to use insurance industry c/s ratios. To determine insurance company c/s ratios, the largest casualty insurance companies were contacted. These included:

1) State Farm Insurance Company; Bloomington, Illinois
2) Allstate Insurance Company; Northbrook, Illinois
3) Farmers Insurance Company; Los Angeles, California
4) Aetna Insurance Company; Hartford, Connecticut
5) Nationwide Insurance Company; Columbus, Ohio
6) Liberty-Mutual Insurance Company; Boston, Massachusetts

Together, these companies account for approximately 42% of the homeowners' insurance market. These companies have all established residential content coverages as a percentage of the depreciated replacement value of the structure. None of the companies contacted could cite any study from the last 30 years or data that were used in establishing these ratios. The percentages are based on what their claims have been when the contents were nearly or completely destroyed.

State Farm is the largest carrier of residential casualty insurance. In the 1950s, a State Farm survey of residential c/s values indicated a ratio of 40% on actual cash value policies. "Actual cash value" is equivalent to depreciated replacement value. This ratio has increased to 55% on actual cash value policies, using a ratio of the depreciated value of contents to the replacement value of the structure. On replacement value policies, which constitute 80% of the policies written, State Farm reported that it had used a 55% c/s value ratio some time ago. "Over the years," this ratio has increased to 75% mainly because of increased mechanization of the household, and a lot of new products. The 75% was described by State Farm as still being insufficient in many instances and 100% was being considered (Pierson, personal communications, 1991). In a 1992 review, State Farm tested the adequacy of the 75% limit on replacement value coverage. State Farm determined that the residential replacement value of content loss claims exceeded 75% of the structure replacement value in 75 or 54% of 138 large loss claims. In 31 or 22% of the 138 claims, replacement values exceeded the 75% limit by over 50%.

Allstate uses a c/s value of 50% for actual cash value homeowners' policies, based on a ratio of depreciated replacement value to the undepreciated structure value, and 70% on policies which are based on replacement values of both structure and contents (Palmer, personal communications, 1991).

Aetna still uses 50% for its standard c/s ratio, where contents are defined strictly by the actual cash value and structure value is measured by the undepreciated replacement value (Clark, personal communications, 1991).

Nationwide Insurance Company uses a ratio of 55% on policies with contents insured at actual cash value, and 75% when contents are insured at their replacement value and structure is measured by the depreciated replacement value (Carlson, personal communications, 1991).

Liberty-Mutual allows homeowners to set their own content coverages and then premiums are adjusted accordingly. A suggested minimum coverage is 50% for contents insured at actual cash value, 70% for standard replacement value coverage, and 75% for those households with significant valuables (Waskon, personal communication, 1991).

Farmers Insurance Company indicated they used a c/s ratio of 50% for actual cash value policies, with depreciated content values taken as a proportion of the replacement value of the structure. (Kaz, personal communication, 1991).

None of these ratios covers the full costs of jewelry, furs, fine arts, photography equipment, or tools. Nationwide Insurance estimated that 20 to 30% of their policy holders have riders to allow additional coverage on these items.

OTHER SECONDARY SOURCES

Other existing sources of information considered in this investigation were the U.S. Census Bureau, the U.S. Department of Energy, the U.S. Bureau of Economic Analysis (BEA), probate records, and research organizations.

The BEA offers a very valuable source of time series data on the stock of household contents and the stock of household structures. A detailed discussion of the BEA data and its significance for estimating residential affluence is described in Chapter Seven.

Census data are useful in determining income, family size, and average tenure for census tract or community. Census data include very limited information on household contents. The only information available is on the number of kitchens with various appliances and the number of homes with

televisions and telephones. There is no information on the value of these items. The most valuable census report is the American Housing Survey for the United States, which is published every two years. The survey gives the number of households with refrigerators, ovens, dishwashers, washing machines, dryers, and window air conditioners by appliance age of less than five years old and five years old or greater. These figures are broken down by homeowner and renters. The housing survey has numerous useful aggregated statistics, such as average household size, average tenure, and home value-to-household income ratio.

Another potential reference is the Department of Energy's triennial survey of housing characteristics. Housing Characteristics includes information on the number and percent of all households with certain energy consuming appliances.

Probate records have been suggested as a potential source of content value information. These data, however, have numerous problems: 1) The records usually contain information on elderly people who do not have joint property; 2) personal property in probated estates is generally distributed among the heirs and appraisals are rare; 3) when appraisals are made, they are usually only for the most valuable estates; 4) since probate records are rarely based on appraisals, information is often erroneous; and, 5) since there is limited need for aggregate data, probate records are seldom computerized.

Another potential data source is the E. H. Boeckh and Company publication, Apartment and Condominium Personal Property Cost Guide. The Boeckh guide allows for determining content values for apartments and condominiums by knowing the size of the apartment, the quality of the building, and the region of the country. No similar guide yet exists for single family homes. However, the Boeckh Company has plans to compile such a guide. The research for this guide will consist of professional appraisals of the contents of several hundred homes (Viehweg, personal communication, 1991).

CONCLUSIONS

This investigation of secondary sources was done to determine if any data could be used to easily establish a baseline or projected level of content value. Of all the secondary sources investigated, only the insurance industry c/s ratios, and the BEA time series data for the stock of consumer durables and non-durables and the value of household stock were potentially useful in estimating content values. While there was no recent insurance industry study that could be used in estimating residential values, industry contacts were useful in identifying approximate c/s ratios based on experience with total losses. The BEA data were useful in determining the growth of residential contents relative to income. Analysis of BEA data is summarized in Chapter Six.

CHAPTER 5
HOUSEHOLD CONTENT SURVEYS

OVERALL OBJECTIVES

The secondary data sources described in Chapter Four did not provide a sufficient base for estimating residential content values. Surveys were evidently going to be necessary to estimate residential content values. Both personal interviews and mail surveys were conducted. These surveys were conducted: 1) to establish a methodology that could be applied by Corps field offices; 2) to establish baseline c/s ratios for the communities in which they were applied; 3) to determine a reasonable c/s ratio that might be used in reconnaissance studies in lieu of any area-specific information; 4) to identify the major variables that influence content value and determine if they can be used in a regression model for estimating content values; 5) to determine if the degree of flood risk was a significant determinant of content value; and, 6) to determine if results could be compared with future surveys at the same locations to establish a time series of residential content data. Regression analysis was considered the most effective statistical procedure for determining the direction and level of significance of each variable.

PERSONAL INTERVIEW SURVEYS

The personal interview surveys used in these case studies were multi-purpose instruments. The surveys were used to determine flood warning response and depth-damage relationships, as well as residential content and structure values. The content survey was also conducted in the hope of finding the magnitude and effect of the primary determinants of content value, so that a

model could be developed for estimating content values at other locations and at other points in time.

PETERSBURG-MOOREFIELD, WEST VIRGINIA SURVEY

The survey instruments were lengthy, but skilled and persistent interviewers were able to maintain respondent interest and complete most of the surveys. The Petersburg and Moorefield surveys were performed in conjunction with feasibility studies being done by the Baltimore District, Corps of Engineers. The Petersburg and Moorefield surveys contained a separate list of items for each room for valuing household contents. The first priority the interviewers were given was to obtain the actual cash value of each item. The interviewers were given a suggested range of low, medium, and high values for each item. Estimated values of depreciated items were then adjusted downward, based on age and condition. Depreciation was based on interviewer judgement and not on a depreciation table. Estimates of structure value were determined by county tax assessment records. Land values were deducted from these structure value estimates.

In addition to the content questions, respondents were asked the age and number of rooms of their homes, the number of residents, the age of the principal wage earner, the residents' level of education, marital status, and income.

The Petersburg and Moorefield surveys were done in a stratified, random order. The homes were divided into seven building types based on the number of stories and whether there was a basement. Residents were selected for interviews, randomly, from each building category in proportionate numbers to each building type. Due to a number of incomplete interviews, the final sample may not be in the same proportion as originally planned.

There were approximately 75 surveys between the two communities complete enough to calculate individual c/s ratios. The average c/s ratio for the sample was 50.0%. The mean value for the c/s ratios content and structure values of the West Virginia survey are given in Table 3.

TABLE 3
PETERSBURG-MOOREFIELD, WEST VIRGINIA
SAMPLE MEANS

	N	Minimum	Maximum	Mean	Std Dev
C/S RATIO	75	.053	1.961	.500	0.338
TOTAL CONTENTS	75	3490.	57590.	13373.	9314.
ASSESSED VALUE	75	5187.	101621.	31581.	19307.

Regression analysis of the Petersburg-Moorefield data was completed with the backward elimination procedure. The backward procedure removed variables, beginning with the least significant. The less significant of any pair of overly correlated variables (subject to excessive multicollinearity) were also eliminated. Some of the variables were put in a log format so that the variables would generally be at a similar level of magnitude. This had the effect of putting the one-decimal number of residents and 5- or 6-digit structure value variables on a similar scale. The coefficients of the independent log variables represented the elasticity of content values with respect to that variable. For example, if log of income had a coefficient of .2, then the total value of contents would increase by 20 cents for each additional dollar of income.

Table 4 gives results of the regression analysis for Petersburg and Moorefield:

TABLE 4 REGRESSION ANALYSIS FOR PETERSBURG AND MOOREFIELD, WEST VIRGINIA			
IC = 7.820	+ .097*R	+ .270*E	+ .230*M
t = (27.20)	(2.56)	(4.02)	(1.75)
stb =	(.274)	(.432)	(1.86)
R^2 = .348			

where:

IC = log of total content value
R = number of rooms
E = years of education
M = resident is married

Variables eliminated from the model are also important to help determine whether there should be a priority to include them in any future model.

Table 5 lists the variables eliminated from Petersburg and Moorefield regression.

TABLE 5
VARIABLES REMOVED FROM THE
PETERSBURG-MOOREFIELD REGRESSION

Step	Variable Removed	T
1	Number of Residents	0.11
2	Age of Home	0.59
3	Age of Principal Wage Earner	0.68
4	Log of Income	0.54
5	Log of Assessed Value	1.08
6	Resident is Single	1.40
7	Resident is Widowed	1.40

Years of education was determined to be the most significant factor. Number of rooms (a proxy for square feet) and whether the respondent was married were also determined to be significant variables in the regression. Education, number of rooms, and married all had positive signs. They all had a positive influence on content value. The standardized beta coefficients indicated that education was the most important independent variable in the regression, followed by number of rooms and married. The West Virginia communities were the only case study where education was a significant variable. Education may directly increase a household's ability to acquire more contents, it increases potential earnings and increases the awareness and demand for various products and may lead individuals into careers which require more expensive attire. Number of rooms, which was an indicator of the size of the home, just as square feet was in other regressions, was an important determinant of structure value. Overall, the regression had an R^2 of .348 and was significant at the .9997 level. The West Virginia survey was the only case where income was not a significant variable in determining content values. The population had a consistently low income level. The mean income was only $14,218.

HARRIS COUNTY, TEXAS SURVEY

The Harris County, Texas survey was performed in conjunction with Galveston District's feasibility studies of Cypress Creek and Greens Bayou. The survey form was a modified version of the West Virginia survey, with the same set of objectives. Household items were again surveyed by room, with questions on the age and replacement cost of each item. Suggested low, medium, and high values for each item were listed on each page.

Depreciated replacement values for the Harris County structures were calculated using the Marshall-Swift Residential Estimator Program. These

calculated structure values were a function of size in square feet, quality and condition of the structure, effective age (a measure of depreciation), building materials, and other features such as presence of garages, fireplaces, and porches. The size and portion of basement area that was finished was usually an important consideration in calculating structure values. However, there are virtually no basements in the Houston area. As a basis of comparison to the depreciated replacement value, respondents were asked the approximate market value of the home.

In addition to the content and structure value questions, respondents were asked the number of residents, the age of the principal wage earner, level of education, marital status, income, tenure at that residence, market value estimate and previous flood experience.

For the tabulation of the content value data, a depreciation schedule was established using a modification of insurance company data. All items were depreciated on a straight-line basis, except for some, like silverware and china, which were depreciated by a flat percentage multiplier, and others, such as paintings and antiques, which were not depreciated.

The Houston survey had 152 cases which were complete enough to calculate c/s ratios. The mean values for the c/s ratio, market value, and depreciated replacement values for the survey are shown in Table 6.

TABLE 6 HARRIS COUNTY, TEXAS SAMPLE MEANS					
Variable	N	Minimum	Maximum	Mean	Std
C/S RATIO	152	0.096	2.541	0.466	0.327
TOTAL CONTENTS	152	5648.	148070.	41714.	23348.
MARKET VALUE	126*	8200.	205000.	75478.	25173.
DEP. REPL. VALUE	152	10680.	197625.	103056.	41184.

*The smaller N is because of 26 respondents who said they did not know the market value of their home.

The Harris County survey is a excellent example of the potential difference between market value and depreciated replacement values. Note that in this sample the average depreciated replacement value was $103,056, while the average structure market value, excluding land, was $75,478. The average depreciated replacement value was 36.5 percent higher than the average market value. This is due to the depressed Harris County real estate market at the time of study.

The backward regression procedure for the Houston data yielded the equation given below in Table 7:

TABLE 7 REGRESSION ANALYSIS FOR HARRIS COUNTY, TEXAS				
IC =	2.050	+ .135*II	+ .574*1Dr	+ .020*Ah
t = stb =	(1.43)	(1.97) (.195)	(4.47) (.533)	(2.13) (.224)
R^2 = .308				

where:
IC = log of total content value
II = log of income
IDr = log of depreciated replacement value
Ah = age of the house

Table 8 lists the variables eliminated from the Harris County regression:

TABLE 8
VARIABLES REMOVED FROM THE HARRIS COUNTY REGRESSION

Step	Variable Removed	T
1	Number of Residents	0.05
2	Previous Flooding	0.25
3	Own or Rent	0.50
4	Level of Education	0.54
5	Log of Structure Value	0.79
6	Log of Square Feet	1.00
7	Tenure	1.22
8	Age of Principal Wage Earner	1.01

The depreciated replacement structure value, income, and age of the home were all significant variables in determining content value. They all had positive coefficients, indicating that people with higher incomes, more valuable homes, and older homes all had higher content values. The standardized beta coefficients indicated that depreciated replacement value had by far the greatest influence on content value, indicating the importance of size, quality, and condition of the structure in determining content value. The backward elimination procedure selected the replacement value measure as being more important than market value. In this log format, the coefficients of income (.144) and depreciated replacement value (.554) both represent the elasticity of contents with respect to income and depreciated replacement value. For every dollar increase in income, there is a 14 cent increase in content value, and for every dollar increase in depreciated replacement value, there is a 55 cent increase in depreciated replacement value.

"Previous flood experience" had a 't' value of only .25, and was the second variable eliminated from the model. This indicated that flood risk had little influence on content investment, and the positive sign of the previous flood variable indicated even more ambiguity in the effect of flood risk on content investment.

MAIL SURVEYS

The Wyoming Valley and Santa Ana surveys was the first attempts to use a mail questionnaire to determine residential content values and c/s ratios. The mail survey was believed to be less expensive for large geographic coverage and a potentially more effective way of having a random sample. The Wyoming Valley Levee Raising Project in Luzerne County, Pennsylvania and the Santa Ana Flood Control Project in Orange County, California are major Corps of Engineer

flood control projects in contrasting settings where c/s ratios have been a major issue. The survey was designed to calculate separate c/s ratios for the two study areas. These results could also be compared with those obtained in a time series with future surveys of the area to determine the change in content values and the c/s ratio. The Baltimore and Los Angeles Corps of Engineer Districts cooperated in these investigations.

Depreciated replacement values for the mail questionnaire were determined through a series of questions from the Marshall-Swift Residential Estimator Program. These included questions about number of stories, square footage, age of structure, zip code, type of building, building material, size and finished area of basements, garages, and amenities. Since there was no opportunity to visit these homes, it was necessary to make some assumptions about the effective age, quality, and condition of each home. It was assumed that, for most homes, significant upkeep would occur that would reduce the effective age of the structure. It was assumed that the effective age was generally one-half the actual age. Quality and condition of structures were determined for each zip code, based on discussions with individuals very familiar with each area. Further adjustments were made in the effective age estimates based on Marshall-Swift formulas of the effect of quality and condition.

To test the significance of flood risk as a major determinant of content investment, it was decided to establish clearly defined study area boundaries, which would include locations with little or no flood risk, just outside the study areas. All respondents in the Luzerne County and Orange California surveys were given color-coded survey forms. These forms would indicate if the respondents were in the 100-year floodplain, the 100- to 500-year floodplain, or outside the 500-year floodplain. Both the Pennsylvania and California locations were divided into the three flood risk zones. A sample from both populations was

drawn from lists of randomly selected listed and unlisted telephone numbers. Equal numbers were selected from each flood zone in both states.

Background questions were also included on whether that residence had been previously flooded and how the respondent would assess the degree of flood risk. Respondents were asked to rate the degree of flood risk in their neighborhood on a 1 to 5 scale.

A total of 4,737 households were contacted by phone and 2,808 agreed to participate in the survey. A total of 672 questionnaires were returned, including 425 from Luzerne County and 247 from Orange County. However, only 208 of the Luzerne County returns and 179 of the Orange County returns were complete enough to use in the c/s ratio calculations and regression analysis.

Another major objective was to test the feasibility of conducting a content inventory with a mail questionnaire. There was no certainty as to whether there would be a sufficient number of complete responses to a necessarily time-consuming and very personal survey. Also, one-third of the original sample of residents would have no direct benefit from any flood control project. A number of measures were taken to increase the response to the survey. These included: 1) pre-survey telephone screening; 2) keeping the surveys completely anonymous; 3) encouraging the respondents to keep a copy of their responses for insurance purposes; and, 4) follow-up mailings to those who had not responded.

TABLE 9 LUZERNE COUNTY, PENNSYLVANIA SAMPLE MEANS					
Variable	N	Minimum	Maximum	Mean	Std Dev
C/S RATIO	208	0.102	2.408	0.727	0.529
TOTAL CONTENTS	208	5185.	125665.	36246.	21299.
MARKET VALUE	182*	10620.	332500.	67953.	38178.
DEP. REPL. VALUE	208	12238.	342954.	60343.	35809.

*The smaller N is because 26 respondents did not answer the question regarding the market value of their home.

The backward regression procedure for the Houston data yielded the equation given below in Table 10:

TABLE 10 REGRESSION ANALYSIS FOR LUZERNE COUNTY, PENNSYLVANIA						
IC=2.678	+.183*II	+.004*T	+.300*ISf	+.284*ISv	+.436*M	+.344*W
t=(2.19) stb=	(2.27) (.179)	(1.88) (.198)	(2.43) (.131)	(2.51) (.198)	(3.96) (.307)	(1.86) (.152)
R^2 = 0.256						

where:

IC = log of total content value
II = log of income
T = tenure (length of time at that residence)
ISf= log of square feet
ISv= log of structure value
M = married
W = widow

Variables were removed with the backward regression procedure in the following order:

Table 11 lists the variables eliminated from the Luzerne County regression:

TABLE 11
VARIABLES REMOVED FROM THE
LUZERNE COUNTY REGRESSION

Step	Variable Removed	T
1	AGE OF PRINCIPAL WAGE EARNER	0.07
2	500-YEAR FLOOD PLAIN	0.40
3	RESIDENT IS SINGLE	0.48
4	100-YEAR FLOOD PLAIN	0.68
5	LOG OF DEPRECIATED REPLACEMENT VALUE	0.50
6	YEARS OF EDUCATION	0.63
7	NUMBER OF RESIDENTS	0.87
8	AGE OF HOME	1.08
9	OWN OR RENT	1.29

The Luzerne County regression analysis produced the most elaborate model. Six variables were found to be significant, with 't' values of .186 and higher, including married, log of market value, log of square feet, log of income, tenure, and widowed. Only the dummy variable, indicating the respondent was married, which had a 't' value of 3.96, and a standard beta coefficient of .307 was particularly higher. The market value, income, and square foot variables had elasticities of .198, .179, and .131 respectively. Overall, the regression had an R^2 of .256 and was significant at the .9999 level.

TABLE 12
ORANGE COUNTY, CALIFORNIA
SAMPLE MEANS

Variable	N	Minimum	Maximum	Mean	Std Dev
C/S RATIO	174	0.105	2.029	0.442	0.319
TOTAL CONTENTS	174	7124.	336172.	45946.	38983.
MARKET VALUE*	152	19750.	560000.	171829.	91353.
DEP. REPL. VALUE	174	44315.	310208.	104027.	40122.

*The smaller N is because 22 respondents did not answer the question regarding the market value of their home.

The backward regression procedure for the Houston data yielded the equation given below in Table 13:

TABLE 13 REGRESSION ANALYSIS FOR ORANGE COUNTY, TEXAS				
IC = -2.711	+ .440*II	+ .712*IDr	+ .254*M	+ .468*W
t = (-1.63) stb=	(4.71) (.334)	(4.53) (.328)	(2.25) (.164)	(2.42) (.169)
R^2 = 0.32				

where:
IC = log of total contents
II = log of income
IDr = log of depreciated replacement value
M = married
W = widowed

Table 14 lists the variables eliminated from the Orange County regression:

TABLE 14 VARIABLES REMOVED FROM THE ORANGE COUNTY REGRESSION		
Step	Variable Removed	T
1	Tenure	0.23
2	Own or Rent	0.27
3	Log of Structure Value	0.20
4	Single	0.52
5	Number of Residents	0.50
6	Years of Education	0.63
7	Age of House	0.77
8	100-Year Floodplain	0.94
9	Log of Square Feet	0.98
10	500-Year Floodplain	1.02
11	Age of Principal Wage Earner	1.65

The regression model for Orange County was the strongest fit of the case studies. It produced an R^2 of .372 and was significant at the .9999 level. Four variables, all with positive coefficients, were significant, including log of income, with an stb. of .334; log of depreciated replacement value, with an stb. of .328; married, with an stb. of .164, and widowed, with an stb. of .169. These variables were consistent with the other case studies. The regression indicated that contents increased 44 cents for each dollar increase in income and 71 cents for every dollar increase in depreciated replacement value.

Regression analysis on both samples, using total content value as the dependent variable, found neither the flood zone nor the flood risk variable significant in any of the regressions.

An analysis comparing different flood zones found that there was no significant difference between the mean c/s ratio of the flood zones in either community at the 95% level of confidence limits. At the 90% confidence level, there was no significant difference between the c/s ratios between zone A and zone C. There was also no significant difference when the two flood risk zones were combined and compared to zone C. In both samples, zone B had a significantly lower ratio than zone C at the 90% confidence level. Since the flood zone and flood risk factors were insignificant in the regression equations, it is probable that the small differences between c/s ratios from zone B to zone C may well be due to other factors. On the basis of this evidence, it is concluded that flood risk does not significantly reduce household content investment for either community.

To further explore the issue of household tenure and succession of floodplain residents, a comparison was made between the flood and the flood-free samples. To examine the theory that floodplain residents move out as their incomes increase, floodplain residents would have to demonstrate substantially

lower incomes and shorter tenures at the same time. Table 11 gives the income and tenures for the Luzerne and Orange County floodplain and flood-free areas. (It should be noted that the term "flood-free" is relative in this context. At least some of the people living in Zone C, outside the 500-year floodplain, are subject to some flood risk.)

A hypothesis test for the above data, based on 'z' statistics, indicated that there is 86.2% confidence that the Luzerne County floodplain and flood-free population means for income are different; there is 97.7% confidence that the Luzerne County floodplain and flood-free population means for tenure are different; there is 99.9% confidence that the Orange County population means for income are different; and there is 93.1% confidence that the Orange County population means for tenure are different.

These data indicate that in neither the Luzerne nor Orange County samples do both the income and tenure conditions exist that would substantiate the theory that floodplain residents move out as their incomes increase. Although the Luzerne County flood-free residents have a slightly shorter tenure, they also have higher incomes than the flood-free respondents. Although the Orange County flood-free sample had a higher income than the floodplain respondents, the floodplain respondents had a longer tenure.

A final consideration regarding the Luzerne County and Orange County case studies involves the question of why the Luzerne County c/s ratio is so much higher. A new variable was computed to measure the ability of the respondents to afford household purchases. "Afford" equals household income divided by the market value of the home, including land. "Afford" equaled .518 for Luzerne County and .251 for Orange County. "Afford" was not used in the regressions because of potential multicollinearity with the income variable. While "afford"

cannot be used in the same model with income, it is still useful as an easily obtained indicator of whether there might be a high or low c/s ratio.

TABLE 15
COMPARISON OF LUZERNE AND ORANGE COUNTY FLOODPLAIN AND FLOOD-FREE INCOME AND TENURE

Luzerne County Floodplain					
Variable	N	Minimum	Maximum	Mean	Std Dev
Income	120	5000	167500	36625.00	25545.83
Tenure	123	1	82	21.39	17.62
Luzerne County Flood-Free					
Variable	N	Minimum	Maximum	Mean	Std Dev
Income	76	5000	85000	33157	18741
Tenure	80	1	81	27.04	21.07
Orange County Floodplain					
Variable	N	Minimum	Maximum	Mean	Std Dev
Income	100	15000	112500	55275	25907
Tenure	106	1	37	14.20	10.33
Orange County Flood-Free					
Variable	N	Minimum	Maximum	Mean	Std Dev
Income	62	15000	167500	73790	39876
Tenure	66	1	40	12.64	11.63

CHAPTER 6
BUREAU OF ECONOMIC ANALYSIS DATA

The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) collects annual data on the domestic purchases of residential durable and non-durable goods in the United States. Data on these domestic purchases are published monthly by BEA in the Survey of Current Business. The expected life of each category of good is used to determine the stock of these items at any time. BEA has shown that the value of residential contents, both durable and non-durable, has increased over time, above and beyond the growth in the level of income.

WHAT THE BEA DATA INCLUDES

The BEA reports the value of durable goods owned by consumers in the following categories: Furniture, kitchen and other household appliances, china and glassware, jewelry, radios, televisions, records, musical instruments, books and maps, and ophthalmic and orthopedic devices. Motor vehicles are listed as durable goods, but are excluded from this analysis. One category of durable that took a tremendous rise was radio, television, records, and musical instruments, which went up from $75 to $837 per capita in constant 1982 dollars between 1960 and 1988. Non-durable commodities include clothing, semi-durable household furnishings, non-durable toys, food, and other non-durables.

DERIVATION OF STOCK DATA

The derivation of the BEA stock estimates is consistent with the national income product accounts (NIPA) of all goods purchased in the United States. Each classification of goods is assigned an expected service life. Ideally, these service lives would vary over time with business conditions and technology; but,

given insufficient information, these service lives are held constant. Products are depreciated on a straight line basis with purchases zeroed out at the end of the service life. The consumer price index is used to create a constant dollar version of the stock data. The stock data are available on an annual basis from the National Income and Wealth Division at BEA.

RESULTS OF BEA ANALYSIS

Using the annual data for the period 1958-1988, the following growth rates were calculated:

TABLE 16
BUREAU OF ECONOMIC ANALYSIS
ANNUAL GROWTH RATES (1958-1988)

Variable	Average Annual Growth Rate
Contents per capita in constant 1952 dollars	= 3.2%
Contents per household in constant 1952 dollars	= 2.3%
Net stock of residential equipment and structures per capita in constant 1952 dollars	= 1.8%
Net stock of residential equipment and structures per household in constant constant 1952 dollars	= 1.0%
Disposable personal income per capita in constant 1952 dollars	= 2.1%
Disposable personal income per household in constant 1952 dollars	= 1.3%

Figure 1 is a plot of the BEA data for the per household level of the net stock of durable and non-durable residential contents and the net stock of residential equipment and structures. The figure shows how the real value of both content and structure has increased as income has increased. Figure 2 is a time series from 1958 to 1988, which indicates the increases in the net stock of durables and non-durables, the net stock of residential equipment and structures, personal income, and disposable personal income. The two figures show an aggregate c/s ratio increasing from approximately 22% to approximately 34%. There are several reasons why the 1988 aggregate c/s ratio is lower than that found in these case studies. They include:

1. There is a completely different depreciation schedule used for the BEA; many items are given shorter lives than estimated in the case studies and used by insurance companies. For instance, furniture was assumed the BEA to last only 14 years, while the case study estimates were typically 20 or more years.

2. The BEA zeros out the value of each item at the end of its useful life. No minimum or salvage value is considered.

3. The BEA data does not account for products purchased secondhand.

4. Several items, subject to little or no depreciation, such as antiques and paintings, are attributed the same useful lives as other products.

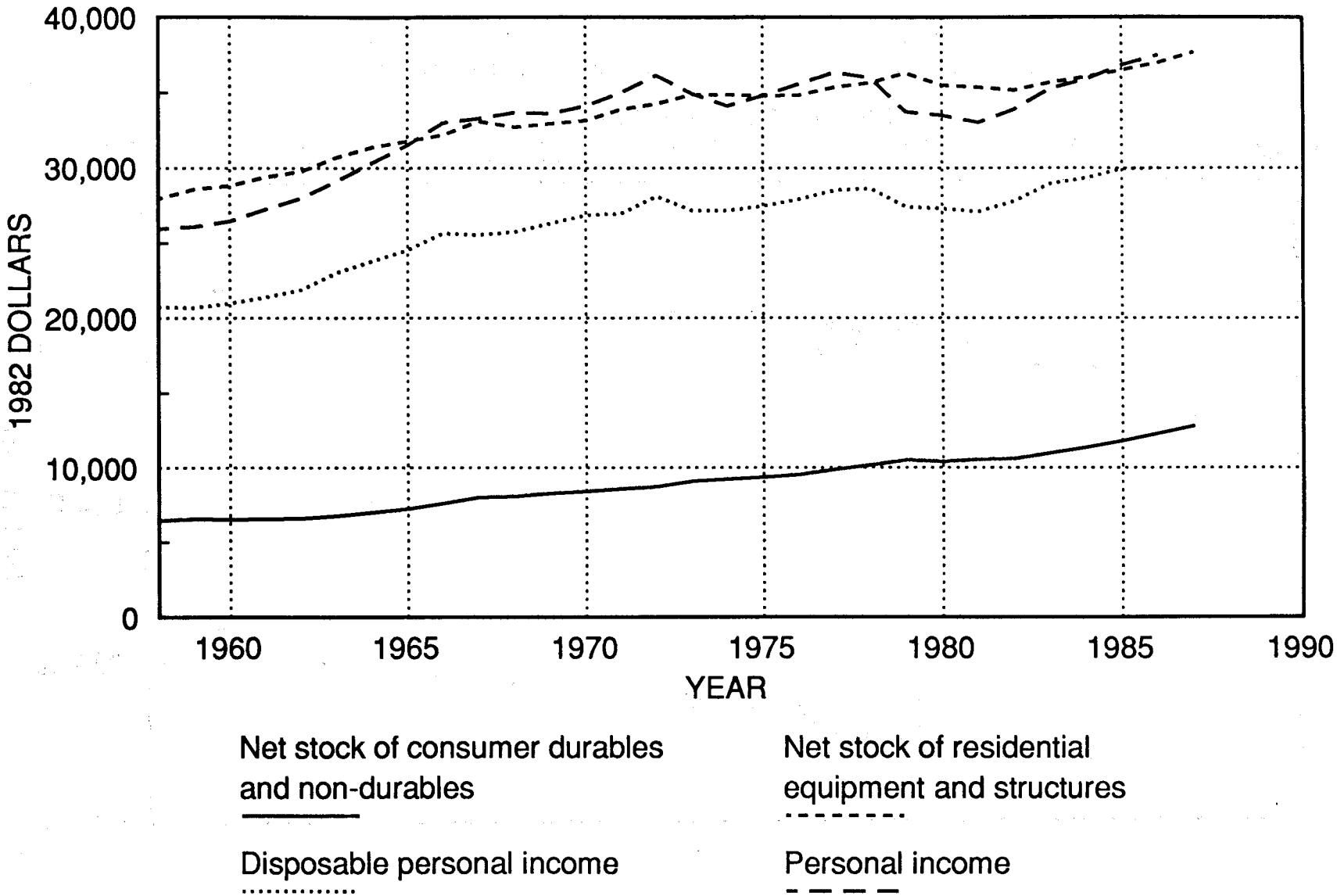
5. Items in furnished apartments, business property found in the home, and other items not typically found in the home, would not be considered residential stock by BEA.

The stock value is included to show how the c/s ratio would change over time. These percentages reflect an increase in content value much higher than the increase in income, whether considered on a per capita or a per household basis.

Table 17 shows the effect of applying these BEA growth rates to a hypothetical community. Assume that in 1958 a community has average structure values of $50,000 at 1982 prices, an average content value of $20,000, and an average household income of $25,000. The table shows the average c/s ratio going from .4 to .587 based on per household data and .4 to .603 for per capita data. The increases in per household and per capita c/s ratios of .468 and .506 were somewhat less than the respective increases in household and per capita disposable income of .473 and .865.

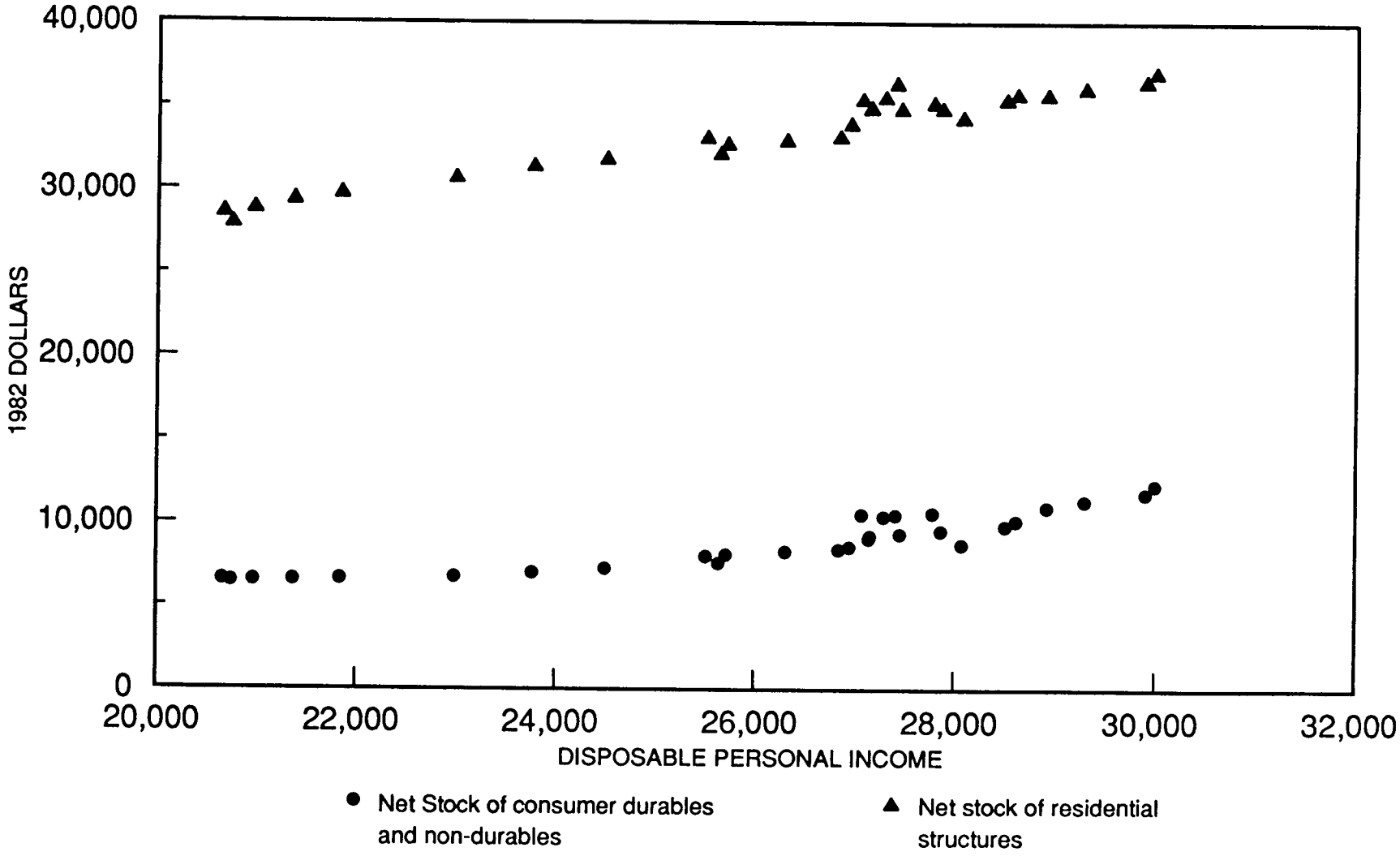
(The reason that the increase in per capita income is so much more than the increase in per household income is that, during this period, the average household size decreased from 3.33 to 2.64.)

It should be noted that when Corps feasibility studies are conducted, real household values are generally assumed to remain constant over the life of the project. No structural improvements or depreciation is considered. With structure values held constant, the c/s ratio in the Table 17 example would go from .4 to .79 (instead of .587) on a per house basis, and from .4 to 1.03 (instead of .603) on a per capita basis.



SOURCE: Department of Commerce

FIGURE 1. - TREND IN PER HOUSEHOLD VALUES



SOURCE: Department of Commerce

FIGURE 2. - RELATIONSHIP BETWEEN DISPOSABLE PERSONAL INCOME AND CONTENT AND STRUCTURE VALUES (PER HOUSEHOLD)

TABLE 17

BUREAU OF ECONOMIC ANALYSIS DATA
CHANGE IN HOUSEHOLD CONTENT VALUE AS COMPARED TO STRUCTURE VALUE AND INCOME

YEAR	PER HOUSEHOLD STRUCTURE VALUE	PER HOUSEHOLD CONTENT VALUE	PER HOUSEHOLD DISPOSABLE INCOME	PER CAPITA STRUCTURE VALUE	PER CAPITA CONTENT VALUE	PER CAPITA DISPOSABLE INCOME
1958	50000	20000	49500	15152	6061	15000
1559	50500	20460	50144	15424	6255	15315
1960	51005	20931	50795	15702	6455	15367
1961	51515	21412	51456	15985	6661	15965
1962	52030	21904	52125	16272	6874	16300
1963	52551	22408	52802	16565	7094	16643
1964	53076	22924	53489	16863	7321	16992
1965	53607	23451	54184	17167	7556	17349
1966	54143	23990	54888	17476	7797	17713
1967	54684	24452	55602	17790	8047	18085
1968	55231	25107	56325	18111	8304	18465
1969	55783	25684	57057	18437	8570	18853
1970	56341	26275	57799	18768	8844	19249
1971	56905	26879	58550	19106	9128	19653
1972	57474	27497	59311	19450	9420	20066
1973	58048	28130	60082	19800	9721	20487
1974	58629	28777	60863	20157	10032	20917
1975	59215	29439	61655	20520	10353	21356
1976	59807	30116	62456	20889	10684	21805
1977	60405	30808	63268	21265	11026	22263
1978	61010	31517	64091	21648	11379	22730
1979	61620	32242	64924	22037	11743	23208
1980	62236	32983	95768	22434	12119	23695
1981	62858	33742	66623	22838	12507	24193
1982	63487	34518	67489	23249	12907	24701
1983	64122	35312	68366	23667	13320	25219
1984	64763	36124	69255	24093	13746	25749
1985	65410	36955	70155	24527	14186	26290
1986	66065	37805	71067	24969	14640	26842
1987	66725	38674	71991	25418	15109	27406
1988	67392	39564	72927	25876	15592	27981

BEGINNING STRUCTURE, CONTENT, AND INCOME VARIABLES ARE HYPOTHETICAL GROWTH RATES ARE ALL BASED ON ACTUAL BEA DATA
ALL FIGURES ARE IN CONSTANT 1982 DOLLARS

PER HOUSEHOLD DATA

BEGINNING CONTENT-TO-STRUCTURE RATIO: .4
ENDING CONTENT-TO-STRUCTURE RATIO: .587
INCREASE IN CONTENT-TO-STRUCTURE RATIO .468
INCREASE IN PER HOUSEHOLD DISPOSABLE INCOME: .473

PER CAPITA DATA

BEGINNING CONTENT-TO-STRUCTURE RATIO: .4
ENDING CONTENT-TO-STRUCTURE RATIO: .603
INCREASE IN CONTENT-TO-STRUCTURE RATIO .506
INCREASE IN PER HOUSEHOLD DISPOSABLE INCOME: .865

A simple regression analysis was also done with the BEA data. The following relationship was estimated with the per household data (t-statistics in parentheses):

$$D = \underset{(-3.058)}{-5183.6} + \underset{(8.415)}{.43418 * Y_p} \qquad \text{Adjusted } R^2 = .70650$$

and for the per capita data:

$$D = \underset{(-5.595)}{-1564.2} + \underset{(16.422)}{.42537 * Y_p} \qquad \text{Adjusted } R^2 = .90258$$

where:

D = net stocks of durable goods held by consumers (excluding autos, wheel goods, durable toys, sports equipment, pleasure boats, pleasure aircraft, and other motor vehicles), plus inventories of consumer non-durables owned by consumers in constant 1982 dollars **= contents**

Y_P = personal income in constant 1982 dollars

The elasticity of contents with respect to income was 1.576 in the first equation (per household), as shown above, and 1.531 in the second equation (per capita). The real value of residential structures is generally held constant for the purpose of projecting flood damage reduction benefits. Based on these results, per household and per capita content values will increase over time at least as much as income. There is also evidence that even if structure values are projected to increase, per household content values can still be expected to rise with income, as the increase in c/s ratio has been nearly equal to the per household increase in income.

REASONS FOR RESIDENTIAL AFFLUENCE

The figures given here substantiate the original findings in support the residential affluence factor. The results still lead to the question of why the cross-sectional data obtained from the personal interview and mail surveys do not show as high an elasticity of content value with respect to income as the BEA data. The reason is the limited comparability of time series and cross-sectional analysis. Increases in content values in the 1958-1988 period reflect a substantial increase in the mechanization of the household. Many products totally unavailable before are now widely found in residences: personal computers, video cassette recorders, microwave ovens, and food processors are a few examples. Iso, even though the prices of many household products have not increased as much as the general consumer price index (Figure 3), substantial increases in the number and improvements in the quality of many items have lead to increases in the total real value of those items in residences.

CHAPTER 7

ECONOMIC MODEL FOR DETERMINING HOUSEHOLD CONTENT VALUES

Time series data generally make stronger, more reliable models for estimating and projecting economic variables than cross-sectional data. Unfortunately, time series data are generally unavailable on a local or regional basis. A content value model, based on cross-sectional data may, nevertheless, still prove useful in creating a content value estimation model or in determining when c/s ratios might differ appreciably from any standard ratio.

Table 18 gives the coefficients and the 't' statistics for variables found to be significant in the four regression models presented in Chapters Five and Six.

To construct a single model for residential content values, it would be reasonable to include those variables found to be significant in the surveys done for this report. Those variables include: income; size of structure, measured in square feet or number of rooms; tenure; market value of the structure; education; married; and, widowed. All of these variables were positively correlated with content value, indicating that if these parameters are significantly different between the study area and the National average, or between the study area and the regional average when using regional c/s ratios, then particular emphasis should be placed on conducting a separate content value survey.

The surveys done for this analysis allowed for the construction of a cross-sectional model by combining the Harris County, Luzerne County, and Orange County data bases. The Petersburg-Moorefield data base was left out of this analysis because of dissimilarities in variable definitions. The combined data base used all of the variables found to be significant in the regression models for these three cases, plus intercept dummy variables, which indicated the sample from which the data was drawn.

TABLE 18

SIGNIFICANT VARIABLES IN CONTENT VALUE REGRESSION MODELS

Parameter Coefficients (COEF), 'T' Values, and Standard Beta Coefficients (STB) are Given for Each Variable.

SURVEY LOCATION

Variable	Petersburg-Moorefield, WV.			Harris County, TX.			Luzerne County, PA.			Santa Ana, CA.		
	COEF	'T'	STB	COEF	'T'	STB	COEF	'T'	STB	COEF	'T'	STB
Log of Income				.135	1.97	.195	.183	2.27	.179	.440	4.71	
Log of Depreciated Replacement Value[1]				.574	4.47	.533				.712	4.53	
Log of Market Value[1]							.284	2.51	.198			
Log of Square Feet[2]							.300	2.43	.131			
Number of Rooms[2]	.097	2.56	.274									
Married	.230	1.75	.186				.436	3.96	.307	.254	2.25	
Widowed							.344	1.86	.152	.468	2.42	
Education	.270	4.02	.432									
Age of Home				.020	2.13	.224						
Tenure							.004	1.88	.198			

[1] Both variables are measures of structure value.

[2] Both variables are measures of size.

The regression analysis for the combined data bases, using log of total contents as the dependent variable, yielded the following equation (t-statistics and standardized beta values (stb) are in parentheses):

TABLE 19
COMBINED REGRESSION ANALYSIS FOR HARRIS, LUZERNE, AND ORANGE COUNTIES WITH LOG OF TOTAL CONTENTS AS DEPENDENT VARIABLE

IC=3.410	+.225*II	+.005*T	+.370*ISf	+.132*IStv	+.368*M	+.290*W
t=(5.499) stb=	(4.701) (.250)	(2.648) (.116)	(5.206) (.243)	(2.768) (.134)	(5.044) (.248)	(2.458) (.122)
R^2 = 0.303						

where:
IC = log of total contents
II = log of income
T = tenure
ISf = log of square feet
IStv = log of structure value
M = married
W = widowed

The combined data set provides for a strong cross-sectional model with a .303 R^2 value. The log of income, log of square feet, and married are the dominant independent variables. Structure value, tenure, and widowed are also important determinants of content value. This regression model could be used for estimating differences between communities.

The states were included as intercept dummy variables in an early round of regression analysis, but did not prove to be significant. The age of the home, which was significant in an earlier regression, was not a significant variable here.

CONTENT-TO-STRUCTURE RATIO AS THE INDEPENDENT VARIABLE

Because estimates and projections of total content value are the ultimate concerns of this research, total content value was the dependent variable in all of the models reported on in this report. Nevertheless, this research would not have been complete without attempting to build alternative models with the c/s ratio as the dependent variable, to determine if stronger models would be produced. Regression analysis was done separately on the data from all four case studies, as well as on the combined data from Harris, Luzerne, and Orange Counties. All five regressions, with the c/s ratio as the dependent variable produced much weaker results than the regressions done with contents as the dependent variable. A much smaller degree of variance in the c/s ratio could be explained than could be explained in total content value. The c/s ratio models also had limited consistency as to which independent variables would be part of the model.

CHAPTER 8
CONCLUSIONS

ANSWERS TO MAJOR CONCERNS

These conclusions include an item-by-item review of the concerns raised in Chapter Three. Answers are given to each point, based on the result of this research effort.

1. Base Year Content Value.

A. Content Definition. A definition of residential contents, consistent with that used in computation of depth-damage functions, should be established. The following definition is similar to that used by the Federal Insurance Administration in its flood damage claims file: Residential contents are items in the home or garage which are not permanently attached to the structure. Any built-in appliances, wall-to-wall carpeting, heating and cooling systems (other than window air conditioners, space heaters, and portable fans), and built-in cabinets and bookshelves are considered part of the structure. All items enclosed in a home or garage and not part of the structure can be considered contents, except motor vehicles, which are treated separately. It is recommended that ER 1105-2-100 be amended to include the above or similar definition. It may be desirable to list those items that might be subject to ambiguity in categorization.

B. Content-to-Structure Value Ratios. The "50 percent limit" for base year content estimates was not specifically raised by AAA, but the auditors did comment that a specific study should be used if c/s ratios higher than the insurance industry rule-of-thumb are applied. In direct response to this comment, the Corps amended Engineering Regulation 1105-2-100 in 1990. The ER now

restricts Corps economists from using baseline estimates or making projections of c/s ratios of higher than 50 percent, unless an empirical survey of the study area was undertaken. Future research and policy initiatives might allow a higher ratio.

An alternative to use of individual surveys for each project would be the use of insurance industry rules-of-thumb. To determine these rules-of-thumb, the largest casualty insurance companies were contacted. These companies have all established residential coverages on the depreciated value of the contents as a percentage of the undepreciated replacement value of the structure. None of the companies contacted could cite any specific study or data that were used in establishing these ratios. The percentages are based on what their claims have been when the contents were nearly or completely destroyed. Three of the companies, including Allstate, Aetna, and Farmers had a ratios of 50%, while State Farm and Nationwide had ratios of 55%. A sixth company, Liberty-Mutual, had policy holders select their own ratio. Since these ratios are based on a "depreciated" content value and an "undepreciated" structure value, the actual ratio of "depreciated content" value to "depreciated structure" value should be significantly higher.

C. Real Structure Values Content value estimates have been inexorably tied to structure values. This will certainly be true as long as standard c/s ratios are used to estimate content values. One report, the South Frankfort Levee Raising Project, was alleged by AAA to have inflated estimates of content values because c/s ratios were applied to inflated estimates of structure values. In the Frankfort case, the market values were greatly influenced by the recent flooding and the generally depressed regional economy at the time of the estimates. The effect of both these phenomena may well be very temporary. The market effects of the flood risk are certainly highest just after a major event, and the local economy will go through many changes during the life of a project.

A more consistent practice of using depreciated replacement values, instead of market values, would help alleviate the effects of these short-term perturbations. Depreciated replacement values are a more reliable indicator of the willingness-to-pay as measured by inundation reduction benefits. Inundation reduction benefits are concerned with the impact of flooding on physical structure and contents and not on the land. Using depreciated replacement values makes it possible to more fully separate the land value from structure value. As mentioned in Chapter Two, this policy has already been established in ER 1105-2-100.

D. Flood Risk and Content Values. The mail questionnaires in this research effort used both actual and perceived flood threat, as well as previous flood experience, to determine the effect of flood threat on the investment in residential contents. In neither community were any of the flood risk variables significant in the regression analysis. The results indicate that, at least for these communities, flood risk has no significant effect on content value.

2. Residential Affluence Factor.

Evidence of a residential affluence factor was found in the BEA data, a survey of the insurance industry, and in all of the empirical surveys done by IWR.

A. Household Tenure and Succession. The argument that people will move away from their lower value homes rather than increase their investment in contents was initially made by Professor Leonard Shabman of Virginia Polytechnical Institute when he was consulting for the Assistant Secretary of the Army's Office. Professor Shabman says that his statement referred to a specific project in Puerto Rico, where the homes where small and of extremely poor quality. He did not intend for his statement to have any general application

beyond that specific project area. There is no evidence to support the argument that people necessarily do move out of floodplain locations as their incomes increase over time.

B. Insurance Company Content-to-Structure Ratios. Additional evidence of the increase in c/s ratios over time includes the insurance industry c/s ratio. The ratio noted by ER '351' in 1975 averaged between 20 and 25 percent at the time, although the ratio was said to be considerably higher for homes over $135,000 in value. A representative of State Farm Insurance Company recently confirmed that increases in the ratio had occurred at his company.

C. Cross-Section Data and the Relationship Between Income and Content Value. The household surveys done by IWR found household income to be a significant variable in determining the value of contents in each of the study areas. The elasticity of content value with respect to income ranged from .13, in the case of Petersburg and Moorefield, to .4, in the case of Orange County.

D. The Residential Affluence Factor. The reinstitution of a residential affluence factor would allow benefits on flood damage reduction to the increased value of residential contents. Three criteria would appear important to the unqualified application of this benefit:

1.) Growth in Real Content Value vs. Growth in Income. The real value of residential contents per household would need to increase as much household income over time. The BEA time series of the per capita and per household value of durable and non-durable goods answered this criteria. The growth in both these categories far exceeded the growth of per capita and per household personal income over the period from 1958 to 1988. The BEA data found a definite upward trend in the real value of the residential contents. During the period from 1958 to 1988, the real value of per household stock increased at

an annual rate of 2.3 percent, while disposable personal income per household increased at annual rate of only 1.3 percent. These are similar to findings in ER '351', which covered the period from 1955 to 1969. It can be concluded from the BEA data that if the real value of residential housing stock is held constant, as is done for most flood reduction studies, the c/s value ratio will increase at a higher rate than income over time.

2.) Content Value and Flood Risk. The effect of any residual flood risk would need to have a limited effect on investment in household contents. The surveys done for this research showed no significant differences between the investment in contents in flood prone and flood-free locations.

3. Predictive Relationship Between Household Income and Content Value. It would need to be demonstrated that income has a strong influence on household content values. While income was a significant variable in the determination of content value, the relationship was too weak to indicate content values would continue to increase with income. It is recommended that without further conclusive research that produces a predictive model for content values that there should be no projection of future content values.

RECOMMENDED FOLLOW-UP RESEARCH

The questions related to estimating and projecting residential content values cannot be entirely answered by this research effort. The following actions are recommended as follow-up to this research:

1. Further Development of a Content Value Estimation Model. The regression models done for this analysis identified income, structure value, married, widowed, and size of structure as being determinants of content value.

A regression on combined data bases yielded a model that could be used in content value estimation. Further data collection and refinement may help build a stronger model.

2. Continue to Monitor Insurance Company Data. New sources of residential content values may become available if insurance companies become more concerned about their exposure. Specific follow-up might include:

A. Writing to the 20 major underwriters of homeowners' policies to request access to any data on complete losses to both structure and contents.

B. Further exploring the libraries and research staffs of the College of Insurance and the Insurance Information Institute.

3. Follow-up to Selected Content Value Surveys. Follow-up content value surveys should be made at the locations surveyed for this report. These should be done at ten-year intervals. The survey forms should be as similar as possible to those used for this research. A copy of a standard survey form with the most common and significant household items is included as Appendix A of this report. A copy of background questions are included for correlating demographic factors with content values. Appendix B contains useful lives or percent of value retained for common household items. The appendix explains the application of these tables.

4. Guidance and Field Office Surveys. Suggested procedures for conducting personal interviews and mail content surveys should be documented. (This has been done in the Institute for Water Resources report, National Economic Development Procedures Manual-Urban Flood Damage, Volume II, Primer for Surveying Flood Damage for Residential Structures and Contents (Mills, Davis, and Hansen, 1991). Corps field offices should be encouraged to

use these procedures for their own surveys. Results of these surveys should then be sent to IWR to be included in a centralized data base. (See Appendixes A and B.)

5. Screen Survey Questionnaire Items. The item-by-item totals for each room on the questionnaires can be used to revise the questionnaires to insure all potentially significant items are included, and any insignificant items dropped, from the survey form. Dropping items which have had little contribution to total content values will allow the respondents to be prompted on their most significant possessions without having the form become overly cumbersome. Adequate space for writing in items should be retained.

6. Further Testing of Flood Threat Hypothesis. Additional surveys should continue to test the effect of actual and perceived flood risk on the accumulation of household contents.

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APPENDIX A:
RESIDENTIAL CONTENTS SURVEY FORM

INVENTORY INSTRUCTIONS:

Most pages of this questionnaire are designed for you to do a thorough inventory of the contents of your home. Contents are items within your home or garage which are not permanently attached to the building.

The simplest way for you to complete this inventory is to walk through the room to which each page applies. For each type of item listed on a page:

1	AND EITHER	2	OR	3	
Indicate how many pieces of each item there are in the room(s) to which the page applies.	Indicate the total current cash value for each item. Current cash value is the current cost of replacing an item, minus whatever value the item has lost from deterioration.			Indicate total replacement costs, if you were to purchase the item now.	Indicate the approximate average age of each item.

The information you provide does not have to be absolutely precise. If in doubt, make your best guess. Be sure to fill out each page which lists items found in your house. Most types of items will be listed on only one page. If an item you own is listed on a room page different from the room where the item is found in your house, put the value and age for the item on that page.

After you complete the inventory sheets, please answer the final background questions and mail back our questionnaire. DON'T FORGET TO TEAR OUT THE YELLOW COPIES TO KEEP WITH YOUR INSURANCE RECORDS.

Your participation in this survey is voluntary and you may refuse to give any or all of the requested information.

LIVING ROOM

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Unattached Bookcases				Years Ago
	Books				Years Ago
	Couches/Sofas				Years Ago
	Chairs				Years Ago
	Tables				Years Ago
	Lamps				Years Ago
	Curtains/Drapes				Years Ago
	Unattached Carpets/Rugs				Years Ago
	Television Sets				Years Ago
	Stereo Equipment				Years Ago
	VCR Equipment				Years Ago
	Video Tapes				Years Ago
	Records/CDs/Cassettes				Years Ago
	Pictures				Years Ago
	Television Sets				Years Ago
	Antiques				Years Ago
	Pianos				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

DINING ROOM

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Unattached Buffet/Bar				Years Ago
	Chairs				Years Ago
	Tables				Years Ago
	Unattached China Cabinets				Years Ago
	China				Years Ago
	Glassware				Years Ago
	Silverware				Years Ago
	Curtains/Blinds/Drapes				Years Ago
	Linens				Years Ago
	Unattached Carpets/Rugs				Years Ago
	Pictures				Years Ago
	Tables				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

KITCHEN AND PANTRY

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Fresh Food				Years Ago
	Canned Food				Years Ago
	Frozen Food				Years Ago
	Liquor				Years Ago
	Freezers				Years Ago
	Refrigerators				Years Ago
	Range/Stove				Years Ago
	Microwave Ovens				Years Ago
	Portable Dishwashers				Years Ago
	Portable Trashcompactor				Years Ago
	Chairs				Years Ago
	Tables				Years Ago
	Dishes & Crockery				Years Ago
	China				Years Ago
	Glassware & Crystal				Years Ago
	Silverware				Years Ago
	Knives/Other Utensils				Years Ago
	Pans & Cooking Ware				Years Ago
	Appliances (Mixer, etc)				Years Ago
	Desks/File Cabinets				Years Ago
	Lamps				Years Ago
	Curtains/Drapes				Years Ago
	Other				Years Ago

DEN, OFFICE, LIBRARY OR FAMILY ROOM

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Unattached Bookcases				Years Ago
	Books				Years Ago
	Couches/Sofas				Years Ago
	Chairs				Years Ago
	Tables				Years Ago
	Desks/File Cabinets				Years Ago
	Lamps				Years Ago
	Curtains/Drapes				Years Ago
	Unattached Carpets/Rugs				Years Ago
	Unattached Bar				Years Ago
	Television Sets				Years Ago
	Videotapes/VCR Equipment				Years Ago
	Stereo Equipment				Years Ago
	Records/CDs/Cassettes				Years Ago
	Computer Hardware				Years Ago
	Computer Software				Years Ago
	Pictures				Years Ago
	Sewing Machine				Years Ago
	Typewriters				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

LAUNDRY, BASEMENT, AND GARAGE ITEMS

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Chairs				Years Ago
	Tables				Years Ago
	Clothes Dryer				Years Ago
	Clothes Washer				Years Ago
	Ironing Equipment				Years Ago
	Freezer				Years Ago
	Refrigerator				Years Ago
	Luggage				Years Ago
	Hand Tools				Years Ago
	Power Tools				Years Ago
	Lawn & Garden Tools				Years Ago
	Work Bench				Years Ago
	Barbecue Equipment				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

BEDROOMS

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Beds				Years Ago
	Box Springs/Mattresses				Years Ago
	Bedding/Bedspreads				Years Ago
	Chest of Drawers				Years Ago
	Dressing Tables				Years Ago
	Night Tables				Years Ago
	Other Tables				Years Ago
	Lamps				Years Ago
	Chairs				Years Ago
	Curtains/Drapes				Years Ago
	Unattached Rugs				Years Ago
	Pictures				Years Ago
	Trunks (Hope Chests)				Years Ago
	Television Sets				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

MENS CLOTHING

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Ties/Neckwear				Years Ago
	Coats and Jackets				Years Ago
	Raincoats				Years Ago
	Pants				Years Ago
	Shirts				Years Ago
	Suits				Years Ago
	Sweaters				Years Ago
	Underwear				Years Ago
	Robes				Years Ago
	Socks				Years Ago
	Shoes and Boots				Years Ago
	Jewelry				Years Ago
	Belts				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

WOMENS CLOTHING

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Coats and Jackets				Years Ago
	Raincoats				Years Ago
	Dresses				Years Ago
	Pants & Slacks				Years Ago
	Skirts				Years Ago
	Blouses & Shirts				Years Ago
	Suits				Years Ago
	Sweaters				Years Ago
	Robes				Years Ago
	Underwear				Years Ago
	Socks/Stockings				Years Ago
	Shoes and Boots				Years Ago
	Handbags/Purses				Years Ago
	Hats				Years Ago
	Jewelry				Years Ago
	Scarves				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

CHILDRENS CLOTHING

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Coats and Jackets				Years Ago
	Raincoats				Years Ago
	Dresses				Years Ago
	Pants				Years Ago
	Skirts				Years Ago
	Blouses/Shirts				Years Ago
	Suits				Years Ago
	Sweaters				Years Ago
	Sportswear				Years Ago
	Underwear				Years Ago
	Socks/Stockings				Years Ago
	Shoes and Boots				Years Ago
	Jewelry				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

SPORTS, RECREATION, AND HOBBY ITEMS KEPT IN RESIDENCE

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	Billiard Table				Years Ago
	Camping Equipment				Years Ago
	Fishing Tackle				Years Ago
	Games				Years Ago
	Golf Equipment				Years Ago
	Skiing Equipment				Years Ago
	Guns/Hunting Equipment				Years Ago
	Musical Instruments				Years Ago
	Photography Equipment				Years Ago
	Sewing Machine				Years Ago
	Tennis Equipment				Years Ago
	Bicycles				Years Ago
	Exercise Equipment				Years Ago
	Toys				Years Ago
	Collections (Coins, etc)				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

BATHROOM ITEMS, MEDICAL APPLIANCES, AND MISCELLANEOUS ITEMS

For ALL such items, please give:
(1) the total number of pieces,
AND EITHER
(2) the total current cash value,
OR
(3) the total replacement cost, and average age.

(1)		(2)	(3)		
Total No. of Pieces		Total Current Cash Value	Total Replacement Costs	Average Age	
	BATHROOM ITEMS				
	Medication				Years Ago
	Hygiene Items				Years Ago
	Towels				Years Ago
	Bathroom Appliances				Years Ago
	Cosmetics/Perfumes				Years Ago
	Other				Years Ago
	MEDICAL APPLIANCES				
	Wheelchairs				Years Ago
	Walkers				Years Ago
	Other				Years Ago
	MISCELLANEOUS ITEMS				
	Art Work				Years Ago
	Indoor Plants				Years Ago
	Telephones				Years Ago
	Curtains/Drapes/Blinds				Years Ago
	Luggage				Years Ago
	Briefcases				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago
	Other				Years Ago

	Other				Years Ago

BACKGROUND QUESTIONS

Please fill in the following background questions circling the appropriate number and filling in the blanks.

Q1. From the list below, please circle the number in front of the type of building that most closely matches your residence.

(CIRCLE ONE NUMBER)

1. SINGLE FAMILY
2. LOW-RISE MULTIPLE FAMILY (3 STORIES OR LESS)
3. MID- AND HIGH-RISE MULTIPLE FAMILY (4 OR MORE STORIES)
4. TOWNHOUSE, END UNIT
5. TOWNHOUSE, INSIDE UNIT
6. DUPLEX
7. MOBILE HOME

Q2. From the list below, please circle the number of the building style that most closely matches the style of this residence.

(CIRCLE ONE NUMBER)

1. ONE STORY
2. TWO STORY
3. THREE STORIES
4. SPLIT LEVEL
5. 1 1/2 STORY (WITH THE 1/2 FINISHED)
6. 1 1/2 STORY (UNFINISHED 1/2)
7. 2 1/2 STORY (WITH THE 1/2 FINISHED)
8. 2 1/2 STORY (UNFINISHED 1/2)
9. 3 1/2 STORY (WITH THE 1/2 FINISHED)
10. 3 1/2 STORY (UNFINISHED 1/2)
11. BI-LEVEL (2 STORY WITH 1ST FINISHED)
12. OTHER (Please Explain):

_____

Q3. From the list below, please circle the number of the heating and/or cooling system that most closely matches the system installed in this home.

(CIRCLE ONE NUMBER)

Heating Only:

1. FORCED AIR
2. GRAVITY FURNACE (HOT AIR, NO FAN)
3. FLOOR FURNACE (NO HEAT DUCTS)
4. WALL FURNACE (NO HEAT DUCTS)
5. FLOOR, RADIANT HOT WATER
6. CEILING, RADIANT ELECTRIC
7. BASEBOARD, ELECTRIC
8. BASEBOARD, HOT WATER
9. RADIATORS, HOT WATER
10. RADIATORS, STEAM
11. WARMED AND COOLED AIR
12. HEAT PUMP SYSTEM

Cooling Only:

13. EVAPORATIVE WATER COOLER (SINGLE OR SHORT DUCTS)
14. REFRIGERATED, WITH CONDENSER AND DUCTS

Q4. From the list below, please circle the number of the type of exterior wall covering that best matches most of the exterior of this home.

(CIRCLE ONE NUMBER)

1. PLYWOOD
2. HARDBOARD SHEETS
3. STUCCO
4. SIDING
5. SHINGLE
6. MASONRY VENEER
7. COMMON BRICK
8. FACE BRICK
9. STONE
10. CONCRETE BLOCK

Q5. From the list below, please circle the number of the roofing type that most closely matches the roof of this home.

(CIRCLE ONE NUMBER)

1. COMPOSITION SHINGLE
2. BUILT-UP ROCK (EMBEDDED IN ASPHALT
3. WOOD SHINGLE
4. WOOD SHAKE
5. CONCRETE TILE
6. CLAY TILE
7. GALVANIZED METAL
8. SLATE
9. COMPOSITION ROLL
10. PLASTIC TILE

Q6. How many bathrooms OF THE FOLLOWING TYPES are there in this home?

There are: _____ FULL BATHS (SINK, TOILET, AND TUB, WITH OR WITHOUT SHOWER)

There are: _____ 3/4 BATHS (SINK, TOILET, AND SHOWER)

There are: _____ 1/2 BATHS (SINK, AND TOILET)

Q7. Please give the total square feet of finished floor area for floor area for all rooms in this home, not including the basement.

(GIVE YOUR VERY BEST ESTIMATE)

AREA NOT INCLUDING BASEMENT: _____ SQUARE FEET

Q8. Please give the total square feet of floor area for the basement in this home.

(GIVE YOUR BEST ESTIMATE)

TOTAL BASEMENT AREA: _____ SQUARE FEET

FINISHED BASEMENT AREA: _____ SQUARE FEET

Q9. Please circle all of the home features listed below that apply to this home:

(CIRCLE ALL THAT APPLY)

1. ATTACHED GARAGE
2. DETACHED GARAGE
3. BUILT-IN GARAGE
4. CARPORT
5. UNFINISHED BASEMENT AREA
6. FINISHED BASEMENT AREA
7. OPEN SLAB PORCH
8. FIREPLACE

Q10. What year was your home built? _____

Q11. How many years have you lived at this address? _____ years

Q12. How many people live at this residence? _____ people

Q13. Do you own this home? (CIRCLE)

1. YES 2. NO

Q14. If you own this home, how much would it be worth if it were to be sold in the real estate market today? (YOUR BEST GUESS)

$_____

Q15. What is your zip code? _____

Q16. What is the marital status of the principal wage earner of this household? (CIRCLE ONE NUMBER)

1. SINGLE
2. MARRIED
3. WIDOWED
4. DIVORCED OR SEPARATED
5. OTHER

Q17. What was the age of the principal wage earner of this household on his/her last birthday?

_____ YEARS OLD

Q18. The list below contains income categories. Please circle the number of the category that contains your annual household income (before taxes) for 1989. Include income for you and all other members of this household. (CIRCLE ONE NUMBER)

1. UNDER $10,000
2. $10,000 - $19,999
3. $20,000 - $29,999
4. $30,000 - $39,999
5. $40,000 - $49,999
6. $50,000 - $59,999
7. $60,000 - $69,999
8. $70,000 - $79,999
9. $80,000 - $89,999
10. $90,000 - $99,999
11. $100,000-$124,999
12. $125,000-$149,999
13. $150,000-$174,999
14. $175,000 AND OVER

THANK YOU FOR YOUR COOPERATION

YOU MAY MAKE ANY ADDITIONAL COMMENTS BELOW:

APPENDIX B:
USEFUL LIFE AND DEPRECIATION TABLE

USEFUL LIVES FOR HOUSEHOLD INVENTORIES

This table serves as a basis for depreciating the value of household items. An item will be depreciated based on one of the following methods:

1) For most items, the replacement cost is multiplied by a percentage, which is determined by the age of the item as a proportion of the average useful life for that item. Using this method, the maximum depreciation of an item should be 75%. Any item still in use, except for motor vehicles, should generally be worth at least 25% of its replacement cost.

2) For items with little or no depreciation, such as antiques or paintings, simply multiply the replacement cost by the percent of value retained.

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Air Conditioner (window)	10	
Answering Machine	10	
Antique		100%
Appliances	10	
Aquarium	20	
Arts and Craft Supplies		75%
Baby Equipment	10	
Baby Carriage	10	
Bar (not built=in)	15	
Baskets	4	
Bath Seat	15	
Bathroom Items	5	
BBQ Equipment	10	
Bed/Mattress	25	
Bedding/Linens	10	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Bedroom Suite	20	
Belts	5	
Bicycles	10	
Billiard/Pool Table	13	
Binoculars	25	
Bird Cage	15	
Blender	8	
Blood Pressure Machine	10	
Boat	10	
Bookcase	25	
Books		60%
Bread Machine	15	
Briefcase	20	
Buffet	20	
Calculator/Adding Machine	10	
Camping Equipment	10	
Cane	25	
Canned Foods		100%
Car/Truck	8	
Chain Saw	15	
Chairs	20	
China Cabinet	30	
China		90%
Christmas Decorations		75%
Clock	50	
Clothes Washer	10	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Clothes Dryer	10	
Clothing	5	
Coats & Jackets	6	
Coffee Maker	10	
Collections		100%
Commode (Portable)	10	
Computer Software	10	
Computer Hardware	10	
Console/Big Screen TV	12	
Contact Lenses	3	
Cook Ware	20	
Cooking Utensils	20	
Cooler	10	
Copier	10	
Cosmetic/Perfumes		50%
Couch/Sofa	15	
Cradle	20	
Crutches	10	
Deep Fryer	10	
Dehumidifier	12	
Desk	25	
Dining Chairs	20	
Dining Table	20	
Dining Table & Chairs		
Dishes		70%
Dishwasher (portable)	10	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Dividers	8	
Dog Bed	8	
Drapes	15	
Dresser	25	
Dresses	5	
Drill	15	
Edger/Trimmer	6	
Electric Train	10	
Exercise Equipment	10	
Fan	10	
Fax Machine	10	
File Cabinet	20	
Firearms	25	
Fireplace Equipment	20	
First Aid Kit	10	
Fishing Equipment	10	
Floor Lamps	15	
Food Processor	12	
Foodstuffs		100%
Freezer	15	
Fresh Foods		100%
Frozen Foods		100%
Fur	10	
Games		75%

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Garden Tiller	20	
Glassware		90%
Globe	20	
Golf Equipment	8	
Grill	8	
Hand Tools	20	
Handbag/Purse	5	
Hassock	12	
Hats	5	
Hearing Aid	20	
Heater	20	
Hot Tub	15	
Humidifier	5	
Hunting and Fishing Clothes	6	
Hygiene Items		100%
Ironing Equipment	8	
Jewelry		100%
Jump Suit	5	
Kitchen Table & Chairs	15	
Knick-Knack		100%
Knives	20	
Ladder	25	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Lathe	30	
Laundry Supplies		100%
Lawn Furniture	6	
Lawn Mower	8	
Lawn & Garden Equipment	6	
Life Jacket	10	
Liquor		100%
Living Room Suite	20	
Luggage	20	
Lumber and Building Supplies		90%
Magic Equipment	10	
Meat Slicer	15	
Medicines/Medical Supplies		100%
Microwave Oven (not built=in)	11	
Mirror		90%
Miscellaneous	10	
Mixer	10	
Motor Home	8	
Motorcycle	8	
Musical Instruments	20	
Night Tables	25	
Nightwear	5	
Office Supplies		100%
Outboard Engines	10	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Paint and Paint Supplies	5	
Pants	5	
Photography Equipment	15	
Piano	25	
Pictures (Paintings and Photos)		100%
Pillow	6	
Ping Pong Table	2	
Plants		100%
Plastic Container	10	
Playpen	17	
Pool Equipment	12	
Pots (Clay)		90%
Power Tools	15	
Radio	10	
Raincoat	5	
Range/Oven (not built=in)	15	
Razor (Electric)	4	
Records/Compact Discs		60%
Refrigerator	15	
Rugs	15	
Salt and Pepper Shakers		90%
Sander	15	
Scanner	10	
Scarves	6	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Sculpture		100%
Sewing Machine	25	
Sewing supplies		90%
Shed (portable)	20	
Sheet Music		100%
Shirts/Blouses	4	
Shoes & Boots	4	
Silverware		90%
Ski Clothes	6	
Skiing Equipment	7	
Skirts	7	
Snow Blower	10	
Socks	2	
Spinning Wheel		90%
Sports Equipment	6	
Sportswear	4	
Stand, Rack, or Cart	10	
Steam Cleaner	15	
Stereo Equipment	15	
Suits	5	
Suspenders	6	
Sweat Clothes	4	
Sweaters	10	
Swing	10	
Table TV	12	
Table Lamps	15	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Tables	25	
Telephones	25	
Telescope	25	
Tennis Equipment	10	
Ties/Neckwear	3	
Toaster	10	
Tool Chest	25	
Towels/Linens/Blankets	4	
Trash Can	15	
Trash Compactor	12	
Trays	10	
Trophies		90%
Trunks	35	
Typewriter	20	
Umbrella	5	
Unattached Bookcases	25	
Underwear	6	
Uniform	3	
Vacuum Cleaner	15	
Video Cassette Recorder	12	
Video Game Equipment	7	
Video Rewinder	12	
Video Tapes	15	
Wardrobe (Armoire)	35	

ITEM	USEFUL LIFE	PERCENT OF VALUE RETAINED
Walkers	15	
Water Cooler	10	
Weaving Loom	25	
Welder	20	
Wheelchairs	20	
Wicker Furniture	20	
Wigs	8	
Work Bench	40	