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Date: 14 March 1974

Project Title: **Study of Building Material Shortages**

Project No: **E-17-607**

Principal Investigator **Dr. Frank J. Clarke**

Sponsor: **Housing Education & Research Institute, Inc.; Atlanta**

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GEORGIA INSTITUTE OF TECHNOLOGY
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Date: February 21, 1975

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Project No: E-17-607

Principal Investigator: Dr. Frank J. Clarke

Sponsor: Housing, Education and Research Institute, Inc.

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Background

Home building in Atlanta is subject to many influences, some of which cannot be controlled or modified by actions of the home builders. One such recent influence has been the shortage of petroleum products used in home building. This shortage began over two years ago and has been gradually worsening as more products and services became involved.

The crisis which resulted from the petroleum shortages received public attention as the result of the Arab embargo on shipments of petroleum feed stock to American refineries. Normally this feedstock is converted into many products used in home building. In addition, a direct result was the shortage of gasoline, diesel fuel and lubricating oil used in trucks and heavy equipment during home building.

However, the problem was far broader than indicated from the shortages of gasoline and diesel fuel at service stations. For example, shortages of raw material for production of phenol used in adhesives which hold plywood together resulted in curtailed and erratic deliveries of exterior plywood for several months.

Shortage in the plastics industry were directly related to the national allocation policy for petroleum products. As manufacturers of plastics examined alternative uses for the limited raw material available they naturally chose products which were the most profitable.

The result of this decision was the shortage of sheet plastic for vapor barriers in house foundations. The alternative product made was plastic trash and garbage bags, a comparatively new product which can be sold profitably under various brand names. Sheet plastic, a commodity item usually sold unbranded, was less profitable.

These examples point up the dilemma facing the home builder. Are these, and many other, shortages likely to continue? If so, should construction techniques be modified to avoid using scarce materials? What effect will the use of alternatives have on the marketability of the homes?

At the same time that these factors involved in design and construction had to be considered, the home builder had to predict whether buyers would continue to buy homes located many miles from jobs and the center of Atlanta.

The National Problem

To place conditions in Atlanta in proper perspective it is necessary to review conditions which prevail throughout the American home building industry. In a single word they are "spotty". But then that's to be expected in an industry made up of many small firms none of whom are dominant giants whose decisions govern industries like those in automobile manufacturing.

Atlanta had been a major growth center from 1970 through 1972 with many newly arrived families seeking homes in all price brackets. Land for easy building was available at relatively low prices. Jobs were plentiful and unemployment was at a low as 1973 began. But by 1973 the American economy had been stretching its productive capacity for at least three years so that many industries had been habitually running at or near full capacity. Within this framework the demand for individual homes in Atlanta boomed. Home builders planned more starts than heretofore but many construction materials became difficult to obtain. These included cement, brick, some plumbing fixtures, and some reinforcing steel items. Lumber, which had been very expensive became scarce as well causing some home builders to switch to metal or concrete components or systems.

To compound these shortages the energy crisis became apparent after years of speculation about its validity. After a boom year in 1972, housing starts dropped in 1973 and again into 1974. Material previously in short supply became easier to obtain simply because there were fewer customers. The shortages resulting from very large demands from other industrial segments continued. So diversions of supply among industries became common. If home building starts had continued at a high rate they would have considerably worsened the conditions as home builders bid against other users for scarce materials.

In late 1973 economists of the U. S. Department of Commerce stated that

"The United States is currently experiencing some stringency of supply on all petroleum products, with some intermittent local shortages. The outlook for 1974 and the year immediately beyond is uncertain, but sufficiently clouded to raise the threat of serious economic dislocations which could be generated by the energy deficiency...."

Our energy problems have their cause, quite simply, in demand outrunning environmentally acceptable supply...The shortfall is now about 15% and growing.

(Note: This assumes the rate of increase in demand will remain constant or grow larger through 1985. Unless some steps are taken to provide alternative sources of energy there will be increasing shortages. The other possibility is to drastically change American demands for energy - a very difficult task.)

One reason given for the shortfall was the low-price of many basic items particularly those related to petroleum.

Today, less than 6 months later the price of a barrel of crude oil has sky-rocketed. Since the United States demand outstrips domestic supply, world petroleum must be used and with it comes the much higher world price. All petroleum derivatives can be expected to cost more as well. Home builders are directly affected for several reasons:

First, they can recover only part of current and future costs from the sale of houses already built but not sold.

Second, they cannot accurately forecast capital requirements because of the very fluid market prices for all building materials, pass through of increased fuel costs is now common.

Third, lead time between the building start and sale is lengthening which means longer term construction loans. Better material availability should help this but it will still be costly.

Fourth, alternative materials may not be available so abnormal delays may occur when a determination is made that preferred items aren't available as planned.

Fifth, the location of some development probably should be re-evaluated in terms of the ability of potential buyers to commute to and from their homes. The private auto is still the preferred mode but may be impossible due to shortages.

In December 1973, Professional Builder magazine surveyed 45 builders in selected areas around the U. S. Those who did not experience shortages of building products serious enough to cause production problems claimed that recognition of possible shortages and planning ahead had minimized the shortages. But they claimed that the manufacturers were not ready for the housing boom and therefore ran out of productive capacity before they could supply the home builders' needs.

As expedients, the builders tried additional sources and alternative materials. The use of alternatives was limited to the buyer's knowledge of them and how to use them. A proposed solution was for the federal government to increase the allocation of petro chemicals to the manufacturers who could then fill the back orders from the builders.

The materials in short supply in December, 1973 were:

	Users Reporting Shortages Percentages (%)
Bathroom fixtures	73.3
Asphalt roofing	44.4
Asphalt	37.8
Plumbing Fixtures (faucets)	35.6
Windows	33.3
Copper tubing	33.3
Gypsum products/wallboard	33.3
Sewer pipe	33.3
Sliding glass doors	31.1
Insulation	31.1
Brick	31.1
Cement	26.7
Reinforcing bars/rods	26.7
Plywood	20.0
Wire mesh	17.8
Particleboard	13.3
Steel products	11.1
Paneling	11.1

In early 1974, McGraw Hill surveyed 53 United States Corporations concerning material shortages attributable to the energy crisis, of these 53% had experienced a crisis.

As of March 1974 another survey identified black markets in five items regularly used in home building. Since these items were formerly price controlled, major increases can now be expected:

	<u>Price Regularly</u>	<u>Black Market</u>
Polyvinyl chloride (plastics), lb.	.14	.76
Styrene, (plastics), lb.	.17	1.00
Steel rebars, cwt	9.50	22.00
Propane, gal	.25	.90
Steel pipe, ft.	1.81	5.75

Description of the Study

In January 1974 the Atlanta home builders requested Georgia Tech to study the effect of the petroleum crisis on the supply of material used in home building in Atlanta. The study was undertaken by a team from the Housing Resources Program and the School of Architecture at Georgia Tech.

The study attempted to determine from empirical data the extent of the petroleum related shortages in building material and to forecast the conditions likely to prevail in 1975.

Methodology

The study sought to establish the bases of supply for construction materials used in Atlanta home building. The data were acquired from many sources by personal interviews which were purposely unstructured to permit a free flow of opinion, facts, comments and prediction. The interviewer, using a topic outline, covered salient points but avoided biasing the comments by interjecting his opinion.

Initially, Mr. W. D. Farmer, a home designer, furnished the study team a list of items which he believed to be affected by some type of shortage or supply problem as of February 1974. Appendix 1 has this list of items.

An analysis of this list indicated that the supply of those items marked with an asterisk (*) might be impacted by the current petroleum shortage. Other items might be in short supply for other reasons such as low price or excessive exportation or lack of imported goods. Only those items with a petroleum related problem were studied further. However, the study team found many relationships among items which greatly broadened the original list of items affected by the petroleum shortage.

For example, the shortage of diesel fuel curtailed deliveries of many items which led to larger less frequent deliveries and the need to store material on site before it was needed. A security problem resulted and an unforeseen expense to the home builder.

The team decided to trace each type of material back along its supply channel until accurate supply information could be obtained. The channels for regular flow of similar information for the future were also to be established.

The study began with interviews of typical Atlanta home builders who expressed their opinions of the current supply problems and listed items which were difficult to obtain regularly, in the quantities and kinds needed.

The major building material suppliers were contacted next. First, they were asked whether they knew of material shortages. If they listed any, the suppliers were asked for their opinions on the causes of the shortages. After recording these data the interviewer asked about specific petroleum related items mentioned by the home builders as being in short supply in Atlanta. Their replies were also recorded.

This survey tended to establish whether certain home builders had unique problems in obtaining material. It also established an indication of the attitudes of suppliers toward home builders with whom they did business.

Moving back along the supply channels the team next contacted local trade associations and determined their view of the supply of building materials in Atlanta.

This step established both the local peculiarities of supply and the steps being taken by member firms to alter current conditions. The professional staffs of these associations were extremely knowledgeable about their industries and could predict likely change. However, they did not possess cross linkages to other industrial trade associations on a regular basis so of necessity they had a limited parochial outlook. The executives of the associations recognized this limitation and made specific recommendations how to alleviate it if it was desirable to do so in the opinion of membership.

The last link was back to the prime source, for example, to the U. S. Forest Service for current predictions on timber, lumber, plywood and related products. It was at this point that the national impact was evident. For example, the controversy on clear cutting of timber has reduced production of West Coast lumber items which are used extensively in Atlanta homes. No easy solution exists for this is a national policy problem which does not now favor an increased supply of lumber. Even if the petroleum shortage was solved the potential shortage of lumber for other reasons would greatly reduce home building along present designs.

An analysis and interpretation was made of the collected data. The findings and recommendations reached follow in Part V.

A word of caution:

The data were collected over a very short period, approximately one month, in a very unusual period of inactivity among Atlanta builders. The team concluded that a return to more normal activity was imminent based on the prevailing funding policy for mortgages. The petroleum shortage as it existed in early 1974 will disappear this Spring and with it the memory of energy dislocations. Only higher prices for gasoline will remain. In the opinion of the study team this will NOT inhibit the house hunters.

Unfortunately, the announcement on April 15, 1974 of a prime rate over 10% may be far more inhibiting than any material shortage.

Findings and Recommendations

1. The home building season 1974-75 in Atlanta will not be drastically affected by material shortages arising from the petroleum crisis.

2. There is a large demand for homes, particularly among young couples, which is not being met by apartment living. Assuming the continued availability of mortgage money as is now predicted, although at a higher interest rate, these prospects will visit many of the existing projects during April-June 1974 and commit themselves to purchasing an existing home. Shortages of gasoline in Atlanta have been limited and should have little effect upon prospects who wish to look at several projects before buying. The cost of gasoline has risen drastically but since this has occurred, in a period of general price advances, it appears to be accepted resignedly. Some softening of retail gasoline prices occurred during April 1974, and the supply to competing non-branded stations appears to be increasing. The supply of gasoline at .60 - .70 per gallon should improve during summer 1974 and decrease the attention of the public towards possible shortages at a later date. Therefore, there should be less resistance to buying homes located at a distance from center city.

3. As the existing new homes are sold some builders will activate earlier (delayed) plans for new starts. Material to build additional homes during the summer-fall 1974 will be available up to the amount which would have normally been built in late 1973 and early 1974. Building materials were procured by suppliers based on historical data. When the predicted home starts did not occur these materials were stock piled. The result is that materials needed for several months of building are available in or near Atlanta. Two factors will affect the supply of these materials to Atlanta home builders. One is the builders willingness to forecast requirement and place firm orders for materials already in stock at Atlanta supply houses. The second is their willingness to pay substantially higher prices for all materials. Builders who can meet these conditions will be able to procure their needs. In addition, building supply houses will undertake to order additional material to be earmarked on arrival based on customers known or projected requirements. In most cases pricing will be based on delivery dates and preference will be given to home builders who place orders for a range of products which allow the supplier latitude in obtaining supplies. The old custom of shopping among suppliers and buying from each only those items which are cheapest may not work.

4. Petroleum based plastics will remain in short supply throughout 1974. The national demand for plastics is far in excess of supply and producers will continue to favor product lines which are more profitable. New uses for plastics such as in brand name furniture and trash bags will be more profitable than older uses where the products have become price footballs. Home builders will have two choices. First, offer higher prices for plastics used in home building than those prevailing in alternative uses. Second, seek non-petroleum based products as replacements.

5. Increased costs resulting from the petroleum crises can be passed on by suppliers who are impacted by them. These suppliers will continue to identify these costs and attempt to pass them to the homebuilders. However, the home builders will find buyer resistance against increases in selling prices which are clearly identified as resulting from higher fuel costs. To avoid this pass-through of fuel increases the home builder should attempt to contract for fixed prices on all materials even if the actual delivery to the building site extends over several months. If this cannot be arranged the home builder will be faced with regular selling price increases which cannot be readily explained to a prospective buyer.

6. Information flow among home builder needs to be increased preferably through the HBMA so that anonymity can be preserved as needed. Any builder who thinks that he has a problem resulting from the petroleum crisis should be able to verify current conditions through the HBMA and so determine whether he has an unique problem.

7. Concerted action to obtain material needs to be taken by home builders as a group. As is true with small independent grocers, large buying power will obtain preferential treatment over a long period of shortages. It is true that some home builders have long standing arrangements which insure that their needs will be filled, but others do not, particularly builders who have recently started in business.

8. Contact among local trade associations needs to be increased. These groups have the advantage of knowing what problems their members are experiencing and can assist them by working with local associations professionals in other industries. These contacts should give home builders warnings about local conditions which cannot be obtained through NAHB or similar national contacts.

9. Alternative materials and construction techniques to minimize shortages are known to other local trade associations officials who can provide data on performance in the Atlanta area. Many home builders are now inhibited from trying new or alternatives materials because it is so difficult to obtain data on local applicability. One method of bringing this information to local home builders would be through the Housing Resources Program at Georgia Tech.

10. Decisions to use alternative material and building techniques raises the question of obtaining assistance of these decisions by code enforcement agencies and financial institutions. The Housing Resources Program at Georgia Tech is now performing this function for home builders in other parts of Georgia. This low cost service could be extended to include Metro Atlanta home builders.

11. Conditions on the building site are likely to change. Material will be delivered in larger quantities which will require safe storage until actually used.

12. Deliveries will be less frequent and must be requested to fit suppliers truck schedule so that fuel use will be optimized. Special fill-in deliveries will be either impossible or available only upon payment of premium prices.

13. Ready mix concrete sand, gravel, etc. will be delivered in smaller trucks but on a tight schedule to minimize lost time waiting to unload. Careful planning of sites to avoid trucks bogging down in mud will be important because of labor and fuel costs involved.

Availability of Petroleum Products

Using national data and Mr. Farmer's "educated guesses" it is now possible to say that supply of building materials used by home builders in Atlanta is, and will be through 1976, highly dependent on the availability of petroleum products.

This study indicates that the availability of gasoline, diesel fuel and propane/butane will dominate the concerns and planning of Atlanta home builders for at least three years beginning in January 1974. It is as simple as this, if there is limited or no fuel for trucks, earth moving equipment or passenger cars there will be very little construction of any kind. Of the little that does occur, the jobs which yield the best return, or have the widest latitude to absorb high or changing prices will get the scarce fuel. Individual political influence as such won't yield gas or diesel at any price but organized efforts by the NAHB to achieve national awareness of the vital role of home building in

the economy should help. It appears that national allocation of scarce materials, including petroleum, follows official perceptions as to the importance of the industry receiving the allocation. If, nationally, housing is viewed as a stop gap, low priority need, allocation will also be low or non-existent. Meanwhile, a friendly station owner may make the difference between continuing to build and having to suspend operation during periods of shortage.

The prediction for gasoline for Atlanta is adequate supply at most stations but expensive and likely to remain so. This means fewer deliveries of emergency items to a site by the supply house in response to a phone call unless the builder is willing to pay premium prices. More building supply houses are going to ask builders for material needs as far in advance as possible so that deliveries can be scheduled. This means larger inventories on site subject to pilferage and larger investments in items before they are actually needed on the job.

The cost of gasoline is likely to reach .60 to .70 per gallon in the near future once the world price of fuel is established and the increase is passed through to consumers. Construction workers traditionally use cars to reach the jobs especially those in the suburbs of Atlanta where most of the home building has occurred in the past three years. The result may be pressure for higher wages, allowances for mileage traveled, or requests for the builder to transport the workers to and from the job to some central point along a MARTA route. The effect on liability insurance isn't clear but there is a good chance that there will be attempts to translate longer travel time into the need for more money and result in greater cost in some form.

Diesel fuel for heavy trucks and equipment should be readily available at higher prices. These prices will have a direct effect on costs on site and an indirect effect on the price of some items delivered to the job. For example, diesel trucks deliver most of the ready-mix concrete used in Atlanta. These trucks formerly carried 10 to 14 yards per load but changed transport regulation now restrict loads to 9 yards. This means more runs to deliver the same quantity. In addition, the cost of operating the trucks has risen to the point where delays in underloading due to poor scheduling or mud on-site will cost the builder premium prices. Some small builders may be unable to get frequent deliveries of small quantities except at premium prices, about 5 yards per delivery seems to be the minimum without paying a premium.

Lubricating oils may be in short supply occasionally as has been true in the immediate past, but again there will be supplies at higher prices.

Butane/Propane supplies will vary as bidding for the increasing supplies continues into 1975. If the petrochemical industry can obtain its needs readily even at higher prices there will be plenty for other major users such as farmers. Then the smaller users including builders will be able to obtain their needs readily at higher prices. Priority among competing demands for short supplies is likely to occur during Summer-Fall 1974 which could affect the 1974 building season. The recent actions of the Federal Energy Office indicate that the shortage of propane during the past year was contrived and there are adequate supplies nationally. The price of propane has been decreasing. In addition, adequate supplies of propane are being diverted to the petrochemical industry which will increase the supply of plastics, many of which are used in home building. Propane is also used in heating and drying on site and lower prices and high availability should be generally helpful.

Nationally the allocation of gasoline, diesel fuel and propane for 1974 is expected to be a high percentage of the same quantity used in 1973. This may effect those home builders who did not build in 1973 or could not obtain material to complete as many homes per month in 1973 as they hope to build in 1974-75. However, compared to major commercial builders who want to come into Georgia with no prior experience factor for 1973 in Georgia, local home builders have no allocation problem.

New home builders willing to pay higher prices and plan in advance should be able to obtain fuel in the Atlanta area.

Concrete Block

Some material like concrete blocks, which are affected by the supply of propane for drying, are in stock now. The planned deliveries will be adequate to supply present projected demands through August without running short as has happened in normal years.

Concrete

The supply of concrete is much better in Georgia than in Northern states because there are new cement plants operating in surrounding states. This supply plus regular deliveries of foreign cement through the port of Tampa should easily fill presently projected needs through 1975. There are strict air pollution standards being enforced on cement plants but the new plants serving Georgia do not expect any unforeseen restrictions on production. Some older plants have closed because they could not comply with federal guidelines.

Aggregate and sand for use in home building may be in short supply because of three factors. First, diesel fuel for shovels and earth moving equipment in the pits has been scarce and is now much more expensive. This price increase is likely to be passed through to ready-mix concrete plants and to the jobs where sand and aggregate are used directly. Second, increased digging for aggregate and sand is likely to be opposed by environmental protection groups. Third, increased heavy hauling from pits is likely to be opposed by local authorities who will restrict loads to protect road surfaces. At least some attempt will be made to reduce load limits which translates into more runs and higher fuel consumption and higher prices.

Copper

The production of copper depends heavily on oil, but chiefly in the smelting steps rather than in fabricating. Prices should be 10% or more higher. How high depends on world prices but if smelters shut down there will be a major black market and gap in supply for two or more years.

Aluminum

Aluminum, often used as an alternative to copper or even to wood, is in heavy demand and no new manufacturing plants have been added, because of environmental concerns. Production depends on electricity rather than petroleum.

Wire and Cable

Wire and cable of either copper or aluminum is likely to have a long lead time and should be purchased well in advance of needs. Possibly notify supplier of total annual needs then draw against this requirement as building begins.

Asphalt Products

The competition for scarce materials has been keen and is likely to continue in 1974-75. For example, asphalt is used in roofing of homes and many other types of commercial and industrial buildings. There has been a major shortage of asphalt, roofing felt and roofing shingles in the Atlanta area. In the opinion of the major roofing companies there has been a definite change in the market for asphalt-based products. The demand is very high while the supply has been erratic. In the immediate past there has been a surplus of asphalt based products which had to be sold, but the increased rate of commercial and industrial building has completely reversed this situation. Home builders are directly competing for this material and will continue to do so.

Asphalt

Asphalt for paving is not in short supply in Atlanta with the major source being able to furnish all of the present demands. The supply for the balance of 1974-75 is expected to be 90% or better. The asphalt paving industry directly competes with the concrete paving industry and will continue to do so. Therefore, the price of asphalt and concrete for paving in home developments is likely to be higher, but competitive for those home builders prepared to use either material. Major roofers in Atlanta also handle work outside the metro area which will directly compete for asphalt if there are shortages.

Plywood

Variations in demand have caused displacements in supply of plywood in Atlanta according to some supply sources. There are new plywood plants in the Southeast that concentrate on the production of Southern pine plywood, but most of the hard wood plywood comes from West Coast mills. These mills had experienced extremely high demand in 1971 - 1973 from home builders. There were shortages which aggravated by a continuing shortage of phenolic used in the adhesives used to bond plies in manufacture of plywood. The plywood makers suggested that the specifications for exterior plywood which requires high strength (high phenolic resin content) adhesives be modified to use less phenol. This would increase the supply of plywood and simplify inventory problems on all supply levels.

There are technical problems involved and the shortage vanished before they were resolved. The shortage was relieved because the rate of home building greatly decreased in late 1973 and early 1974. Supplies of plywood are available now, but if home builders do build as now planned but do not advise the plywood manufacturers, there may be a shortage late in 1974 and 1975 because production of plywood will not have increased accordingly. The supply of phenolic resin based adhesives will depend on the demand from the plywood manufacturers. If they do not order, the phenol will be diverted to plastics and other petro-chemical products.

Steel

The current shortage of some steel items has been caused by a number of unrelated factors merging. First, the shortage of natural gas curtailed the manufacture of steel while the production of an alternative fuel, low sulfur

high quality coal, has been going to utility companies which are unable to obtain fuel oil or natural gas because of the petroleum crisis. The steel mills are therefore unable to produce the secondary items used in home building. Second, several years ago foreign companies obtained most of the American market for certain steel items. Their own markets now require the capacity and they have ceased exporting to American home builders. The home builders turning back to American steel producers found that very limited amounts could be furnished and those would go to long term customers who had continued to buy American steel despite its higher price. Third, high quality steel scrap is scarce and expensive. Fourth, was the scarcity and high price for diesel fuel for steel haulers which resulted in trucking strikes and tieups.

Plastics

The supply of plastics used in home building is likely to remain tight. During late 1973 and early 1974 buildings starts were slow and so plastics producers profits were low. Added to this were sporadic shutdowns in the industry. Now the production may be further curtailed because some producers see a national recession. This curtailment will cause shortages in styrene-butadiene, stereo elastomer, polybutadiene and ethylene-propylene rubber products. Prices will be substantially higher for what is available. (See Black Market Listing)

There is evidence that the home builder, the toymakers and the furniture makers are all planning to use the same supply of plastics. Toy manufacturers had planned to curtail their use of plastics for Christmas 1974 toys but news that home building was seriously off late in 1973 caused them to revise their plans to use the plastic which home builders won't be able to use since they won't be building! This optimistic evaluation runs directly counter to home building programs encouraged by easier borrowing and increased support of Federal Housing Administration programs. Furniture makers have turned more and more to plastic components and even to whole items aimed at young newly married couples who are a major market for first home sales.

There could be a three way collision with very tight supplies and high prices resulting since all three industries seem to be planning in a vacuum concerning future supplies.

Home builders have changed many of their demands from natural to man-made products during the past five years. These manmade products are chiefly made from petrochemicals many of which have become increasingly difficult to obtain. Moreover, the equivalent natural material, since it was no longer in demand, has not been produced in the same quantities as in past years. Examples of this are vinyl or aluminum siding versus wooden siding or fiber glass bathtubs and stall showers versus similar porcelain items. Therefore, it will be very difficult to switch back from man-made to natural products and expect prompt delivery.

Home building is an erratic demand compared to many other demands competing for petro chemicals. Manufacturers may decide to divert raw materials to selected products which are more profitable and/or have more predictable demands.

For example, paper products for packing are in great demand and although prices have risen the supply is still inadequate. A recently recommended solution is to adopt corrugated plastic sheeting as an alternative packing material even though it is more expensive. The potential users would offset the higher price because plastics are reusable while paper is not. This would be a new and highly profitable diversion of scarce petroleum based plastic materials to non-building uses. The new demand would be large, steady and growing. Plastics manufacturers are likely to accept it quickly.

Predictions nationally are that any large increase in home building will cause shortages of many materials. Part of this shortage may be the result of changes in inventory policy by users. In the past there has been a steady flow of material to the job with short delivery dates and fill in shipments when planning was faulty. As stories of possible shortages were published, many users began to build inventories against future needs. A similar situation now prevails in retail gas stations where customers buy small quantities frequently to top off their tanks where in the past they would have bought larger amounts much less frequently. In effect, a secondary inventory of fuel at very high levels now exists in the fuel tanks of vehicles. Secondary inventories of some "scarce" material probably exist. Since home builders will probably build about the same number of homes as they usually do, this inventory will be a readily available part of their

total needs and suppliers who reorder in anticipation of large demands may be left with unsold inventory with a high book value but no buyers.

In the future, obtaining accurate data on the true causes of current shortages will be difficult because some suppliers will attribute their changes in price and delivery schedule to conditions related to the energy crisis when in reality they are adjusting long standing inequities as they view the matter. Therefore political pressure to increase the supply of energy allocated for home building will not alleviate the problem since it is not a supply/demand problem at all.

Builders will be able to get petro-chemical related materials in 1975-76 but marginally profitable items or those used by only a few builders may be scarce and much more expensive. Suppliers have already experienced difficulty in obtaining some commodity items like polyethylene sheeting which formerly sold at lower prices than did trash bags made from the same basic material. Building supply dealers were told that trash bags were more profitable than sheet polypropylene even though neither item was sold under a brand name. It is likely that other commodity items will be scarce and proportionately closer in price to branded items. This could affect the price of roofing shingles and felt as well as the availability of unbranded merchandise at lower prices.

Specialty Items

Specialty Items used by only a few home builders in one part of the area may also be in short supply. Some suppliers indicated that they were taking the opportunity presented by the uncertain conditions to reduce the range of items available, simplifying quantity packages and eliminating less profitable items in favor of those in greater demand. Builders may be told that these infrequently requested items are not available - and they won't be - simply because the suppliers are concentrating on the more popular and profitable items. Attempts will be made to switch builders to more popular items.

Range

The range of sizes, colors, finishes, etc. is likely to remain very good so the home builder who knows the total product market will be able to fill his needs easily. Suppliers are taking new customers who have never built before and supplying them new items which are not in short supply and established builders who traditionally buy only a limited range of material - and from the same supply sources regularly - are unlikely to have supply

difficulties. The larger supply houses plan to furnish their regular customers on a priority basis, particularly when they can accurately predict demand for certain items.

The large building supply dealers have accumulated data on their customers which indicate that an Atlanta home builder builds about the same number of houses every year, if he builds at all. He also tends to use the same materials since he can accurately plan their utilization and his crews know how to use these materials. The building suppliers in turn have orders with their sources for enough material to fill these demands this summer and fall. In addition, there are good inventories of many materials because of the slow building season in late 1973. Material ordered for sale earlier but not used is available now so builders are assured of good supplies up into the Fall 1974.

Probable Outcome of Petroleum Shortage

If demand for some types of material drops, the pressure on the manufacturers to operate at full capacity will also drop. In the past this has led to a gradual slowing and less frantic buying of raw material at any price. Some decrease in end items prices also resulted which aided home builders.

In 1974-75 the situation should be quite different. As manufacturers watch material costs rise in 1974 they will tend to accumulate inventories needed for future production. This will insure raw material cost but will not alter high selling prices in a tight economy.

If labor costs rise in Summer - Fall 1974 as now expected this added cost will be passed through to customers as increases in prices. Home builders will be directly affected. In addition, manufacturers working from inventories purchased earlier will be more responsive but at increased prices which reflect replacement costs of the raw material.

Therefore building supply dealers seeking to replenish material bought in 1973, but not sold until Summer 1974 are going to find major increase in prices on virtually every product.

This may be better for home building because one generalization reached from this study is that industry is not going to put capital into - or produce items which do not seem likely to yield an adequate profit.

Minor items, specialty items and those by only a few customers too small to be served economically are going to be gradually phased out.

Many suppliers have catered to the special needs of all customers in the belief that they would lose customers if they did not. A period of scarcity has shown that customers are far more reasonable and less exacting than they formerly appeared to be.

At least some suppliers are taking advantage of scarcity to realign their business to increase its profitability as outlined above. Changes in small deliveries, stocking of small requirements items, provision of full service in their former manner and shortages in general will be explained in terms of the "energy crisis", a catch all of use by everyone.

If home builders decide that there is a market for homes in Summer-Fall 1974 they will find the supply situation mixed.

If only a few home builders place new orders for material they will be supplied from stock. But if many builders reach the decision to build, shortages will occur late in the Fall 1974. The national economy is still running close to capacity and new customers, in this case the Atlanta home builders will have to wait in line.

The result will be that the time to complete housing starts, which has increased from 4.8 months in 1971 to 6.6 months in 1973, will increase still further to over 8 months in 1974-75.

If the national economy slows but home building increases there will be a gradual easing of shortages as more production is diverted to housing.

Home builders will then find the supply situation considerably easier but prices will be very high compared to 1970-72 when the housing boom last occurred.

The demand for homes is still present - and if not satisfied in Summer 1974 - will remain and intensify. Wage adjustments will make some difference. Even with inflation there will be prospects whose combined income will have risen to the point that they can afford a home. What this home will be like and where it will be located remain two tough questions while higher selling prices seem inevitable.

It should be an interesting and profitable period for the home builder who can successfully predict which factors will dominate the market.

A SECOND LOOK

When the petroleum crisis hit, the American economy was already running at a very high level. Manufacturing capacity was being strained in many industries to keep up with the demand from world markets as well as American customers. The leadtime for delivery of many basic materials had been increasing and since the world-wide demand was also continuing at a high level, there was very little raw material to devote to expansion or building new productive capacity.

This situation led to the decisions which complicated the petroleum crisis and its effects on the availability of residential construction materials.

For example, there have been shortages in plate and light structural steels for several months and these shortages are continuing today. Most of these steels go into the manufacture of other products among which are freight cars. During this period of heavy demand the steel industry has been unable to deliver the required steel plate for conversion into freight cars at the rate needed to keep the railroads supplied.

This had a direct effect on the supply of building material much of which is delivered by railroad. Two shortages, i.e. West Coast lumber and cement, were attributable to the lack of freight cars. This situation is still continuing and would worsen rapidly if part of the present deliveries to building supply houses by truck had to be handled by the railroads as would be true in a petroleum shortage.

The steel industry also made some difficult choices among its products in terms of profitability. Rebars being a low profit item lost out and the production of rebars dropped below demand. Now that price controls have been removed rebars will be available in larger quantities - at higher prices.

Metal lath and similar items used in home building continue to be in short supply.

To further complicate matters the total demand for steel is so great that it is likely that rebars and metal lath will lose out again to other higher profit margin items within a year. If home building does not materialize as anticipated in 1974 the allocation of scarce steel to these items will not include very much for 1975-76 for residential construction.

A related situation exists in the production of nails. At present nails are in short supply especially concrete coated nails, and other special types used by home builders. The production of nails is still behind world demand and it is unlikely that imported nails will be available to fill shortages from American mills.

Production of structural steel is also behind demand and in the Atlanta area the building of commercial and industrial buildings has continued at a high level while residential construction has slowed.

Part of this structural steel was to be used in the building of additional capacity for production of plastics, but construction has been delayed and this capacity won't be available as soon as hoped.

In general, however, plastics are in better supply than three months ago and the situation is continuing to improve up to the point which present productive capacity will permit. Sheet plastic for vapor barriers is still in short supply. As explained in this report commodity items like polypropylene and polyethylene sheeting are unlikely to be readily available as long as the demand for higher profit branded goods is not filled. More capacity is needed if all items are to be produced as now being demanded.

Asphalt products are still in short supply especially roofing felts. It has become the custom to tie together the sale of roofing felts and roofing shingles but the supply of felts has become so uncertain that even this practice may be discontinued. The low profit felts are not available in sufficient quantity. Attempts to track down the reason for the shortage haven't been successful, but the producers plan to recommend the revision of building codes to eliminate the requirement to use asphalt felt. Until these changes are made in local codes, asphalt felts may be critically short. Some jurisdictions will grant exceptions on a job by job basis since it is clear that the asphalt roofing suppliers aren't going to be able to meet demands for at least eight months.

Paint appears to be available as are thinners, lacquers and related products which were hard to get three months ago.

An interesting comment made by some suppliers who have both commercial and residential builders as customers is that it is only the slow down in home building that kept materials from being in very short supply. Some additional material also came from decreased demands from automobile industry but most of this surplus was absorbed by non-construction industries.

The shortages in plywood seem to be eased at present but the higher prices paid for future deliveries of round logs used in plywood indicate that plywood will be very expensive next year and even more so in 1976. This will directly affect both construction and interior fittings such as paneling and cabinets.

Some paper products continue to be in short supply. Paper bags are particularly short and expensive. Alternative use plastic and cloth bags are also scarce. This type of related shortage shows up frequently. In the case of bags for example, it hampers the delivery of blasting sand which is otherwise available for use in construction and renovating.

When the suppliers were recontacted during May they were also asked about the impact which the slowing of home building had had on their inventory investment policy. Although home building was slow, commercial building was brisk in Atlanta and the cost to replace inventory is rising rapidly now that price controls have been lifted.

The suppliers appeared to be trying to maintain a balanced stock of the materials normally used by home builders even though the cost of holding the same quantities of material was substantially higher.

Some suppliers were cutting back from high 1973-74 stock levels by as much as 25%. This policy was forcing them to make hard decisions as to the ready availability of replacement stock from their suppliers should home building really speed up late in 1974. The decision to reduce investment in inventory could mean delays in delivery and competition among builders for relatively fewer items should home construction increase among many small builders

who have been out of the market.

The cost of financing inventory is sharply higher and carrying costs for materials produced but not sold remain a problem.

Concrete block is an example of this situation. There is little demand from commercial builders for block but substantial inventories were available in Atlanta three months based on past usage by home builders. Most of this stock remains unsold. On the other hand, ready-mix concrete which is used in commercial building has been selling well. In fact, this product may have kept some suppliers solvent while waiting for home building to pick up.

The suppliers have heard that many home builders plan to build again as soon as the inventory of completed homes is reduced. Hopefully, this will be soon. The suppliers also recognize the financial squeeze on home builders but there are some new builders entering the Atlanta market so together with the established firms there should be a steady demand in second half of 1974 and early 1975.

The building suppliers also have the problem of competing with purchasing agents of large companies who are buying in anticipation of much higher prices later in 1974 and 1975. Borrowing from banks to finance additional inventory includes many raw materials used in general construction. The result has been substantially higher prices for such items as storage tanks and greatly extended delivery date promises.

Many of the increases in price allowed as a result of the petroleum crisis are still filtering down to building suppliers which means that the value of their inventories is rising but the cost of replacement items will be even higher than indicated by today's prices. It is difficult to get firm prices on most items unless they can be delivered from stock.

Increases due to higher labor and fuel cost will be coming all Summer and Fall then prices will stabilize briefly, only to change as labor negotiates higher pay and benefits. It is safe to say prices will be substantially higher.

Overall, the material picture has improved during the past three months and should continue to improve provided that at least a moderate number of starts in home building are made in ~~the~~ last half of 1974 and early 1975. Conversely, if these starts are not made the suppliers will be forced to cut back along their supply channels which will make it very difficult to respond quickly to a building surge in Spring and Summer 1975.

APPENDIX 1 - List of Items Likely to Be Affected
by a Shortage of Petroleum

FOUNDATION

Soil treatment chemicals

EXTERIOR WALLS

Siding-wood, vinyl, aluminum

Base Flashing-felt or copper coated paper

Paint-including primers

FLOOR FRAMING

Rigid insulation

Membrane - 4 mil Visqueen

SUB-FLOORING AND FINISH FLOOR

Plywood - especially if exterior glue required

Varnish

ROOFING

Plywood

Asphalt shingles

Asphalt saturated felt

GUTTERS

Gutters - vinyl or aluminum

DECORATING

Enamel

Sealer

Stain

WINDOWS

Weatherstripping - bronze or vinyl

Shutters - vinyl, metal

CABINETS

Plywood

Plastic laminate

Particle Board

FLOORS

Sheet vinyl including Hydracore back

PLUMBING

Fiberglass fixtures

Inside drains - plastic

Water piping - plastic

HEATING

Duct material - Fiberglass

WIRING AND LIGHTING FIXTURES - BUILT IN FEATURES

Non-metallic cable - Romex

Fixtures and Lenses - plastic

Connections for washer and dryer, dishwasher, hood, fan surface unit, oven