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AN ANALYSIS OF THE

PORTLAND CEMENT MARKET

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ENGINEERING EXPERIMENT STATION, GEORGIA INSTITUTE OF TECHNOLOGY

An Analysis of
THE PORTLAND CEMENT MARKET
IN AND NEAR GEORGIA

Prepared for
The Georgia Department of Commerce
Scott Candler, Secretary

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Industrial Development Branch
Engineering Experiment Station
Georgia Institute of Technology
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FOREWORD

This is the fourth report in the series of 15 in progress or completed as part of the Industrial Development Branch's program of research for the Georgia Department of Commerce. Its principal focus is the opportunity which exists for establishing in Georgia another cement plant to serve the State's unmet and growing needs.

Related mineral development research will be completed after the first of the year. This work will be conducted by the Mineral Development Group in the Material Sciences Division of the Experiment Station. Both prospecting and chemical analysis work will be undertaken to determine whether more conveniently located sources of limestone exist which could provide an economic source of raw material for a cement plant located in either the Bainbridge or Brunswick area.

Both the research and the report on the findings of this minerals project will be closely correlated with the work of the Branch. Together, the two projects are designed to give a complete picture of the opportunities for establishing a new cement plant in Georgia.

Kenneth C. Wagner, Head
Industrial Development Branch

ACKNOWLEDGMENTS

Data for the report have been obtained by interview, correspondence, and review of pertinent literature. Dr. John L. Fulmer of the Georgia Institute of Technology kindly made available valuable data on county income in Georgia. Much helpful information was furnished by research directors and others in the industry, trade press, and trade associations, and particularly by persons in the hundreds of cement-buying organizations responding to the questionnaire. Their courtesy and help are gratefully acknowledged.

Appreciation is likewise expressed to Mr. W. H. Armstrong of Armstrong and Edwards; Mr. Howard H. Callaway, Executive Director, Ida Cason Callaway Gardens; the Portland Cement Association; and the Corps of Engineers, United States Army for their courtesy in making available a number of interesting photographs, some of which are reproduced herein. Permission was obtained from the following persons and organizations to use the photographs indicated. Their offices are in Atlanta, except as otherwise noted.

Atlanta Municipal Airport, Model -- Robert and Company Associates
Farmers' Market, Model -- Abreu and Robeson, Inc.
Pavilion, Callaway Gardens -- Ida Cason Callaway Gardens,
Pine Mountain, Georgia
Fort Gaines Lock and Dam -- Corps of Engineers, U. S. Army

Credit for the excellent photographs of a new and attractive Atlanta motel goes to personnel of the Photographic Laboratory of the Engineering Experiment Station, Georgia Institute of Technology. One of these pictures, a close-up, was used by Mr. James H. Lee in designing the cover.

Dr. Ernst W. Swanson and Dr. Kenneth C. Wagner made valuable suggestions at several stages of the study, and reviewed the manuscript. Mr. Robert Bullock assisted in the editing and processing of the report. The writers also express their appreciation to Mrs. F. N. Edwards and Mrs. Sidney Jaffe of the Industrial Development Branch, and to Mr. James E. Garrett and Mr. Maurice Hedin of the Photographic Laboratory, Engineering Experiment Station, for their care and skill in the reproduction of the report.

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ERRORS which are likely to confuse the reader are corrected below.

Page

- 4 On seventh line from bottom of page, substitute ready mixed for read-mixed.
- 20 On line three, insert after production capacity: at old and new plants. . .
- 24 On line two, read as 1940 (not 1950).
- 39 On line six of third complete paragraph, substitute pounds for points.

Appendixes

- 56 Footnote number one applies to columns captioned Total and Apparent Consumption.
- 57 Footnote number one applies only to Georgia and Florida caption.
- 61 (Footnote number one applies to the main heading
- 62 (of the table.
- 62 Footnote number four applies to Population, in the column farthest left.
- 63 Add asterisk (*) to Cordele in left-hand column and to Lake City, Florida in right-hand column.
- 64 Delete footnote number three.

SUMMARY

The growth and well-being of the portland cement industry depend primarily upon the fortunes of that large and dynamic part of the economy called construction. According to trade forecasts, the country faces spectacular gains in construction activity during and after the 1960's. Significant increases in total population and family-formation, and continuing rises of personal income levels are the basic factors pointing to impressive and sustained advances in many branches of construction.

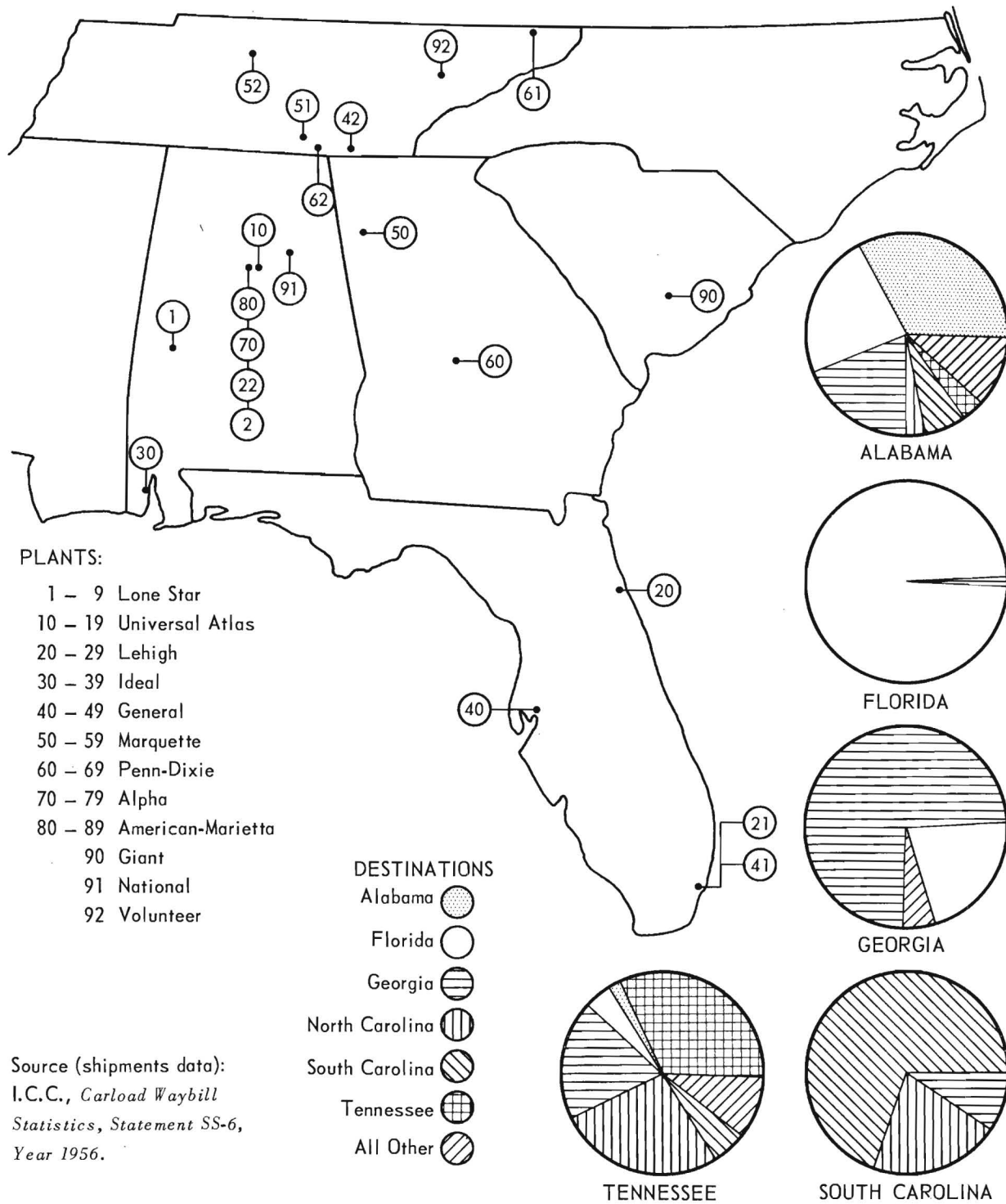
Cement demand is expected to be buoyed by these broad, general developments, and particularly by the national highway program. Growth in "normal" demand plus the special needs to complete the road building program are expected to result in progressive rises in cement consumption from the present level of about 300 million barrels to double this volume by 1975. Despite considerable expansions in industry capacity in recent years, further major installations of new capacity will be needed to supply the market and to replace some of the older producing units.

Area of Focus

The present study devotes special attention to a six-state region which includes Alabama, Florida, Georgia, the Carolinas, and Tennessee. Within this region, Georgia and Florida are outstanding in their rate of advance both in total and per capita cement consumption. These sharp rises have been attended by growth in cement-using enterprises, and by new cement capacity in Florida. The latter has retained its primary position among these six states in total consumption, and its per capita consumption rate is one of the highest in the country. Georgia advanced from fifth position in 1949 to second in the region by 1955, displacing Tennessee, North Carolina, and Alabama.

All of North Carolina's cement supplies come from other States. Florida, Georgia, and possibly South Carolina still receive substantial in-shipments. Also, as late as 1956, Florida still imported major quantities from foreign countries and Puerto Rico and accounted for a large share of total United States cement imports. It is generally uneconomic to ship cement for great distances, because of the low unit value of the product in relation to transportation costs. Domestic rail shipments average about 150 miles. By contrast, the average haul per ton of the 9.6 million barrels of cement railed in 1956 from Alabama and Tennessee mills to Florida, Georgia, and the Carolinas was 326 miles.

MAP 1
PORTLAND CEMENT MILLS IN SIX SOUTHEASTERN STATES,
AND STATE-BY-STATE PATTERN OF THEIR SHIPMENTS



Cement Production and Distribution in Six-State Region

Examination of the present geographic distribution of cement mills in the six-state area shows that a number of cities in south Georgia and north Florida are relatively distant from a mill. Questionnaire results indicate that a large proportion of reported shipments into these localities incur very large rail hauls. For buyers in these districts this means comparatively high prices for delivered cement and, what is even more serious, greater likelihood of local shortages in periods of peak demand. When materials shortages occur, the pace of construction activity is slowed, with apparent effects for the local economy.

Such imbalances are not likely to last for a great length of time. There are some vigorous competitors among producers in the cement business. Once they are convinced that there are attractive new markets to be gained, they usually move to restore the balance. In recent years such corrective action happened in the Miami area, where two large new plants have gone in despite today's cost of up to \$10 to \$12 per ton of annual capacity, as compared to perhaps a third of that a decade ago. New plants have also been built in areas of less rapid population growth. In several recent instances, however, groups vitally interested in having additional cement production in their areas have not waited for established producers to act. A gas company in Arkansas, a company organized by Mississippi people with local capital, and a group of alert Texas contractors have established, or are now building, new and independent cement mills.

Continuing advances in cement consumption are likely in the foreseeable future, and these may well justify additional producing or distributing facilities to serve the local market areas in south Georgia and north Florida where supplies now come from relatively distant producing points. Bainbridge and Brunswick, Georgia, deserve serious consideration as alternative locations of a proposed new cement plant. They are not the only possibilities, but they appear to be excellent representatives of the type of location needed. Their water transportation facilities could be of crucial importance if it is necessary to bring in raw materials from a considerable distance.

Bainbridge: Market Territory and Potentials

Bainbridge is in the midst of a cluster of cities in three states which comprise a "neglected" market. Since Bainbridge now enjoys the advantages of

water transportation as well as good rail facilities, it is favorably situated for either a producing mill or a distribution plant. Its main marketing territory, as determined by distance, freight rates, and locations of competing mills, would include 41 counties in Georgia, 21 in Florida, and 7 in Alabama. Available evidence indicates that this combined area consumed between 2.9 and 3.7 million barrels of cement annually in the 1956-57 period. Actual purchases in 1957, as reported by some of the carload-lot buyers to whom questionnaires were sent, include over 935,000 barrels at delivered prices which would yield very favorable net mill values f.o.b. Bainbridge. In additional areas, where reported purchases in 1957 were about 1.1 million barrels, the net mill values at Bainbridge would be somewhat below the average actually received by Georgia cement mills in 1958 according to published figures.

Future potentials for the Bainbridge territory, projected from the range of estimated consumption in 1956 and using available data on local, state, and national economic trends, indicate a market of some 3.2 to 4.6 million barrels by 1960, 3.6 to 5.4 million by 1965, 3.8 to 5.7 million by 1970, and 4.6 to 6.9 million barrels by 1975. These projections for Bainbridge do not quantify the dynamic forces which may well begin to operate in future years with further development of the area's water power and river navigation potentials.

Brunswick: Market Territory and Potentials

Brunswick would offer many advantages as a cement producing mill location. In terms of comparative freight rates, it is well within reach of many of the cities in south Georgia and north Florida which are now distant from existing mills. Furthermore, with its good rail connections and port facilities it should compete favorably for a portion of such markets as Augusta, as well as Jacksonville and other south Atlantic ports.

Questionnaire respondents located within this market territory reported 1957 purchases of some 1,265,000 barrels at delivered prices which would permit favorable prices f.o.b. Brunswick. These responses included 10 of the 17 Georgia read-mixed concrete firms located in the market territory, but otherwise represented but a small fraction of listed organizations in other buyer categories. Most replies were from firms in Georgia, with a few from Florida. The survey did not cover the Carolina port cities.

Brunswick's main market territory--including 32 counties in Georgia, 11 in Florida, and one in each of the Carolinas--is estimated to have consumed from 2.9 to 3.1 million barrels of cement annually in the 1956-57 period.

These areas experienced a population growth from 1950 to 1956 at a rate more rapid than the national average. One set of demand projections to 1960 and beyond reflects this trend, but within the limits of the Census projections of population for the local areas' respective states. Potentials for 1960 are 3.3 to 4.2 million barrels. For later periods, the range is 3.9 to 5.2 million in 1965; 4.5 to 5.8 million in 1970; and 5.4 to 6.9 million barrels by 1975.

To relate the foregoing estimates of cement market potentials to the actual sales volume needed to keep a new plant in good business health, a small plant (say, of 700,000 barrels annual capacity) would require, for the optimum rate of operation, yearly sales of 630,000 barrels. A mill in the most common size-group (one to two million barrels capacity), also operating at the optimum rate, would need to sell about 1,350,000 barrels annually. Actually, it is a rare cement plant that operates at the optimum rate every year, or even most years. The estimated market appears to be adequate to support a cement mill of medium size (say, up to 2,000,000 barrels capacity).

CONCRETE PRODUCTS
from
PORTLAND CEMENT

Illustrations of Some Notable Uses in Georgia and Elsewhere

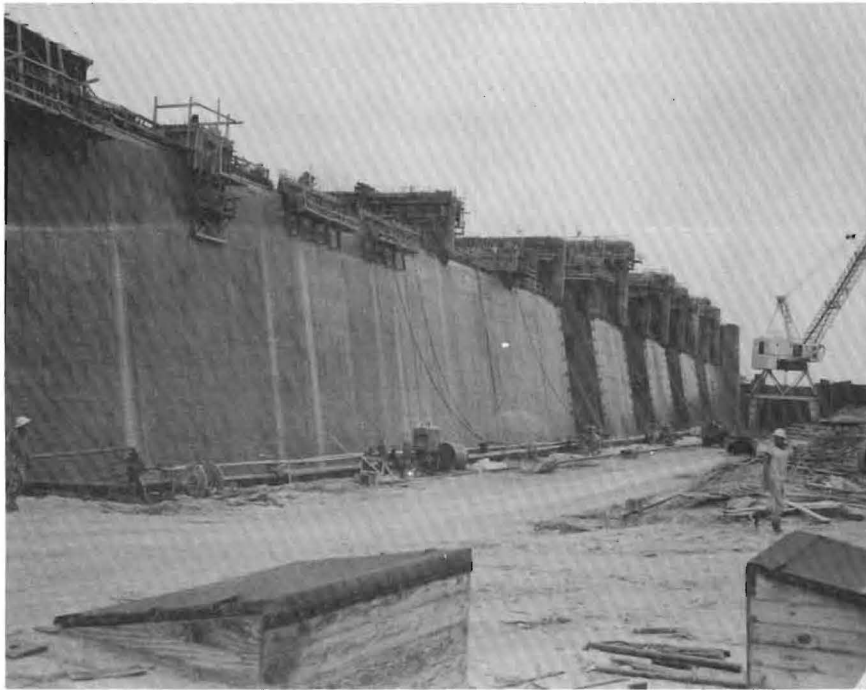
FORT GAINES LOCK AND DAM
ON THE CHATTAHOOCHEE RIVER

(Under construction by the Corps of Engineers, U. S. Army)



To be dedicated to the late Walter F. George, a statesman known and respected throughout the world for his service as a United States Senator, this is a dual-purpose river-improvement project designed and being built primarily to generate electric power and to provide a 9-foot channel for navigation from the Gulf of Mexico to Columbus, Georgia.

FORT GAINES LOCK AND DAM



FARMERS' MARKET

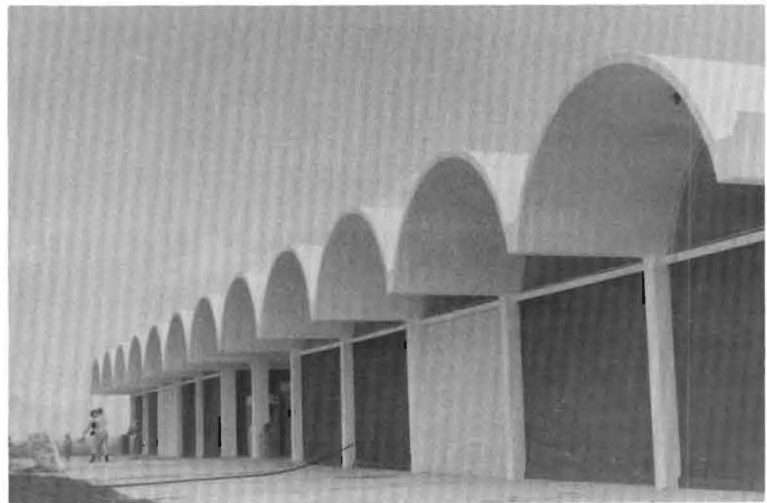
Atlanta, Georgia



This is said to be one of the largest precast operations in the United States. The structural framings for the dealers' buildings and the farmers' sheds were precast in a casting yard set up at the job site and were then moved by a specially designed carrier to their place on the building foundations. The restaurant, featuring a barrel shell roof, was a cast-in-place operation.

JEKYLL ISLAND, GEORGIA--

Bath house features a barrel shell roof.



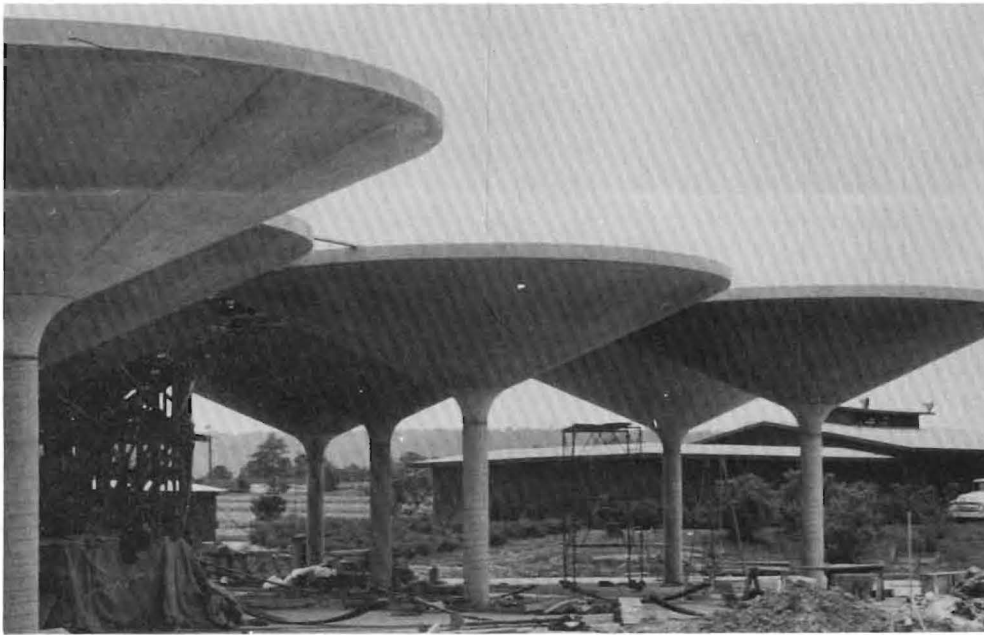
Motel in Atlanta, featuring grille wall made of concrete block. . .



A section of this grille, which was produced in Atlanta, appears on the cover of this report.

DINING AND DANCING PAVILION, FEATURING CONCRETE SHELLS

During construction. . .

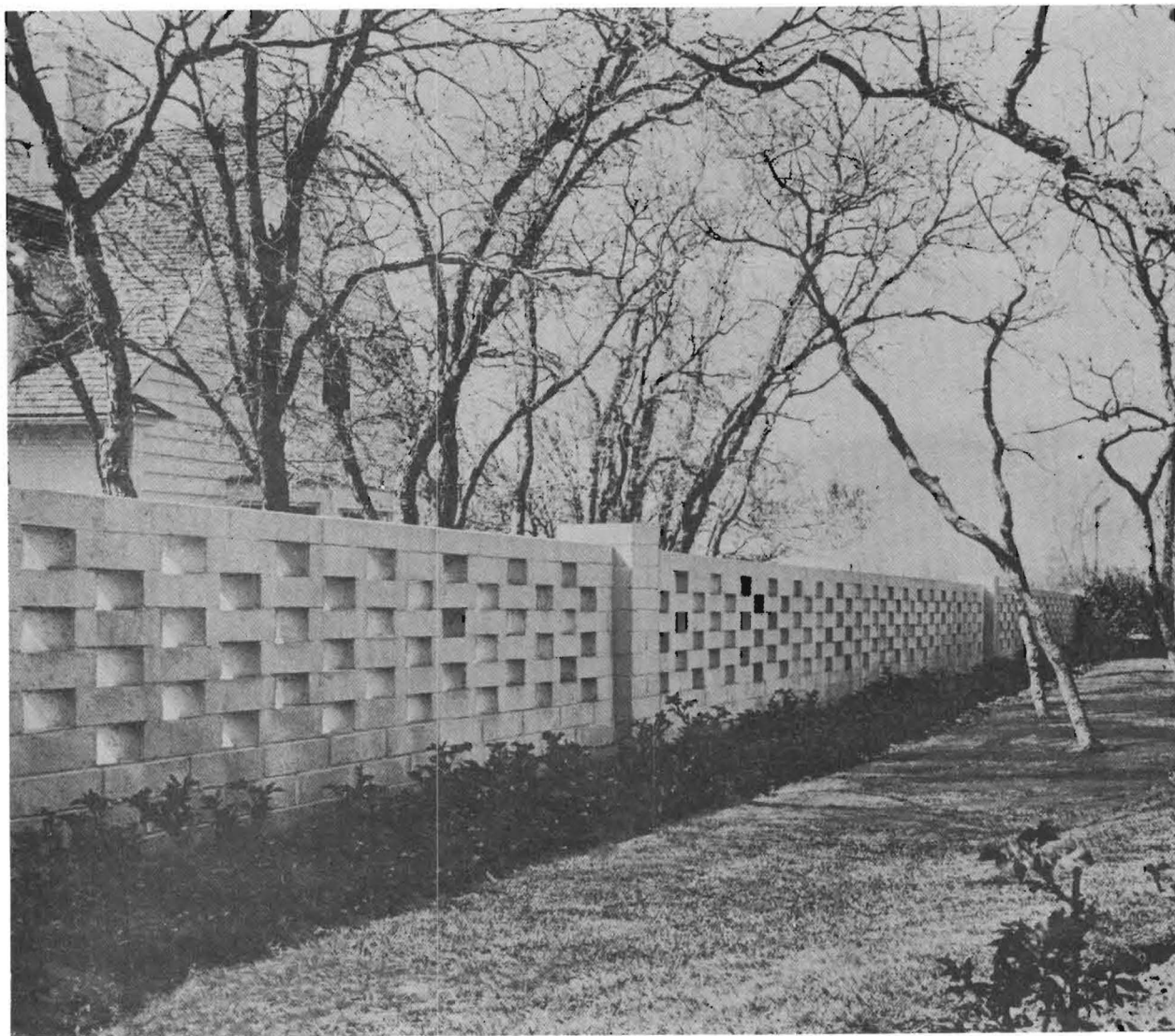


Completed structures. . .



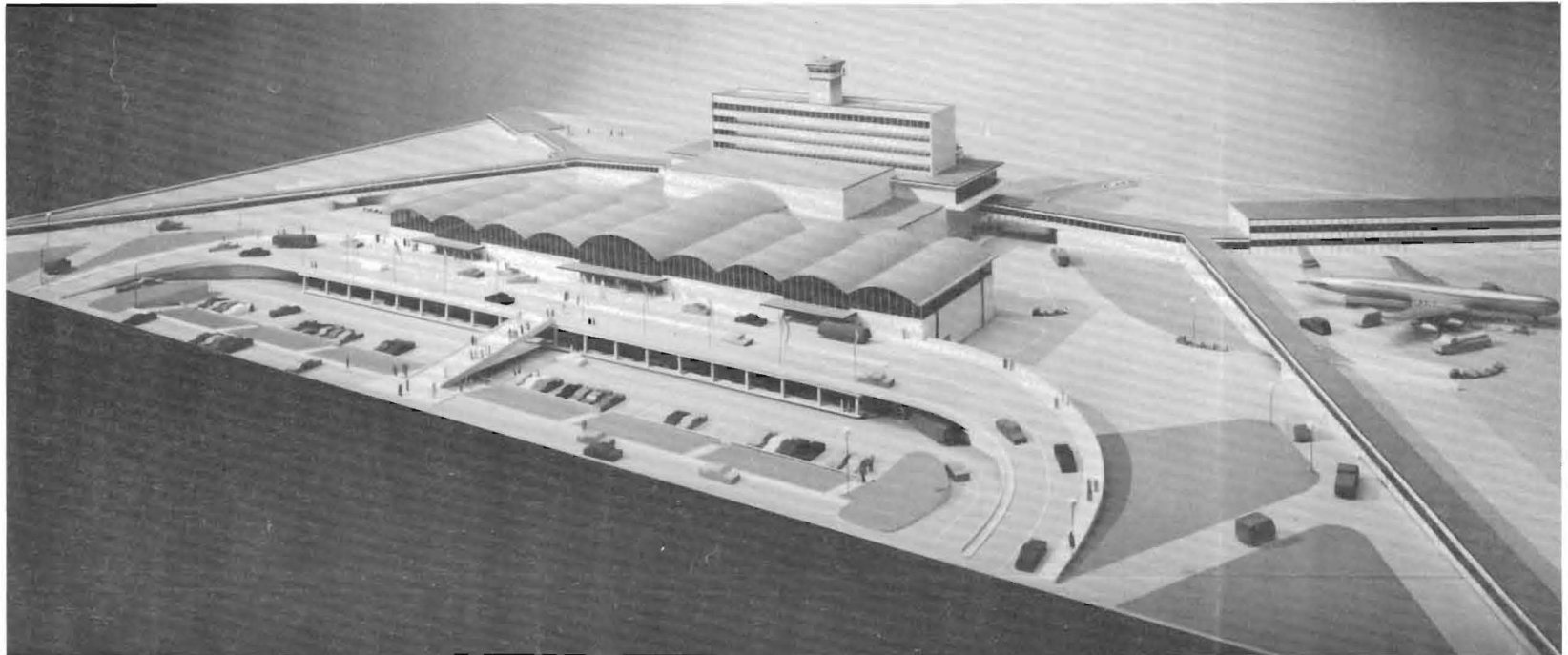
Called a "peek into the future" by park and recreation authorities, this pavilion consists of 21 giant concrete shells, towering 19 feet into the air from slim bases to form an interlocking shelter over an area half the size of a football field. Each shell is 30 feet in diameter. Rain water drains through a pipe embedded in the columns. The pavilion is located on Robin Lake Beach, Ida Cason Callaway Gardens, Pine Mountain, Georgia.

Beauty and the breeze . . .



ATLANTA MUNICIPAL AIRPORT

Terminal and Administration Building



This structure, using reinforced concrete in frame, floors, and roof, features the thin shell concrete roof. Also, a large amount of exposed aggregate concrete panels will be used throughout the project.

INTRODUCTION

In the approaching decade, the soaring volume of construction activity in the United States is expected to add mightily to the demand for such materials as portland cement. New technological developments such as prestressing are also expanding markets for portland cement concrete. To meet the major increases in demand, the cement industry's present productive capacity will need to be expanded considerably. Although the pace of economic advance can be expected to vary from region to region, cement supplies normally do not move in great volume from areas of surplus capacity to far distant deficit areas. Economic shipping distances are relatively limited.

This study examines supply and demand relationships for cement in Georgia and the Southeast, in order to determine whether, where, and approximately when additional production or distribution capacity in Georgia might be expected to occur. Special attention is focused on those areas in and near Georgia which are now comparatively remote from a producing mill. An analysis of market potentials is made, based on available evidence as to recent cement consumption in these local areas and on other pertinent factors.

The availability of suitable raw materials, a prime factor in the selection of a producing site, is the subject of a separate investigation being undertaken by the Material Sciences Division's mineral development group. This is not, therefore, an economic feasibility study. However, in true chicken-and-egg tradition, it usually is helpful to have some indication of market potentials before final decisions are made as to the ultimate scope and intensity of a raw materials search.

It is hoped that the information developed and analyzed here will be useful to persons and organizations having an active interest in the cement market potentials of south Georgia and certain nearby areas.

SUPPLY AND DEMAND RELATIONSHIPS IN GEORGIA
AND THE SOUTHEAST^{1/}

Production

Existing cement producers in the six southeastern states under study include the following, with their mill locations:

<u>Company</u>	<u>Mill Location(s)</u>
Alpha Portland Cement Co.	Birmingham, Alabama
American-Marietta Co. Southern Cement Division	Robertta (near Birmingham), Alabama
General Portland Cement Co. Florida Division Signal Mountain Division	Hooker's Point (Tampa), Fla. Miami, Florida Near Chattanooga, Tenn.
Giant Portland Cement Co.	Giant (Harleyville), S. C.
Ideal Cement Co. Alabama Division	Mobile, Alabama
Lehigh Portland Cement Co.	Birmingham, Alabama Bunnell, Florida (and distribu- tion plant at Jacksonville, Fla.) Miami, Florida
Lone Star Cement Corp.	Birmingham, Alabama Spocari, Alabama
Marquette Cement Mfg. Co. (including Southern States Portland Cement Co., a sales subsidiary)	Nashville, Tennessee Cowan, Tennessee Rockmart, Georgia
National Cement Co.	Ragland, Alabama
Penn-Dixie Cement Co.	Clinchfield, Georgia; Kingsport and Richard City, Tennessee
Ponce Cement Corp.	(Distribution plant) Port Ever- glades, Florida)
Universal-Atlas Cement Co. (a subsidiary of U.S. Steel Corp.)	Leeds (near Birmingham), Alabama
Volunteer Portland Cement Co.	Knoxville, Tennessee

Summarizing by state, Alabama has eight producing mills, Tennessee six, Florida four, Georgia two, South Carolina one, and North Carolina none. In terms of total annual capacity, Alabama has about 14.9 million barrels, Florida almost 11 million, Tennessee about 9.7 million, South Carolina 2.9 million, and Georgia about 2.3 million barrels. It is estimated that when the two new

^{1/} See Appendix 1 for pertinent statistical problems.

mills near Miami are in full operation, Florida's total capacity will exceed 11 million barrels per year.

Current and recent increases in cement production capacity in the Southeast include the following:

<u>Place</u>	<u>Company</u>	<u>Estimated Present Capacity Million bbl./yr.</u>	<u>Year of Completion</u>
Tampa, Fla.	General	4.0	1954
Bunnell, Fla.	Lehigh	3.07	1956
Miami, Fla.	Lehigh	2.0	1958
Miami, Fla.	General	2.5	1958
Giant, S. C.	Carolina Giant	2.9	1957
Rockmart, Ga.	Marquette	1.1	1957
Roberta, Ala.	American-Marietta (Sou. Cement Div.)	2.5	1957
Leeds, Ala.	Universal-Atlas	2.4 (est.)	1958
Knoxville, Tenn.	Volunteer	3.0	1958

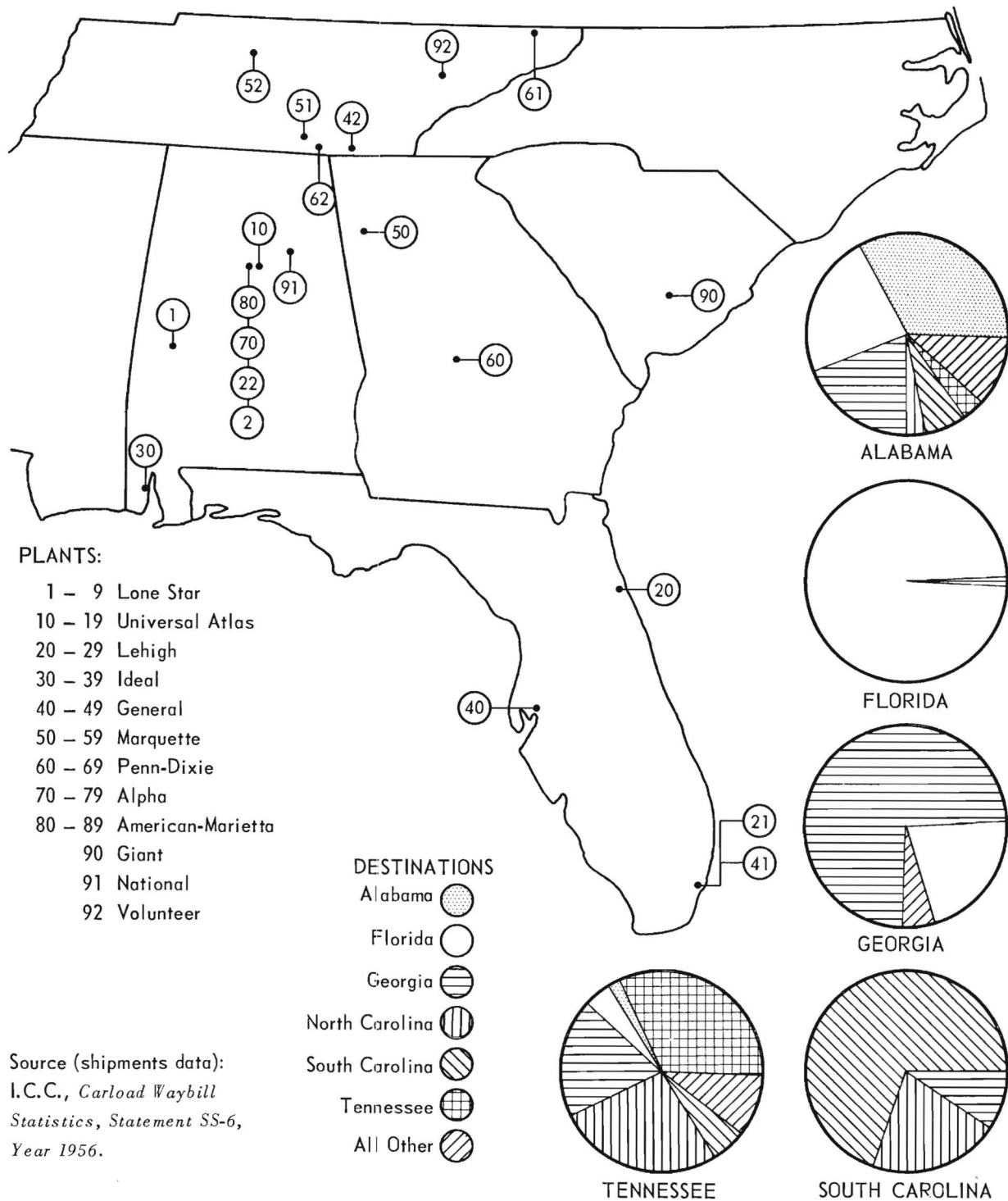
In addition, the Ponce Cement Company in 1957 added 12 silos with a capacity of 176,000 barrels to its distributing plant at Port Everglades, Florida. This cement is produced in Puerto Rico and brought to the distributing plant by ship. Lehigh also owns distribution silos in Florida, at Jacksonville--supplying them via the intracoastal waterway from Bunnell, some 70 miles southward.

As brought out in Appendix 5, production in the six-state region has varied in rough proportion to capacity. For example, Alabama's annual production in most recent years has been on the order of 12 million barrels, as compared with its capacity of approximately 15 million barrels.

Interstate Trade Patterns

Cement plants typically serve a regional market. Georgia appears to be well situated for additional portland cement capacity, despite the substantial capacity increases that have taken place in recent years in Florida and, to a lesser degree, in other adjacent states. For the Southeast as a whole, supply and demand at the moment are held by some producers to be in balance. However, considerable quantities of cement continue to be shipped into Georgia from Tennessee and Alabama and into Florida from Alabama and Puerto Rico. Georgia's productive capacity is less than half of this state's consumption--and highway construction in the years immediately ahead should add much to demand, both

MAP 1
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directly and indirectly. That is, in addition to the roads themselves, highway-and-by-pass-oriented buildings (commercial and industrial) should account for an important volume of new construction.

Furthermore, when comparatively low-cost cement becomes readily obtainable in an area which formerly had to rely on relatively high priced supplies from distant mills, consumption is likely to rise significantly. One specific recent illustration of this principle is seen on the island of Jamaica, where during the past few years after a new mill was built cement consumption rose rapidly. The plant is now in its third round of expansion.

In many parts of the United States, the distribution of cement mills geographically is roughly proportionate to the population distribution. The "normal" pattern of mill-and-market location is illustrated in the eastern United States. Plants in New York State supply most of the New England states' needs, while parts of New York receive shipments from nearby mills in Pennsylvania. Several exceptions to this general pattern occur in the Southeast. North Carolina is one of the few states without even one cement mill. Its supplies in 1956 came mainly from Tennessee, Virginia, South Carolina, and Alabama. During the same year waybill statistics indicate that South Carolina's net in-shipments were 144,700 short tons (about 769,800 barrels). As of now, production in South Carolina appears to be approximately in balance with that state's consumption. Florida is still a net importing state, even after substantial capacity increases and the construction of three new mills in recent years. In-shipments are received mainly from Puerto Rico, Alabama, Tennessee, and even distant foreign suppliers.

Similarly, Georgia receives large in-shipments, principally from Alabama and Tennessee. The latter two states have traditionally been heavy net "exporters." Substantial tonnages of cement from mills in these states have moved into distant market areas, with hauls far exceeding the so-called economic shipping radius of 200 miles. In 1956, for example, the average short-line haul per ton for the 9.6 million barrels of portland cement shipped from Alabama and Tennessee mills to Florida, Georgia, and the Carolinas was 326 miles. The state-to-state averages ranged from 207 (shipments to Georgia) to 454 (to Florida).

Neither Georgia nor the Southeast can be identified as a self-contained cement producing and consuming market. Each producing mill, wherever located, can be said to have a primary market area defined very roughly by a 200-mile

circle. In each instance this initial, theoretical market is subject to considerable trimming or stretching, due to several adjusting factors, before it may realistically be termed a market area. Consideration of such adjustments is reserved for a later section of this report.

Marketing Channels and Practices

Portland cement is sold by the mill direct to the consumer when these consumers are large enough to handle cement in wholesale quantities generally, that is, in carload lots. Such consumers include state and county governments, contractors doing highway and bridge work, and contractors handling large industrial projects. Mills also sell cement to ready mix operators whose principal business is the processing and mixing of concrete materials for sale to contractors doing all classes of work. Lesser quantities go to building supply dealers, who in turn re-sell to home owners and other small users.

Cement marketing channels in Georgia correspond generally to the country-wide pattern. Ready mixed concrete firms comprise the top ranking group of customers for the cement mills. Next come the building materials dealers--those which sell a sufficient quantity to buy in carload lots. These two important groups are not always mutually exclusive, however. In some instances there is duplication or overlapping of ownership.

Some building material dealers also have a ready mix operation as part of the same business, and some ready mix companies function as dealers to some extent, reselling some of the cement they buy. A third major group of cement users, construction companies, shows even wider variations in marketing practices. Many buy ready mixed concrete and finished concrete products from other firms, and purchase no cement themselves; others buy cement from jobbers. Still others are in the group with which this study is immediately concerned--that is, they ordinarily buy at least part of the cement they use directly from cement mills.

Consumption by State; End-Use Pattern

Annual consumption of portland cement in the United States increased steadily each year from 1949 through 1956, then declined in 1957 to below the 1955 level. Shipments in 1958 are running well above the 1957 level. Georgia's consumption is following the same general trend.

Per capita cement consumption in both Georgia and Florida, based on domestic shipments data, more than doubled between 1950 and 1955, as indicated below.

<u>Year</u>	<u>Barrels per capita</u>	
	<u>Florida</u>	<u>Georgia</u>
1940	1.29	.61
1950	1.80	.96
1955	2.61	1.44
1956	3.04	1.45
1957	(a)	1.24

(a) Not available

Complete data are not in for 1957 or 1958, but continuing substantial increases in population and domestic shipments indicate that its total cement consumption is still moving upward.

During recent years, cement consumption in Georgia and Florida has been increasing at a more rapid rate than the average for the country as a whole. From 1949 to 1956, for example, Florida's annual consumption rose some 255 per cent to almost 11.5 million barrels. It increased 34 per cent from 1954 to 1956. Georgia's increased 168 per cent to about 4.7 million in 1957, receding from its peak of almost 5.4 million in 1956.

Looking at regional consumption in terms of absolute quantities, Florida retained its number one position among the listed six states from 1949 through 1957.^{1/} Georgia moved up from fifth position in 1949 to second in 1955 and thereafter, displacing Tennessee, North Carolina, and Alabama.

Cement demand in south Florida is high, while production has been relatively low. Florida holds second rank among all the states in per capita cement use, but of the 9,985,000 barrels shipped into or within Florida during 1957, less than half was produced within the State. This figure excludes net foreign imports. Large quantities came from Puerto Rico^{2/} (part of the domestic shipments total) and Europe, costing Florida builders an estimated premium of

^{1/} Based on domestic shipments. Available data on imports and exports for 1954 through 1956 show substantial net imports for Florida in 1955 and 1956. Alabama had considerable net exports in 1954 and 1955, and minor net imports in 1956.

^{2/} During some periods in 1957, Florida contractors reportedly were obtaining 35 to 40 per cent of their cement supplies from Puerto Rico, in part because of strikes in mainland plants.

as much as 50 cents a barrel. Lehigh estimates that its new plant in the Miami area will lower the local price about 10 per cent.

The main markets of Lehigh's expanded plant at Bunnell, Florida, are in the central and northern portions of the State. The company evidently considers its present capacity there adequate for any level of demand likely to develop in the near future. Overnight delivery service can be assured for most localities in the mill's primary market area. Lehigh also has a distribution plant at Jacksonville. It is supplied via the intracoastal waterway from the Bunnell mill, which is some 70 miles south of Jacksonville. The capacity increases and storage plant were planned to supply north Florida and part of the East Coast region which formerly had been supplied from cement plants in Georgia and Alabama. Barges move the bulk cement from the mill to Jacksonville for the storage silos, or for packing into bags. It was anticipated that most outbound shipments from Jacksonville would move by rail.

End-Use Pattern

The approximate countrywide end-use pattern for cement according to one authority is as follows:

<u>End-Use</u>	<u>Per Cent of Total</u>
Highways	20
Nonresidential buildings	20
Residential buildings	15
Military construction	10
Public utilities	10
Sewer and water works	8
Other	<u>17</u>
Total	100

Another breakdown of shipments applies to mill sales but does not accurately identify the types of organizations actually buying cement from mills. According to this market pattern, roughly 50 per cent of mill production has gone to the ready mixed concrete industry in recent years. Concrete products accounted for another 12 per cent of mill sales; "highways" 12 per cent (here confusion enters, because this category probably embraces parts of several categories of buying organizations); "housing," 9 per cent; "industrial," 3 per cent; and other uses, 14 per cent. These figures are said to represent the first destination of sales after they leave the cement plant.

Regardless of the buying organization, however, it seems clear that ready mixed concrete is by far the leading use of portland cement. Estimates by the Ready Mixed Concrete Association based on returns from 1,312 companies out of 2,474 ready mixed concrete companies surveyed (or 53 per cent of the total number) indicate a consumption of some 95.2 million barrels of cement by the reporting companies. A breakdown of the uses of ready mixed concrete by the same source shows 29 per cent of the total production used in home building, 18 per cent in commercial construction, 16 per cent in industrial construction, 12 per cent for streets and highways, 8 per cent for non-federal public works, 5 per cent in federal public works, and less than 2 per cent in farm construction. Miscellaneous and unspecified uses accounted for the remaining 10 per cent of the total.

During 1957, also, the average value of this ready mixed concrete in the United States and Canada was \$13.43 per cubic yard. Comparable average values in the Southeast were:

Alabama	\$11.42
Florida	15.20
Georgia	13.73
North Carolina	14.30
South Carolina	13.38
Tennessee	13.27

It may be of some significance that the higher average values occurred in importing states such as Florida and North Carolina, the lower ones in net "exporting" states (Alabama and Tennessee), and that "in balance" South Carolina approximated the national average.

The number of cubic yards of ready mixed concrete produced by state in 1957 follows:

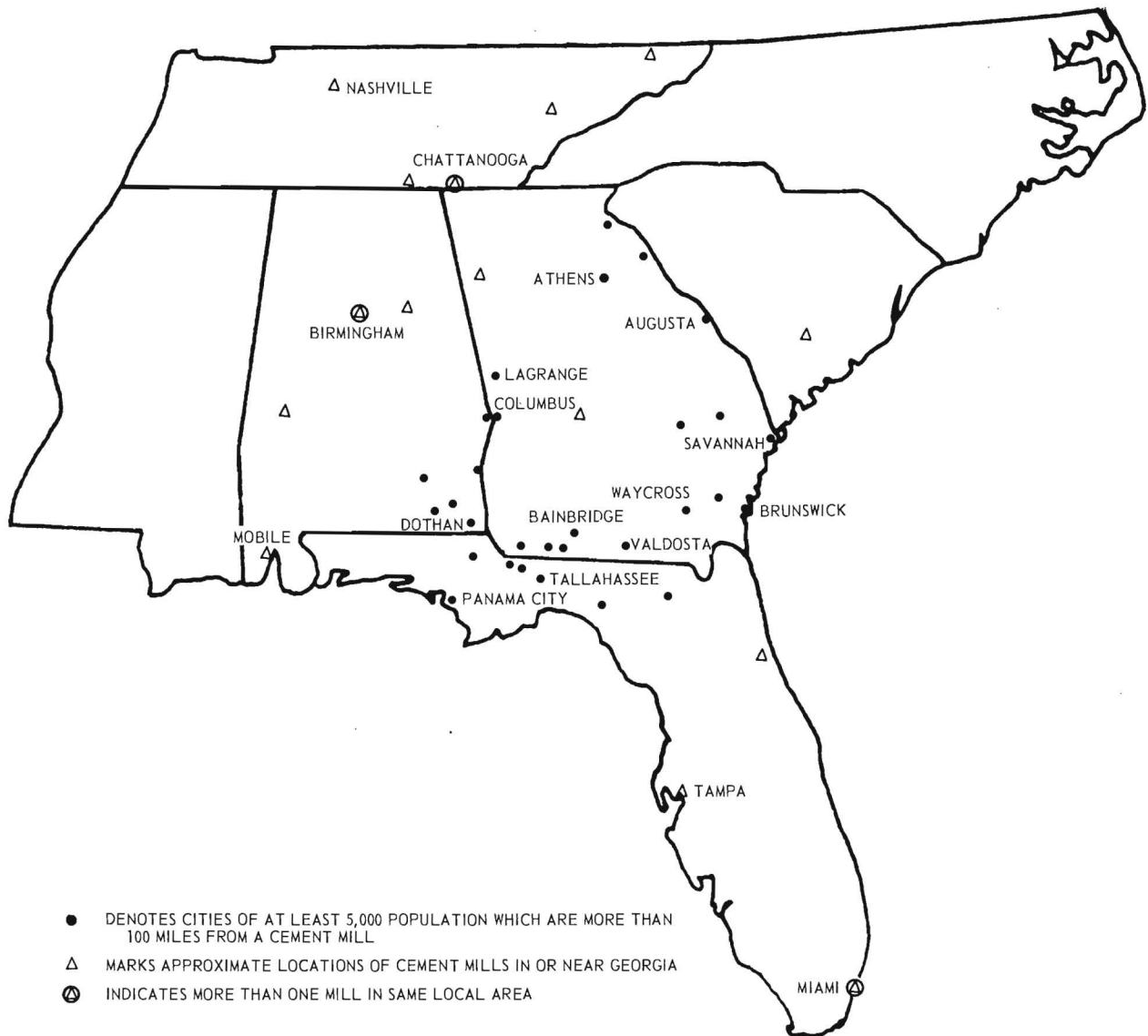
Alabama	818,586
Florida	2,657,515
Georgia	467,418
North Carolina	778,187
South Carolina	329,749
Tennessee	442,466

Primary Market Areas of Georgia's Existing Cement Mills

Analysis of carload waybill statistics for the latest year available (1956) indicates that cement mills in Georgia sell almost three-fourths of their total output within the State, with 95 per cent of total shipments destined for Georgia and Florida. The remaining five per cent of the total, or about 90,400 barrels, was shipped to Illinois, Louisiana, and Wisconsin. The average short line haul per ton for intrastate shipments was only 78 miles, and for "exports" to Florida it was 240 miles. The overall average of all cement shipments from Georgia mills was approximately 143 miles. On this basis, the average freight cost per barrel shipped was about 83 cents.

By comparison, the average short line haul per ton for all portland cement shipments terminating in Georgia during the same period was about 172 miles. For "imports" alone, the overall average haul was about 208 miles, comprising mainly in-shipments from Alabama (217-mile average) and Tennessee (192-mile average). The corresponding average freight charges per barrel were 94 cents (overall, 94 cents (Alabama), and 90 cents (Tennessee).

MAP 2
CITIES IN GEORGIA, FLORIDA AND SOUTHEAST ALABAMA
RELATIVELY DISTANT FROM EXISTING CEMENT MILLS



ANALYSIS OF MARKET POTENTIALS FOR CEMENT PLANT
AT BAINBRIDGE OR BRUNSWICK, GEORGIA

Choice of Proposed Plant Locations

The two Georgia cities of Bainbridge and Brunswick are chosen for analysis of their cement market potentials for a combination of reasons. As the accompanying map shows, both southwest Georgia and southeast Georgia contain a cluster of cities which are now relatively distant from existing cement mills. There are also a few others, such as Augusta and Toccoa. In the case of Bainbridge, there are also several such cities nearby in Florida and Alabama. Brunswick, though not in the exact center of the southeast Georgia cluster, should enjoy favorable access to the big Jacksonville, Florida market, as well as to other South Atlantic port cities. Both Bainbridge and Brunswick have water transportation facilities and services. Low-cost water transport could be of crucial importance if it is necessary to bring in raw materials from some distance away.

It is to be noted at the outset that the two cities are regarded as alternative locations for the proposed cement plant. Portions of their respective market territories overlap. Moreover, they are not the only possibilities. They were chosen for the analysis because they appear to be excellent representatives of the type of location needed.

Rough Indicator: Population and State Per Capita Consumption

General, order-of-magnitude estimates of cement consumption can be made for localized areas within state boundaries by multiplying population by the state's per capita consumption. The usefulness of such estimates is, of course, limited by the fact that per capita consumption of cement varies from locality to locality, as well as from state to state in a given year. Nevertheless, they do serve as a starting point, and in the absence of published statistics for such local consumption there are few if any practicable alternatives.

Such starting estimates have been obtained for areas which would comprise market territories for a cement plant at Bainbridge or Brunswick. To check against these initial estimates, other indicators and estimating techniques are brought to bear. The results are set out in other sections of this report.^{1/}

^{1/} It is emphasized that statistics and estimates applying to the two market territories are not additive. The two territories are not mutually exclusive; some counties are included in both.

The year 1956 is chosen for the basic set of estimates because it is the latest calendar year for which population statistics and complete cement shipments data by state, plus comparable U. S. totals, are readily available. For Georgia, 1957 data also have been obtained. It must be pointed out, however, that 1957 was a "low" year for cement sales nationally, following a dozen years in which successive new peaks were reached. In relation to current and probable future cement consumption levels, the 1957 estimates which follow are apt to be on the conservative side.

Bainbridge

Within a radius of 100 miles of Bainbridge are 36 Georgia counties having an aggregate population of about 682,900 in 1956 and 690,000 in 1957.^{1/} Also, within the same circle are seven Alabama counties totaling about 199,600, and 16 Florida counties aggregating 301,400 in population.^{2/} Multiplying the respective population totals by the appropriate per capita consumption rates for the latest year available yields a total of approximately 2,068,300 barrels of cement as the estimated consumption in 1957 for the "core" of Bainbridge's market area. The corresponding estimate for 1956 is 2,229,900 barrels.

The main cities of 10 of the "core" counties with a combined population of 100,122 in 1957 are somewhat closer to an existing plant at Clinchfield than to Bainbridge, but the difference is not appreciable.

The intermediate market area would comprise any additional counties of south Georgia and north Florida which are at least as close to Bainbridge as to any existing cement mill. Fitting this description are four Georgia counties (Brantley, Clinch, Pierce, and Ware) totaling about 56,000 in 1956 and 56,300 in 1957 population, and two Florida counties (Lafayette, Suwanee) with a combined population of 18,200. Estimated 1956 consumption in these intermediate areas was 136,600 barrels and for 1957 it was 125,100 barrels.

A peripheral market area for Bainbridge would include more distant cities and communities within a 200-mile radius which, though somewhat closer to an existing mill, could reasonably be expected to furnish some business for a

^{1/} John L. Fulmer, "Population Estimates of Georgia Counties for 1956-1957 With Analysis of Reasons for Changes from 1950"; Industrial Development Branch, Engineering Experiment Station, Georgia Institute of Technology, Special Report No. 33, December 1957.

^{2/} Population estimates for local areas in states other than Georgia are for 1956, and appear in Commercial Atlas and Marketing Guide, copyrighted in 1958 by Rand McNally and Company, Chicago, Illinois.

Bainbridge plant. They include the important cities of Brunswick, Georgia, and Jacksonville, Florida, as well as Columbia and Baker counties in Florida. Consumption estimated on the above-described basis was some 1,308,300 barrels in 1956 and 1,303,000 in 1957. This leaves out of account such places as LaGrange and the Atlanta metropolitan area, which are considerably closer to existing mills and well within range of the "exporting" mills of Alabama and Tennessee. Nevertheless, under conditions of tight supply it is likely that these areas, too, could and would buy cement from a plant at Bainbridge.

The three marketing zones which might be served from Bainbridge consumed an estimated 3,674,800 barrels of cement in 1956.

Brunswick

Use of a similar estimating procedure for Brunswick shows that its "core" market area would comprise 30 Georgia counties plus perhaps five counties of north Florida--including the important Jacksonville market. The combined interstate area consumed an estimated 2,140,800 barrels in 1956 and 2,036,400 barrels in 1957. A few other counties of northern Florida encompassed in the 100-mile radius are excluded from the "core" classification because of their proximity to the large Bunnell mill. Jacksonville is still importing cement from distant mills, and could be served by water or rail from Brunswick.

The intermediate market zone for Brunswick would include Screven County in Georgia and six Florida counties across the northern tier, through and beyond Tallahassee (Leon County). The estimated 1956 total for these localities is 490,500 barrels, and for 1957 it is 486,700 barrels.

Brunswick's peripheral markets would be the Augusta, Georgia, metropolitan area and the port cities of Charleston and Wilmington. These, it is estimated, consumed about 410,100 barrels of cement in 1957 and 461,200 in 1956.

The cities of Brunswick and Jacksonville, as well as certain other localities within the inner and outer bands of the aforementioned market territory, have experienced rapid economic growth in recent years. Consumption in the entire territory, estimated at 2,933,200 barrels for 1957 and 3,092,400 for 1956, should climb at a good rate in the years ahead.

Construction Employment by Local Area

The latest authoritative figures on construction employment by local areas

are for March 1956.^{1/} For the counties comprising the marketing territories described above, they show for the "Bainbridge territory" totals of 9,246 employed in the Georgia counties, 13,068 in Florida counties, and 1,303 in the Alabama counties. These intrastate employment sub-totals amount to 18.6 per cent, 14.6 per cent, and 4.2 per cent, of their respective state totals (after deducting from the latter the undistributed, statewide figures). The comparable percentages for the "Brunswick territory" are 18.8 per cent for Georgia, 13.0 per cent for Florida, 11.8 per cent for South Carolina, and 2.2 per cent for North Carolina. These percentages when applied to 1956 cement consumption quantities for the respective states yield the following estimates for the interstate market territories, including the "core," "inter-mediate," and "periphery" areas:

Cement Consumption in Barrels, Based on Construction Employment:	<u>1956</u>
"Bainbridge territory"	2,884,600
"Brunswick territory"	2,875,300

Geographic Distribution of Ready-Mixed Concrete Firms

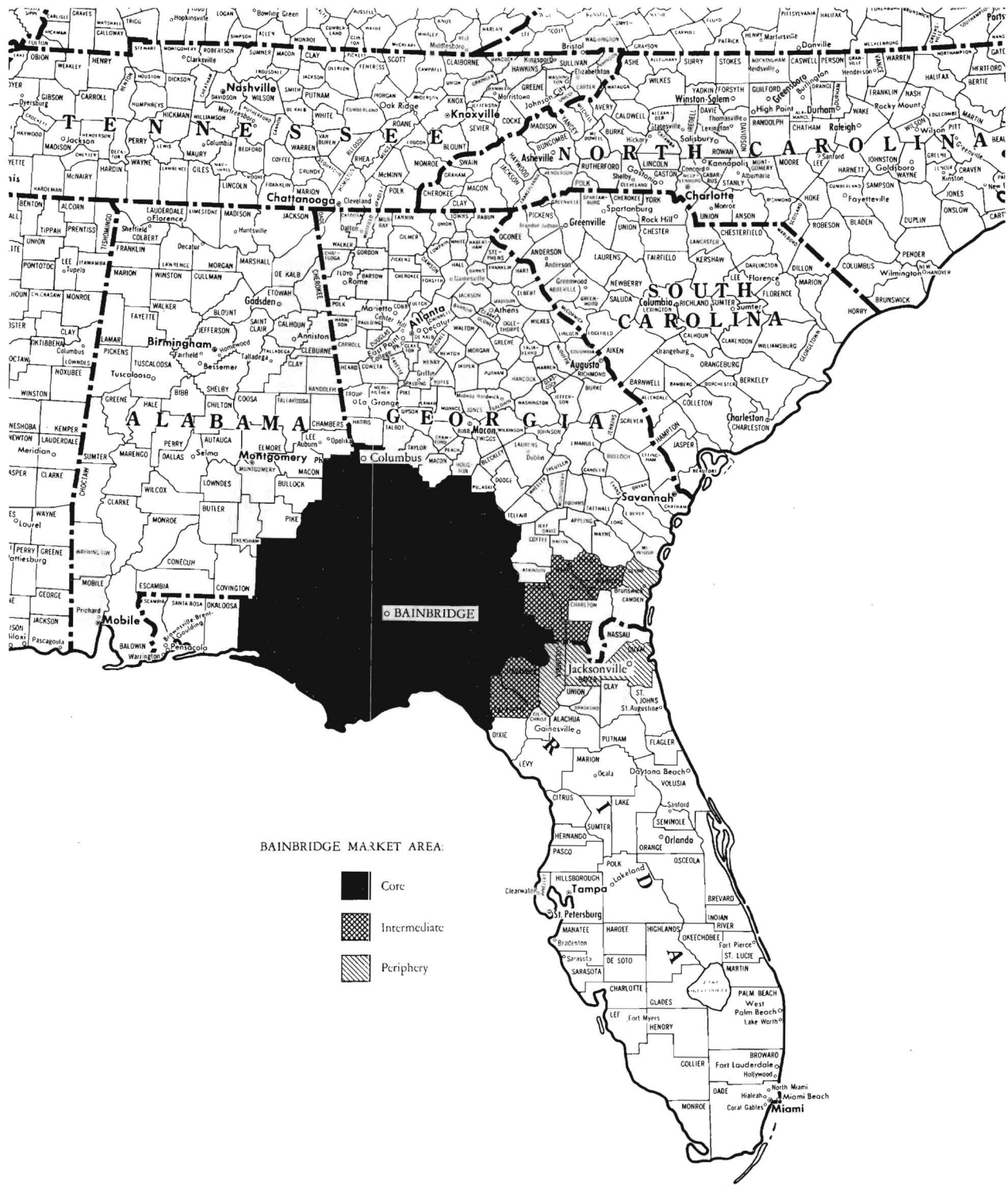
The National Ready Mixed Concrete Association lists 59 ready-mixed firms in Georgia, 111 in Florida, 49 in Alabama, 31 in South Carolina and 71 in North Carolina. Analysis of these firms' locations shows for the Bainbridge marketing territory, 11 ready mixed firms in Georgia (18.6 per cent of the state total), 15 in Florida (13.5 per cent of the total) and 5 in Alabama (10.2 per cent). For the Brunswick territory, the corresponding numbers of ready-mixed firms are 17 in Georgia (28.8 per cent of total), 11 in Florida (9.9 per cent), plus 4 in Charleston, South Carolina (12.9 per cent of that state's total) and 1 in Wilmington, North Carolina (1.4 per cent of total).

The Association's listings, while probably the best available for the country as a whole, are not represented as being absolutely correct or complete. A number of cement-using firms responding to the questionnaire developed for this study (described in Appendix 1) probably are classifiable as ready mix operators, though not listed as such by the National Ready-Mixed Concrete Association.

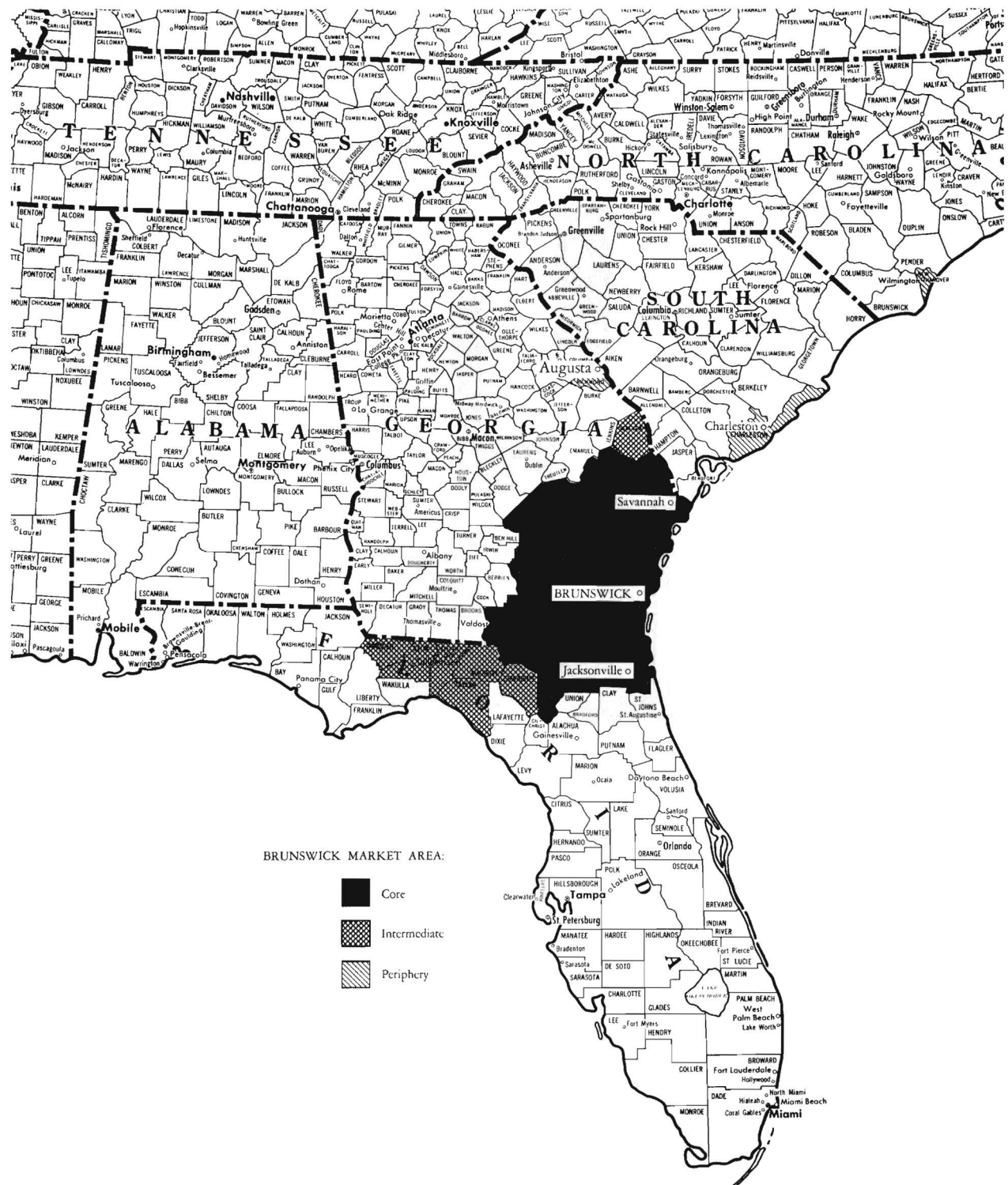
An apportionment of states' 1956 cement consumption among local intra-state areas on the basis of ready-mixed concrete companies' locations would

^{1/} Published in County Business Patterns, First Quarter 1956.

MAP 3 MAIN MARKET TERRITORY OF A PORTLAND CEMENT PLANT AT BAINBRIDGE, GEORGIA



MAP 4
MAIN MARKET TERRITORY OF A PORTLAND CEMENT PLANT
AT BRUNSWICK, GEORGIA

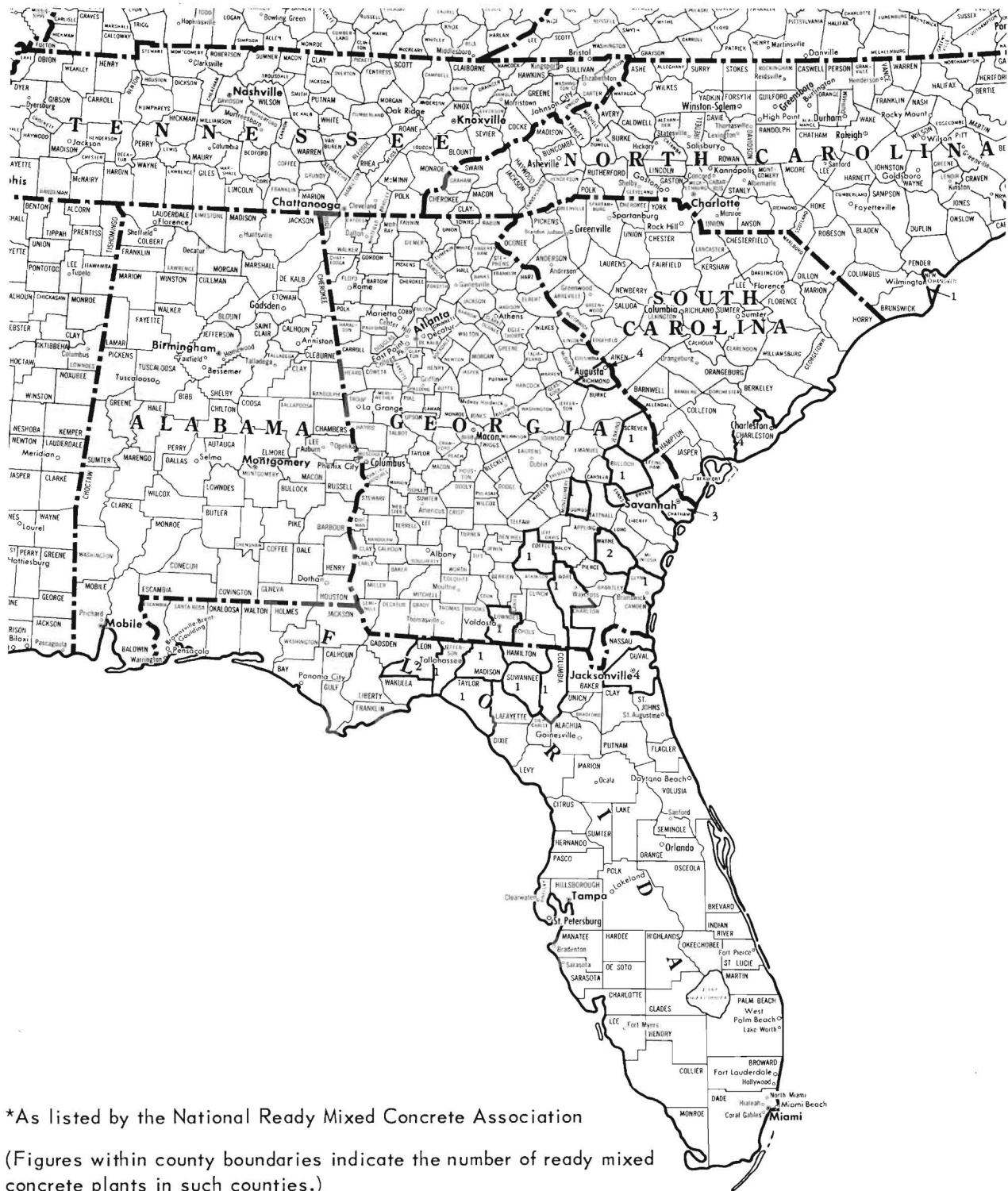


*As listed by the National Ready Mixed Concrete Association

(Figures within county boundaries indicate the number of ready mixed concrete plants in each county.)

(Figures within county boundaries indicate the number of ready mixed concrete plants in such counties.)

MAP 6
LOCATIONS OF READY MIXED CONCRETE PLANTS* IN MARKET
TERRITORY OF PROPOSED CEMENT PLANT AT BRUNSWICK, GEORGIA



*As listed by the National Ready Mixed Concrete Association

(Figures within county boundaries indicate the number of ready mixed concrete plants in such counties.)

yield the following estimate for the market areas under study:

<u>1956 Cement Consumption</u>	<u>Barrels</u>
Bainbridge territory	3,068,800
Brunswick territory	3,051,600

Estimated Cement Consumption in the Market Territories, 1956 and 1957

Taking into account the several indicators and guides discussed in the preceding sections, the 1956 cement consumption level appears to have been within the range of 2.9 to 3.7 million barrels for the Bainbridge market territory and from 2.9 to 3.1 million barrels in the Brunswick territory. The comparison of these ranges in terms of estimated 1956 cement consumption, in barrels is set out below:

<u>Basis of estimate</u>	<u>Bainbridge Territory</u>	<u>Brunswick Territory</u>
Population and state per capita consumption rates	3,674,800	3,092,400
Construction employment in the market territories	2,884,600	2,875,300
Incidence of ready mixed concrete firms	3,068,800	3,051,600

The 1957 consumption indicated by the latest available population and state per capita cement consumption figures was 3,496,500 barrels for the Bainbridge market territory and 2,933,200 barrels for the Brunswick territory. Estimates by means of the alternative methods are not feasible because of the lack of complete statewide cement consumption figures for Florida and Alabama.

Comparative Freight Costs

In the market areas that would be served by a producing mill or distribution plant at Bainbridge or Brunswick, nearly all cement has been moving by rail from mill to customer. Very few of the respondents to the questionnaire addressed to cement buyers indicated that they receive deliveries by truck. Barge transportation is used between Bunnell and Jacksonville. Otherwise, water transportation is not used for cement shipments in the Southeast, except for such areas outside the focus of this study as south Florida (shipments from Puerto Rico) and western Alabama. However, the availability of water transportation would be of major importance at

the Georgia ports under study.

At Bainbridge, the availability of barge transportation widens the scope of possibilities for assembling the necessary raw materials at competitive costs. Alternatively, it is a distinctly favorable factor in weighing the economic feasibility of establishing a cement distribution plant comparable to those already located in Florida and at sites in Louisiana and Texas accessible to the Gulf. Finished bulk cement would be barged in for storage and subsequent distribution in bulk or after bagging. The nearest producing mills which might profitably use such an arrangement are at Tampa, Florida and Mobile, Alabama.

At Brunswick the same benefits of water transport would apply, as regards widening the possibilities of economic raw material assembly. In other respects, however, the benefits would differ materially. The company owning the nearest producing mill--at Bunnell, Florida--already ships bulk cement to its distribution plant at Jacksonville. Its nearest competitor producing at a waterfront mill is at Miami; this company presumably would ship from Miami to Jacksonville direct, if at all. On the other hand, a Puerto Rican producer desirous of selling in the Jacksonville and southeast Georgia market areas might find it advantageous to establish a terminal plant at Brunswick similar to the one already in being in south Florida. Finally, a Brunswick plant could utilize water transportation profitably in delivering finished cement to other South Atlantic ports farther north. As yet there is no waterfront mill between Bunnell, Florida and Norfolk, Virginia.

For cement shipments by rail, Brunswick is served directly by the Southern and Atlantic Coast Line, and indirectly (at nearby Thalmann) by the Seaboard. Brunswick would enjoy equal or preferential rates to a number of localized markets, including Savannah, Valdosta and lesser cities of southeast Georgia. It would have the second lowest freight costs into the big and growing Jacksonville market, where substantial quantities continue to come in from distant mills in Alabama. The detailed freight rate comparisons shown in Appendix 11 include Jacksonville as a competitive origin point instead of Bunnell because it is assumed that whenever competitive conditions warrant it, northbound rail shipments can originate at the former point. Brunswick's area of freight rate advantage, therefore, would also include several south Georgia cities for which the rate from

Jacksonville is slightly less than from Brunswick--for two reasons. First, there is some cost involved in barging bulk cement from Bunnell to Jacksonville. Second, questionnaire returns show that shipments to Georgia from Florida are negligible; indeed, the Florida mills are not supplying all the cement now delivered to Florida buyers.

Bainbridge is served by the ACL and Seaboard and would enjoy equal or preferential rail rates to a number of local market areas including Columbus, Valdosta, Dothan, Panama City and Tallahassee. Also, its rates to many other cities in south Georgia and north Florida would be much lower than those on shipments now being made from plants in Alabama and Tennessee.

Therefore each variation of one cent in quoted freight rates is equivalent to a difference of 3.76 cents in bulk (3.8 cents in bags) per barrel of cement hauled. The corresponding variations per carload for each one cent different in basic quoted rate are \$6.00 (minimum CL) and \$15.04 (maximum CL).

The published maximum f.o.b. mill price of at least one cement plant in the Birmingham area is known to be \$3.30 per barrel, compared to \$3.45 for the existing mills in Georgia. If these price quotations accurately reflect differences in mill production costs, then a new mill in Georgia with costs no lower than the existing Georgia plants would need a freight rate advantage of almost 4 cents per 100 points to compete satisfactorily with Birmingham mills. From Bainbridge this test could be met at such places as Dothan, Panama City, Tallahassee, Albany, Tifton, Valdosta and Americus, plus cities farther east. Similarly, Brunswick shipments could meet this test at Tallahassee, Bainbridge, Tifton, Valdosta and Jacksonville, as well as south Georgia cities east of Tifton and Valdosta.

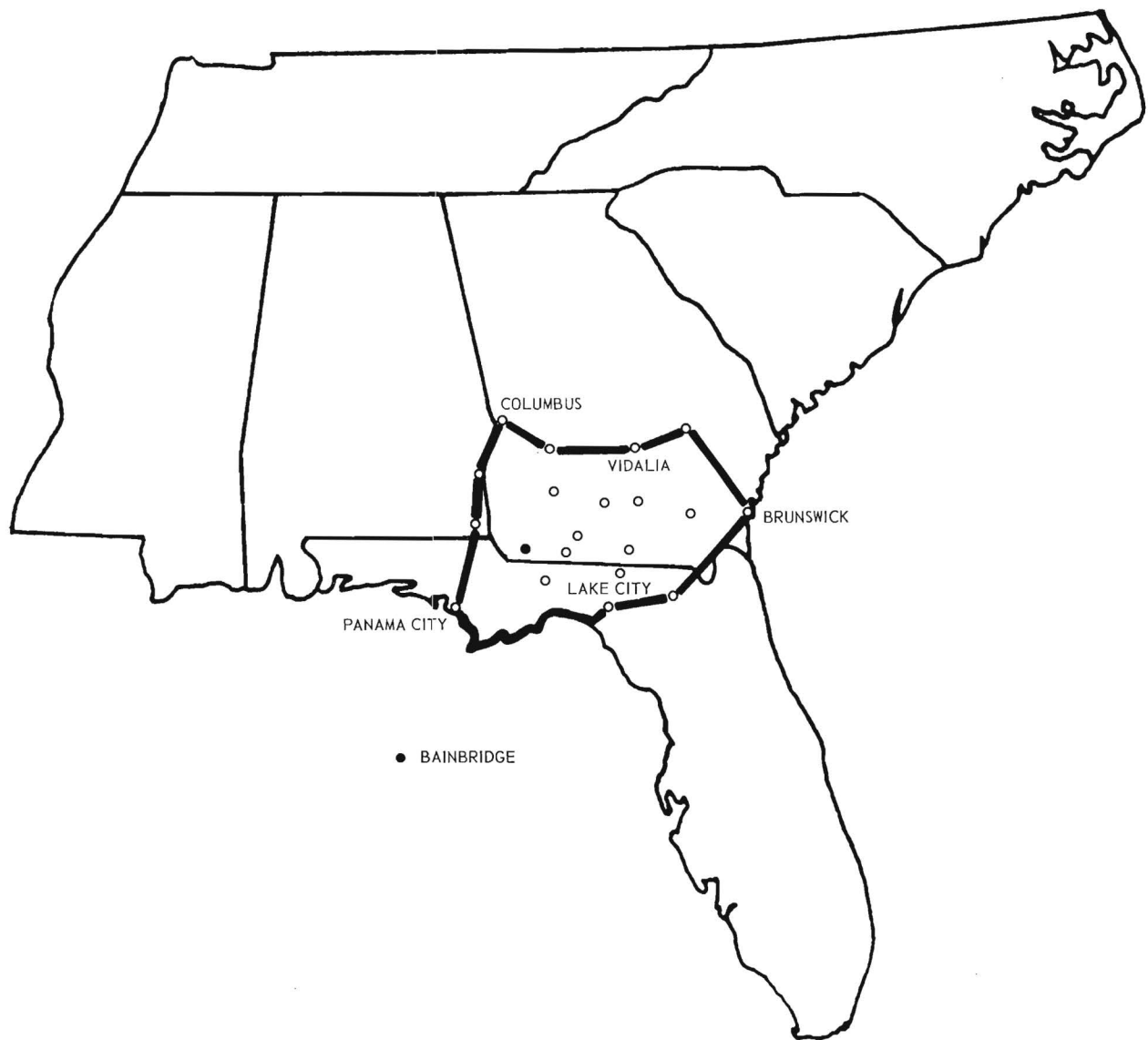
Perhaps a more accurate indication of cost and price differences is offered by the average f.o.b. mill values of actual shipments as compiled by the U. S. Bureau of Mines. For the first six months of 1958, a period of ample supplies at the plants, these averages in dollars per barrel were \$3.04 for Alabama mills, \$3.14 for Georgia, Florida and Tennessee mills, and \$3.31 for plants in South Carolina and Virginia. If these values measure mill cost relationships adequately, then existing Georgia mills and any new one with about the same cost structure should compete favorably with Alabama mills at all destinations where the Alabama mills have a freight rate disadvantage of three cents or more per 100 pounds, and with all other competing plants at destinations where the Georgia mill would have equal or preferential rates.

Responses to the questionnaire show that in a number of cities in or near the market territories under study, quoted cement prices would permit net mill values of at least \$3.14 per barrel at Bainbridge and/or Brunswick. The accompanying maps delineate these "favorable net mill value" zones. Appendixes 12 and 13 list the destinations, the quantities of cement reported purchased in 1957, the current local prices reported, and the derived net mill values f.o.b. Bainbridge and/or Brunswick. These reported quantities total some 998,714 barrels purchased which would yield favorable f.o.b. values for Bainbridge, and about 1,281,282 barrels for Brunswick. Left out of account in this tabulation are a number of communities in Florida and Georgia from which no questionnaires were returned, as well as quantities which might be supplied from Brunswick to such South Atlantic port destinations as Charleston and Wilmington.

Sizable market areas on the rim of the "\$3.14-or-better" zone include, for Bainbridge, the metropolitan areas of Atlanta, Macon and Jacksonville. In these the total reported 1957 purchases were 1,098,681 barrels. Bainbridge's net mill values would be \$2.95 for shipments to Atlanta, \$3.04 to Macon and \$2.99 to Jacksonville. Consumption in their metropolitan areas, on the basis of available population and state per capita consumption figures, was 1,113,685 barrels in the Atlanta area (1957), 213,478 barrels in the Macon area (1957) and 1,174,656 barrels in the Jacksonville (Duval County) area in 1956.

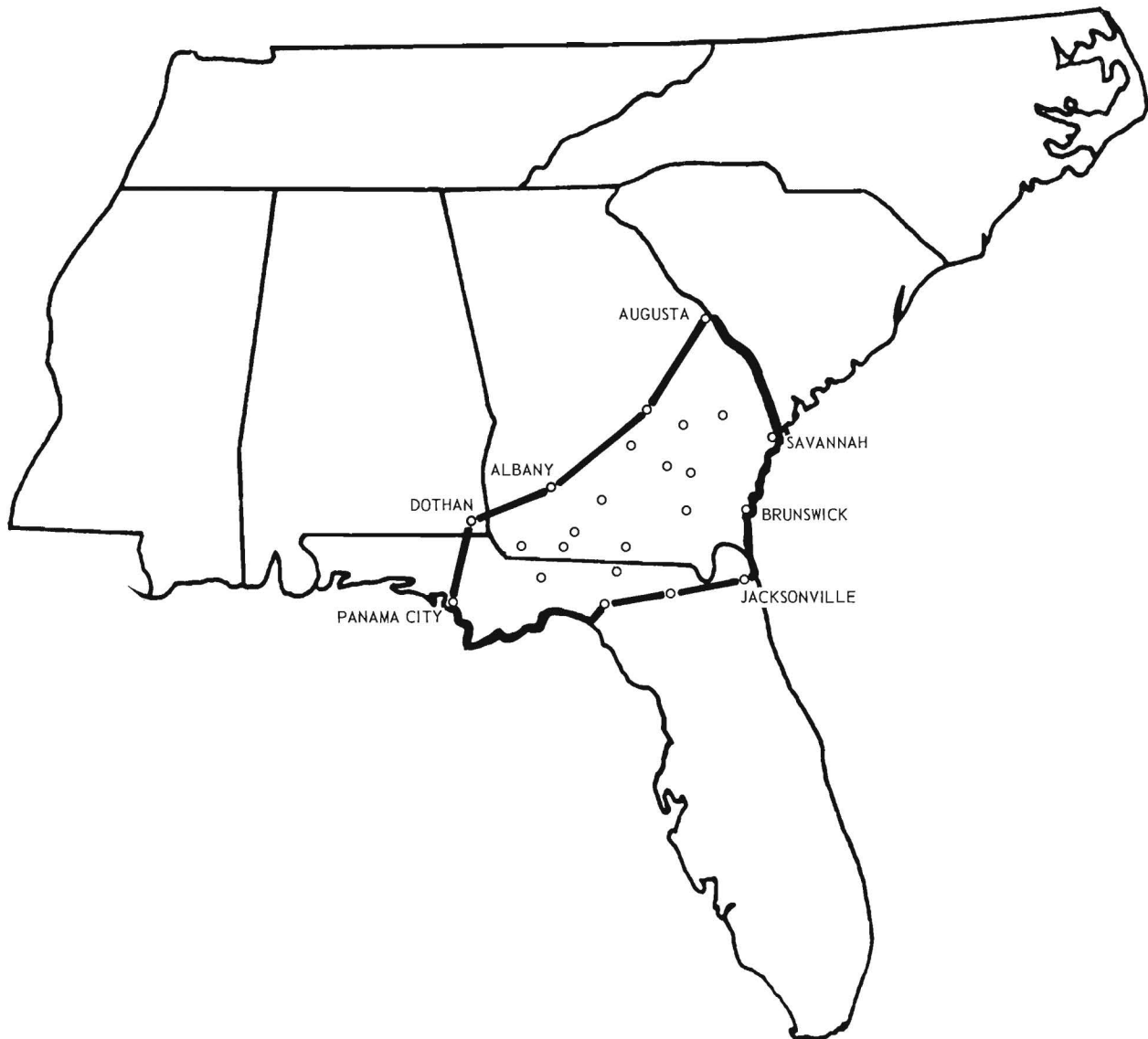
From Brunswick the net mill values obtainable at current local delivered prices are \$2.88 to Atlanta and \$3.03 to LaGrange. Marketing strategy might well call for a moderate volume of shipments at below-average mill net values. A considerable quantity of present shipments from Alabama and Tennessee mills are almost certainly at f.o.b. levels lower than these.

MAP 7
"FAVORABLE NET MILL VALUE" AREA*
FOR BAINBRIDGE, GEORGIA



*Area embracing destinations to which cement shipments would yield \$3.14 per barrel or more, f.o.b. Bainbridge, according to reported prices and freight rates as of September 1958. (Average 1958 net mill values at cement plants in Georgia and Florida: \$3.14 per barrel.)

MAP 8
"FAVORABLE NET MILL VALUE" AREA*
FOR BRUNSWICK, GEORGIA



*Area embracing destinations to which cement shipments would yield \$3.14 per barrel or more, f.o.b. Brunswick, according to reported prices and freight rates as of September 1958. (Average 1958 net mill values at cement plants in Georgia and Florida: \$3.14 per barrel.)

MARKET FORECAST--1960 TO 1975

The Bainbridge Market Territory

The areas that would comprise the main market territory of a cement plant at Bainbridge include some cities of rapid growth such as Tallahassee, Panama City, Albany, and Jacksonville. The area as a whole is comparatively undeveloped, in the sense that it does not yet have quite its per capita share of construction employment, manufacturing, and trade. For example, as shown in Appendix 8, the Georgia segment contains slightly more than a fifth of the State's population as compared to less than 20 per cent of its construction employment or payrolls, about 13 per cent of its manufacturing payrolls, less than 10 per cent of its wholesale trade payrolls, and less than a fifth of its personal income and retail trade payrolls.

The Alabama portions of the territory include the thriving city of Dothan, but this areas as a whole actually lost population between 1950 and 1956. The 41 Georgia counties had a net gain of over 8 per cent during the same period; this gain was 77 per cent of the rate of increase for the United States from 1950 to 1956. However, the Florida counties represent almost a fifth of that State's population and a somewhat larger percentage of Florida's wholesale trade payrolls.

The interstate market territory in its entirety had a growth in population from 1950 to 1956 that approached the national average, for an index rating of 92. Since then, however, the economy of Bainbridge itself is commencing to show signs of impressive growth, now that river navigation and waterfront facilities are a reality. Shipping volume already has surpassed the early expectations. Completion of projects now underway on the Chattahoochee, and possibly future extension of navigation on the Flint to Albany should act as a powerful stimulant to many lines of economic development in the entire region. Some 436 million KWH of electric power annually (enough to serve 172,000 homes or more than 500,000 people) are expected to be available in the early 1960's at the Walter George Dam on the Chattahoochee. When new industrial power supplies come, new manufacturing industry usually is not far behind. In addition to the considerable quantities of cement used in the dams, locks, and related structures such as relocated bridges, this broad-scale development program will generate much new demand for the future commercial, industrial, and institutional construction which will almost certainly develop in the 1960's and thereafter.

The Brunswick Market Territory

Each of the components of Brunswick's main market territory has an impressive growth rate in recent years. The 32 Georgia counties showed an increase in population from 1950 to 1956 that was 126 per cent of the U.S. rate. Similarly, the Wilmington area of North Carolina (a logical market for waterborne shipments) showed an increase in the same period of 120 per cent of the national average. The rates for the Charleston, South Carolina area and the 11 Florida counties were even higher--145 and 225 per cent, respectively, of the national average. These interstate areas as a whole increased in population by 161 per cent of the U.S. average from 1950 to 1956.

In addition, as shown in Appendix 9, the localities making up Brunswick's market territory have already been accounting for a good share of their respective states' economic activity. The Georgia areas had about the same proportion of construction employment and payrolls as population. They had disproportionately small per capita shares of industry and trade payrolls, and were somewhat low on personal income. The Wilmington, North Carolina area has comparatively little manufacturing, but is strong in construction, trade, and commerce. Similarly, Charleston scores very highly on all the indicators except manufacturing. The Florida counties account for somewhat less than their per capita shares of the State's construction employment and retail trade, but more than their share of manufacturing and wholesale trade.

Completion of the new Bestwall Gypsum Company plant and waterfront facilities at Brunswick, together with port improvements by the State of Georgia and a possible new oil refinery, will add substantially to the area's business and industrial base.

A considerable amount of specific community data has been developed and presented in "A Petroleum Refinery for Brunswick, Georgia," an economic feasibility study published recently by the Industrial Development Branch, Engineering Experiment Station, Georgia Institute of Technology.

Estimates of Future Cement Demand in the United States

A report in December 1956 by the Select Committee on Small Business, U.S. House of Representatives, assembled estimates of 1960 cement demand by five methods. In millions of barrels, these ranged from 355 to 398. By comparison, U.S. indicated consumption of portland and other hydraulic cement was approximately 314 million barrels in 1955, and 328 million in 1956. However, the Committee's estimates included provision for new highway requirements which are

far below those which have since been projected. The "normal demand" estimates (those exclusive of demand generated by new highway requirements) ranged from 318 to 361 million barrels; but the lowest was formulated on the basis of a forecast of gross national product (GNP) made in 1952, which now appears much too low. Excluding this now-obsolete "normal demand" estimate, and adding the quantities estimated as needed in 1960 for the expanded highway construction program (about 110.5 million barrels, compared to 61.6 million in 1955) the more likely range of total demand in 1960 now appears to be 380 to 410 million barrels, using the Committee's basic estimates.

A separate set of estimated future cement requirements by the Associated General Contractors of America, Inc., also made in 1956, indicates a total of about 415 million barrels as the 1960 demand.

There has been a close correlation in the past between gross national product and countrywide cement demand. For purposes of comparison with the foregoing estimates, applying the percentage increases in GNP from 1955 to the forecast for 1960 by Stanford Research Institute (both in 1947 dollars) to 1955 cement consumption, gives a "normal demand" in 1960 of about 360 million barrels of cement; adding the "extra" highway requirement of about 49 million barrels (110.5 minus 61.6 million) results in an estimate of 409 million barrels as the total for 1960.

For 1965 cement demand, the House Committee's range of estimates for "normal demand" is 398 to 407 million barrels. Trade sources indicate an "extra" requirement for highways that year of about 52 million barrels (113.6 minus 61.6). By adding this estimate, the indicated total for 1965 is 450 to 459 million barrels. The comparable estimate by AGC for the same year is approximately 454 million and that obtained by using Stanford Research Institute's projected 1965 GNP, as above, is 479 million barrels.

The expanded highway program is scheduled to extend through 1969. According to market studies made available to one of the large cement producers, but not made public, consumption should rise to the 500 million barrel level by the late 60's. No detailed cement demand estimates along the lines of those discussed above are now available for the years beyond 1965. However, the Stanford projections of GNP extend to 1970 and 1975. Using these in the same manner with 1955 as the base year, projected cement demand for 1970 and 1975 is about 512 and 612 million barrels, respectively, with no special additions for extraordinary roadbuilding activity.

The estimates of future nationwide cement demand, including the AGC estimates for years between 1960 and 1965, and the capacity needed to supply that demand (using a 92 per cent utilization factor) may be summarized as follows:

<u>Year</u>	<u>Demand</u> (Millions of Barrels)	<u>Capacity Required</u> (Millions of Barrels)
1960	380 - 415	413 - 451
1961	422	459
1962	431	468
1963	438	476
1964	446	485
1965	450 - 479	489 - 521
1970	512	557
1975	612	665

Estimates of Future Cement Demand for Bainbridge and Brunswick

Given the estimates of cement consumption in the market territories in 1956,^{1/} future demand can be forecast on the basis of certain stated assumptions. First, it is assumed that demand will increase at the same rate as indicated for the country as a whole. The potentials for the Bainbridge territory under this assumption are then as follows:

<u>Year</u>	<u>Range of Demand (thous. of barrels)</u>	
	<u>Bainbridge</u>	<u>Brunswick</u>
1960	3,341 to 4,648	3,330 to 3,911
1965	3,956 to 5,365	3,943 to 4,514
1970	4,501 to 5,734	4,486 to 4,825
1975	5,380 to 6,854	5,363 to 5,768

Appendix 14 indicates for each intrastate segment of the Bainbridge market territory the percentage of the total population of its own state represented by that segment in 1950 and in 1956. The difference in each instance is translated into average annual percentage change. The annual rates of percentage change are then used to estimate the same geographic areas' proportions

^{1/} The year 1956 is chosen as the base for projections to future demand levels because it is the most recent year for which adequate data are now available for total cement consumption in the U.S. and certain states, notably Florida. The percentage increases from U.S. consumption in 1956 to the aforementioned estimates for future years are applied to the range of estimated consumption during 1956 in the two market territories.

of their respective states' populations in future years, as projected by the U.S. Bureau of the Census. The population projections thus obtained for the Bainbridge market territory are compared with projections for the U.S. in the same years, and any deviation in the ratio^{1/} for 1960 (for example) from that in 1956 (the base year for cement demand projections) is applied to the estimates of future cement demand made on the "equal-advance" assumption as set out above. This procedure is repeated for the Brunswick area. The following set of alternative estimates of future demand is the result:

<u>Year</u>	<u>Range of Demand (thous. of barrels)</u>	
	<u>Bainbridge</u>	<u>Brunswick</u>
1960	3,229 to 4,493	3,617 to 4,248
1965	3,630 to 4,923	4,517 to 5,172
1970	3,848 to 4,902	5,375 to 5,781
1975	4,600 to 5,860	6,426 to 6,911

How do these estimated cement market potentials relate to actual sales volume required to keep a new plant in business? A small plant comparable to the new one in Mississippi of 700,000 barrels annual capacity, would require annual sales of 630,000 barrels to operate at 90 per cent of capacity (the approximate optimum rate) over the course of each year. A mill in the most numerous size-group (one to two million barrels) operating at 90 per cent of, say, 1.5 million barrels annual capacity, would need to sell 1,350,000 barrels a year. In actual experience, most if not all mills have years in which they operate at much lower percentages of capacity. Hence the estimated market potentials are sufficient to support a cement mill of medium size at Bainbridge or Brunswick as early as 1960.

^{1/} Ratio of the estimated population in the market territory to that for the U. S.

Appendix 1

NOTES ON METHODOLOGY

Methods of Analysis

The market territory for a cement plant at Bainbridge, Georgia includes portions of Georgia, Florida, and Alabama. Similarly, the Brunswick market territory includes portions of Georgia, Florida, and South Carolina. Cement consumption in these interstate market areas was estimated by applying a series of ratios to published cement consumption statistics for the states involved, and adding the results. These ratios express the relationship of each intrastate segment of the market territory to its state as regards population, construction employment, and the number of ready mixed concrete firms. The ratios were derived from published data for the pertinent counties and states. The range of consumption estimates thus obtained was used as a base for projecting future demand in the two market territories.

Questionnaire

Additional data on cement consumption by localities were obtained by a mail questionnaire to cement buyers in the market territories. The questionnaire, furthermore, provided supplemental information which made possible the derivation of specific patterns of consumption of cement.

The questionnaire was sent all known ready mixed concrete and concrete products companies; to building supply firms; the larger cities' purchasing departments; and to a portion of the construction firms. A grand total of approximately 900 was mailed to these various organizations, known or believed to be buyers of cement direct from mills. The questionnaire appears on the next page.

Altogether, some 299 replies were received, a gross return of about 33 per cent. Of these, 179 confirmed that they do buy cement direct from cement mills. The "yes" replies include 63 from ready mixed concrete and concrete products firms, including some who also function as building supply dealers or contractors. Another 79 comprise building supply dealers (other than those in the ready mix business). Only seven replies were received from city governments, only one of which buys cement from mills. In addition, 11 construction firms not included in any of the foregoing groups

MAIN QUESTIONS ASKED CARLOAD-LOT BUYERS
OF PORTLAND CEMENT

1. Do you buy portland cement from any cement manufacturers?

 Yes

 No (IF ANSWER IS "NO," THE REMAINING QUESTIONS ARE NOT APPLICABLE)

2. Please state the approximate quantity of portland cement you purchased from cement manufacturers in calendar year 1957: _____ barrels (376 pounds); and in 1956: _____ barrels (376 pounds).

3. Please estimate approximate quantity of your total 1958 purchases of portland cement: _____ barrels (376 pounds).

4. In 1957 did you buy cement in bulk? Yes No; in bags? Yes No; if both, about _____ in bulk and _____ in bags.

5. Delivered cost of your 1957 cement purchases: \$ _____ per barrel (376 pounds); current delivered price quotations: \$ _____ per barrel (376 pounds).

6. Estimated breakdown of your 1957 cement purchases by the origin of shipment:

<u>State of Origin</u>	<u>Approximate Quantity in Barrels (376 pounds)</u>
Georgia	_____
Alabama	_____
Tennessee	_____
South Carolina	_____
Florida	_____
Others	_____

7. What you do with cement you buy:

<u>Use</u>	<u>Per Cent of Total Purchases</u>
Resell	_____
Raw material in construction operations	_____
Raw material in manufacture of concrete products which you sell	_____
Other (please explain) _____	_____

responded to the questionnaire. Geographically, the canvass was designed to focus on Georgia, some 20 counties in north Florida from about Panama City eastward, and the southeastern corner of Alabama. Because of the great numbers of construction firms, coverage of them was by random sampling of alphabetical lists in some areas such as northwest Georgia, which is already served by a large number of nearby cement plants in three states.

Georgia respondents reported total purchases of 2,068,499 barrels in calendar year 1957. This represents about 44 per cent of Georgia's 1957 cement consumption as recorded by the U.S. Bureau of Mines, and excludes quantities known to have been bought by certain large contractors with Georgia headquarters for actual delivery at jobs in other states. If there were additional quantities to be adjusted for in this manner, they were probably more than offset by shipments to Georgia destinations for the account of construction firms headquartered in other states, and not covered in this questionnaire.

Of the total purchases reported by Georgia respondents for 1957, the ready mixed concrete group of customers (31 firms) accounted for about 1,316,413 barrels, or some 64 per cent of the total. Their purchases included 1,148,471 barrels (87 per cent) in bulk and the remainder (13 per cent) in paper bags. The building supply dealers' purchases were all in bags. Reporting purchasers in the important Atlanta area bought some 650,266 barrels from mills in Alabama and Tennessee, or about 84.9 per cent of the reported total. This is surprising in view of the proximity of two Georgia cement plants; about 47 and 120 miles distant, respectively.

Responses as to the amounts and kinds of purchases in 1956 and 1958 were, understandably, much less complete and in some cases less clearly allocable to Georgia. Nevertheless, the total quantities--1,828,321 barrels in 1956 and 2,109,145 barrels in 1958--comprise a large portion of shipments to and within Georgia as reported by the Bureau of Mines. In the leading group, at least two-thirds of the ready mixed concrete firms indicate increases in 1958 over the previous year. It is quite possible that some of the others reported actual purchases to date of response rather than a forecast of the entire year's purchases based on actual purchases to date.

Classified and tabulated according to the volume of their purchases in 1957, a comparatively small number (11) of Georgia ready mixed concrete firms accounted for about 71 per cent of all reported cement purchases by ready mixed firms. Six of these 11 bought from 50,001 to 100,000 barrels each, and the

other five bought over 100,000 barrels each. The average annual volume among all reporting Georgia ready mix dealers in 1957 was 40,214 barrels. By contrast, buyers in the concrete products group averaged only 6,209 barrels a year; nine of the 13 reporting bought not more than 5,000 barrels each. Likewise, the building materials dealers and contractors groups are low volume buyers--averaging about 1,880 and 11,500 barrels, respectively. The latter average is distorted by the fact that one of the ten contractors bought 75,000 barrels; the other nine averaged about 4,400 barrels.

Questionnaire responses from Florida and Alabama also indicate ready mixed concrete firms to be the dominant cement buying group. They accounted for about 96 per cent of the reported 1957 total. Again, a few large-volume firms in the ready mixed concrete group bought most of the cement. However, the response from contractors and building materials dealers was too slight for the sampling to be representative. Twelve of the 21 responses from Alabama and Florida were in the ready mix category, as contrasted to 49 out of 155 Georgia respondents. Questionnaire returns from areas outside Georgia probably do not constitute a representative sample of the total cement market in those areas. They are deemed unsuitable for making projections.

Questionnaire results for the market territories

Respondents located in the Bainbridge market territory reported 1957 purchases totaling 681,646 barrels from mills in Alabama and Tennessee. This represents 53.9 per cent of total reported purchases. In every instance the rail hauls involved were at least as long as they would be from Bainbridge; in most cases they were considerably longer. Corresponding purchases reported for 1957 by buyers within the Brunswick territory totaled 451,349 barrels, or 36.9 per cent of the reported total. Purchases for which Georgia or Florida were indicated as the state of origin are assumed to have been from the nearest mill in Georgia or Florida.

Responses from 43 cement buyers in Georgia areas of the Bainbridge market territory (defined in an earlier section of the report) included five ready mixed concrete firms out of 11 listed establishments in the area. These reported 1957 purchases totaling 284,897 barrels of cement. In addition, replies were received from 11 other concrete products firms; with reported 1957 purchases totaling 373,825 barrels; 21 building materials dealers who bought 26,477 barrels; and six other buyers, mostly contractors, reporting purchases of 14,607 barrels. The total reported purchases were 699,806 barrels.

If the six non-reporting ready mixed concrete firms in the area bought at the same rate, on the average, as the five reporting companies, this would indicate a total of some 626,773 barrels as the 1957 consumption of all ready mixed firms in the Georgia portions of the Bainbridge market territory. Nationally, the ready mixed concrete category accounts for about 49 or 50 per cent of all cement mill sales. Taking the foregoing simple projection as the ready mixed total, and assuming it represents half of the area's total cement consumption, then the apparent 1957 purchases approximated 1,253,500 barrels in this part of Georgia. This is high in comparison with estimates for the same Georgia areas obtained by other methods, as indicated below.

<u>Method</u>	<u>Barrels</u>
Local areas' population times state per capita consumption	944,500
Construction employment (adjusted by applying 1956 percentages to 1957 statewide consumption	871,400
Ready mixed concrete firms in area (adjusted to 1957, as above)	871,400

For the Brunswick market territory, the total of 40 Georgia respondents comprised 10 ready mixed concrete firms, 16 building materials dealers, nine concrete products firms (other than ready mix), and five contractors. The ready mixed group bought 262,892 barrels (about 45 per cent of the total reported barrelage), and the remainder was distributed as follows:

	<u>Barrels</u>
Concrete products firms	245,105
Building materials dealers	20,695
Contractors	57,500

A simple projection of the ten respondents' cement purchases to all 17 Georgia ready mixed concrete firms listed for the area, plus an assumption that this projected sub-total represented half the total sales in the area, indicates a consumption of 893,832 barrels for the Georgia segment of the Brunswick territory in 1957. This compares closely with the results obtained from two of the three other methods of estimating.

<u>Method</u>	<u>Barrels</u>
Local population/state per capita consumption	898,000
Construction employment, adjusted to 1957	882,600
Ready mixed firms in area, adjusted to 1957	1,346,900

Statistical Problems

Certain of the statistical problems common to many market studies apply fully to one dealing with portland cement. The available and reliable published data on consumption are not as precise or current as might be desired. First there is a time lag of about two years involved in getting the official foreign trade figures. The effect of net imports or net exports on nationwide apparent consumption is negligible in some years, but fairly important in others. In a few states, such as Florida, it is of major importance in some years. Another, less serious defect of foreign trade statistics is that portland cement is not separated from other types of hydraulic cement; other types ordinarily comprise a very minor portion of the total.

The comprehensive statistics of the Bureau of Mines, from which may be derived a reasonably close approximation of the nation's "apparent consumption" of portland cement, have the two-year time lag and do not include a breakdown by states. Foreign trade figures for states must be compiled from data presented for individual ports, and with the aforementioned time lag. Finally, the "domestic shipments by destination" data (published with only a two months lag) are the nearest approximation available of consumption by state, but not the true equivalent. These "consumption" statistics are not published for smaller areas.

There is probably no cement mill in existence having a market area conforming precisely to state boundaries. And it is virtually certain that no state's cement supplies are produced solely within that state. On the production side, the problem is somewhat more severe. Here authoritative figures are not published for each producing state. States having fewer than three different cement manufacturing companies do not have their production figures published separately. Thus, Georgia and Florida, each with two producing companies (though the two in Florida operate two mills each), are grouped together in official production figures.

Appendix 2

U. S. NEW CONSTRUCTION EXPENDITURES, 1956 AND 1957, WITH ESTIMATES FOR 1958, 1962, AND 1967

(millions of dollars)

	<u>1956</u>	<u>1957</u>	<u>1958</u> ^(a)	<u>1962</u> ^(b)	<u>1967</u> ^(b)
Total new construction	46,292	48,492	50,220	57,300	70,000
<u>Total Private Construction</u>	<u>33,287</u>	<u>34,138</u>	<u>34,752</u>	<u>39,200</u>	<u>48,300</u>
Nonresidential building	8,817	9,556	8,352	11,000	13,700
Industrial	3,084	3,557	2,064	3,900	5,200
Commercial	3,631	3,564	3,504	4,200	5,100
Other	2,102	2,435	2,784	2,900	3,400
Residential building (nonfarm)	17,677	17,019	18,576	19,700	24,000
Farm construction	1,560	1,590	1,620	1,700	1,800
Public utilities	5,113	5,774	6,000	6,600	8,500
All other private	120	199	204	200	300
<u>Total Public Construction</u>	<u>13,005</u>	<u>14,354</u>	<u>15,468</u>	<u>18,100</u>	<u>21,000</u>
Nonresidential building	4,074	4,486	4,644	5,100	6,500
Industrial	453	473	(c)	600	600
Educational	2,556	2,825	(c)	3,200	4,100
Hospital, institutional	298	333	(c)	500	900
Administrative and service	362	439	(c)	(800	(900
Other	405	416	(c)	((
Residential building	292	506	888	300	300
Military facilities	1,395	1,322	1,236	1,400	1,300
Highways	4,655	5,215	5,556	7,900	9,100
Sewer and water systems	1,275	1,344	1,452	1,700	2,400
Miscellaneous public service	384	393	456	600	900
Conservation and development	826	971	1,080	900	950
All other public	104	117	156	200	250

Notes: (a) Seasonally adjusted annual rate, through September, 1958.

(b) 1957 dollars.

(c) Breakdown not available.

Source: U. S. Departments of Commerce and Labor (1956-58);
Architectural Forum (estimate for 1962 and 1967).

Appendix 3

APPARENT CONSUMPTION OF PORTLAND AND OTHER HYDRAULIC CEMENT IN THE U. S., 1946-1956

(millions of barrels)

<u>Year</u>	<u>Shipments from U. S. Mills</u>			<u>Imports</u>	<u>Exports</u>	<u>Apparent Consumption</u>
	<u>Portland</u>	<u>Other</u>	<u>Total</u>			
1946	169.6	2.5	172.1	<u>2/</u>	5.2	166.9
1947	187.5	2.9	190.4	<u>2/</u>	6.8	183.5
1948	204.3	3.4	207.7	0.3	5.9	202.0
1949	206.1	3.2	209.3	0.1	4.6	204.9
1950	227.8	4.2	232.0	1.4	2.4	231.0
1951	241.2	3.5	244.6	0.9	2.9	242.6
1952	251.4	3.4	254.8	0.5	3.2	252.1
1953	260.9	3.5	264.3	0.4	2.6	262.2
1954	274.9	3.5	278.4	0.5	1.8	277.0
1955	292.8	17.5	310.3	5.2	1.8	313.7
1956	308.7	17.0	325.6	4.5	2.0	328.1

1/ Details may not add to totals due to rounding.

2/ Less than 100,000 barrels.

Source: U. S. Department of the Interior, Bureau of Mines.

Appendix 4

CAPACITY DATA OF THE PORTLAND CEMENT INDUSTRY, UNITED STATES TOTAL AND SELECTED DISTRICTS, BY MONTHS IN 1957 AND 1958

	<u>Estimated annual capacity at various dates in thousands of barrels</u>									
	<u>U. S. Total</u>		<u>Alabama</u>		<u>Tennessee^{1/}</u>		<u>Georgia and Florida</u>		<u>South Carolina^{2/}</u>	
	<u>1957</u>	<u>1958</u>	<u>1957</u>	<u>1958</u>	<u>1957</u>	<u>1958</u>	<u>1957</u>	<u>1958</u>	<u>1957</u>	<u>1958</u>
January	349,442	366,861	13,358	14,185	8,520	8,520	9,382	9,382	1,815	2,900
February	350,692	368,001	13,358	14,332	8,520	8,520	9,382	9,382	1,815	2,900
March	350,692	368,001	13,358	14,332	8,520	8,520	9,382	9,382	1,815	2,900
April	352,947	370,251	13,358	14,332	8,520	8,520	9,382	9,382	1,815	2,900
May	352,947	373,701	13,358	14,332	8,520	8,520	9,382	9,382	1,815	2,900
June	353,147	373,701	13,358	14,332	8,520	8,520	9,382	9,382	1,815	2,900
July	355,847	390,733	13,523	14,920	8,520	8,520	9,382	10,762	2,900	2,900
August	355,847	393,233	13,523	14,920	8,520	8,520	9,382	13,262	2,900	2,900
September	360,347	--	13,523	--	8,520	--	9,382	--	2,900	--
October	360,747	--	13,523	--	8,520	--	9,382	--	2,900	--
November	363,547	--	14,023	--	8,520	--	9,382	--	2,900	--
December	363,547	--	14,023	--	8,520	--	9,382	--	2,900	--

^{1/} Of which Georgia is estimated from trade journal sources to have 2.3 million barrels capacity.

^{2/} The one plant in South Carolina is understood from trade journal articles to have had 1,815,000 barrels of annual capacity until sometime in 1957 when its capacity was increased to 2,900,000.

Source: United States Department of the Interior, Bureau of Mines, and various trade journals.

Appendix 5

PRODUCTION OF FINISHED PORTLAND CEMENT UNITED STATES TOTAL AND SELECTED PRODUCING DISTRICTS

Area	Thousands of Barrels				
	1954	1955	1956	1957	1958 ^(a)
United States Total, including Puerto Rico	271,277	296,829	316,460	297,801	303,659
Alabama	10,968	12,161	12,960	11,939	12,007
Tennessee	7,407	8,109	8,387	7,181	7,438
Virginia and South Carolina	(b)	7,015	7,011	7,643	6,749
Georgia and Florida	(b)	7,176	7,830	7,166	8,483

(a) Twelve months ended August, 1958.

(b) Included in wider grouping: 18,347,000 barrels for Virginia, South Carolina, Georgia, Florida, Mississippi, and Louisiana.

Source: United States Department of the Interior, Bureau of Mines.

Appendix 6

PORTLAND CEMENT SHIPMENTS TO GEORGIA FROM ALABAMA AND TENNESSEE, 1950-1956

<u>Year</u>	<u>Alabama</u>		<u>Tennessee</u>	
	<u>Short tons</u>	<u>Barrels</u>	<u>Short tons</u>	<u>Barrels</u>
1950	296,900	1,579,508	59,900	318,668
1951	291,900	1,552,908	123,500	657,020
1952	384,800	2,047,136	161,200	857,584
1953	408,800	2,174,816	151,100	803,852
1954	457,800	2,435,496	162,500	864,500
1955	545,500	2,902,060	240,500	1,279,460
1956	374,000	1,989,362	259,600	1,380,851

Source: Interstate Commerce Commission, Carload Waybill Statistics.

Appendix 7

SELECTED ECONOMIC GROWTH TRENDS, 1949-1957, FOR ALABAMA, FLORIDA, AND GEORGIA

Year	Per Cent of United States Total					
	Population			Personal Income		
	Ala.	Fla.	Ga.	Ala.	Fla.	Ga.
1949	2.02	1.79	2.24	1.18	1.56	1.51
1950	2.03	1.86	2.28	1.18	1.61	1.56
1951	2.00	1.93	2.30	1.20	1.61	1.60
1952	1.98	1.99	2.30	1.20	1.69	1.61
1953	1.95	2.05	2.26	1.18	1.78	1.58
1954	1.89	2.15	2.24	1.14	1.86	1.55
1955	1.88	2.23	2.22	1.21	1.99	1.60
1956	1.87	2.32	2.22	1.19	2.08	1.60
1957	1.85	2.41	2.22	1.21	2.18	1.57

Source: United States Department of Commerce.

Appendix 8

SOME ECONOMIC INDICATORS FOR THE BAINBRIDGE CEMENT MARKET TERRITORY

(Each intrastate segment's relative economic importance in its state)

	Market Area in:		
	Alabama	Florida	Georgia
	(Per cent of respective state total ^{2/})		
Construction employment	4.16	14.57	18.64
Contract construction payrolls	3.33	13.18	18.64
"Industry and Commerce" payrolls	3.45	16.62	13.51
Manufacturing payrolls	3.00	15.76	13.09
Wholesale trade payrolls	3.17	22.47	9.49
Retail trade payrolls	4.42	15.22	17.18
Personal income	<u>3/</u>	<u>3/</u>	18.29
Population ^{4/}	6.37	19.45	20.79
	(Per cent of change)		
Population change, 1950 to 1956	-5.80	16.62	8.12
	(Index no.; U. S. % of increase, 1950-56 = 100)		
Index of increase, 1950-1956	<u>5/</u>	158	77

1/ Data are for 1956, unless otherwise noted.

2/ State gross totals are adjusted to exclude undistributed (statewide) figures.

3/ Data not available.

4/ Estimated; 1957 estimates are used for Georgia areas.

5/ Decrease.

Sources: U. S. Department of Commerce and Health, Education and Welfare,
County Business Patterns, First Quarter 1956.

Industrial Development Branch, Engineering Experiment Station,
Georgia Institute of Technology.

Appendix 9

SOME ECONOMIC INDICATORS FOR THE BRUNSWICK CEMENT MARKET TERRITORY

(Each intrastate segment's relative economic importance in its state)

<u>Indicator</u>	<u>Market Area in:</u>			
	<u>Florida</u>	<u>Georgia</u>	<u>N. C.</u>	<u>S. C.</u>
	(Per cent of respective state total ^{2/})			
Construction employment	12.97	18.88	2.16	11.76
Contract construction payrolls	12.04	19.92	2.12	13.57
"Industry and Commerce" payrolls	14.92	14.67	1.75	8.16
Manufacturing payrolls	18.30	13.74	1.02	4.49
Wholesale trade payrolls	20.94	11.99	3.80	15.31
Retail trade payrolls	13.26	17.86	4.64	12.31
Personal income	<u>3/</u>	17.31	<u>3/</u>	<u>3/</u>
Population	15.71	19.20	1.61	7.44
	(Per cent of change)			
Population change, 1950 to 1956	23.74	13.32	12.69	15.25
	(Index no.; U. S. % of increase, 1950-56 = 100)			
Index of increase, 1950-1956	225	126	120	145

^{1/} Data are for 1956, unless otherwise noted.

^{2/} State gross totals are adjusted to exclude undistributed (statewide) figures.

^{3/} Data not available.

^{4/} Estimated; 1957 estimates are used for Georgia areas.

Sources: U. S. Departments of Commerce and Health, Education and Welfare, County Business Patterns, First Quarter 1956.

Industrial Development Branch, Engineering Experiment Station, Georgia Institute of Technology.

Appendix 10

CITIES WITH POPULATION OF 5,000 AND OVER,
WITHIN A 200-MILE RAIL DISTANCE OF:

BAINBRIDGE:

Albany*
Americus*
Brunswick*
Cairo*
Chattahoochee, Florida*
Columbus*
Cordele
Dothan, Alabama*
Douglas
Enterprise, Alabama*
Fitzgerald*
Fort Valley
LaGrange
Lake City, Florida*
Macon
Moultrie*
Ozark, Alabama*
Quincy, Florida*
Quitman*
Tallahassee, Florida*
Thomasville*
Tifton*
Troy, Alabama*
Valdosta*
Vidalia
Warner Robins
Waycross*

BRUNSWICK:

Albany*
Americus
Augusta*
Bainbridge*
Cairo*
Charleston, South Carolina
Chattahoochee, Florida*
Cordele*
Douglas*
Dublin
Fitzgerald*
Gainesville, Florida*
Jacksonville, Florida*
Jesup*
Lake City, Florida
Macon*
Milledgeville
Moultrie*
Palatka, Florida*
Quitman*
Saint Augustine, Florida
Savannah*
Statesboro
Tallahassee, Florida
Thomasville*
Tifton*
Valdosta*
Vidalia*
Warner Robins*
Waycross*

*Indicates direct rail connections to destination; no inter-company transfer necessary. Cities are in Georgia unless otherwise noted.

Appendix 11

RAIL FREIGHT RATES ON PORTLAND CEMENT TO SELECTED DESTINATIONS IN ALABAMA, FLORIDA, AND GEORGIA FROM CERTAIN EXISTING AND POTENTIAL PLANT LOCATIONS

(Cents per 100 pounds, CL lots)^{1/}

Destination	Lowest existing rate	Indicated rates from:		Other going ^{2/} rates ^{2/}
		Bainbridge, Ga.	Brunswick, Ga.	
Albany, Georgia	16 (a)	17	--	26 (e)
Americus, Georgia	16 (a)	20	--	26 (e)
Atlanta, Georgia	14 (b)	26	--	23 (e)
Augusta, Georgia	20 (c)	--	25	30 (f)
Bainbridge, Georgia	22 (a)	-0-	24	28 (e)
Brunswick, Georgia	18 (d)	24	-0-	24 (a)
Columbus, Georgia	21 (a)	21	--	22 (e)
Dothan, Alabama	22 (a)	15	26	25 (e)
Fitzgerald, Georgia	17 (a)	--	21	--
Hazlehurst, Georgia	20 (a)	--	20	--
Jacksonville, Florida ^{3/}	-0- (d)	24	18	30/34 (e)
McRae, Georgia	19 (a)	--	20	--
Montgomery, Alabama	19 (e)	23	--	--
Panama City, Florida	26 (a)	21	30	29 (e)
Savannah, Georgia	21 (c, d)	--	20	34 (e)
Statesboro, Georgia	23 (a)	--	22	--
Tallahassee, Florida	23 (d)	13	25	30 (e)
Tifton, Georgia	17 (a)	19	21	--
Valdosta, Georgia	20 (d)	17	20	30 (e), 32 (f)
Vidalia, Georgia	21 (a)	--	20	--
Waycross, Georgia	17 (d)	21	20	--

Notes

1/ CL minimum weight is 60,000 pounds except in covered hopper cars. In the latter the ordinary minimum is 120,000 pounds; but when car is loaded to full visible capacity, the governing minimum is actual weight or 100,000 pounds (whichever is higher).

2/ From distant competing mills actually shipping to the named destination.

3/ Via barge from Bunnell, Florida

(a) Clirchfield, Georgia

(b) Rockmart, Georgia

(c) Giant (Harleyville), South Carolina

(d) Jacksonville, Florida (exclusive of barging from Bunnell, Florida.)

(e) Birmingham, Alabama

(f) Chattanooga, Tennessee

Sources: Atlantic Coast Line Railroad Company and
Seaboard Air Line Railroad Company.

Appendix 12

FAVORABLE NET MILL VALUES INDICATED FOR SHIPMENTS TO SELECTED MARKET AREAS FROM PROPOSED CEMENT PLANT AT BAINBRIDGE, GEORGIA^{1/}

Locality	Purchases Reported For 1957 (Barrels)	Per Barrel in Bulk	
		Current Quoted Prices	Derived Net Mill Value f.o.b. Bainbridge Based on Current Prices
Albany, Georgia	101,250	4.09	3.45
Americus, Georgia	8,700	4.46 ^{2/}	3.31
Bainbridge, Georgia	12,478	4.28	4.28
Brunswick, Georgia	126,988	4.23	3.33
Columbus, Georgia	199,068	4.03	3.24
Dothan, Alabama	108,900	4.19	3.63
Douglas, Georgia	10,210	4.47	3.64
Eufaula, Alabama	6,000	4.11	3.40
Lake City, Florida	11,331	4.58 ^{2/}	3.35
McRae, Georgia	13,200	4.56 ^{2/}	3.22
Madison, Florida	4,700	4.28	3.57
Moultrie, Georgia	22,550	4.07	3.47
Panama City, Florida	107,067	4.33 ^{2/}	3.54
Perry, Florida	200	4.72 ^{2/}	3.57
Tallahassee, Florida	29,360	4.35	3.86
Thomasville, Georgia	22,800	4.25 ^{2/}	3.76
Tifton, Georgia	1,000	4.56 ^{2/}	3.45
Valdosta, Georgia	8,360	4.64 ^{2/}	3.60
Vidalia, Georgia	33,680	4.26	3.24
Waycross, Georgia	170,872	4.19	3.40
	998,714		

^{1/} Based on current quoted prices at destinations shown, and rail freight rates from Bainbridge. Average 1958 net mill value for cement mills in Georgia and Florida: \$3.14 per barrel.

^{2/} Bulk price not reported. This is the bag price, which is approximately 40¢ higher than the corresponding bulk price.

Source: Questionnaire returns from cement buyers.

Appendix 13

FAVORABLE NET MILL VALUES INDICATED FOR SHIPMENTS TO SELECTED MARKET AREAS FROM PROPOSED CEMENT PLANT AT BRUNSWICK, GEORGIA ^{1/}

<u>Locality</u>	<u>Purchases Reported For 1957 (Barrels)</u>	<u>Per Barrel in Bulk</u>	
		<u>Current Quoted Prices</u>	<u>Derived Net Mill Value f.o.b. Brunswick Based on Current Prices</u>
Albany, Georgia	101,250	4.09	3.23
Augusta, Georgia	88,931	4.20	3.26
Bainbridge, Georgia	12,478	4.28	3.38
Baxley, Georgia	1,765	4.65 ^{2/}	3.61
Brunswick, Georgia	126,988	4.23	4.23
Dothan, Alabama	108,900	4.19	3.17
Douglas, Georgia	10,210	4.47 ^{2/}	3.32
Dublin, Georgia	15,600	4.13 ^{3/}	3.30
Fitzgerald, Georgia	4,000	4.00 ^{2/}	3.21
Hazlehurst, Georgia	870	4.55 ^{2/}	3.40
Jacksonville, Florida	284,654	3.89 ^{2/}	3.21
Lake City, Florida	11,331	4.58 ^{2/}	3.32
McRae, Georgia	13,200	4.56 ^{2/}	3.41
Madison, Florida	4,700	4.28	3.45
Moultrie, Georgia	22,550	4.07	3.24
Panama City, Florida	107,067	4.33 ^{2/}	3.20
Perry, Florida	200	4.72 ^{2/}	3.38
Savannah, Georgia	90,724	4.24	3.49
Statesboro, Georgia	9,792	4.35	3.52
Tallahassee, Florida	29,360	4.35	3.41
Thomasville, Georgia	22,800	4.25 ^{2/}	3.39
Tifton, Georgia	1,000	4.56 ^{2/}	3.37
Valdosta, Georgia	8,360	4.64 ^{2/}	3.49
Vidalia, Georgia	33,680	4.26	3.51
Waycross, Georgia	170,872	4.19	3.44
	1,281,282		

^{1/} Based on current quoted prices at destinations shown, and rail freight rates from Brunswick. Average 1958 net mill value for cement mills in Georgia and Florida: \$3.14 per barrel.

^{2/} Bulk price not reported. This is the bag price, which is approximately 40¢ higher than the corresponding bulk price.

^{3/} Estimated price.

Source: Questionnaire returns from cement buyers.

Appendix 14

POPULATION TRENDS IN THE BAINBRIDGE AND BRUNSWICK MARKET TERRITORIES, 1950 TO 1956

(Local areas which are parts of the listed states are components of the Bainbridge and Brunswick market territories. The population of such component areas in 1950 and 1956 are expressed below as percentages of their respective state totals.)

	Per Cent of Indicated State Total Population			
	Bainbridge		Brunswick	
	<u>1950</u>	<u>1956</u>	<u>1950</u>	<u>1956</u>
Alabama	6.91	6.37	--	--
Florida	22.30	19.45	14.92	15.71
Georgia	20.74	20.86	18.18	19.20
North Carolina	--	--	1.55	1.61
South Carolina	--	--	7.77	7.44

Source: Computed from Census statistics and various population estimates for local areas.