GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT INITIATION

Date: December 15, 1972

Project Title: The Current Status and Future Trend of the Construction Industry in Five Southeastern States

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Project Director: George D. Woodard

Sponsor: Radcliff Materials, Inc.

Effective . . December 12, 1972 . . . . Estimated to run until: . January 31, 1973 . . . .

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GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT TERMINATION

Date __March 23, 1973__

PROJECT TITLE: The Current Status and Future Trend of the Construction
Industry in Five Southeastern States

PROJECT NO: A-1488

PROJECT DIRECTOR: George Woodard

SPONSOR: Radcliff Materials, Inc.

TERMINATION EFFECTIVE: ~~February 14, 1973 (Final~~ Report Mailed

CHARGES SHOULD CLEAR ACCOUNTING BY: ~~All acceptable~~ charges have cleared.

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THE MARKET FOR CONCRETE BLOCK
IN A SELECTED SOUTHEASTERN AREA

By

Harvey Diamond

THE MARKET FOR CONCRETE BLOCK IN A SELECTED SOUTHEASTERN AREA

Introduction

In 1971, residential and nonresidential construction in the U. S. reached an all-time high. Spurred by increasing family formation, migration shifts, and expanding industry, new building activity for the year exceeded 3.45 billion square feet of floor area. This footage, 17% more than 1970 and almost 7% greater than the previous high of 3.24 billion square feet in 1969, is continuing a sharp growth pattern for 1972. Preliminary data indicate that building construction for the past calendar year totaled 4.0 billion square feet.

As residential and nonresidential construction expands, so does the demand for many basic building products. One of these materials, concrete block, is the principal consideration of this study.

Purpose and Procedure

The purpose of this report is to determine and locate quantitatively the market potential for concrete building block in specific southern states and areas and to indicate for the same study area the future demand for concrete block based on building construction trends.

The study area, delineated on Map 1, is composed of the states of Alabama and Mississippi plus portions of Florida, Georgia, and Tennessee.

Because reliable regional data for concrete block are not available, floor area square footage volumes of residential and nonresidential building constructions as reported by the F. W. Dodge Division of McGraw-Hill Information Systems for 1971 are used as the statistical basis for the study. By application of a multiplication factor of 1.01 to the square footages of floor space, an approximate figure for block can be calculated.

Building Construction

During the 1960's, the number of households formed each year in the U. S. increased while annual housing starts vacillated between 1.2 million and 1.6 million units. This created a demand for adequate dwellings which could not readily be satisfied. Of the 68.7 million housing units reported in the 1970 Census, it is estimated that 4 million dwellings lack indoor plumbing and 2.7 million are in

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Map 1

MARKET AREA FOR CONCRETE BLOCK
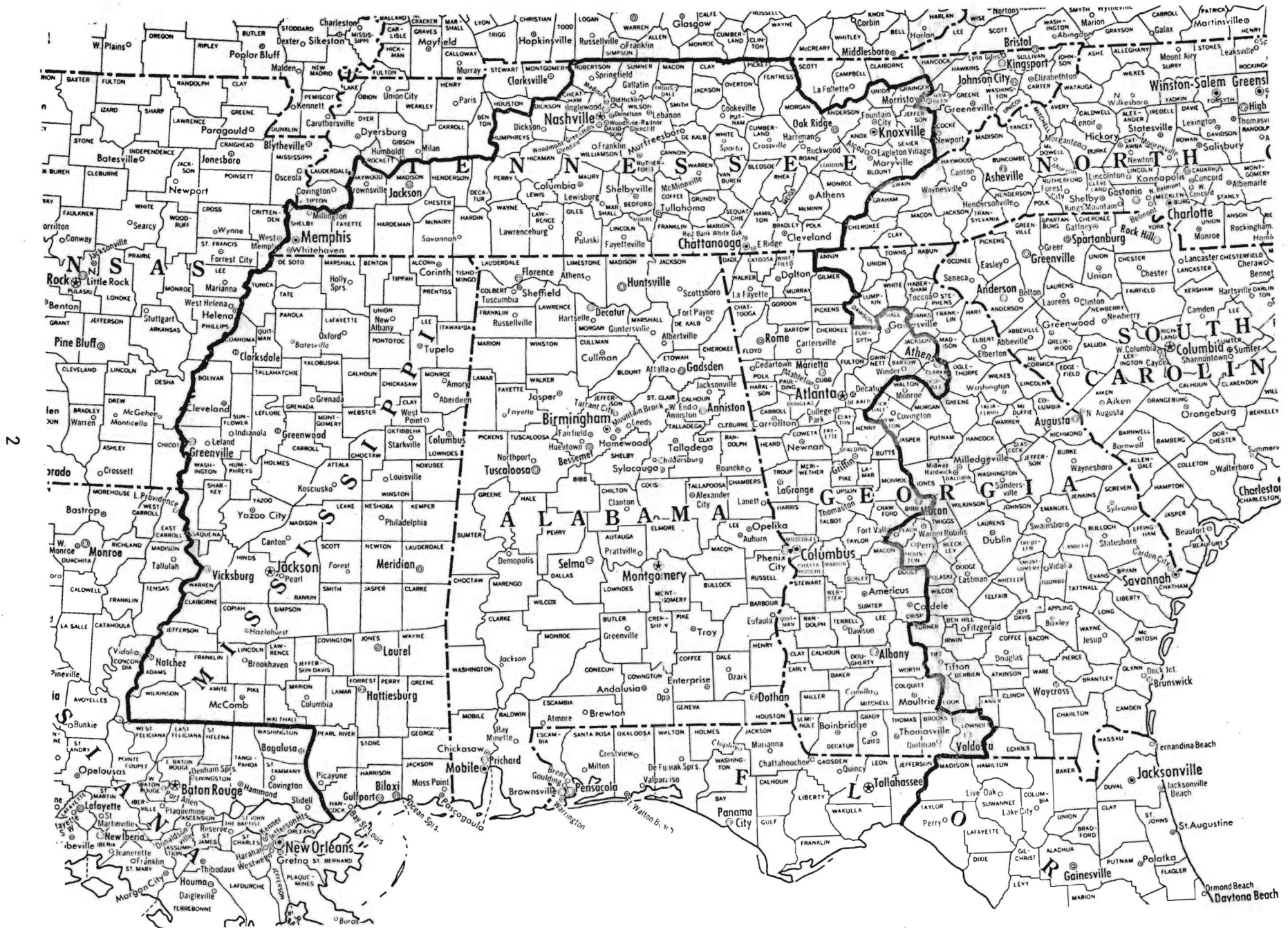
dilapidated condition.

To help alleviate the demand-supply imbalance, which could precipitate a major housing crisis, the federal government set, by the Housing and Urban Development Act of 1968, a national goal of producing at least 26 million new and rehabilitated units by 1978. The vehicle for this ambitious undertaking was "Operation Breakthrough," a HUD program designed to introduce mass production methods and techniques to the building industry.

Results of the program for 1969 and 1970 were unimpressive. In 1971, however, housing starts increase substantially, and by the end of December, homebuilding starts in the U. S. had risen for the year to an unprecedented volume of 2.1 million units. For 1971, domestic residential building construction reached 2,291 million square feet, an increase of 22% over the previous high of 1,876 million square feet in 1968. (See Figure 1.)

Unlike residential construction, nonresidential building activity in 1971 was disappointing. Still reflecting general economic uncertainties, annual nonresidential construction volume was 1,163 million square feet, differing by less than 1% from 1970 and off 15% from the peak of 1,368 million square feet put in place in 1969. (See Figure 1.) Preliminary data, however, indicate that nonresidential building increased by approximately 6% in 1972.
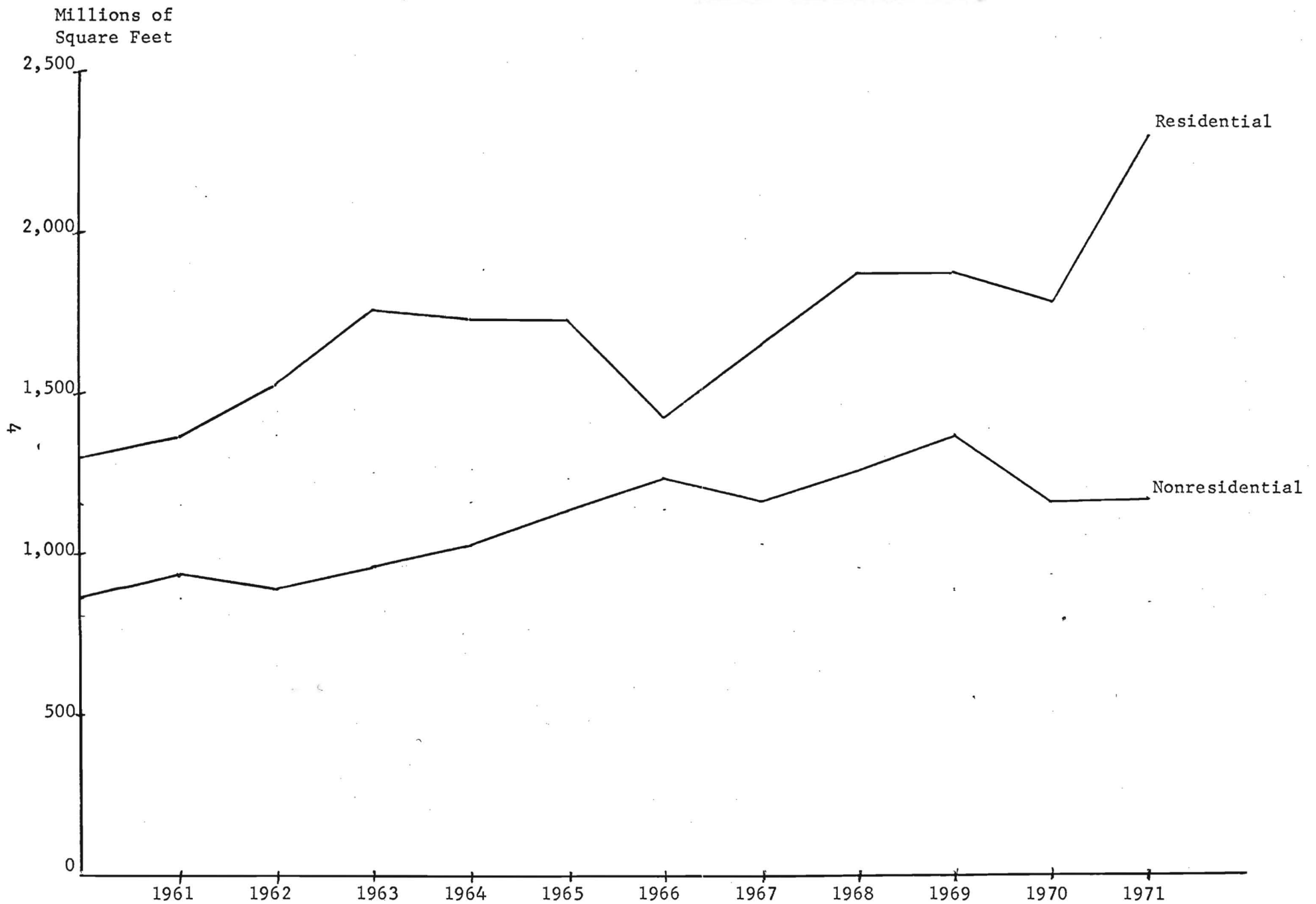
Study Area Market

Since concrete block is used primarily for structural building material, it is not surprising to find a high coefficient of correlation (0.95) between domestic production of concrete block and the national volume of residential and nonresidential building construction. (See Figure 2 and Appendix 1.) This high positive correlation validates the use of a factor derived from the relationship between block and construction as a basis for estimating present and future block consumption in particular areas.

Building activity in the selected study area totaled more than 302 million square feet in 1971. Of this figure, 212 million square feet was for residential construction and 90 million square feet was for nonresidential building.

On the average, for each 100 square feet of building floor space put in place nationally, 101 concrete blocks are used. (See Appendix 2.) Application of this ratio in conjunction with current Dodge construction statistics places the annual market for concrete block in the five-state study area at approximately 305.2 million units for 1971. Because the bulk of residential and nonresidential construction is
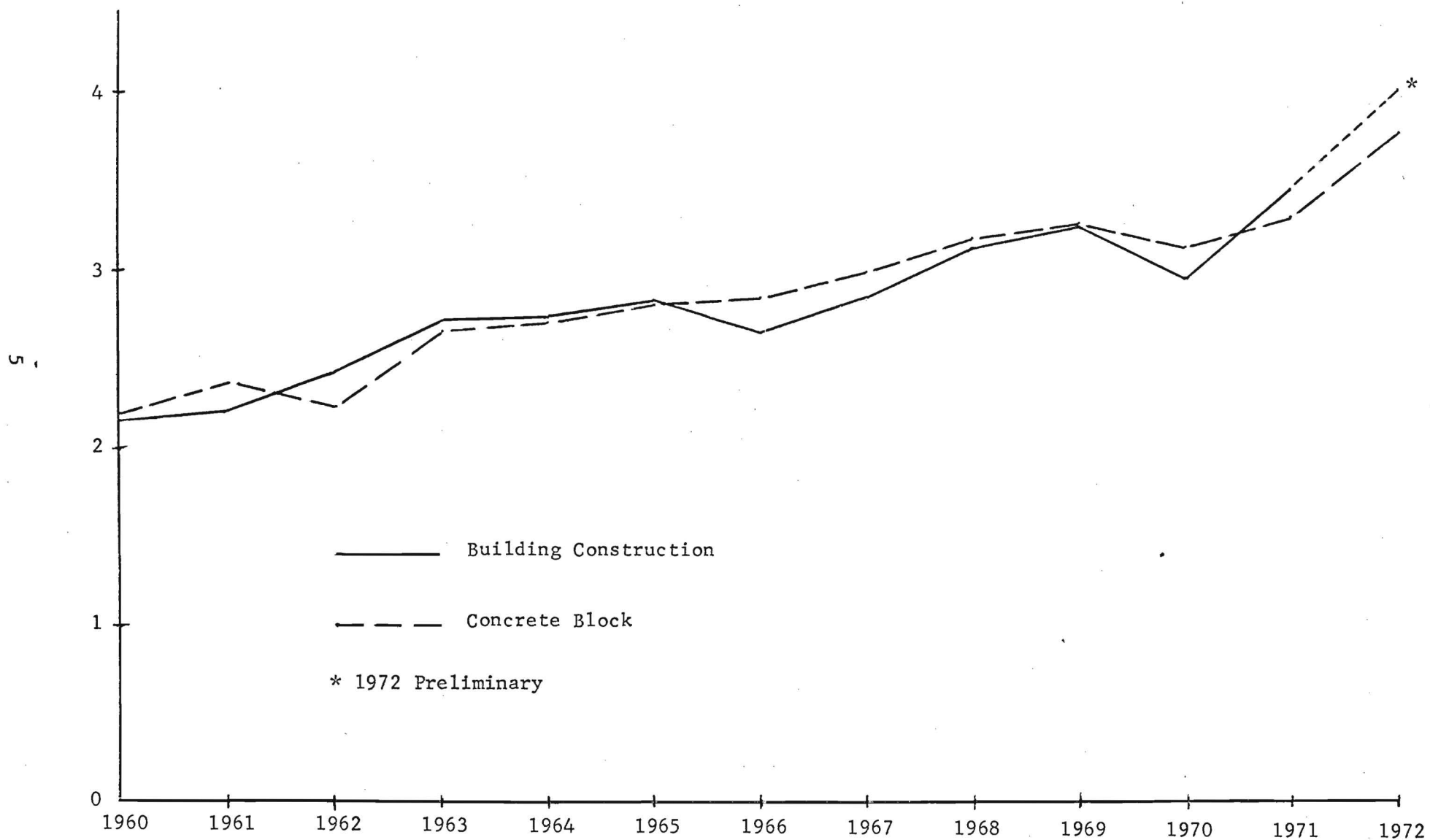
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Figure 1

RESIDENTIAL AND NONRESIDENTIAL BUILDING CONSTRUCTION IN THE U. S.

Billions of square feet and
billions of block

Building Construction

Concrete Block

* 1972 Preliminary

in cities, it can be assumed that the largest portion of this concrete block market is directed toward urban areas.

Eighteen standard metropolitan statistical areas (SMSA's) are located in the southeastern study area. (See Map 2.) Collectively, builders in these cities use about 185 million blocks annually, a figure equal to almost 61% of the entire volume consumed in the area. (See Table 1.)

Table 1

ANNUAL MARKET FOR CONCRETE BLOCK
IN THE SOUTHEASTERN STUDY AREA, 1971

(in thousands of units)

State	State Total	SMSA Total
Alabama	66,263	39,048
Florida	17,513*	11,070
Georgia	104,165*	71,616
Mississippi	37,315	9,702
Tennessee	79,950*	53,720
	305,206	185,156

$$\frac{185,156}{305,206} = 60.7\%$$

* Estimate for rural areas based on 1970 Census of Population and includes only counties within study area.

The Atlanta, Georgia, metro area has by far the greatest annual market potential for concrete block. This city plus three other SMSA's that utilize more than 15 million blocks each represent a market of almost 120 million units or 39% of the study area total. Volumes for individual SMSA's are listed by state in Table 2.

For more than a decade, the value of building construction has grown faster in the five southeastern states which contain the concrete block study area than in the U. S. as a whole. (See Figure 3.) While national residential and nonresidential construction values during the 1960-1971 period have increased at an average of 7.4% annually, the individual states have enjoyed the following growth:

Alabama	8.9%
Florida	10.3%
Georgia	12.0%
Mississippi	11.3%
Tennessee	8.6%
Five-State Area	10.3%

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Map 2

SMSA LOCATIONS IN THE SOUTHEASTERN STUDY AREA
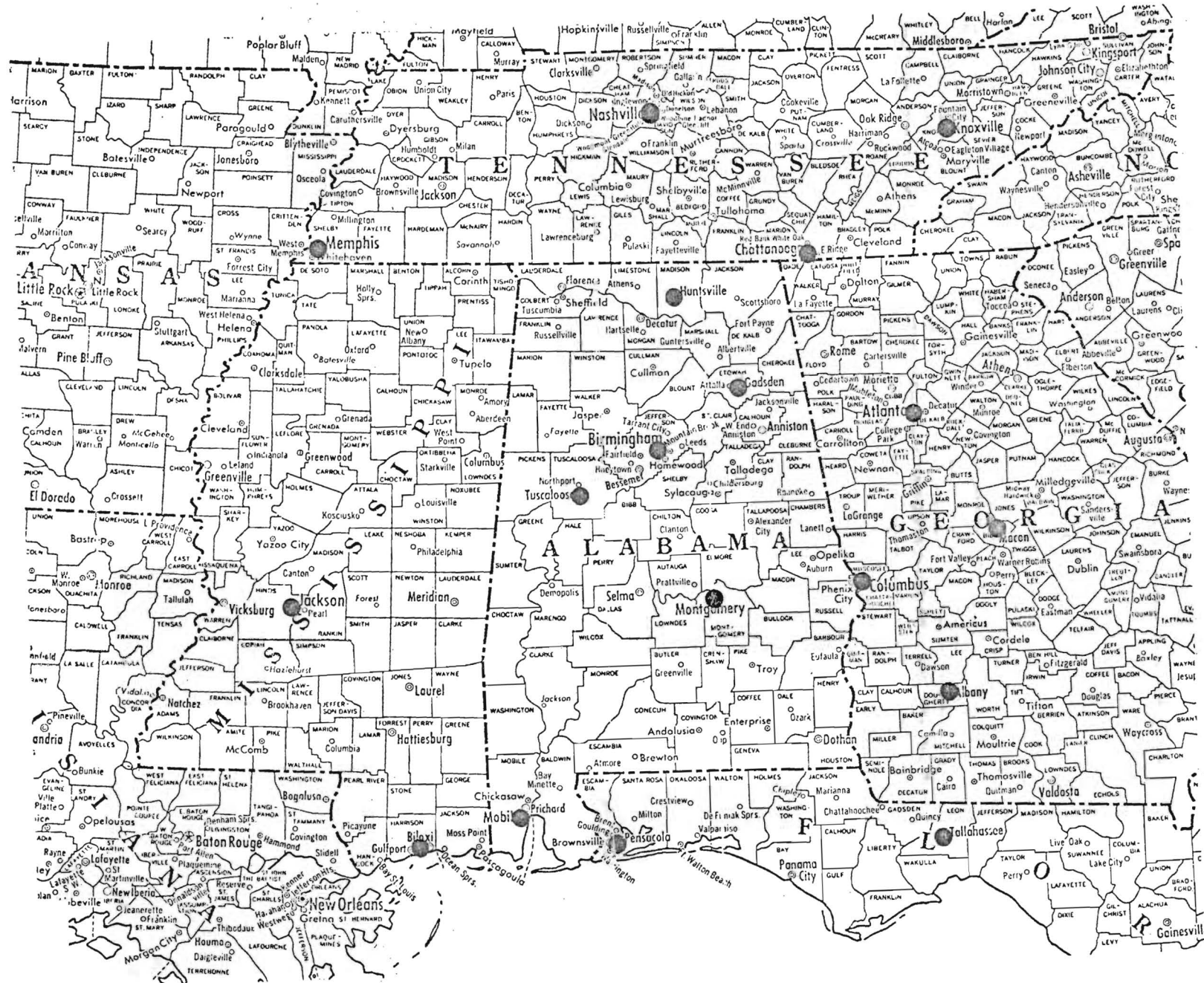
Table 2

SMSA'S LOCATED IN CONCRETE BLOCK STUDY AREA

State	City	Market for Concrete Block (thousands of units)
Alabama	Birmingham	18,703
	Gadsden	897
	Huntsville	3,229
	Mobile	5,852
	Montgomery	6,750
	Tuscaloosa	3,617
Florida	Pensacola	4,962
	Tallahassee	6,108
Georgia	Albany	2,205
	Atlanta	62,049
	Columbus	3,905
	Macon	3,457
Mississippi	Biloxi-Gulfport	3,809
	Jackson	5,893
Tennessee	Chattanooga	7,178
	Knoxville	7,626
	Memphis	22,069
	Nashville	16,847

This regional construction growth, resulting from population changes and new industrial activity, is expected to be maintained through the 1970's. Population projections through 1977 are shown in Appendix 3.

The state value of building construction growth percentages listed above, however, are relatively higher than those of building footage, reflecting an annual increase of 3.0% in building cost per square foot. (See Figure 4.) Therefore, these percentages must be adjusted before determing the future regional market potential for concrete block.

After unit cost adjustment, should state and SMSA trends continue at present rates and should block price and block-to-square-foot ratio remain comparatively constant, by 1977, the annual study area block market could be estimated at 452 million units. State and SMSA annual projections are given in Appendix 4.

Actually, because these block estimates are based on a utilization ratio which is national in derivation, they may tend to be inflated for some regions and conservative for others. The concrete block volumes for the study area in this report appear conservative.

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Figure 3

VALUE OF CONSTRUCTION CONTRACTS IN SELECTED SOUTHEASTERN STATES
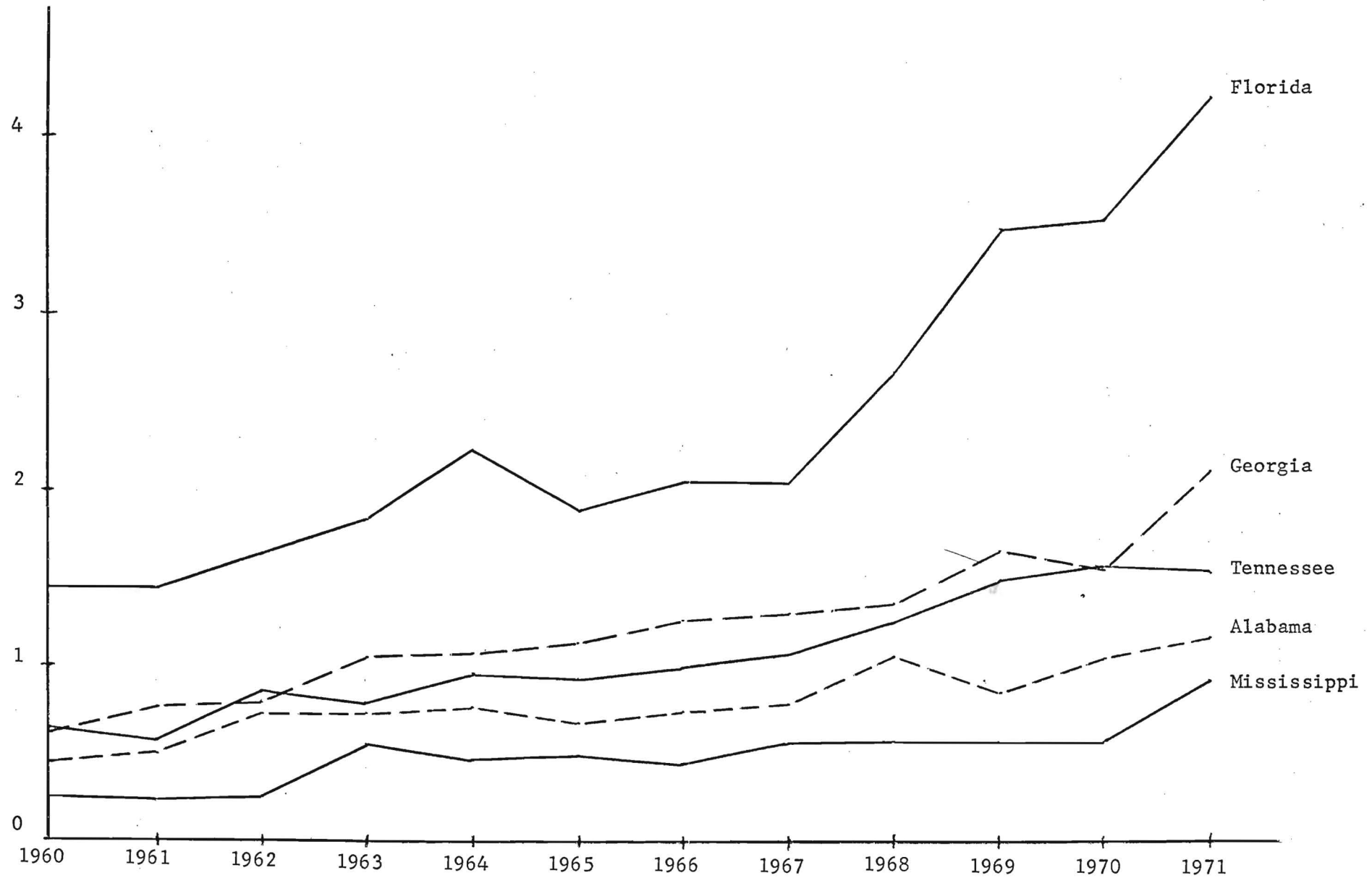
Figure 4

U. S. RESIDENTIAL AND NONRESIDENTIAL BUILDING COST PER SQUARE FOOT
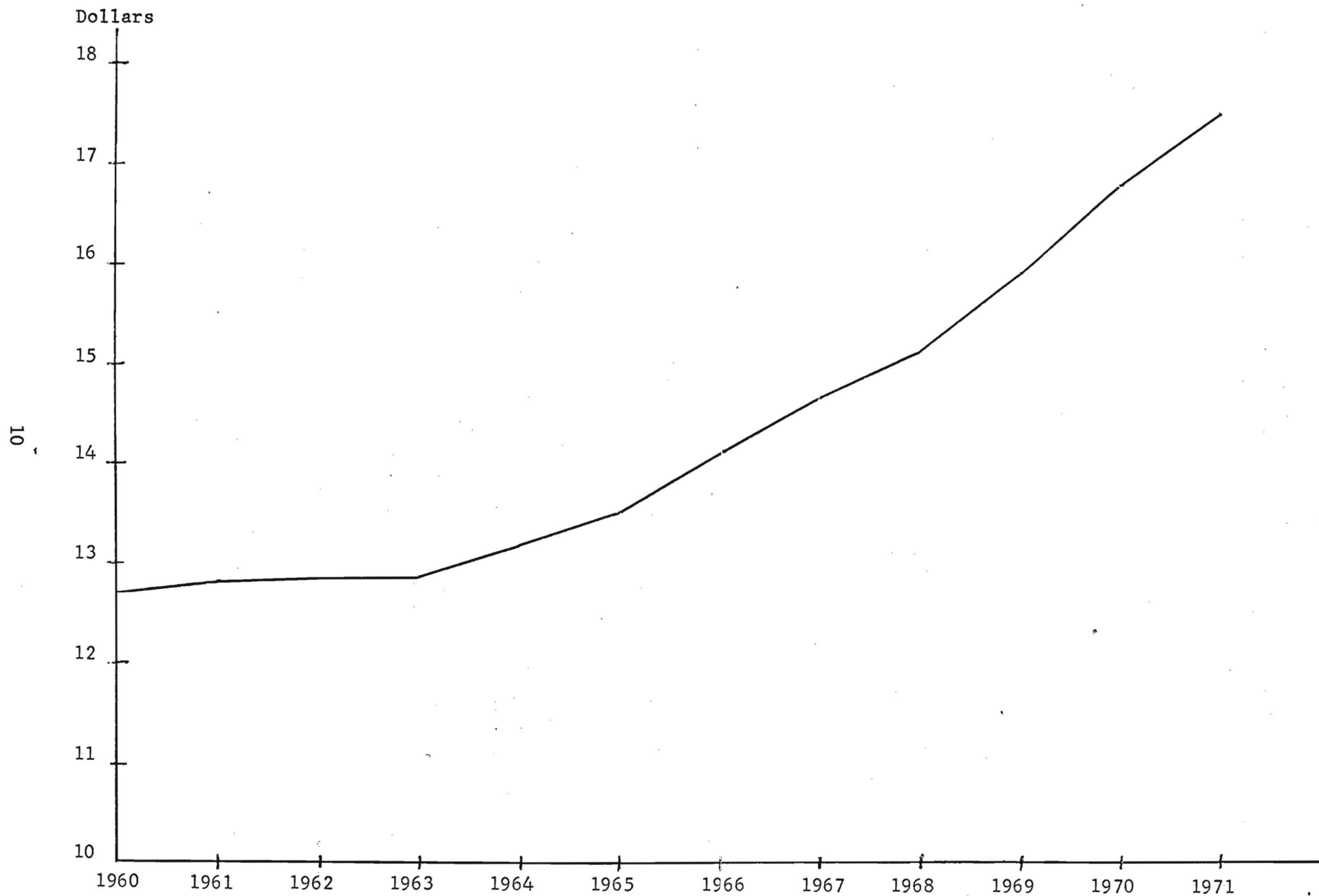
Available state value of shipment figures for concrete block and brick products (SIC 32711), released for Census years, show an increase in the southeastern share of production.

Value of Shipments, SIC 32711
(in millions of dollars)

State	1958	1963	1967
Alabama	6.0	7.0	· 8.9
Florida	N.A.	16.1	23.5
Georgia	7.7	14.3	17.7
Mississippi	N.A.	2.1	N.A.
Tennessee	7.3	13.7	N.A. ·
U. S.	413.8	505.2	550.1

Since Census of Transportation data for 1967 reveal that 94.6% of all concrete block and brick production is shipped less than 100 miles, it can be assumed that block is used primarily in the state or area of manufacture. This would indicate that current and future estimates of concrete block production in the five-state study area are even greater than those depicted.

The anticipated demand for block in the southeastern five-state study area presents a large and growing market for raw materials such as cement, aggregate, and sand, from which concrete is produced.

Appendix 1

CORRELATION BETWEEN CONCRETE BLOCK PRODUCTION AND SQUARE FEET OF RESIDENTIAL AND NONRESIDENTIAL CONSTRUCTION

Year	X	Y	x $(X-A)$	y $(Y-A)$	xy	x^2	y^2
1960	220	215	-61	-62	3,782	3,721	3,844
1961	235	220	-46	-57	2,622	2,116	3,249
1962	224	241	-57	-36	2,052	3,249	1,296
1963	266	271	-15	- 6	90	225	36
1964	272	274	- 9	- 3	27	81	9
1965	280	284	- 1	7	- 7	1	49
1966	285	264	4	-13	-52	16	169
1967	298	282	17	5	85	289	25
1968	318	313	37	36	1,332	1,369	1,296
1969	327	324	46	47	2,164	2,116	2,209
1970	312	294	31	17	527	961	289
1971	330	345	49	68	3,332	2,401	4,624
Sum	3,367	3,327			15,954	16,545	17,095

Average (A)   281   277

Number (N)   12

$$\sigma_x = \sqrt{\frac{\Sigma x^2}{N}} = \sqrt{\frac{16,545}{12}} = \sqrt{1,379} = 37.1$$

$$\sigma_y = \sqrt{\frac{\Sigma y^2}{N}} = \sqrt{\frac{17,095}{12}} = \sqrt{1,425} = 37.7$$

$$\text{Coefficient: } r = \frac{\Sigma xy}{N\sigma_x\sigma_y} = \frac{15,954}{12(37.1)\ (37.7)} = \frac{15,954}{16,784} = 0.95$$

X = Concrete block

Y = Square feet of residential and nonresidential construction

Appendix 2

CONCRETE BLOCK PRODUCTION AND RESIDENTIAL
AND NONRESIDENTIAL CONSTRUCTION

	Billions of Units*	Millions of Square Feet	Block per Square Foot
1960	2.20	2,154	1.02
1961	2.35	2,203	1.06
1962	2.24	2,414	.93
1963	2.66	2,711	.98
1964	2.72	2,737	.99
1965	2.80	2,843	.98
1966	2.85	2,643	1.08
1967	2.98	2,820	1.06
1968	3.18	3,129	1.02
1969	3.27	3,242	1.01
1970	3.12	2,938	1.06
1971	3.30	3,454	.96
Total	33.67	33,288	

$$\frac{33,670}{33,288} = 1.01$$

* Furnished by the National Concrete Masonry Association

Appendix 3

POPULATION (1970) AND BASE-LINE POPULATION PROJECTIONS*
FOR SMSA'S AND SELECTED SOUTHEASTERN AREAS
(in thousands)

		1970	1973	1974	1975	1976	1977
Alabama	Birmingham	739.3	759.4	766.3	773.2	780.1	787.2
	Gadsden	94.1	96.7	97.5	98.4	99.3	100.2
	Huntsville	228.2	241.5	246.0	250.7	255.5	260.3
	Mobile	376.7	392.7	398.2	403.8	409.5	415.2
	Montgomery	201.3	204.3	205.4	206.4	207.4	208.5
	Tuscaloosa	116.0	119.2	120.2	121.3	122.4	123.5
	State Balance	1,688.5	1,722.7	1,734.2	1,745.8	1,757.5	1,769.3
Florida	Pensacola	243.1	247.9	249.5	251.1	252.3	254.4
	Tallahassee	103.0	112.6	115.9	119.4	123.0	126.7
	State Balance**	318.6	331.6	336.0	340.5	345.1	349.7
Georgia	Albany	89.6	92.6	93.6	94.6	95.7	96.7
	Atlanta	1,390.2	1,497.7	1,535.4	1,574.1	1,613.8	1,654.4
	Columbus	238.6	243.6	245.4	247.1	248.8	250.5
	Macon	206.3	215.9	219.1	222.5	225.8	229.3
	State Balance**	1,266.5	1,307.9	1,322.1	1,336.4	1,350.8	1,365.4
Mississippi	Biloxi-Gulfport	134.6	137.9	139.1	140.2	141.4	142.5
	Jackson	223.0	234.3	238.2	242.1	246.2	250.2
	State Balance	1,859.3	1,887.3	1,896.8	1,906.2	1,915.8	1,925.4
Tennessee	Chattanooga	304.9	318.3	322.8	327.5	332.2	337.0
	Knoxville	400.3	413.0	417.4	421.8	426.2	430.7
	Memphis	722.0	749.4	758.8	768.3	777.9	787.6
	Nashville	541.1	564.1	572.0	580.1	588.2	596.4
	State Balance**	1,216.6	1,258.9	1,273.0	1,287.5	1,302.2	1,317.1

* Projections are derived from the base-line concept, developed by the Bureau of Economic Analysis, U. S. Department of Commerce for the Environmental Protection Agency, 1971.

** Includes only counties within study area.

Appendix 4

CONCRETE BLOCK PROJECTIONS* FOR SMSA'S
AND SELECTED SOUTHEASTERN AREAS
(in millions of units)

		1973	1974	1975	1976	1977
Alabama	Birmingham	23.5	26.3	29.4	33.0	36.9
	Gadsden	1.1	1.1	1.2	1.3	1.5
	Huntsville	2.8	2.5	2.4	2.2	2.0
	Mobile	6.3	6.5	6.7	7.0	7.2
	Montgomery	7.6	8.0	8.5	9.0	9.5
	Tuscaloosa	4.0	4.2	4.3	4.6	4.8
	State Total	74.3	78.7	83.8	88.3	93.5
Florida	Pensacola	5.7	6.1	6.5	7.0	7.5
	Tallahassee	7.0	7.5	8.1	8.7	9.3
	State Total**	20.5	22.1	23.9	25.9	27.9
Georgia	Albany	2.7	2.9	3.2	3.6	3.9
	Atlanta	71.2	76.2	81.6	87.4	93.6
	Columbus	4.2	4.4	4.5	4.7	4.9
	Macon	3.6	3.6	3.7	3.7	3.8
	State Total**	119.9	128.7	138.1	148.2	159.0
Mississippi	Biloxi-Gulfport	4.5	4.8	5.2	5.6	6.1
	Jackson	7.0	7.7	8.3	9.1	9.9
	State Total	44.8	47.4	51.3	55.6	60.2
Tennessee	Chattanooga	9.0	10.0	11.2	12.5	13.9
	Knoxville	8.3	8.6	9.0	9.3	9.7
	Memphis	24.9	26.4	28.1	29.8	31.7
	Nashville	20.5	22.6	24.9	27.5	30.3
	State Total**	89.2	94.1	99.4	105.0	110.9

* Straight-line projections based on state and SMSA growth rates.

** Includes only counties within study area.