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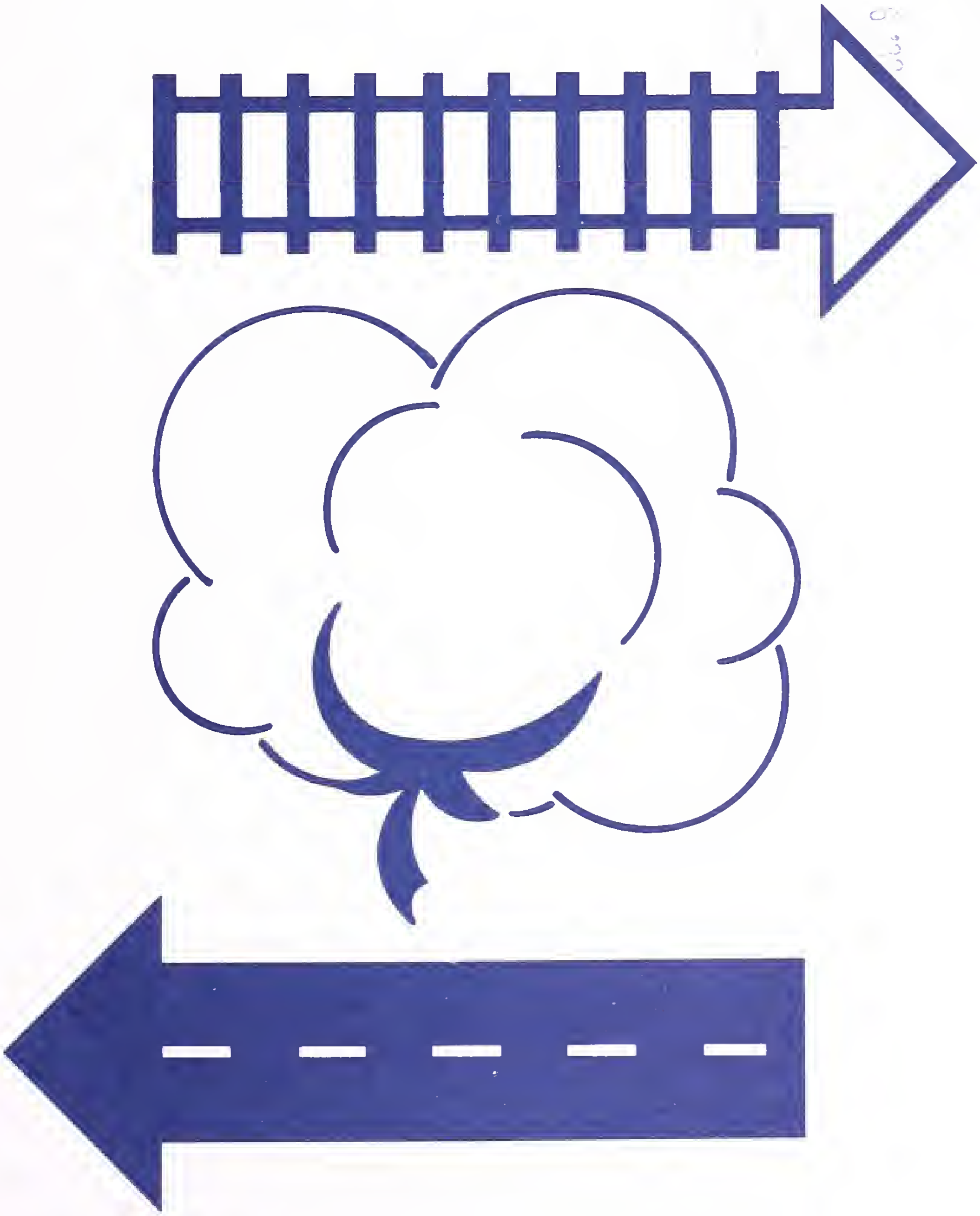
The Transport of Baled Cotton: Review and Outlook



THE TRANSPORT OF BALED COTTON: REVIEW AND OUTLOOK, by James A. Caron and Paul E. Kepler; Office of Transportation, U.S. Department of Agriculture. Marketing Research Report No. 1128.

Abstract

The majority of baled cotton has traditionally moved by rail from warehouse locations to ports and mills within the United States. Over the last two decades, motor carriers have greatly increased their share of the cotton traffic on both short- and long-distance movements. With passage of the Staggers Rail Act of 1980, railroads are allowed greater freedom to price their services and other opportunities, through contracts, to specify service levels in exchange for guaranteed volume commitments by shippers. In order that each mode may be utilized in services for which the greatest comparative advantage exists, shippers, railroads, and motor carriers are encouraged to adopt costing methodologies which account for both transport and nontransport costs of cotton shipments.

Notes

This study was conducted in cooperation with The Cotton Foundation of Memphis, Tennessee, under a cooperative agreement in accordance with the Agricultural Marketing Act of 1946 (7 U.S.C. 1621 et seq, Sections 20(a) and 453(b)).

References to companies or products within this study do not imply evaluation or endorsement by the U.S. Department of Agriculture.

Cover photographs are courtesy of The Cotton Foundation.

Key words: Cotton, Transportation, Shipping, Rail, Motorcarrier, Intermodal

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PREFACE

Severe shortages of transportation equipment for baled cotton in the 1979/80 marketing year and recent legislation substantially reducing the amount of economic regulation of rail and motor carriers generated concern among cotton shippers as to the future of transportation services for their product. The Cotton Foundation and the Office of Transportation, U.S. Department of Agriculture, agreed to cooperate in a study of those concerns. The study objective was to examine innovative methods, or adaptations of commonly used methods, to reduce transportation costs and mitigate recurring shortages of equipment. Study components were defined as follows:

1. Develop a profile of domestic cotton flows, by mode, from production areas to domestic mills and ports.

2. Examine competitive carrier performance over time.

3. Identify (a) service requirements and problems of shippers and receivers and (b) service capabilities and problems of carriers.

4. Examine the implications of rising energy costs in regard to future carrier costs.

5. Determine the impact of the changing regulatory environment on transport supply.

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FINDINGS

Cotton Flows

---Production continues to shift to the Western growing region (42 percent of U.S. production in 1980), closer to export terminals and farther from textile mill concentrations.

---Domestic mill consumption has held somewhat constant over the period 1975-79, averaging 6.6 million bales per year.

---Severe transportation shortages were experienced in seasonal year 1979/80 due to a 49-percent increase in cotton exports over the previous year and strong competition for similar equipment by other commodities.

---Variations in the quality of cotton fibers among regions cause some "cross hauling" of cotton to mills and ports.

Rail Carriage

---Although railroads have experienced a national average revenue-to-variable cost ratio of 1.034 for cotton traffic, ratios varied widely among rail districts.

---Analysis revealed ratio variances between 1.23 and 2.91 on specific high-volume cotton corridors based on similar costing procedures. Costs are computed using Rail Form A regional averages.

---Rail revenue/cost ratios were found to increase as linehaul distances decreased.

---For railroads reporting cotton traffic in 1975-79, cotton revenues as a percent of total revenues exceeded cotton tonnages as a percent of total tonnages. This reflects the relatively longer hauls of cotton.

---Yearly totals for the period 1975-79 showed that rail tonnages of cotton decreased an average 10.2 percent per year, rail cotton revenues decreased an average 4.4 percent per year, while cotton movements to ports and mills increased an average 18.0 percent per year.

Motor Carriage

---Motor carrier revenue to total cost ratios varied from 0.55 to 1.55, the ratios increasing as linehaul miles decreased.

---Longer linehaul revenues usually returned less than the total cost of the service. However, revenues were adequate to cover shortrun variable costs, i.e., driver, fuel, and lubricants. Return trip revenues would have to cover all other costs of the round trip in the long run.

---Fuel costs comprise between 27 and 35 percent of total motor carrier costs depending on the linehaul. A 38-percent increase in fuel (to $1.815 per gallon) would increase total costs by 11 to 17 percent. Percent increases in rates would be greater the lower revenues are in relation to total costs.

Intermodal Services

---Trailer-on-flatcar service was found to be only marginally competitive when compared to straight rail service.

---Container-on-flatcar service was generally limited to minibridge service between domestic ports.

Carrier Competition

---In the period 1961-75 rail shares of all cotton moved dropped from 73 percent to 47 percent due to motor carrier competition.

---Most of the share decline was specific to shorter linehaul distances, but rail losses of 17 percentage points were reported for traffic in linehaul distances greater than 2,500 miles.

---From 1975 to 1980, rail rates increased an average of 18.6 percent while truck rates increased an average of 32.4 percent.

---For February 1981, the average costs to shippers for motor carrier service were found to be 11 percent greater than for rail service on 18 selected linehaul corridors.

---Capital carrying costs, i.e., interest on the value of cotton during transit, along with other transport and non-transport costs, should be considered by shippers to determine transport mode or service.

Deregulation

---Ease of entry to other markets by motor carriers may slightly decrease demand of motor carriage for cotton.

---Reduced empty miles by motor carriers may reduce costs per loaded mile and provide for lower rates in some cases.

---Rail deregulation may stimulate rate instability for cotton shippers. Rate-making may become more flexible, more timely, and more independent of other rail carriers.

---Rail contracting is an option for shippers who desire stable rates. Volume traffic is necessary to obtain rate and service guarantees.

CONCLUSIONS

The low costs of rail transportation, plus the stability of rates based on guaranteed service conditions available through contract arrangements, make rail service a potentially better transport option than in the past. While today's rail rates are only slightly lower than motor carrier rates, anticipated energy price increases will affect motor carrier costs more than rail costs.

Shippers often mention poor rail service as the primary reason for choosing motor over rail carriage. Rail contracting provides a means for obtaining service attributes that before were unavailable. Although many cotton movements may be better served by trucks, railroads appear able to provide adequate service at lower costs than motor carriers on long linehaul movements.

Shippers may begin examining the potential for contracting rail service by:

1. Identifying and quantifying regular traffic movements between various origin and destination points.
2. Selecting high-volume movements to determine the potential for regularity of shipments throughout the year.
3. Determining the costs to the railroad for providing the service. The assistance of a rail cost analyst may be necessary.
4. Determining the maximum rate the shipper is willing to pay, given past motor carrier rates, the minimum legal rail rate, and present rail cost determinations.
5. Using total logistical costing methods to determine service requirements at various rate levels.
6. Seeking other shippers who would be interested in entering into a common contractual arrangement if individual shipper volumes are insufficient to meet rail carrier volume requirements.

Whether or not rail contracting is used, shippers should use total logistical costing to determine which mode to use for a particular shipment. Computerization of the cost algorithm may be necessary.

THE COTTON INDUSTRY

Production

In 1960, the Southeast region produced 13.5 percent of all U.S. cotton or 1,929,000 bales. By 1980, production had declined steadily to 496,000 bales, and represented 4.4 percent of the U.S. total. By contrast, the Western region had increased its share of production from 21.6 percent in 1960 to 42.0 percent in 1980. Since 1930, the Southwest and Delta regions have consistently supplied the majority of the U.S. crop. Table 1 identifies cotton production by region from 1930 to 1980 and demonstrates the variability of regional production on both an absolute and a relative scale. Demographic shifts, insect predation, farm mechanization, and new irrigation technologies are important determinants in shifting cotton production to the Western States.

Ginning

At harvest, seed cotton must be transported to gins for initial processing. As gins are widely distributed throughout the production areas, the cotton is transported relatively short distances. Producers or ginners may use trucks, truck-trailer, or farm tractor-trailer combinations for these hauls. Capacity varies from 3 to 10 bales per load depending on vehicle capacity and method of cotton harvest. If gin capacity is not immediately available, cotton is stored in tarped wagons, in the field on pallets, in ricks, or in modules. At the gin, seed is removed from cotton lint and the lint is cleaned, dried, and baled. The final step, the baling or packaging of the lint cotton, compresses and wraps the product for ease and efficiency in storage and transport.

Common compression densities per cubic foot are: gin flat (12-13 pounds), modified flat (14-16 pounds), standard density (23 pounds), and universal density (28 pounds). Bales also vary in weight depending on regional ginning practices, type of fiber, moisture content when ginned, moisture accumulation in storage and in transit, and type of packaging (polypropylene or jute). A shipper must consider each bale's weight when assembling a lot for shipment. Lot weight is extremely important because of carrier- or government-imposed maximum loads and carrier rate minimum loads. The U.S. average net weight of a bale at ginning is 492 pounds. 1/ Although the ginning industry is gradually accomplishing a universal density bale, gin conversion costs and lack of economic incentives inhibit the modification in some gins. Variations in densities of bales among growing areas may be

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1/ Statistics on Cotton and Related Data 1960-80, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Statistical Bulletin No. 617, March 1979.

Table 1 - Cotton production by region and as a percentage of total production, United States, 1930-80

Year beginning August 1	Western[1] Region		Southwestern[2] Region		Delta[3] Region		Southeastern[4] Region		United States
	1,000 bales[5]	Per-Cent	1,000 bales	Per-Cent	1,000 bales	Per-Cent	1,000 bales	Per-Cent	1,000 bales
1930	516	4	4,892	35	3,588	26	4,933	35	13,932
1940	868	7	4,036	32	4,122	33	3,540	28	12,566
1950	1,639	16	3,188	32	3,518	35	1,669	17	10,014
1960	3,076	21.6	4,797	33.7	4,435	31.2	1,929	13.5	14,237
1961	2,813	19.7	5,145	36.0	4,485	31.4	1,840	12.9	14,283
1962	3,118	21.0	5,026	33.9	4,710	31.8	1,973	13.3	14,827
1963	2,822	18.4	4,744	31.0	5,407	35.4	2,231	15.2	15,294
1964	2,813	18.6	4,403	29.1	5,468	36.1	2,461	16.2	15,145
1965	2,707	18.1	5,030	33.7	5,051	33.8	2,150	14.4	14,938
1966	1,925	20.1	3,393	35.5	3,077	32.2	1,162	12.2	9,557
1967	1,651	22.2	2,958	39.7	2,179	29.3	655	8.8	7,443
1968	2,482	22.7	3,786	34.6	3,612	33.1	1,046	9.6	10,926
1969	2,104	21.1	3,138	31.4	3,691	36.9	1,057	10.6	9,990
1970	1,796	17.6	3,402	33.4	3,819	37.5	1,175	11.5	10,192
1971	1,780	17.0	2,791	26.6	4,468	42.5	1,438	13.7	10,477
1972	2,593	18.9	4,609	33.6	5,139	37.5	1,363	9.9	13,704
1973	2,550	19.7	5,126	39.5	3,990	30.8	1,308	10.1	12,974
1974	3,806	33.0	2,796	24.2	3,576	31.0	1,362	11.8	11,540
1975	2,640	31.8	2,563	30.9	2,491	30.0	607	7.3	8,302
1976	3,444	32.6	3,489	33.0	2,874	27.2	773	7.3	10,581
1977	4,100	28.6	5,936	41.3	3,827	26.6	527	3.7	14,389
1978	3,177	29.3	4,174	38.4	2,939	27.1	566	5.2	10,856
1979	4,870	33.3	6,061	41.4	3,061	20.9	639	4.4	14,629
1980	4,674	42.0	3,521	31.6	2,433	21.9	496	4.4	11,124

[1] California, Arizona, New Mexico, and Nevada.
[2] Texas, Oklahoma, and Kansas.
[3] Missouri, Arkansas, Tennessee, Mississippi, Louisiana, Illinois, and Kentucky.
[4] Virginia, North Carolina, South Carolina, Georgia, Florida, and Alabama.
[5] 480-pound net weight.

Sources: Statistics on Cotton and Related Data 1960-80, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Statistical Bulletin No. 617, March 1979. Crop Production-1980 Annual Summary, U.S. Department of Agriculture, ESCS, Crop Reporting Board, CrPr 2-1(81), January 1981.
Statistics on Cotton and Related Data 1920-1973, U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin No. 535, October 1974.

perpetuated by variations in the distance baled cotton must be transported for consumption. For example, in the Southeast, 96 percent of the cotton travels relatively short distances from gins through warehouses or directly to local textile mills for final processing. Cotton is usually compressed only to gin flat or modified flat densities. Condensing a modified flat bale to universal densities reduces bale volume by nearly 50 percent. Average warehouse compression charges were $4.50 per bale in 1975. 2/ Doubling the load factor of a semitrailer from 40 to 80 bales would cost $360 in compression charges. In 1975, an estimated 63 percent of all cotton traffic in the Southeast was transported by truck, up from 35 percent in 1970. 3/ Using estimated truck transportation costs of $0.59 per mile, 4/ the economics of further compression would predominate only if warehouse-to-textile mill distances exceeded 610 miles. As 95 percent of domestically used cotton is consumed by mills located in the Southeastern production region, the mileages from warehouse to mill seldom exceed 610 miles.

Warehousing/ Compressing

As most cotton is harvested and ginned over a period of a few months and use is fairly uniform throughout the year, bales are usually shipped to warehouses to be stored and processed further. At the warehouse the bale again is examined, sampled, weighed, and tagged. A negotiable warehouse receipt, showing weight, storage date, and tare, is prepared. The owner of the cotton is given the receipt which may be used to transfer ownership of the bale or used as security for a loan. Because the receipt, along with the bale sample, identifies a particular bale, buyers and sellers usually have no cause to see the bale itself. If the bale is of modified flat density, it usually is compressed further to universal

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2/ Edward H. Glade, Jr., and Joseph L. Ghetti, Marketing U.S. Cotton to Domestic and Foreign Outlets in 1977/78: Practices and Costs, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, ESCS-79, February 1980.

3/ Ghetti, Joseph, L., et. al., Domestic Shipments of U.S. Cotton, 1975-76 Season, U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin No. 855, May 1978 - hereafter cited as "Ghetti, Cotton Shipments, 1975-76".

4/ Truck Costs per mile in 1976 are based on costs developed in Patrick P. Bole's Costs of Operating Refrigerated Trucks for Hauling Fresh Fruits and Vegetables, PB 270 625, National Technical Information Service, July 1977.

density. The additional compression reduces storage and transport space requirements. Both truck and rail carriers offer lower rates for the higher density bales.

The warehouser will receive an order from the owner to assemble a number of bales into a lot for shipment. A lot may vary from 80 to 250 bales, depending on demand and method of transport. As each bale is uniquely identified in the sale, the required breakout of each bale from warehouse stock is highly labor intensive, hence a costly operation. Careful maintenance of warehouse records is important to assure that correct bales are included in the lot to be shipped. The lot is then loaded for shipment by truck or rail according to shipper or receiver instructions.

Merchant-Shippers

Although many types of cotton buyers exist, merchant-shippers perform all or most of the financial and logistical functions involved in moving much of the country's cotton from gin to mill, both foreign and domestic. These firms vary from small operations in confined growing areas to larger organizations operating throughout the Cotton Belt and selling to domestic and foreign customers. The operations often involve large capital outlays because of the volume purchased and the time period a shipper may actually own the cotton (sometimes for more than a year). Cotton is harvested, ginned, and sold over a period of 2 or 3 months but final consumption, both foreign and domestic, is spread evenly throughout the year.

Storage charges, interest rates, transportation rates, and market price fluctuations are closely monitored. In order to accomplish the marketing function with minimum risk and capital outlay, a shipper may hedge his or her operations by buying or selling futures on the cotton contract market. 5/ For example, if a shipper purchases cotton from a grower without a complementary sale to a buyer, the shipper hedges the purchase by selling the same quantity and quality of bales on the exchange. Conversely, if a mill sells yarn or cloth for a one-time or periodic future delivery, purchases of raw cotton, from which to produce the cloth, may be made with delivery deferred until needed. In this case, the mill will either buy cotton yet to be harvested (forward contracting with producers) or buy cotton futures on the exchange as a hedge against the future sale.

5/ Cotton futures are presently traded on the New York Cotton Exchange and the New Orleans Cotton Exchange. The Chicago Board of Trade is awaiting approval by the Commodity Futures Trading Commission to trade cotton futures.

Textile firms, depending on their size and storage capacity, may purchase cotton several months ahead of mill use. The amount will depend heavily on anticipated future demand for textiles, existing cotton stocks, and projected production estimates. A textile mill has the option of purchasing cotton in the field, at the gin or warehouse, or "landed" at the mill. In all but the latter case the mill would be responsible for assuring takeup and transportation of the lot. Mill purchases made on a landed basis require the shippers to arrange transportation and pay these costs. All marketing functions are itemized in table 2. Estimated costs of each function are shown for each region for the 1977/78 cotton season.

Consumption

Demand for lint cotton in the last decade has shifted dramatically from domestic textile mills to foreign mills. In the period 1970-74, annual average sales of cotton to foreign customers were 4.5 million bales, comprising a substantial 38-percent share of cotton disappearance. By the period 1975-79, exports had increased to 46 percent of the U.S. market with 5.8 million bales transported annually to overseas mills. Domestic mills consumed the remaining 54 percent during that period and 62 percent in the former period.

The shift of production to the Western region and the shift of consumption through the Pacific and Gulf ports helped domestic carriers transport an additional 1.3 million bales each year, on the average, during the latter period, with less stress on the system and cost to shippers than would have been experienced if one of the shifts had not occurred. One exception to the orderly flow of cotton to destinations occurred in 1979 when exports increased 49 percent over the previous year. While domestic consumption increased only slightly over the previous year, unprecedented imports of U.S. cotton by China, coupled with strong demand from regular Asian customers, created unusual demand for transportation that caused equipment supply to become critical at times.

Tables 3 and 4 detail mill consumption by State and exports by customs district, respectively, for these periods. Year-to-year absolute variances in both tables may be correlated with production estimates in table 1.

Table 2 - Estimated average cost of marketing U.S. cotton to domestic consumption points by cost item and region, 1977/78 season

Cost item	Southeast	South Central	Southwest	West	United States
	Dollars per bale				
Buying and local delivery	0.99	1.30	1.53	1.23	1.33
Warehouse services:					
Storage	2.79	3.60	2.88	3.20	3.24
Compression	----	4.48	4.65	4.15	4.39
Other	3.84	4.05	4.28	3.06	3.94
Transportation	4.12	7.57	9.22	14.99	8.99
Cotton insurance	.18	.26	.32	.36	.29
Financing	5.04	5.48	5.26	5.83	5.42
Selling	.69	1.01	1.31	1.25	1.11
Miscellaneous	.17	.61	.37	.21	.45
Overhead	1.95	2.26	3.45	2.66	2.68
Total	19.77	30.62	33.27	36.94	31.74

Source: Edward H. Glade, Jr., and Joseph L. Ghetti, Marketing U.S. Cotton to Domestic and Foreign Outlets in 1977/78: Practices and Costs, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, ESCS-79, February 1980.

Table 3 - Mill consumption of all growths of cotton by State, United States, 1960-79

Year beginning August 1	Alabama	Georgia	North Carolina	South Carolina	Tennessee	Texas	Virginia	Other	Total[1]	New England States	All Other	Total[1]
					1,000 bales[2]							
1960	842	1,539	2,445	2,520	169	138	200	93	7,946	273	33	8,252
1961	942	1,732	2,716	2,729	196	148	220	103	8,786	264	21	9,071
1962	875	1,587	2,525	2,576	184	132	203	80	8,162	209	20	8,391
1963	934	1,590	2,598	2,583	190	146	208	84	8,333	201	20	8,554
1964	1,038	1,722	2,810	2,732	207	153	215	91	8,968	183	20	9,171
1965	1,117	1,782	2,929	2,794	211	163	209	83	9,288	190	19	9,497
1966	1,135	1,776	2,907	2,786	199	174	182	88	9,247	182	19	9,449
1967	1,078	1,725	2,858	2,615	188	160	179	89	8,892	162	17	9,071
1968	1,026	1,577	2,599	2,328	180	111	156	83	8,060	139	16	8,215
1969	997	1,567	2,497	2,244	174	105	161	95	7,840	115	10	7,965
1970	1,005	1,550	2,630	2,236	181	97	183	98	7,980	80	8	8,068
1971	997	1,501	2,634	2,252	175	94	178	98	7,929	72	9	8,010
1972	984	1,452	2,600	2,179	178	97	196	95	7,781	78	12	7,871
1973	1,015	1,397	2,443	1,989	173	84	177	93	7,371	69	6	7,448
1974	772	1,075	1,950	1,541	125	55	164	90	5,772	52	10	5,834
1975	926	1,334	2,446	1,932	150	61	224	103	7,176	43	9	7,228
1976	873	1,201	2,316	1,742	124	63	216	98	6,633	37	4	6,674
1977	868	1,161	2,254	1,671	122	63	189	104	6,432	26	5	6,463
1978	894	1,166	2,235	1,627	123	65	203	132	6,400	30	5	6,435
1979	822	1,171	2,291	1,624	128	58	222	120	6,436	23	4	6,436

[1]Totals were made before data were rounded.
[2]480-pound net weight bales.
Sources: Statistics on Cotton and Related Data 1960-80, U.S. Department of Agriculture, Economics, Statistics and Cooperatives Service, Statistical Bulletin No. 617, March 1979.
Crop Production - 1980 Annual Summary, U.S. Department of Agriculture, Crop Reporting Board, ESCS, Crpr 2-1(81), January 1981.
Statistics on Cotton and Related Data 1920-1973, U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin No. 535, October 1974.

Table 4 - Exports of U.S. cotton by customs district, annual 1970-79[1]

Customs district	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
					1,000 bales					
Pacific ports										
Los Angeles	708	541	992	1,322	1,355	1,261	1,899	2,188	2,308	3,423
San Francisco	238	181	414	588	564	529	1,042	1,415	1,116	1,732
Gulf ports										
Galveston	1,703	1,151	2,073	2,219	1,040	1,053	1,054	954	1,339	1,983
Houston	369	308	410	509	216	152	269	362	685	936
New Orleans	466	648	948	759	336	82	141	156	345	404
Mobile	2	3	126	77	53	21	18	30	17	202
Great Lakes ports										
Detroit	308	331	259	265	191	133	187	213	200	254
All others[2]	103	222	89	384	171	80	174	165	170	295
Total	3,897	3,385	5,311	6,132	3,926	3,221	4,784	5,483	6,180	9,229

[1] Season beginning August 1.
[2] Includes districts of Portland, St. Albans, Ogdensburg, Buffalo, New York City, Baltimore, Norfolk, Charleston, Savannah, Port Arthur, Laredo, San Diego, Portland, and Seattle.

Source: "Foreign Agriculture Circular - U.S. 1979-80 Cotton Exports by Customs Districts," U.S. Department of Agriculture, Foreign Agricultural Service, September 1980.

Two studies of cotton flows by the U.S. Department of Agriculture for 1970 and 1975 6/ supply information on destinations of regional cotton production. This information is summarized in table 5. With domestic consumption decreasing 10.4 percent (8.1 to 7.2 million bales) and exports decreasing 17.0 percent (3.9 to 3.2 million bales), flow data indicate the strongest influence was felt in the West. With only slight changes in each of the other regional patterns, Western cotton reacted strongly, decreasing exports by 4.5 percent of its production, and sending 3.2 percent more cotton than in the previous year to domestic mills.

Western cotton is a medium-staple, high-strength variety, which up until the last decade was preferred by domestic mills for polyester/cotton blends. As textile firms became more experienced in blending, Delta and Southeastern cottons replaced Western cotton to a great extent. Today, Western cotton, even with its high transportation costs, still competes with Eastern cotton as a domestic blend fiber. Texas and Oklahoma cotton, on the other hand, is a shorter staple variety which, if not used domestically for coarse yarns, is generally exported. 7/ The difference in qualities of cotton by region helps explain proportional increases in Western cotton being shipped East, while exports of Texas and Oklahoma cotton increased. The strong Asian market for this cotton generated increased exports through Pacific ports.

6/ Ghetti, Cotton Shipments, 1975-76 and Joseph L. Ghetti, et. al, Domestic Shipments of U.S. Cotton, 1970-71 Season, U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin No. 483, March 1972.

7/ M. C. McArthur, et. al., The Cotton Industry in the United States, Farm to Consumer, Department of Agricultural Economics, Texas Tech University, College of Agricultural Sciences, Publication No. T-1-86, Lubbock, Texas, April 1980 - hereafter cited as "McArthur, The Cotton Industry."

Table 5 - Shipments of cotton from warehouses by major cotton-producing regions, 1970 and 1975[1]

Origin/destination	1970	1975
	Percent	
From Southeastern region		
To Southeastern mills	96.1	95.3
Other destinations	3.9	4.7
From Delta region		
To Southern mills	74.8	77.2
Interior concentration points[1]	12.7	10.8
Other destinations	12.5	12.0
From Southwestern region		
To Southeastern mills	37.0	37.9
Western Gulf	49.0	47.0
Interior concentration	12.4	6.7
Pacific Coast	-	6.4
Other destinations	6.6	7.0
From Western region		
To Southeastern mills	38.4	41.6
Pacific Coast	50.6	45.1
Interior concentration points	4.5	8.4
Other destinations	6.5	4.9

[1]Interior concentration points are nonconsuming destinations from which cotton is reshipped to final destinations.

Sources: Joseph L. Ghetti, et. al., Domestic Shipments of U.S. Cotton, 1975-76 Season, U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin No. 855, May 1978.

Joseph L. Ghetti, et. al., Domestic Shipments of U.S. Cotton, 1970-71 Season, U.S. Department of Agriculture, Economic Research Service, Statistical Bulletin No. 483, March 1972.

THE COTTON CARRIERS

Railroads and motor carriers are the principal modes moving cotton from warehouses and gins to domestic consumption points. The westward progression of cotton production, a significant rise in energy costs, and the recent escalation of interest rates have all contributed to a significant increase in transport costs. Data in table 2 reveal that 28 percent of marketing costs may be attributed to transportation alone. The following material reviews each mode's industry structure, pricing strategy, and costs of operations.

The Rail Carriers

Rail Equipment

Cotton moves by railroad in boxcars, containers, trailers, and, in the past, even was carried on flatcars. Today, the principal piece of rail equipment for moving cotton is the 50-foot boxcar. Although the car is built in various dimensions, a representative car would measure 50'6" by 9'2" by 10'6" (all dimensions are given in length, width, and height). The dimensions permit a car to carry 180 bales at universal or standard densities. A few more bales may be added to meet weight minimums for lower rail rates.

Other boxcars used include the 40-foot box with common internal dimensions of 40'6" by 9'2" by 10'6". This car may accommodate up to 150 bales depending upon the size of the bales. Because of efficiencies of larger railcars, increasingly important in the rail industry, railroads have virtually ceased purchasing or refurbishing the 40-foot boxcar.

Shippers, carriers, and receivers are currently experimenting with the 50-foot "Hi-Cube" boxcar. With interior dimensions of 50'6" by 9'6" by 12'11", the car will carry at least 250 bales.

Piggyback or trailer-on-flatcar (TOFC) is not a commonly used method of transport for cotton but is being used to some extent. The TOFC package consists of a 40-foot trailer van specifically reinforced for rail shipment. Trailers are placed in tandem on an 89-foot flatcar. Each van has the capacity to hold 85 bales.

Containers are used at few interior points but are regularly "stuffed" at Gulf ports and transported by rail overland to Pacific ports, i.e. "mini-bridged." Container sizes commonly measure 40' by 8' by 8' and hold an average of 80 bales. Containers measuring 20' by 8' by 8' are used occasionally for cotton shipments.

Flatcars were used in the past to transport cotton but are not in use today. The safety hazard, especially of fire, is often mentioned as the reason for discontinuing open carriage of cotton. 8/ Other considerations are protection of cotton against the elements and problems of securing the load so as to prevent shifting in transit.

Rail Economics

U.S. rail service emerged as the sole means of transporting production on routes not parallel to navigable waters. In order to collect and distribute traffic, railroads built thousands of miles of "feeder" lines into the hinterlands. The national effort to construct a rural, secondary, arterial, and interstate highway network made many rail lines redundant byways that lost traffic to motor carriers. Some suggest that government regulations, modal competition, rail industry structure, and the lack of a comprehensive national transportation policy have placed many railroads in a weak financial position. Today, railroads and shippers are faced with rail costs that must reflect increasing labor, fuel, and maintenance costs, coupled with deferred reinvestment costs.

Rail Costing

Price determination for rail services is predicated primarily on two factors: cost of service and competition. The competition, how it can and will react, is a challenge to any firm. Railroads closely monitor truck and barge rates and costs to measure the interrelationships with rail service pricing. Determination of rail costs has received increasing attention by railroad management. Prices must, on the average, cover all costs of operation, including reinvestment, because railroads generally lack excess capital to operate at a loss. The Interstate Commerce Commission (ICC) has established costing methods to be used by railroads and sets regulatory guidelines for rate setting based on those costs.

Two approaches common to empirical rail cost determination are statistical inference and conventional cost accounting techniques. Traditional cost accounting methods may be used where direct observation of cost-output relationships is practicable. In most cost determinations, however, the simplicity and accuracy of the conventional approach cannot be used exclusively due to important interactions hidden within

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8/ An undocumented account prevails of the last shipment of cotton by rail flatcar. Some 12 years ago, an uncovered load of cotton is reported to have caught fire, causing the train to derail, subsequently destroying a number of homes and a church. The railroad received enough bad publicity to discontinue this method of conveyance. Other railroads followed suit.

the cost-output relationship. The determination of each cost element, as fixed or variable, and the division of joint or common costs rely heavily on the statistical approach.

Few industries face the extensive joint operations between firms which typify transport, and especially rail, operations. For this reason, statistical measures are commonly used and controlled experimentation is rarely feasible.

Rail Form A costing methodology is presently used by the ICC and many railroads to determine equity and profitability of rail service pricing. The statistical data supplied by the ICC reflect regional averages of variables such as number of cars in a train, number of switches for various linehaul distances, and fuel consumption, to name a few. With these averages, given information relating to type of commodity, its weight, rail equipment used, and the number of linehaul miles, the costs may be computed for hauling a particular commodity between specific points. The cost analyst may increase the accuracy of the computation by introducing known elements about the particular linehaul in question. In many cases, information about switching, way versus through train mileage, and circuitry can be determined from rail operational data. 9/ Although such information generally is not publicly available, the railroads may be able to provide it.

Rail Form A variable costs reflect costs which over a relatively longrun period, and at the average density of traffic, have been found to be variable with traffic changes. They include freight operating expenses, rents and taxes (excluding Federal income taxes), plus an allowance for the cost of capital. Constant or fixed costs, those costs which do not vary with traffic changes, are distributed proportionally over all revenue traffic on a ton basis for terminal costs and ton-mile basis for linehaul costs. 10/

9/ A through train is one operated primarily to move cars in road service between two or more terminals. A way freight train is one operated primarily to pick up and distribute cars in road service and move them to way stations and terminals. A more precise definition of each function may be found in the Interstate Commerce Commission Reports, Vol. 243, pp. 646-7, Interstate Commerce Commission, 1941.

10/ Rail Carload Cost Scales, 1977, Interstate Commerce Commission, Bureau of Accounts, Statement No. 1C1-77, February 1978.

The Determination of Rail Freight Rates

The rate bureau is the primary means by which rates are set and tariffs published. These organizations are composed of carrier representatives in particular territories. The Interstate Commerce Commission must approve the rules and procedures by which a bureau operates. Bureau members pay dues to a central organization to cover tariff publications, administrative salaries, and legal fees. A carrier operating in more than one area is usually a member of other rate bureaus. Bureau ratemaking was legalized and placed under ICC jurisdiction in 1948 with the passage of the Reed-Bullwinkle Act. The Act also gave individual carriers the right to take independent action.

For years, however, the railroads have applied to the ICC for general rate increases on all traffic on their systems. The method is convenient to raise the level of revenues to cover increased costs due to inflation and competitive resource demand. The ICC and Congress have encouraged railroads to abandon the across-the-board increases in charges in favor of rate increases on specific traffic.

Rail Costs and Revenues for Cotton

In support of a petition by the U.S. railroads to increase freight rates on December 31, 1980, the Association of American Railroads (AAR) commissioned costing analysis to be done for 100 specific commodity groups on a nationwide basis. 11/ The prepared schedule consists of data on estimated rail revenues and Rail Form A variable costs. Table 6 presents a sample of those revenue/variable cost ratios for selected commodities of the total 100 commodities presented.

The data supplied allow comparison of costs for cotton hauls with those for other commodities. Because the estimated costs in this instance include only those costs that vary with traffic and do not include the fixed costs, a commodity rate must return at least 100 percent of those costs if cross subsidy is to be avoided. In the examples presented, rates for wheat on a nationwide basis return 158.2 percent of variable costs while phosphate rock returns only 77.2 percent. The return of cost for all 100 commodities costed is 116.6 percent. Cotton returns 103.4 percent on a national basis.

11/ M. L. Hall Associates, "Petition of United States Railroads for Authority to Increase Freight Rates and Charges, Nationwide-1981", Ex Parte 386, Verified Statement No. 5, September 1980 - hereafter cited as "M. L. Hall, 'Freight Rate Petition'".

Table 6 - Rail revenue/variable cost ratios (with current cost of capital) for selected commodities, 1980

Commodity	Revenue/variable cost[1]		
	Intradistrict	Interdistrict	All Freight
		Percent	
Wheat	160.5	130.8	158.2
Agricultural chemicals	144.8	142.8	143.9
Farm machinery	138.0	125.4	131.2
Lumber	123.0	108.2	115.7
Corn and sorghum	110.6	101.7	110.2
Cotton	91.4	110.7	103.4
Shipper containers (empty)	94.0	98.8	96.2
Bituminous coal	90.3	100.9	92.3
Iron ore	87.6	108.1	88.3
Phosphate rock	71.9	92.6	77.2
All commodities	113.8	121.5	116.6

Source: M. L. Hall Associates, "Petition of United States Railroads for Authority to Increase Freight Rates and Charges, Nationwide-1981", Ex Parte 386, Verified Statement No. 5, September 1980.

[1]Appendix 1 lists Class I railroads by ICC district.

In the various schedules presented by the AAR, costs and revenues for each commodity are further broken down by intradistrict and interdistrict movements, and by direction between districts. Cost and revenue differences appear because of topography, labor costs, and rail rates, to name a few. Table 7 presents a limited breakdown of cotton revenues, variable costs, and revenue/variable cost ratios by district and rail cotton movements between districts.

Estimated cotton rail revenues for intradistrict and interdistrict cotton traffic totaled $70.6 million in 1980. Of that total, 66.3 percent was interdistrict traffic, 91.0 percent of which moved from the Western to the Southern district. Western railroads captured 64.8 percent of these interline, interdistrict revenues while Southern railroads earned 35.2 percent. The railroads in those two districts earned 60.4 percent of total cotton rail revenues transporting cotton West to South. The ratios of revenues to variable costs were 112.0 percent and 110.8 percent for the South and West, respectively.

The proposed 5-percent general increase (yet to go into effect for these movements) would increase revenue/variable costs to ratios of 117.6 and 116.3 for the South and West, respectively. This proposed increase may be of questionable benefit to the carriers in light of the successful motor carrier competition for this same traffic. In 1970, the railroads carried 95.4 percent of this traffic; by 1975 the percentage had decreased to 77.8 percent. There are indications that the railroads' modal share decreased even more by 1980 (see table 9).

It is important for the railroads to consider the "elasticity" of demand for their services in deciding to seek rate increases. That is, given a percentage rate increase, by what percentage is the traffic likely to decrease, if at all? The railroads should estimate whether the proposed increases in rates will increase or decrease net revenues for these movements. The railroads' reliance on general increases to generate compensatory revenues may have just the opposite effect on some movements.

Data Aggregation

Although the data in table 7 were collected and aggregated by railroad, the data were presented by district to ensure confidentiality. A further breakdown of costs may prove helpful to both railroads and shippers. Because of data aggregation across all rail firms, cost aspects of particular traffic of a railroad are difficult to discern. Collecting cotton from a warehouse on a light-density feeder line may be much more costly than is collecting cotton from a warehouse very close

Table 7 - Current (1980) revenue, variable costs, and revenue/variable cost ratios and proposed revenue and revenue/variable cost ratios for intradistrict and interdistrict rail cotton movements, United States[1]

Accounting item by district	Intradistrict			Interline/Interdistrict						
	Total	Single Line	Inter Line	Total	East-South	East-West	South-East	South-West	West-East	West-South
					Dollars					
VARIABLE COSTS[2]										
East	8543	2384	6159	1110857	4186	1117	239781	0	864888	885
South	8791954	3614056	5177898	13941317	5370	0	414054	21124	109057	13391712
West	17155563	15050206	2105360	27249674	0	2873	58	96456	2208827	24941460
Total	25956063	18666646	7289417	42301848	9556	3990	653893	117580	3182772	38334057
East	9141	3169	3972	857303	3969	1229	154660	0	697013	437
South	6592497	2105100	448797	15518808	5432	0	391448	28121	95516	14998291
West	17145722	14763581	2382141	30482940	0	4058	259	92716	2758141	27627766
Total	23747360	16871850	6875510	46859056	9401	5287	546367	120837	3550670	42626494
PROPOSED REVENUES										
East	9596	3327	6269	900175	4167	1291	162395	0	731863	459
South	6922118	2210354	4711764	16294754	5703	0	411021	29528	100292	15748210
West	18008001	15501760	2501241	32007090	0	4261	272	97351	2896048	29009158
Total	24934715	17715411	7219274	49202019	9870	5552	573688	126879	3728203	44757827
PRESENT REVENUE/ VARIABLE COST[2]										
					Percent					
East	107.0	132.9	97.0	77.2	94.8	110.0	64.5	.0	80.6	49.4
South	75.0	58.2	86.7	111.3	101.2	.0	94.5	133.1	87.6	112.0
West	99.9	98.1	113.1	111.9	.0	141.2	446.6	96.1	124.9	110.8
Total	91.4	90.3	94.3	110.7	98.3	132.5	83.5	102.7	111.5	111.1
PROPOSED REVENUE/ VARIABLE COST										
East	112.3	139.6	101.8	81.0	99.5	115.6	67.7	.0	84.6	51.9
South	78.7	61.2	91.0	116.9	106.2	.0	99.3	139.8	92.0	117.6
West	104.9	103.0	118.8	117.5	.0	148.3	469.0	100.9	131.1	116.3
Total	96.0	94.9	99.0	116.3	103.2	139.1	87.7	107.9	117.1	116.7

Source: M. L. Hall Associates, "Petition of United States Railroads for Authority to Increase Freight Rates and Charges, Nationwide-1981", Ex Parte 386, Verified Statement No. 5, September 1980.

[1]Appendix 1 lists railroads by ICC district.
[2]Variable costs are computed using current costs of capital.

to or on a mainline. Delivery costs of the cotton may similarly vary depending upon the location of the final destination point. Other determinants of costs of operation would be the amount of both interrailroad and intrarailroad switching involved, weight of the lading per car, and other factors.

Corridor Specific Costing

Table 8 presents rate and cost data for high-volume, domestic, cotton corridors. Rates, solicited from rail freight agents, are for 93,000-pound minimum loads in 50-foot boxcars with no storage-in-transit provisions. Variable costs were computed using ICC Rail Form A costing procedures, based on 93,000-pound loads in 50-foot boxcars. The costing of each corridor haul is based on average operating statistics for each district. Average cost components include:

(a) railcar ownership costs
(b) number of days from origin to destination
(c) way train mileage, train size, number of locomotives and wage rate
(d) through train mileage, train size, number of locomotives, and wage rate
(e) number of intertrain and intratrain switches
(f) loaded versus empty car miles, and
(g) transit billing, terminal costs, and special services.

The revenue to variable cost ratios presented in table 8 differ considerably from one another and from the highly aggregated national ratio of 103.4 percent of variable costs. The ratios presented range from 123 percent to 291 percent. 12/ Extremely high revenue-to-cost ratios on the shorter distance hauls may be attributed to the use of regional terminal and linehaul cost averages presented in Rail Form A. By substituting known operation data the costing accuracy may be increased. Rail Form A costing methodology is presented in appendix 2.

The exercise, however, does add credence to the thesis that while all cotton traffic, when averaged, does not appear to be highly compensatory, some traffic is very compensatory. It should be noted that railroads probably would not price all traffic a certain percent over variable costs even if those costs were known. Modal competition in specific

12/ A cost study based on 1966 data found the ratio of revenue to full costs to be 216 percent for cotton. Source: Rail Transportation Cost Survey, James R. Snitzler Associates, Inc., Camp Springs, Maryland, November 1972.

Table 8 - Rail revenue/variable cost comparisons for primary corridor cotton traffic, February 1981

Origin/destination	Distance	Rate/ cwt[2]	Rate/ cwt/ mile	Variable cost/ cwt[3]	Variable cost/ cwt/ mile	Revenue to variable cost
	Miles[1]	Dollars	Cents	Dollars	Cents	Percent
Movements to Greenville, S.C.						
From						
Tulare, Calif.	3,024	3.19	0.105	2.59	0.085	123
Phoenix, Ariz.	2,373	3.08	.129	2.08	.105	148
Deming, N. Mex.	1,977	3.01	.152	1.78	.090	169
Fabens, Tex.	1,839	2.57	.139	1.68	.091	152
Lubbock, Tex.	1,536	2.23	.145	1.42	.092	157
Big Springs, Tex.	1,475	2.29	.155	1.37	.093	167
Galveston, Tex.	1,230	1.88	.152	1.20	.097	156
Monroe, La.	793	1.64	.206	.80	.101	205
Blythsville, Ark.	770	1.52	.197	.82	.106	185
Memphis, Tenn.	692	1.25	.180	.72	.104	174
Indianola, Miss.	671	1.36	.203	.70	.104	194
Greenwood, Miss.	636	1.33	.209	.68	.106	195
Movements to New Orleans, La.						
From						
Blythsville, Ark.	536	1.32	.246	.64	.119	200
Memphis, Tenn.	458	1.33	.290	.54	.118	251
Greenwood, Miss.	325	1.26	.387	.44	.135	291
Movements to Long Beach, Calif.						
From						
Lubbock, Tex.	1,440	2.10	.146	1.39	.096	151
Fabens, Tex.	994	1.16	.116	1.05	.105	180
Deming, N. Mex.	857	1.16	.135	.94	.109	135

[1]Shortline miles from ICC published tariffs; 16 percent circuitry factor added.
[2]Rates were solicited from railroad freight agents in each region. Rate/cwt are for 50-foot boxcar, 93,000-pound/loads, with fuel surcharges added where applicable.
[3]Costs are based on 50-foot cars with 93,000-pound loads and were computed using ICC Rail Form A. Methodology and cost components are explained in appendix 1.

corridors and area car supply must be considered when pricing traffic. Also, railroads must publish rates for corridors in which they do not haul cotton and, therefore, never apply holddown or reductions to rates for such corridors. Such rates are often referred to as "paper rates," i.e, they are published but are not used in pricing traffic.

The data presented are not meant to confirm or deny the railroads' cost evidence. The selection of routes is not based on any sampling design and cannot be used to generalize about the population of cotton linehaul routes.

Shippers, however, should be aware of differences in compensation that cotton returns on various routes. Shippers might explore the possibility of computing or having costs computed for some of the more common hauls in their traffic base. The usefulness of such information, given the new regulatory environment, is treated in Carrier Deregulation, 1980.

One other point should be made concerning the rates and costs per hundredweight per mile (r/cwt/mi and c/cwt/mi, respectively) in table 8. As previously noted, the railroads' competitive advantage increases as distance between origin and destination increases. Costs of collection and distribution of traffic per mile are much greater than linehaul costs per mile. The former functions are very labor and capital intensive. It follows that if c/cwt/mi increase as linehaul distances decrease, r/cwt/mi will likely follow suit. In table 8, rates increase from the 3,024-mile haul (Tulare, Calif., to Greenville, S.C.) with $0.00105 r/cwt/mi to $0.00209 r/cwt/mi for the 636-mile haul (Greenwood, Miss., to Greenville, S.C.). A cost increase from $0.00085 c/cwt/mi to $0.00106 c/cwt/mi is computed for those same routes, respectively. Rates tend to increase more rapidly than costs as the distance decreases.

Total Rail Cotton Tonnages and Revenue

Another method by which one may approach the question of revenue return to railroads hauling cotton is to look at total tonnages and total revenues of all commodities for each railroad hauling cotton and compare those data for railroads reporting cotton tonnages hauled (table 9). Tonnage figures represent total tonnages hauled on a particular railroad by year.

Much of the traffic (66.3 percent in 1980) was interline traffic between two or more railroads, and therefore, double or even greater overcounting occurred for some traffic. For this reason, total tonnages of all railroads exceeded total cotton disappearance (in this case mill use and exports) in each year. Cotton disappearance each year is also presented in order to correlate increases and decreases in traffic with

Table 9 - Rail revenue and freight tonnage statistics for railroads hauling cotton, annual 1975-79

Railroad	1975[1]				1976				1977				1978				1979				Year Average			
	TON	%T	REV	%R	TON	%T	REV	%R	TON	%T	REV	%R	TON	%T	REV	%R	TON	%T	REV	%R	TON	%T	REV	%R
Illinois Central Gulf	219	0.2	2,488	0.3	180	0.2	2,118	0.3	189	0.2	2,237	0.3	149	0.2	1,896	0.3	163	0.2	2,420	0.3	180	0.2	2,232	0.3
Missouri Kansas Texas	32	0.2	341	0.4	34	0.2	314	0.3	22	0.1	232	0.2	19	0.1	86	0.1	6	0.1	86	0.1	23	0.1	239	0.2
Missouri Pacific	343	0.9	3,509	0.5	359	0.4	4,229	0.5	421	0.4	5,976	0.6	366	0.3	5,194	0.4	109	0.3	1,791	0.4	319	0.4	4,139	0.5
St. Louis-San Francisco	310	0.9	3,155	1.1	243	0.6	2,526	0.8	197	0.5	2,290	0.7	267	0.6	3,307	0.9	217	0.5	3,303	0.7	247	0.6	2,856	0.8
Atchison, Topeka and Santa Fe	412	0.5	7,523	0.7	426	0.5	7,956	0.7	406	0.5	8,028	0.6	441	0.5	9,131	0.6	323	0.3	7,777	0.4	401	0.5	8,083	0.6
Seaboard Coastline	340	0.2	2,306	0.4	367	0.3	2,487	0.4	313	0.2	2,398	0.3	277	0.2	2,223	0.3	222	0.1	1,903	0.2	304	0.2	2,263	0.3
Southern Pacific	568	0.5	10,102	0.8	662	0.6	12,457	0.9	639	0.5	11,741	0.8	416	0.4	8,230	0.5	258	0.2	6,068	0.3	509	0.4	9,720	0.7
Southern Alabama Great Southern	211	1.4	1,155	1.9	234	1.4	1,379	2.0	248	1.4	1,535	2.0	252	1.4	1,521	1.8	187	1.0	1,216	1.2	226	1.3	1,361	1.8
Central of Georgia	136	0.5	668	0.8	173	0.4	632	0.6	130	0.4	700	0.6	139	0.4	755	0.6	125	0.3	727	0.5	130	0.4	696	0.6

All Railroads	1975	1976		1977		1978		1979	
	Total	Total	Percent[3] Change	Total	Percent Change	Total	Percent Change	Total	Percent Change
Total Rail Movements (in thousands of tons)	2,571	2,678	(+4.2)	2,565	(-4.2)	2,326	(-9.3)	1,610	(-30.8)
Total Rail Cotton Revenues (in thousands of dollars)	31,247	34,098	(+9.1)	35,137	(+3.0)	32,343	(-8.0)	25,291	(-21.8)
Total U.S. Disappearance[2] (in thousands of bales)	8,302	11,458	(+38.0)	11,946	(+4.2)	12,615	(+5.6)	15,692	(+24.4)

[1]TON equals cotton tonnages in thousand ton units, carried for by a railroad for a given year. T% is the percentage of cotton tonnage to all traffic. REV equals gross revenue from cotton movements in thousands of dollars, R% is the percentage of gross revenues a railroad receives from cotton as compared to all revenue traffic.
[2]Summation of total mill consumption (table 3) and total exports (table 4) for each year.
[3]Numbers in parenthesis indicate percentage change from the preceding year.
Source: Moody's Investor's Service Inc., Moody's Transportation Manual (New York, NY: 1977-80). Based on ICC Freight Commodity Statistics established in 19[illegible].

changes in disappearance for that year. The data for cotton disappearance are for crop years which begin on August 1, while rail traffic data are for the calendar years beginning January 1.

Because a good portion of the harvest for a given calendar year will be transported after January 1, most of the production is not reflected in disappearance or traffic until the calendar year that begins 5 months after the crop year began. For instance, disappearance levels in 1978 of 12.6 million bales represent a 5.6-percent increase over the prior year. Rail cotton tonnages decreased in both 1978 and 1979. Overall, cotton tonnages carried over the 5-year period decreased an average 10.2 percent per year while disappearance increased an average 18.0 percent per year.

Ton-miles of traffic are not available, but both tonnages and revenues give an indication of a decrease in ton-miles hauled. Percentage increases or decreases of all cotton rail revenues follow the trend of cotton tonnages moved. Cotton revenues to all railroads declined from $31.2 million in 1975 to $24.9 million in 1979, an average decrease of 4.4 percent per year. Moreover, the revenues are not adjusted to compensate for increases in the rates charged to cotton shippers during that 5-year period.

Another item of interest in table 9 is the comparison of cotton tonnages to total rail tonnages and cotton revenues to total rail revenues. Five-year averages of these two totals reveal cotton revenues exceeded cotton tonnages as a proportion of total revenues and tonnage for all commodities carried.

Rail Service Problems

Certainly many problems exist in the interactions between shippers and railroads that tend to frustrate the orderly flow of cotton. Shippers cite examples of poor responses by railroads to pickup and delivery requests, foreign residue in boxcars, and periodic equipement shortages. While some cases of rail company mismanagement are documented, shippers may assist rail carriers' attempts to correct these shortfalls by:

1. promptly loading and unloading cars,
2. issuing shipping instructions or bills of lading as soon as practicable as cars are loaded,
3. releasing cars when empty,
4. ordering cars only as needed,
5. allowing carriers advance notice of needs, with accompanying origin and destination points, and

6. documenting cases of excessively dirty cars even if cars are cleaned by the consignee.

Because of the past tariff structure, few economic incentives could be implemented by agreements between individual railroads and shippers to correct specific problems. However, good communication between shippers, warehousers, and railroads has proven a very effective means of alleviating many of the problems cited.

Rail Routing

Often there are a number of routes that a railcar may take from origin to destination, especially over long distances. Theoretically, however, there is only one route that maximizes the longrun profitability and minimizes longrun costs to the railroad. It is assumed that a railroad, when planning operations, considers the effect those operations will have on other railroads on which it is dependent in varying degrees. The railroad must also consider the level of service, time in transit, traffic flows, intrarailroad and interrailroad interchanges, and other variables that affect costs. The shipper may be provided with a choice of routes at a given rate although the railroad will normally state a route preference.

Unfortunately, economic incentives to individual railroads, the rail industry, and shippers may be in conflict. A railroad may suggest a route that provides a greater share of the joint rail rate but is more costly and time consuming to the rail industry (and occasionally to the originating railroad). On the other hand, if the anticipated delivery date is further away than the normal transit time of the preferred route, the shipper may choose a more circuitous route to gain additional time in transit. The additional time may minimize warehouse charges but could increase costs to the railroads. Both practices lower the profitability of cotton traffic to the railroads, to the longrun detriment of carriers and shippers.

The Motorcarriers

Motorcarrier Equipment

Motorcarriers generally use dry trailer vans, 40 feet or more in length, to transport cotton. A standard 40-foot van has inside dimensions of 39'7" by 7'9" by 7'10" and will accommodate from 80 to 85 bales. Longer vans, more common in the West, hold 90 to 95 bales.

Flatbed trailers are also used in areas with low rainfall and short linehaul distances. The cotton is often protected by a tarp over the entire load in case of inclement weather or over the front part of the load to protect against exhaust from the tractor engine. The flatbed trailer normally carries loads up to 95 bales.

The Motor Carrier Industry

Classes of motor carriers include regular and irregular route common carriers, contract carriers, private carriers (including cooperatives), and noncertified, or so-called "exempt," carriers. Common carriers generally haul regulated commodities (e.g., steel textiles and canned goods) at administered prices over certain routes at predetermined service levels. If regulated commodities are unavailable for reverse-direction hauls, common carriers may haul exempt agricultural products. 13/ Private carriers, firms that own and operate motor carrier fleets, are restricted to carrying their own products, the products of companies wholly owned by them, and exempt agricultural commodities. Cooperatives primarily haul agricultural products and other member business but may carry up to 25 percent regulated traffic per year. Noncertified carriers are generally limited to hauling exempt agricultural products but may haul regulated commodities through trip-lease agreements with regulated carriers following an exempt commodity haul.

The market for the carriage of agricultural products is highly competitive due to the lack of economic regulation and the freedom of entry by all carriers. Of the 920,000 trucks in highway use in 1979, 66 percent were classed as regulated carriers, 6 percent as contract, 17 percent as private, 9 percent as exempt, and 1 percent as agricultural cooperative carriers. 14/ Many of these carriers were engaged, at least part of the year, in hauling exempt agricultural commodities.

Truck Brokerage Firms

While many shippers 15/ and carriers maintain direct contact with one another, both parties may use the services provided by the truck broker. The primary function of the broker is to bring shipper and carrier together into a complementary arrangement. Brokers may formally advertise their services

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13/ Unmanufactured agricultural commodities, some agricultural inputs, and livestock are exempted from economic regulation in Section 10526 (a)(6) of the Interstate Commerce Act and other ICC Administrative Rulings.

14/ Association of American Railroads, "Background on the Trucking Industry and the NMTDB", Staff Paper, 1979.

15/ In this section, the term "shipper" is used to describe both shippers and receivers who contract carrier services for product delivery.

but often depend on word-of-mouth advertising to gain new business. The broker will sometimes mediate pricing of the haul and may provide the following services:

1. Check a new trucker's business reputation, type and condition of equipment, regulatory status, licenses, and authorities to haul specific commodities.

2. Provide information to the trucker about Federal and State requirements for maximum driving time, safety regulations, gross axle weight information, vehicle length restrictions, and operating authority requirements.

3. Assist truckers in filling out forms to comply with Federal and State regulation or assist with trip-lease arrangements.

4. Provide bookkeeping services.

5. Check or help obtain necessary cargo, personal liability, and property damage insurance.

6. Extend credit or give "advance money" for immediate operating expenses of truckers.

Brokers may charge 8 to 10 percent of the trucker's revenues depending on the services provided. Separate charges are sometimes levied if money must be advanced to the trucker. The shipper normally pays the transportation charges to the broker, who, after deducting a fee, pays the trucker.

Problems in the Motor Carrier Marketplace

Perishability, seasonally shifting production areas, and yearly variances in production and consumption by area complicate hauling agricultural products in comparison to other products. The carrier of agricultural products must be operationally and economically flexible and must constantly monitor sources for potential business. The U.S. Department of Agriculture (USDA) publishes monthly production, consumption, and motor carrier cost information and weekly exempt fruit and vegetable motor carrier rates, but carriers must rely on brokers for timely information on specific needs.

An estimated 555 truck brokers exist, and often compete with one another for information about available loads and carriers. There is little economic incentive for one broker to exchange information with other brokers. Both trucker and shipper must contact a number of brokers to obtain a good reading of an area market. A White House Working Party report states:

> Even if brokers are completely open with information and honest in their dealings with both truckers and shippers, the inadequate exchange of information between truckers and shippers, in markets where buyers and sellers are widely separated, can lead to distrust and confusion. Some may think the broker has an economic self-interest in perpetuating such information gaps; this suspicion can create distrust in the essential information and service the broker provides. The seller, the buyer, or both may experience this sense of distrust. 16/

Truck rates for hauling the same agricultural commodity between the same points was found to vary a median 13 percent in a given season. If loads are unavailable when a carrier arrives in an area, the driver is forced to wait or drive empty to areas with available loads. Median waits of 24 hours during peak shipping periods and 72 hours during slow periods have been reported. 17/ On the other hand, shippers in rural areas, sometimes located far from active commodity flow corridors, complain about the chronic shortage of carriers.

Competition Among Motor Carriers

Rates charged for all products by noncertified carriers are lower, <u>on the average</u>, than rates charged by common carriers for comparable service. 18/ Common carriers may haul higher valued, higher rated regulated products. Noncertified carriers may also haul regulated commodities but normally receive less than the administered rate from the common carrier through which they trip-lease. This market segmentation may

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16/ "Report from the Secretary of Agriculture Based on Discussions of the White House Working Party on Problems of Independent Truckers Hauling Exempt Agricultural Commodities", October 22, 1979.

17/ Floyd D. Gaibler, <u>Truck Brokers: An Integral Part of Exempt Agricultural Commodity Movements</u>, U.S. Department of Agriculture, Economic Research Service, AGERS-34, August 1977.

18/ Wilber Smith and Associates, "Rail System Alternatives," report prepared for the United States Railway Association, October 1974.

permit the common carrier to charge a lower rate than the noncertified carrier to carry agricultural products.

Although the federally segregated motor carrier market is felt by some to be economically biased against the exempt carriers, criteria other than rates determine carrier selection. Some advantages of exempt carriers over regulated carriers are stated in a report on National Transportation Policy: 19/

1. Service is more flexible because the carrier
   a. is not restricted to route,
   b. may split deliveries at several points, and
   c. may serve distant markets.

2. Exempt carriers provide expedited service.

3. Equipment is generally available during harvest periods.

4. Rates are often lower than other carriers.

Disadvantages of exempt carriers compared to regulated service cited in the same report include:

1. Increased highway hazards due to lack of proper equipment maintenance.

2. Inferior marketing service because of less ability to contact market sources.

3. Less financial responsibility, particularly with reference to cargo insurance.

4. Less economic stability because rate competition forces firms out of business.

A study by the Association of American Railroads found exempt truckers averaged more miles per year and incurred less cost per mile than private or common carriers. 20/

19/ U.S. Congress, Senate, "National Transportation Policy," Senate Report 445, 87th Congress, 1st Session, p. 552.

20/ D. R. Jansen, "An Analysis of Truckload Freight Operations", AAR Truck and Waterway Information Center, Staff Paper 79-5, August 1979.

Motor Carrier Costs

In order to compare and contrast rail and motor carrier services on a rate and cost basis, motor carrier costs were computed for truck linehauls between the same origin and destination points as those costed for rail movements. Rates, normally quoted in dollars per bale, were solicited from truck brokers, truckers, and shippers. The rates appear in hundredweight for later comparison with rail movements. Table 10 summarizes that data.

To compute motor carrier costs it is necessary to ascertain which costs are fixed (do not normally vary with miles driven) and which costs are variable (with miles driven). Variable costs, the costs of resources depleted during a haul, would include fuel, lubricants, tires, equipment, and driver's time. Fixed costs, the costs of resources to operate a trucking business whether the truck(s) moves or not, include interest on equipment, management and overhead, insurance on equipment, and licenses and permits. The cost components used to determine costs per hundredweight in table 10 appear in table 11.

The costs associated with the listed components are particular to cotton movements between Tulare, Calif., and Greenville, S.C. Costs per mile for fixed cost components and annual costs for variable cost components are computed based on estimated annual mileage for each cotton linehaul corridor. The procedure used to estimate annual mileages, the algorithms used to compute cost components, and a table of annual mileages and costs per mile for each cotton movement are found in appendix 3.

The rates and costs reported in table 10 are also listed by ratio of revenue to total costs. The ratios vary from 0.54 on the longest run (2,423 miles from Tulare, Calif., to Greenville, S.C.) to 1.55 on one of shortest runs (441 miles, New Orleans, La., to Blythville, Ark.). The variance in ratios could be accounted for by a seasonal (or perpetual) shortage or surplus of equipment at those origin or destination points. The availability of backhauls and the rates paid for backhauls also play an important role in determining the rates paid at cotton-haul origin points.

In the case of the Tulare to Greenville run, revenues cover only 54 percent of total costs. It would seem unprofitable to carry cotton at the prevailing rate unless one considers that only shortrun variable costs, for driver, fuel, and lubricants, must be covered on any one trip. Those costs, listed in table 11, total about 51 percent of revenues and would be recoverable each trip. Longrun variable costs (equipment depreciation, tires, and other maintenance) plus

Table 10 - Motor carrier revenue/total cost comparisons for primary corridor cotton traffic, February 1981

Origin/destination	Distance[1]	Revenue/ cwt[2]	Total cost/cwt[3]	Ratio of revenue to total cost
	Miles	Dollars	Dollars	Percent
Movements to Greenville, S.C.				
From				
Tulare, Calif.	2,423	3.25	5.97	54
Phoenix, Ariz.	1,959	3.56	5.02	71
Deming, N. Mex.	1,681	2.55	3.56	72
Fabens, Tex.	1,453	2.55	3.11	82
Lubbock, Tex.	1,273	2.55	2.79	91
Big Springs, Tex.	1,253	2.55	2.78	92
Galveston, Tex.	960	2.24	2.22	101
Monroe, La.	658	1.68	1.67	100
Blytheville, Ark.	583	1.68	1.54	109
Indianola, Miss.	570	1.72	1.52	113
Greenwood, Miss.	541	1.53	1.46	105
Memphis, Tenn.	530	1.48	1.38	107
Movements to New Orleans, La.				
From				
Blytheville, Ark.	441	1.48	.95	155
Memphis, Tenn.	373	1.27	.83	153
Greenwood, Miss. (round trip)	492	1.22	1.03	118
Movements to Long Beach, Calif.				
From				
Lubbock, Tex.	1,111	2.85	2.52	113
Fabens, Tex.	818	1.43	1.97	72
Deming, N. Mex.	703	1.43	1.76	81
Phoenix, Ariz.	386	.92	.85	108
Bakersfield, Calif.(round trip)	308	.71	.71	100

[1]Highway mileages, which include pickup and delivery miles, are taken from Household Goods Carriers' Bureau, Mileage Guide No. 11, March 1978.
[2]Rates were solicited from area truck brokers, shippers, and carriers for February 1981.
[3]Costs per hundredweight were computed using an average truck weight of 40,590 pounds (82.5 bales per truck, 492 pounds per bale).

Table 11 - Owner-operator truck cost components for cotton movements from Tulare, Calif., to Greenville, S.C.[1]

Cost component	Cost per year[2]		Cost per mile	
	- - Dollars - -		- - Cents - -	
1. Interest on equipment	9,840		8.24	
2. Management and overhead	4,317		3.62	
Office rental allowance		942		0.79
Bookkeeping fees		677		.57
Legal fees		348		.29
Telephone		318		.27
Travel		411		.34
Office supplies		126		.10
Dues and charities		180		.15
Federal use tax		354		.30
Other taxes		116		.10
Miscellaneous		845		.71
3. Insurance on equipment	7,443		6.23	
4. Licenses and permits	2,233		1.87	
5. Equipment depreciation expense	11,702		9.80	
6. Driver cost	24,537		20.55	
Wages		16,902		14.15
Social security		1,369		1.15
Worker's compensation insurance		1,994		1.67
Health insurance		480		.40
Subsistence		3,792		3.18
7. Tractor fuel	35,630		29.84	
8. Maintenance	14,763		12.36	
Shop wages		6,233		5.21
Shop supplies		373		.31
Parts		775		.65
Grease and oil		906		.76
Overhaul expenses		6,486		3.43
9. Tires	4,717		3.95	
10. Miscellaneous	4,320		3.62	
	$119,502		100.08	

[1]Costing methods are fully explained in appendix 3.
[2]Total figures may differ from subcomponent summation due to rounding.

fixed costs (interest, insurance, licenses, and overhead) must be covered in the long run. The motor carrier may have a reverse-direction haul(s) into Tulare that returns 149 percent of total costs or more. The cotton haul would be used to pay for the fuel and driver time to return to the more lucrative market.

The other extreme, the 155-percent revenue/cost comparison for the Blytheville to New Orleans movement, needs qualification also. This haul, as with all movements except the two noted as "round-trip," is costed (per mile) on a round-trip basis assuming a 100-percent backhaul. The rates currently paid for the cotton movements are for a one-way haul, of course. If drivers experience difficulty obtaining backhauls out of the New Orleans area they would demand a higher initial rate to enter that area.

The backhaul scenarios presented may be similarly applied to other movements having revenue/cost comparisons between 54 percent and 155 percent. To obtain more accurate costs of cotton carriers, additional data are needed concerning pickup and delivery waits, percent backhauls, backhaul revenues, backhaul waits, and other assumptions made in appendix 3.

Diesel Fuel Prices

Diesel fuel prices, as with all petroleum-based product prices, have risen dramatically in the past decade. Early in 1981, 6-month projections for diesel fuel price increases ranged from $0.25 to $0.50 per gallon depending on economic and political developments. By July, a petroleum market glut had helped to stabilize, or in some cases decrease, the price of diesel fuel.

Given the past volatility of the petroleum market, an exercise to assess the impact of fuel price increase is accomplished in table 12. For a number of cotton corridors diesel fuel price increases have been factored into total costs. These are presented along with current revenues as ratios to better show the relative effect. With tractor fuel prices comprising between 26.7 percent and 34.6 percent of total motor carrier costs at current fuel price levels, an increase of $0.50 per gallon (38 percent) in fuel prices will increase total cost by 11 to 17 percent, depending on the route. On routes having rates which have been shown to cover much less than total costs, increases in fuel prices will have a much greater relative effect.

It is well to keep in mind that similar increases in other petroleum products would quite likely affect other motor carrier costs. Other industries (e.g., tractor equipment

Table 12 - Effect of diesel fuel price increases on cotton truck costs per hundredweight for primary corridor cotton traffic

Origin/destination	Diesel fuel prices[1]					
	$1.315		$1.565		$1.815	
	Cost/ cwt	Revenue/ cost	Cost/ cwt	Revenue/ cost	Cost/ cwt	Revenue/ cost
	Dollars	Percent	Dollars	Percent	Dollars	Percent
To Greenville, S.C.						
From						
Tulare, Calif.	5.97	54	6.33	51	6.75	48
Phoenix, Ariz.	5.02	71	5.30	67	5.65	63
Lubbock, Tex.	2.79	91	2.97	86	3.19	79
Galveston, Tex.	2.22	101	2.36	95	2.53	88
Memphis, Tenn.	1.38	107	1.45	102	1.62	91
To New Orleans, La.						
From						
Memphis, Tenn.	.83	153	.89	142	.96	132
To Long Beach, Calif.						
From						
Lubbock, Tex.	2.52	113	2.68	106	2.87	100
Bakersfield, Calif.	.71	100	.74	96	.79	90

[1]Price, including taxes, of #2 diesel fuel at full-service pumps at seven truck stops located throughout the United States as of February 12, 1981.

manufacturers) would pass along the higher energy input prices in their final product price.

While the individual shipper has litle control over motor carrier rates, awareness of costs and rates is important. Rising energy costs will have different effects depending on the degree of revenue adequacy and other attributes of line-haul runs.

Another important determinant of the rate level charged shippers is the degree of competition drivers face for available loads. Despite some spot shortages, the supply of available motor carrier equipment to haul agricultural products has been more than adequate in most areas of the South and West during the first half of 1981. These surpluses have tended to depress truck rates. Inefficient operators will be forced into other markets or out of service if round-trip revenues stay below round-trip costs over a long period of time.

Intermodal Service

Trailer-on-Flatcar

Trailer-on-flatcar (TOFC) is another option for cotton shippers wishing to combine the supposedly lower cost of rail service with the flexibility of motor carrier service. TOFC service was found to be more popular with cotton shippers in the Delta and Southeast than in other regions, but even here TOFC was not used nearly as often as straight truck and rail service.

The rail portion of TOFC rates tended to be somewhat lower than were nontransit, 50-foot, 93,000-pound minimum rail rates but not low enough to cause widespread use of the TOFC option. Rates for two rail company-owned trailers on a flatcar, with minimum loads of 38,500 pounds per trailer, in ramp-to-ramp service varied from being equal to regular rail service to being $0.13 less per hundredweight. The service at the lowest TOFC rate would save a shipper about $120 per shipment over a regular rail shipment. Drayage charges for TOFC shipments varied from $50 to $75 per trailer for pickup at origin and delivery at destination depending on the areas. These charges, when added to TOFC rates, caused TOFC service not to be competitive with regular boxcar service.

Another problem with TOFC service cited by many shippers was the lack of ramps nearby for loading and unloading trailers from flatcars. Warehouses and textile firms also reported a problem with drayage firms demanding immediate loading or unloading of cotton from trailers in preference over other rail and truck carriers. Drayage firms, because of short hauls, try to make as many hauls per day as possible and, therefore, are more concerned with quicker turnarounds than are longhaul carriers.

In the past, TOFC service was completed through the coordinated efforts of the rail carriers and drayage companies. The shipper or rail carrier would arrange for the drayage. A recent ICC regulatory change has exempted service provided by rail carriers for TOFC and container-on-flatcar (COFC) traffic. 21/ With this freedom the railroad may integrate the modes under rail ownership and provide more competitive TOFC service.

Container-on-Flatcar

Container-on-flatcar service is used to transport cotton to ports for export. The bulk of these movements are from Corpus Christi, New Orleans, Houston, Gulfport, and Galveston to Los Angeles and Oakland, a "mini-bridge" service. This traffic is not commodity specific and is rated as "freight-all-kinds" traffic. Rates to or from various ports are equalized, differing only by number of containers per shipment. Rates are as follows: 1-20 containers, $2.56 per cwt; 21-40 containers, $2.46 per cwt; and more than 41 containers, $2.35 per cwt. Because the rates do not vary with distances, the degree of competitiveness with regular boxcar service varies with the particular port combinations.

"Micro-bridge" shipments of cotton have steadily gained popularity due to lower costs and expedited transit times to foreign ports. With this service, cotton is loaded into boxcars at interior locations and a steamship line issues an intermodal bill of loading. The cotton is transloaded to ships at West coast ports by the steamship line either in container or break-bulk form at the carriers' expense.

Container shipments from inland points are rare because of the cost of transporting the container inland from a port and the reduction in payload a motor carrier experiences using containers. A truck may load from 85 to 95 bales per haul depending on the equipment. If the load were put into a container (80-bale capacity), the reduction of up to 15 bales could mean a decrease in revenues to the trucker of from $52.50 to $67.50 (or 16 percent of total revenues) on Western cotton destined for export. The increased cost per bale moved, plus the cost of placing containers inland, has generally been found to be prohibitive.

21/ Interstate Commerce Commission, 49 CFR Parts 1039, 1090, and 1300, Ex Parte No. 230 (Sub 5) "Improvement of TOFC/COFC Regulation".

Competitive Cotton Carriers

Modal Flows

Although cotton traditionally has been carried to mills and ports by the railroads, motor carriers are rapidly becoming the dominant mode. The following tabulation shows the declining share of rail cotton shipments from warehouses over a recent 15-year period: 22/

Year	Percentage of shipments by mode		Total
	Truck	Rail	
1961	27	73	100
1970	36	64	100
1975	47	53	100

A 1975 study by Ghetti, cited earlier, contains the most recent and complete data on cotton flows by mode. Although no determination can be made as to the modal split in 1980, the total rail revenue and tonnage statistics presented in table 9 suggest that motor carriers have continued to capture more rail traffic since 1975. As cited in the previous section, both gross rail revenues and gross tonnages carried declined an average of 4.4 percent and 10.0 percent per year, respectively, during the period 1975-79; cotton transported to mills and ports increased an average 18.0 percent per year. While gross tonnage carried is not as good an expression of transportation need or accomplishment as is tonmiles, the gross revenue decrease, in light of rapidly escalating rates over this period, suggests a further decline in rail shares of cotton traffic.

Data from two studies conducted in 1970 and 1975 by the USDA on domestic cotton shipments appear in table 13. In the Southeastern region, the rail share of movements of cotton from warehouses declined from 64.8 percent to 36.8 percent over the 5-year period. 23/ Because of the labor and

22/ McArthur, The Cotton Industry.

23/ Appendix 4, Maps A through D, define each region discussed and show the direction and relative magnitudes of cotton flows.

equipment intensiveness of collecting and distributing individual railcars, rail costs per ton mile are greatest for individual movements nearer origin and destination points. 24/ With domestic mills dispersed throughout the Southeastern cotton production area, linehauls between mill and warehouse tend to be relatively short. Motor carriers increased their share from one-third to two-thirds over the 5-year period, demonstrating their comparative advantage for the shorter haul.

A similar turnaround to truck dominance occurred in movements from the Delta region to the Southeast but to a lesser degree. With 77 percent of all Delta traffic moving to Southeastern mills, the decline in rail share was from 60.7 percent in 1970 to 47.1 percent in 1975.

Cotton from the Southwestern region to the Southeastern mills was carried almost exclusively by the railroads in both 1970 and 1975. Competing motor carriers increased their traffic share by 6.2 percentage points over the 2.8 percent share in 1970. Rail movements to the closer Western Gulf ports showed a much larger decline in traffic shares, from 82.1 percent to 51.3 percent.

The railroads' share of movements from Western warehouses to Southeastern mills declined 17.6 percentage points from 95.4 percent share in 1970. Cotton to the Pacific Coast ports continued to move almost exclusively by motor carrier (99 percent of all traffic).

Modal Rates

A shipper's decision to contract with a particular mode is based on many factors, the most discernible of which is the rates carriers charge. Comparisons of carrier rates in 1981 for 18 origin/destination pairs are in table 14. With few exceptions, the rail rates are below truck rates, the median difference being 16 percent. Interviews with shippers and brokers revealed the feeling that truck rates were predicated on the competitive railroad rate. A recent article about Jimmy Beck, a 30-year veteran of the cotton motor carrier business, reveals his pricing strategy: "'I look at the railroad ceilings and charge close to it', he answers candidly. 'I don't have to charge less than the railroads because I give better service.'" 25/

24/ See appendix 2, terminal costs vs. linehaul costs and table 8, rail costs per hundredweight per mile, long- versus short-distance hauls.

25/ "Thinning Trucker Ranks Impacts Cotton Pipeline", Cotton Grower, Sept./Oct. 1980, Memphis, Tenn.

Table 13 - Shipments of cotton from warehouses by mode, by major cotton producing region, 1970 and 1975

Region	Total	Modal Shares: Truck	Modal Shares: Rail	Region	Total	Modal Shares: Truck	Modal Shares: Rail
		Percent				Percent	
From Southeastern Region				From Southwestern Region			
1970[1]				1970			
To Southeastern mills	96.1	35.2	64.8	To Southeastern mills	37.0	2.8	97.2
Other destinations[2]	3.9	- [2]	-	Western Gulf	49.0	17.9	82.1
				Interior concentration points	12.4	25.9	74.1
1975[1]				Other destinations	6.6	-	-
To Southeastern mills	95.3	63.2	36.8				
Other destinations	4.7	-	-	1975			
				To Southeastern mills	37.9	9.0	91.0
				Western Gulf	47.0	48.7	51.3
				Interior concentration points	6.7	39.7	60.3
				Pacific Coast	6.4	5.3	94.7
				Other destinations	7.0	-	-
From Delta Region				From Western Region			
1970				1970			
To Southeastern mills	74.8	39.3	60.7	To Southeastern mills	38.4	4.6	95.4
Interior concentration points[3]	12.7	52.3	47.7	Pacific Coast	50.6	97.7	2.3
Other destinations	12.5	-	-	Interior concentration points	4.5	33.0	67.0
				Other destinations	6.5	-	-
1975				1975			
To Southeastern mills	77.2	52.9	47.1	To Southeastern mills	41.6	22.0	77.8
Interior concentration points	10.8	52.3	47.7	Pacific Coast	45.1	99.0	1.0
Other destinations	12.0	-	-	Interior concentration points	8.4	20.8	79.2
				Other destinations	4.9	-	-

[1]Crop years beginning August 1, 1970 and 1975.
[2]Modal shares are not computed for cotton movements to "other destinations."
[3]Interior concentration points are nonconsuming destinations from which cotton is reshipped to final destinations.

Table 14 - Rail and truck transportation rates for primary corridor cotton traffic from origin to destination, February 1981

Origin/destination	Rail rate/ cwt[1]	Truck rate/ cwt[2]	Difference rail to truck[3]
		Dollars	
Movements to Greenville, S.C.			
From			
Tulare, Calif.	3.19	3.25	(0.06)
Phoenix, Ariz.	3.08	3.56	(.48)
Deming, N. Mex.	3.01	2.55	.46
Fabens, Tex.	2.57	2.55	.02
Lubbock, Tex.	2.23	2.55	(.32)
Big Springs, Tex.	2.29	2.55	(.26)
Galveston, Tex.	1.88	2.24	(.36)
Monroe, La.	1.64	1.68	(.04)
Blytheville, Ark.	1.52	1.68	(.16)
Indianola, Miss.	1.36	1.72	(.36)
Greenwood, Miss.	1.33	1.53	(.20)
Memphis, Tenn.	1.25	1.48	(.23)
Movements to New Orleans, La.			
From			
Blytheville, Ark.	1.32	1.48	(.16)
Memphis, Tenn.	1.33	1.27	.06
Greenwood, Miss.	1.26	1.22	.04
Movements to Long Beach, Calif.			
From			
Lubbock, Tex.	2.10	2.85	(.75)
Fabens, Tex.	0.93	1.43	(.50)
Deming, N. Mex.	0.93	1.43	(.50)

[1]Rates were solicited from railroad freight agents in each region. Rate/cwt are for 50-foot boxcar, 93,000-pound loads, with fuel surcharges added where applicable.
[2]Rates were solicited from carriers, shippers, and truck brokers for February 1981.
[3]Parentheses indicate a negative number.

Exempt truckers are not subject to economic regulation on interstate hauls, and few records are kept of truckers' cotton rates. A publication issued in 1975 reported rail and truck rates in 10 of the traffic corridors for which 1981 rates were collected for this study. Rates for the 10 common origin-destination pairs are compared in table 15. Truck rates were lower than or equal to rail rates of those reported for 1975, with one exception. By 1981, the majority of the truck rates exceeded the rail rates. Truck rates increased 32.4 percent while rail rates increased only 18.6 percent. With truck rates increasing twice as fast as rail rates one might have expected a modal shift to rail, but the opposite has happened. Shippers apparently consider more than rates in deciding on which mode of transportation to use (or truck rates were lower than rail rates until just recently).

Energy Effects on Modal Competition

Since energy costs have increased more rapidly than have carriers' other costs, especially since 1979 when the breakdown of oil flows from Iran occurred, the energy intensiveness of modes may help predict or suggest relative changes in modal rates since early 1979. A 1979 study by the Association of American Railroads looked at fuel costs as a percentage of total revenues for both motor and rail carriers. 26/ In July 1978, fuel cost was 13 percent of total revenue for trucks and 7.5 percent for rail. One year later truck fuel prices had increased by 64 percent and rail fuel prices had jumped 78 percent. Fuel costs as a percentage of total revenue were estimated to be 18 percent and 10.2 percent, respectively. The impact of the fuel price increases on costs for each mode directly relates to the fuel efficiency of the mode.

Using a service distance of 500 miles, rail transport was found to be 2.2 times as energy efficient as were trucks after adjusting for average load and empty miles. Although future increases in energy costs are likely to contribute to an increasing difference between rail and truck total costs, the gap may not soon become so wide as to negate other shipper considerations when selecting a service mode.

26/ David S. Paxson, "The Energy Crisis and Intermodal Competition," Association of American Railroads, Washington, DC, 1979.

Table 15 - Rail and truck transportation rates on selected corridors, in dollars per hundredweight, 1975 and 1981

Origin/destination	1975[1]			1981		
	Rate/cwt		Difference rail to truck[2]	Rate/cwt		Difference rail to truck[2]
	Rail	Truck		Rail[3]	Truck[4]	
	Dollars					
Movements to Greenville, S.C.						
From						
Tulare, Calif.	2.74	2.74	0.00	3.19	3.25	(0.06)
Phoenix, Ariz.	3.03	2.34	.69	3.08	3.56	(.48)
Deming, N. Mex.	2.06	- [5]	-	3.01	2.55	.46
Fabens, Tex.	2.06	- [5]	-	2.57	2.55	.02
Lubbock, Tex.	1.83	2.08	(.25)	2.23	2.55	(.32)
Monroe, La.	1.43	1.22	.21	1.64	1.68	(.04)
Greenwood, Miss.	1.31	1.22	.09	1.33	1.53	(.20)
Memphis, Tenn.	1.22	1.22	.00	1.25	1.48	(.23)
Movements to New Orleans, La.						
From						
Memphis, Tenn.	.96	.86	.10	1.33	1.27	.06
Greenwood, Miss.	.96	.81	.15	1.26	1.22	.04

1/ Source for 1975 rates is McArthur, et. al., The Cotton Industry in the United States, Farm to Consumer, Department of Agricultural Economics, Texas Tech University, College of Agricultural Sciences, Publication No. T-1-86, Lubbock, Texas, April 1980.
2/ Parentheses indicate negative number.
3/ Rail rates were solicited from railroad freight agents in each region. Rate/cwt are for 50-foot boxcar, 93,000-pound loads, with fuel surcharges added where applicable, February 1981.
4/ Truck rates were solicited from carriers, shippers and truck brokers for February 1981.
5/ Truck rates are unavailable.

Capital Carrying Costs

Although energy prices may help rail carriers compete with trucks, energy price increases may also have a negative effect by stimulating monetary inflation and interest rate increases. Recent high interest rates were frequently cited by cotton shippers as a determinant in selecting the carrying mode. Capital carrying costs, or the interest on product held in inventory and transit, were a significant cost factor to cotton shippers and receivers this past year. For a time in 1981, prime interest rates exceeded 20 percent and cotton sold for $1.00 a pound, delivered at southeastern mills.

Cotton is harvested over a period of only a few weeks in the fall, but use is fairly steady over the full year. Therefore, society bears the capital carrying charges of cotton inventories without regard to the mode of transport used to move the cotton. Nevertheless, buyers may delay ordering so long that only the more rapid mode of transport will suffice to meet the needs and prevent "stockouts." In this instance, shippers may reduce their carrying charges by choosing the faster mode of transport.

Alternatively, receivers may routinely order cotton in time for the slower mode to be used, but under contracts specifying payment on and not before, a specified delivery date. Under these conditions, shippers may not be able to reduce carrying charges but may reduce transport charges if the slower mode offers the lower rate. This section details a cotton shipper's modal decision determinants and focuses on modal transit times and rates.

With cotton in a Western region warehouse and a textile mill in need of immediate delivery, a shipper should consider the capital carrying costs when choosing the carrier. Table 16 contains rate comparisons for rail and truck for four cotton movements. Capital carrying costs computed using an annual interest rate of 20 percent compounded daily were added to each rate. Transit times are approximations based on interviews with cotton shippers and rail carriers. A shipper might monitor transit times and construct a probability distribution based on several observations over time. Carrier rates plus capital costs increased all rail rates to levels greater than comparably constructed truck rates. The lowest difference coincided with the lowest difference in transit time, rail to truck. Figure 1 graphically illustrates effective costs for truck and rail when both time and distance are considered.

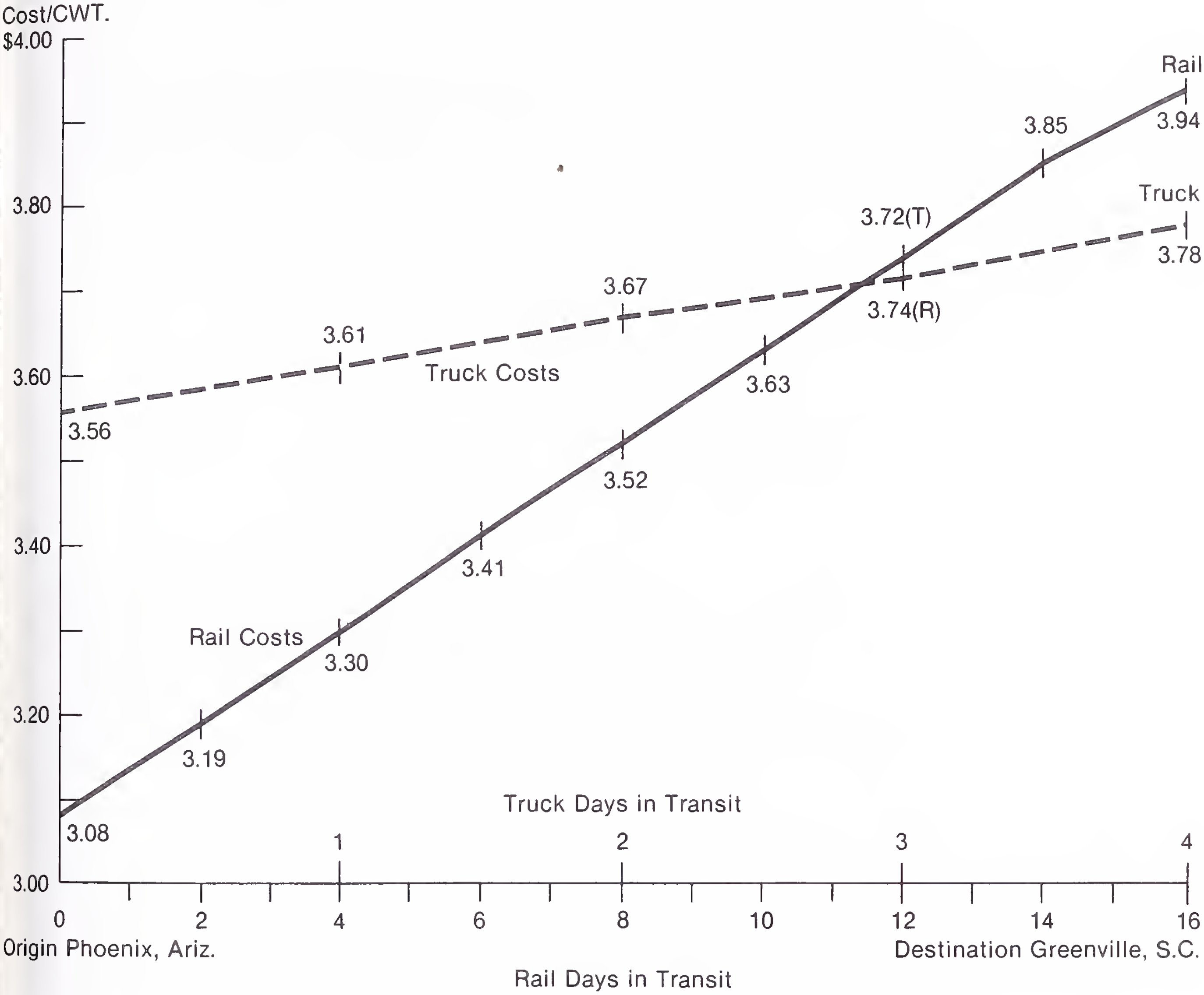
Table 16 - Rail/truck rate comparison, including capital carrying charges, for four cotton movements

Origin/destination	Truck rate/ cwt[1]	Rail rate/ cwt[2]	R-T cwt[3]	Truck TT[4]	Truck CCC/ cwt[5]	Rail TT[4]	Rail CCC/ cwt[5]	Truck rate+ CCC/ cwt	Rail rate+ CCC/ cwt	R-T/ cwt[3]
	- - - -	Dollars	- - -	Days	Dollars	Days	- - - - - -	Dollars	- - - - - -	
To Greenville, S.C.										
From										
Tulare, Calif.	3.25	3.19	(0.06)	4	0.22	12	0.66	3.47	3.85	0.38
Deming, N. Mex.	2.55	3.01	.46	3	.16	10	.55	2.71	3.56	.85
Big Springs, Tex.	2.55	2.29	(.26)	2	.11	8	.44	2.66	2.73	.07
Memphis, Tenn.	1.48	1.25	(.23)	1	.06	6	.33	1.54	1.58	.04

[1]Truck rates (from table 10) are based on 40,590-pound loads, February 1981.
[2]Rail rates (from table 8) are based on 93,000-pound loads per 50-foot car, nontransit, February 1981.
[3]R-T/cwt is the rail rate minus truck rate in hundredweight, parentheses indicate a negative number.
[4]Rail and truck times in transit (TT) are approximations based on cotton shipper interviews.
[5]Capital carrying charges (CCC) are computed using an annual nominal interest rate of 20 percent compounded daily (actual rate of 22.13 percent).

Figure 1

Comparison of Rail to Truck Costs, Including Capital Carrying Charges, Phoenix, Ariz. to Greenville, S.C.



Assumptions:
- 20% nominal annual interest rate for cotton, compounded daily
- 41,000-pound truck, 93,000-pound rail load, 50-foot boxcars, nontransit rate
- Rail transit time 14 days, truck transit time 4 days. (Transit times are estimated)
- Rail and truck rates from Phoenix, Ariz. to Greenville, S.C. are $3.08/cwt and $3.56/cwt as of February, 1981

Total Logistics Planning

Transport rates and capital carrying charges are two cost components of total logistical costs a shipper should consider when choosing a mode. 27/ These and other costs that should be computed to find total costs may be categorized as follows:

<u>Transport costs</u>

1. Rate
2. Loading charges
3. Unloading charges
4. Loss and damage (not recoverable)

<u>Nontransport costs</u>

1. Administrative costs
2. Storage costs
3. Capital carrying costs
4. Market costs

Of the transport costs, rates have been discussed and loading and unloading charges are self-explanatory. Loss and damage costs for each mode may be estimated from historical data. The probability of a loss is multiplied by the expected loss per occurrence. For example, if the probability of occurrence is 0.02 and the probability distribution of all losses is as follows:

Damage or loss per occurrence	Percent of losses in this group
$500	0.30
1000	.40
5000	.20
10,000	.10
Total	1.00

Expected loss per haul = 0.02 [$500 (0.30) + $100 (0.40) + $5000 (0.20) + $10,000 (0.10)]
= 0.02 ($2,550)
= $51

Nontransport costs include any administrative costs to perform the shipping function which would be variable with numbers of orders handled. Storage costs are costs per day

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27/ The importance of nontransport logistics is fully discussed in Joseph B. Waldo's "Non-Transport Logistics Costs and their Affect on Mode Choice", Association of American Railroads, Staff Paper 80-05.

per bale at the warehouse location at origin. Days may be computed from the time the carrier's equipment is ordered until the bales are loaded, or the warehouse ceases to charge storage on the lot. 28/ Estimates of two probabilities must be computed: (a) the probable time required for equipment delivery and (b) the probable time required after equipment arrives for warehouse loading to be completed. Data for these estimates may be computed from historical data in the files of the shippers, or perhaps from consultants who do logistics analysis for cotton shippers.

If a carrier delivers equipment and the warehouse loads the cotton with the following combined probability distribution:

Day Loaded	Probability	Cost/bale
5	.20	$0.25
10	.50	0.50
20	.30	1.00

Then the expected storage cost(s) associated with the use of that carrier (or mode) would be:

$$S = \$0.25\ (0.20) + \$0.50\ (0.50) + \$1.00\ (0.30)$$
$$= \$0.60/\text{bale}$$

Capital carrying costs are interest charges on the value of the lot to be shipped times the number of days between the time the lot is ordered and the time the lot is actually delivered (and payment received). Interest charged can be estimated either as the interest the shipper pays for capital or the interest the shipper would gain if his or her own capital were wisely invested elsewhere (opportunity cost of capital). The time period is the sum of the probable time for (1) equipment delivery, (2) loading, (3) time-in-transit, and (4) unloading. Again, expected times may be given individual probability distributions from historical data, carriers, warehousers, or consultants.

Market loss costs to the shipper are losses in the form of actual claims by the receiver or loss of business if delivery is late or fails to arrive.

28/ Cotton warehouses may charge daily, weekly, or monthly rates for storage. If, for instance, a monthly rate is charged if cotton is stored on the first day of the month or any day thereafter, there is greater potential for loss or savings on warehousing depending on time of shipment.

If cotton is ordered to be delivered as soon as possible the computation of total cost would be made as follows:

$$TC = \overbrace{R+L+U+D}^{\text{TRANSPORT COSTS}} + \overbrace{A+S(Ce+Cl)+I(Ce+Cl+Ct+Cu)+K}^{\text{NONTRANSPORT COSTS}}$$

with, TC = total costs
R = transport charge
L = loading charge
U = unloading charge
D = expected loss and damage
A = administrative costs
S = storage charges
I = costs of capital
Ce = expected days for equipment delivery
Cl = expected days for loading
Ct = expected days of time in transit
Cu = expected days of unloading
K = expected market loss costs

Total costs should be computed for each mode and converted to a common basis, such as ton or hundredweight, for comparisons. If all factors other than time for delivery (Ce + Cl + Ct + Cu) are constant, motor carriers will probably have an advantage because their pickup and delivery times are usually better than rail carriers.

In the event a lot is ordered far enough ahead, the shipper could take advantage of the rail mode's longer transit times and lower rates. The computation of total costs of an order at a future date would be:

$$TC = \overbrace{R + L + U + D}^{\text{TRANSPORT COSTS}} + \overbrace{A - S(Ct + Cu) + K}^{\text{NONTRANSPORT COSTS}}$$

(Variables are identified as in the prior equation)

Assuming the shipper will deliver the order on the future date requested, i.e., the shipper accepts any capital carrying costs incurred, the capital carrying costs will not vary by mode and are dropped from the calculation. The shipper, to minimize costs, may look to reducing storage costs (S) by maximizing time in transit (Ct). Use of unload time (Cu) would be appropriate only if the receiver will not accept delivery until after the cotton is unloaded. Because the latter total cost computation would be more advantageous to the mode with the greater transit time, rail carrier competition would be greater the longer the time between order and delivery.

The variables suggested above are not necessarily all inclusive. The list provides the foundation for the addition of other variables the shipper feels could be relevant to the selling function or for the deletion of irrelevant ones.

The data collection and calculating requirements are too expensive, as a rule, to justify use of the formula to cost just one cotton movement. But when used repetitively on a number of shipments over time, the task may become cost effective, especially if automatic data processing systems are employed. Also, it might be easier to update factors used in computing total costs of specific shipments much more frequently than it would be if only calculator or other manual methods of computation are available. Market information and records of past shipments could be put in, stored, and retrieved in coordination with the shipper's use of a modal selection formula.

Rail carriers may also benefit from viewing commodity movements in a total logistics cost concept. They may avoid wasting effort and money soliciting traffic for which total logistics costs of rail transport rule out use of rails except on a standby or emergency basis. They may also identify truck movements for which compensatory rail rates are feasible. Railroads are known to do analyses of this type at times, and to use such analyses before trying to capture new traffic or to recapture diverted traffic.

Few, if any, exempt truckers are large enough to undertake such analysis, so it is incumbent on shippers to identify those movements where trucking is the preferred mode. Rate comparisons alone are not usually adequate bases for selecting the mode of transport. Shippers, whose operations are uniform or regular, may benefit by an assessment of total logistics costs, including transport rates, to identify the preferred mode.

CARRIER DEREGULATION, 1980

Enactment of the Motor Carrier Act of 1980 (effective July 1, 1980) and the Staggers Rail Act of 1980 (effective October 14, 1980) may create significant changes in the transportation industry. While neither Act totally deregulates either the motor carrier or the rail industry, the reduction of regulation is designed primarily to encourage greater competition within and among transportation modes. The legislation was enacted because Congress and the President expected that, in a more competitive environment, better service and lower rates would result. The new freedoms challenge shippers and carriers alike to deal with the uncertainty and risk characteristics of all competitive markets. The following section examines the changes proscribed in both Acts.

The Motor Carrier Act of 1980

Proponents of deregulation of trucking have stated that lack of competition allowed excess transportation rates to be charged to final consumers. This section examines the regulatory changes and the effects on carriers and shippers of cotton.

Competition Among Motor Carriers

Carriers will be most affected by those provisions which grant easier entry into new markets and access to authority to serve a greater number of geographical points. New authorities include more commodities and more inclusive geographical service areas. Gateway restrictions and circuitous routing are eliminated. Regulated commodity rate charges of 10 percent (and possibly 15 percent) are allowed without ICC review. Rate bureaus are not able to protest independently published rates. Mergers and consolidations are ruled on more quickly and requirements are eased. Private carriers may now engage in intercorporate hauling, and contract carriers may serve an unlimited number of shippers rather than only eight shippers. These and other related entry conditions are considered likely to encourage more competition.

Effects on Carriers

Regulated carriers, because of authorities that restricted competition, have often been accused of capturing excess profits. A staff paper by the AAR 29/ reports that if competition were to decrease the return on equity of regulated

29/ David S. Paxson, "An Analysis of the Potential Impact of the Motor Carrier Act of 1980 on the Railroad Industry", Association of American Railroads, December 1980.

motor carriers to the levels of other industries (i.e. from 23 percent to 16 percent), truckload rates would only decrease 1 percent. Greater decreases would be expected for less-than-truckload traffic.

Another industry effect could be decreased labor costs. Unionized trucking firms will face serious competition from newly certified nonunion firms. Also, increased authority to operate over wide geographic areas should help decrease empty mileages. Reductions more likely will occur for private, contract, and exempt carriers who commonly have higher percentages of empty vehicle miles. However, it is felt by some that total empty intercity truck mileages will not be reduced, and empty mileages will simply be shifted to common carriers. 30/

Effects on Shippers

Net effects of motor carrier deregulation estimated by Paxson should be decreases in long-haul truckload rates by 2 to 3 percent. The truck rates most likely to decline are those for regulated commodities. Exempt commodity rates might decline some, other things being equal, due to relative increases in loaded to total miles, the values of products available for hauling, and perhaps other "spin-off" benefits of deregulation accruing to those truckers heavily engaged in hauling agricultural commodities. Because motor carrier regulations have been structured on the basis of the commodity carried rather than by firm or region, regulated commodity rates likely will be affected more than will the exempt commodity rates.

How active the trucking industry is in pursuing the freedoms granted in the Act is inferred from a recent ICC staff report. The results showed that grants of operating authority rapidly increased in 1980. During the fiscal year ending September 30, 1980, the ICC granted a total of 21,469 applications, an increase over the 1979 figure of 12,223. Also reported as increasing were the independent filings of rates and notices of intercorporate hauling. 31/ Whether the increases occurred after passage of the Motor Carrier Act was not revealed.

30/ David S. Paxson, "Motor Carrier Deregulation and the Opportunities for Reducing Empty Truck Mileage." AAR Truck and Waterway Information Center, Staff Paper 79-2, 1979.

31/ "'Post Act' Report by ICC Staff Shows Trucking Industry Pursuing Liberties", Traffic World, December 22, 1980.

Cotton, an exempt commodity, is carried by all classes of motor carriers at nonregulated rates. Exempt commodities may be in less demand by carriers that now have new authority to carry other products. If, as Paxson suggests, the net effects will be only a minor rate decrease for regulated commodities, the decrease in demand by motor carriers for exempt commodities should also be minor or even nonexistent if agricultural carriage rates increase slightly. That rate increase could be negated by an increase in the loaded-to-total miles ratio, an argument suggested earlier. More important to the cotton shipper will probably be the total market supply of motor carriers competing for deliverable commodities.

The Staggers Rail Act of 1980

Shippers and carriers have expressed concern about the new rail regulatory environment. Although the cotton industry will certainly feel some influence from each of the provisions of the Staggers Act, those that may have direct impact relate to:

(1) degree of future rate changes,
(2) time between notice and implementation of rate changes,
(3) exemption of commodities from regulation,
(4) new rate bureau restrictions, and
(5) rail service contracting.

Rate Changes

The Staggers Act prescribes five basic ways in which a carrier may increase its rates without fear of regulatory interference: "inflation recovery" increases, "below threshold" increases, "rate flexibility zone" increases, joint rate surcharges, and light-density line surcharges.

Provisions for "inflation recovery" increases allow a carrier to raise any rate in effect on October 1, 1980, on a quarterly basis, to recover cost increases due to inflation. Shippers have no authority to challenge those increases.

Provisions for "below threshold increases" allow a rail carrier to raise any rate on traffic for which the carrier does not have dominance or natural monopoly power. The carrier is presumed not to have market dominance if the rate is below a revenue-to-variable cost ratio of 160 percent until September 30, 1981. The percent ratio graduates 5 percent yearly to 180 percent after September 30, 1984, and is subject to cost recovery guides to be set by the ICC. If the rate is over the threshold percentage, and the ICC finds that the carrier has market dominance on that traffic, the ICC may investigate to determine if the rate is unreasonable.

The shippers, in this instance, may have to provide evidence that the rate is above the threshold level, the carrier(s) has market dominance, and furthermore, that the rate is unreasonable. The ICC will determine whether the burden of proof rests with the carrier or shipper in accordance with prescribed rules.

Provisions for "rate flexibility zone increases" allow increases in rates of 6 percent a year but not more than 18 percent over the first 4 years. After that, only railroads not earning adequate revenues may raise rates under these provisions and then only by 4 percent per year.

Provisions for "joint rate surcharges" generally allow a carrier to add charges to joint rates so as to obtain revenues up to 110 percent of variable costs on the joint line routes, subject to certain restrictions.

Provisions for "light-density line surcharges" for carriers earning inadequate revenues on lines carrying less than 3 million gross-ton-miles per mile of traffic per year and for carriers with adequate revenues on lines carrying up to 1 million gross-ton-miles per mile per year to apply surcharges on traffic moving over those lines. The surcharges may generate revenues to cover no more than 110 percent of the variable costs of transporting the traffic to and from those lines and 100 percent of the costs of operating the lines. A shipper may petition for redress if the charges exceed the above percentages or if the shipper can show that he or she bears an unreasonable portion of the costs of maintaining service because of the surcharge.

What these provisions may come to mean to a cotton shipper is directly related to whether or not railroads perceive cotton traffic as returning revenues to cover the costs of operations. The first part of this question may be partially answered by the evidence submitted in September 1980 when the railroads sought a general rate increase. Using guidelines proposed by the ICC, the railroads determined various revenue/variable costs ratios for cotton and other traffic flows. For intradistrict and interdistrict cotton traffic, the ratio, which included the current cost of capital, averaged 1.043. 32/ If that figure were representative of particular runs, shippers might expect the railroads to consider substantial rate increases. In order to prepare to contest

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32/ M. L. Hall, "Freight Petition".

proposed rate increases, the cotton shipper should seek to determine (1) what the railroads perceive the costs to be for individual cotton movements and (2) what the rail costs would be using methods prescribed by the ICC. Evidence of this nature will not only be required for use in rate cases shippers wish to protest, but is helpful in planning longer term transportation strategies.

Rate Bureaus and Other Provisions

Because transportation rates affect the selling price of cotton, the cotton industry has always wanted margin protection in the form of no increases in freight rates during the cotton marketing year. The rate bureaus have provided a means for the industry to pursue this objective.

Railroads in the past have often responded to industry needs by restricting general rate increases for cotton to one per year with increases becoming effective August 1. No prediction can be made as to the frequency and timing of future increases, but individual increases may now be made with less notice. New rail rates or rate increases may become effective on 20 days' notice rather than the previous 30 days' notice. This provision, coupled with new restrictions preventing carriers from discussing, voting on, or agreeing to single-line rates proposed by individual carriers, or proposed interline rates for which participation in this traffic is limited to a specific set of carriers, may encourage carriers to increase rates individually at any time. Without judging the merits of either method, it can be said that the shipper is faced with less certainty of rate levels.

Under provisions of the Act, cotton could become totally exempted from rate regulation. Such exemptions are permitted whenever the ICC finds that regulation is not needed to prevent abuses of market power.

Rail Contracting

The Act also provides new opportunities for shippers and carriers to negotiate in setting rates and services for a sequence of shipments. Although the ICC had allowed some rail contracts to be made before the Act was passed, the new legislation specifically authorizes them. A copy of each contract must be filed with the Commission along with a summary of its nonconfidential provisions. The Commission publishes the nonconfidential provisions of each contract, and makes the information available to the general public.

Contracts to transport agricultural commodities may be challenged by a shipper if: (1) it is felt the carrier would not be able to meet its common carrier obligation and meet the contract terms; (2) the carrier refuses to contract with a shipper on the same basis as it had contracted with one or more other shippers; or (3) the proposed contract constitutes a destructive competitive practice. Additional protection is offered the agricultural shipper by preventing the carrier from offering under contract more than 40 percent of the carrier's owned or leased equipment. Once approved by the Commission, a contract may not be challenged. Parties to the contract may, however, seek remedy for breach of contract in the courts.

Types of Contracts

Contracts are different from the normal rate publications in three respects: (1) contracts apply for a sequence of shipments rather than individual shipments; (2) the shipper is obligated to the carrier as much as the carrier is to the shipper; and (3) specific services may be organized to meet the requirements of the contract, without regard to those provided for common carrier movements.

Two principal forms of contracts exist. In one, the shipper agrees to ship by the carrier a stated percentage of traffic of a specific commodity between designated origins and destinations for a specific time period. The other form allows the shipper to specify the aggregate minimum volume that will be shipped over an agreed time period.

A number of firms (none from the cotton industry) 33/ have already entered into contractual arrangements with railroads. There is considerable variance in the terms shippers offer in exchange for those offered by the railroad. From summaries of contracts obtained from the ICC, 34/ shippers may have to agree to:

(1) pay rates higher than those published in tariffs,
(2) pay penalties for volume shortfalls, and/or
(3) ship annual volumes ranging from 14 cars/month to 180,000 tons/year.

33/ Another form of rail contract was instituted during the 1980-81 season and will be effective for the 1981-82 season. In this 1 year "term contract," the railroads guarantee a fixed rate for the cotton season (except for emergency fuel surcharges). The contract applies to all traffic from the West and Southwest to the Southeast.

34/ Summaries of selected contracts appear in appendix 5.

In exchange they may receive:

(1) guarantees of car supply,
(2) guarantees on schedules,
(3) reduced rates, and/or
(4) penalty payments for service shortfalls.

These contracts have terms that range from 6 months to 20 years, and service may be between one or more origin/destination points. Groups of shippers may enter into contracts. Inflation and fuel surcharge increases may be part of the contract.

Effects of Contracts

The shipper may receive the following benefits from rail contracts:

(1) a stable car supply,
(2) more stable and known transportation rates,
(3) better consistency of delivery, and
(4) improved transit times to reduce capital carrying charges.

Small or remotely located shippers may find relief from poor service or exorbitant rates through contracts. Disadvantages to shippers would be in tieing up too great a volume with one carrier, thereby limiting flexibility. Railroads may profit from the guaranteed traffic to better utilize present equipment and forecast future equipment supplies.

Negotiating the Contract

Shippers wishing to enter into negotiations with railroads to form contracts should:

1. Obtain the necessary legal and transportation management expertise.

2. Determine desired contract provisions.
    a. Segregate high-volume traffic flows.
    b. Gather data on past truck and rail rates.
    c. Determine the apparent costs to the railroad providing the service.
    d. Determine service requirements for the movements.
        (1) time in transit
        (2) volume of equipment needed
        (3) consistency of shipments

e. Logistical cost information may be used to provide appropriate penalties for:

(1) the rail carrier not meeting equipment guarantees, delivery schedules or time-in-transit limits.

(2) the shipper for not meeting annual volume requirements.

Penalties should vary as the costs to each injured party varies.

3. Meet with the railroad(s), negotiate, and establish the contract.

4. Meet with ICC contract rate coordinator to identify potential problems associated with the proposal.

5. Resolve problems, if any, with railroad(s).

6. File the contract with the Commission.

In a 1979 survey by Railway Age, 83 percent of shippers interviewed believed contract rates would provide opportunities for railroads to develop innovative pricing strategies. As many as 77 percent thought the regulatory climate had changed enough to permit the intent of contract ratemaking, i.e., to develop innovative pricing. 35/

The Staggers Rail Act, and to a lesser extent the Motor Carrier Act of 1980, will help the rail industry change the structure and level of rates and services for transportation users in the cotton industry. Rate and service freedoms available to rail carriers increase the risk and uncertainty faced by the shipper. The shipper is provided an opportunity to decrease those uncertainties through the use of rail contracts. Moreover, the pricing innovations available to the railroads may help the railroads' financial crisis and may allow innovative cotton shppers to obtain better service at the same, or even reduced, rates as would have prevailed under continuation of common carrier regulations that existed before the Staggers Rail Act was passed.

35/ "How Shippers View Contract Rates", Railway Age, February 26, 1979.

Shipper Organizations

Although some shipper organizations exist for the purpose of addressing common industry and governmental problems (e.g., the American Cotton Shippers Association), another possibility would be an association of shippers organized to aggregate annual volumes for rail contracting and/or to collect, assemble, and analyze data to better determine logistical costs.

A shipper association's activities are not regulated by the Interstate Commerce Commission, but Section 402(e) of the Interstate Commerce Act sets forth provisions under which the association must operate. The association is normally comprised of individuals with a common interest and functions to serve specific transportation requirements of members. Shipper associations operate on a nonprofit basis. Members, who usually pay a membership fee, are charged for services rendered for a particular shipment or a series of shipments.

The individual shipper often may not have the resources to undertake the development of programs for rail costing, rail contracting, and computerized logistical costing. Shipper associations could provide member services by collecting and disseminating information on the methods and experiences of other cotton shippers in developing these programs. The association could also maintain data on movements, rates, transit times, loss and damage claims, warehouse charges, waits at ports and warehouses, and any other information that might be useful to determine accurate costs. Through the association, confidentiality could be maintained on individual shipper's operations.

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Appendix 1 - Class I Railroads by ICC district 1/

EASTERN DISTRICT

Bangor and Aroostook Railroad Co.
Boston and Maine Corp.
Canadian Pacific Lines (in Maine)
Central Vermont Railway, Inc.
Maine Central Railroad Co.
Baltimore and Ohio Railroad Co.
Bessemer & Lake Erie Railroad Co.
Chesapeake and Ohio Railway Co.
Chicago & Illinois Midland
Delaware and Hudson Railway Co.
Detroit, Toledo and Ironton Railroad Co.
Detroit and Toledo Shore Line Railroad Co.
Elgin, Joliet and Eastern Railway Co.
Grand Truck Western Railroad Co.
Illinois Terminal Railroad Co.
Long Island Railroad Co.
Missouri-Illinois Railroad Co.
Norfolk and Western Railway Co.

SOUTHERN DISTRICT

Alabama Great Southern Railroad Co.
Central of Georgia Railroad Co.
Cincinnati, New Orleans and Texas Pacific Railway Co.
Clinchfield Railroad Co.
Florida East Coast Railway Co.
Georgia Railroad, Lessee Organization
Georgia Southern and Florida Railway Co.
Illinois Central Gulf Railroad Co.
Louisville and Nashville Railroad Co.
Norfolk Southern Railway Co.
Seaboard Coast Line Railroad Co.
Southern Railway Co.

WESTERN DISTRICT

Chicago and North Western Railway System and Transportation Subsidiaries.
Chicago, Rock Island and Pacific Railroad Co.
Duluth, Missabe and Iron Range Railway Co.
Duluth, Winnipeg and Pacific Railway Co.
Fort Worth and Denver Railway Co.
Kansas City Southern Railway Co., and Controlled Companies

1/ Rail Carload Cost Scales, 1977, Interstate Commerce Commission, Bureau of Accounts, Statement No. 1C1-77, February 1978.

WESTERN DISTRICT (continued)

Missouri-Kansas-Texas Railroad Co.
Missouri Pacific Railroad Co.
St. Louis-San Francisco Railway Co.
St. Louis Southwestern Railway Co.
Soo Line Railroad Co.
Texas Mexican Railway Co.
Toledo, Peoria & Western Railroad Co.
Atchison, Topeka and Santa Fe Railway Co.
Burlington Northern, Inc.
Chicago, Milwaukee, St. Paul and Pacific Railroad Co.
Colorado and Southern Railway Co.
Denver and Rio Grande Western Railroad Co.
Northwestern Pacific Railroad Co.
Southern Pacific Transportation Co.
Union Pacific Railroad Co.
Western Pacific Railroad Co.

Appendix 2 - Rail Form A cost components for cotton movements from Tulare, Calif. to Greenville, S.C. 1/

LINE-HAUL COSTS	ORIGIN	DESTINATION	TOTAL
L 1. Cost per gross ton-mile ($/GTM)	0.003852	0.003836	
L 2. Weight of lading per car (in cwt)	930	930	
L 3. Lading cost per mile (L1XL2/L20) ($)	.179130	.178394	
L 4. Tare (tons)	28.0	28.0	
L 5. Tare cost per mile (L1XL4) ($)	.107863	.107420	
L 6. Cost per loaded car-mile ($)	.118064	.120420	
L 7. Unadjusted cost per car-mile (L5+L6) ($)	.225927	.227840	
L 8. Ratio of total-to-loaded miles	1.63	1.63	
L 9. Adjusted cost per car-mile (L7XL8) ($)	.368261	.371379	
L 10. Total line-haul cost per car-mile (L9+L3) ($)	.547390	.549773	
L 11. Miles	2250	774	
L 12. Line-haul cost per car (L10XL11) ($)	1231.63	425.52	
TERMINAL COSTS			
L 13. Station clerical ($)	8.04	5.17	
L 14. Terminal switching ($)	36.03	29.77	
L 15. Carday expense ($)	31.09	25.92	
L 16. Special services ($)	4.31	1.92	
L 17. Lading cost (claims clerical) ($)	0.83	0.35	
L 18. Total cost per carload ($)	80.30	63.13	
TOTAL COSTS			
L 19. Cost per car (L12+L18) ($)	1311.93	488.66	
L 20. Cost index 2/	1.344	1.317	
L 21. Adjusted cost per car (L19+L20) ($)	1763.23	643.56	
L 22. Total cost, origin plus destination ($)			2406.7
L 23. Total cost per cwt ($)			2.587

1/ Rail Carload Cost Scales, 1977, Interstate Commerce Commission, Bureau of Accounts, Statement No. 1C1-77, February 1978. The movement employs a 50-foot boxcar with a 93,000-pound load of cotton.

2/ Costs are indexed using ICC's Rail Cost Update Procedures, (Statement No. 1E3-78) for January 1981.

Appendix 3 - Derivation of truck cost components, annual mileages, and cost per mile for primary cotton corridor movements

A. Truck Cost Components 1/

1. Interest on equipment = ([Purchase price - salvage value) ÷ 2] + salvage value) x interest rate

Truck price	= $65,000	Salvage value	= 20 percent
Trailer price	= $17,000	Interest rate	= 20 percent

   The interest rate is estimated to be at prime interest rates. A firm may be offered a higher or lower rate by the lender. Salvage value is included as part of the capital asset. In effect, interest is computed on the midlife value of the equipment depreciation stream and on salvage value.

2. Vehicle depreciation = [(Purchase price - salvage value) ÷ useful life] ÷ (equipment lifetime mileage ÷ useful life)

   Useful life of equipment = 10 years
   Tractor lifetime mileage = 650,000 miles
   Trailer lifetime mileage = 750,000 miles

3. Driver costs - Wages are estimated at $16,902 per year. Social security is 8.1 percent and workmen's compensation is 11.8 percent of wages. Subsistence varies with the operating situation of each cotton movement.
4. Tractor fuel - The price of diesel fuel, $1.315 per gallon, is based on a survey of seven truck stops selected to reflect a national average price for February 1981. Fuel consumption rates of 4.4 miles per gallon for a loaded vehicle and 5.1 miles per gallon for an empty vehicle are weighted by the load/empty ratio calculated for each cotton movement.
5. Tires - Cost per mile is based on 18 tires at $328.85 per tire over a useful life of 150,000 miles per tire.
6. Miscellaneous - Includes unloading, market, and scale fees.

B. Computation of Annual Mileage

Because total annual costs and costs per mile depend on annual miles driven, it is necessary to compute annual mileage for each corridor movement. The theoretical assumption is that when a motor carrier hauls a load of cotton between two points, the carrier assumes all the annual characteristics of that run. We know in practice a motor carrier often varies operating situations (products, origins, destination, etc.) throughout the year. The assumption of annual characteristics for each corridor movement is necessary to increase the accuracy of each movement's cost per mile estimates.

1/ Truck cost components in this section are derived from Patrick Bole's Current Cost of Operating Refrigerated Trucks for Hauling Fresh Fruit and Vegetables by Multi-Truck Firms, ESCS, USDA, December 1979. When necessary, cost components were updated using indices supplied by the Bureau of Labor Statistics.

Using operating assumptions and methodologies developed in Boles' study, the first computation involves an estimate of the number of hours a year a driver has to devote to the trucking operation. Assuming 2 weeks' vacation (during which the truck is overhauled) and 1 day off per week, the driver is left with 301 days or 7,224 hours for work. Of this, 8 hours per day is rest time and 1.5 hours is eating time; 4,362 hours are left. Because a driver must rest 8 hours for each 10 hours' driving time,1/ additional rest time of 135.2 (436.2 days-301 days) 8-hour periods (1,081.5 hours) must be subtracted from available driving time, leaving 3,281.5 hours for work.

A corridor line-haul is assumed to be round trip with miles added for pick up and delivery depending on the operating situation. Using round-trip mileage times, and estimated 50 miles-per-hour average speed, an hourly figure for the round trip may be calculated. To the round trip time is added time to load and unload (2 hours each) and time to check equipment (0.5 hour each round trip). The total round-trip time is then divided into the available work hours (3,281.5) to arrive at a yearly number of trips. The number of trips times the trip mileage will produce an annual mileage figure.

Table 17 describes each cotton movement by miles driven (one-way), operating situation, annual mileage, and cost per mile. Operating situations 1 through 4 describe a carrier's propensity to capture a backhaul for each movement based on the number of miles driven one way. The table below describes each operating situation:

Operating Situation	One-Way Distance	Fronthaul pickup & delivery		Backhaul pickup & delivery		Wait
	Miles	Miles	Hours	Miles	Hours	Hours
1	0-250	25	4	0	0	0
2	250-500	25	4	25	4	0
3	500-1,750	25	4	25	4	24
4	1,750 +	25	4	25	4	48

1/ A driver may not be on duty more than 60 hours in any continuous 7-day period or 70 hours in any continuous 8-day period. In addition, a driver must rest for 8 hours after 10 hours continuous driving or after 15 hours on duty. On-duty time would include driving related tasks such as vehicle inspection and montioring loading and unloading of the vehicle. Source: U.S. Dept. of Transportation, Federal Highway Administration, Federal Motor Carrier Regulations. Bureau of Motor Carrier Safety, 1975.

Table 17 - Motor carrier operating characteristics for primary corridor cotton movements, February 1981

Origin/destination	Highway distance	Operating situation	Annual distance	Cost per mile
	Miles	Number	Miles	Dollars
Movements to Greenville, S.C.				
From				
Tulare, Calif.	2,423	4	119,412	1.00
Phoenix, Ariz.	1,959	4	112,180	1.04
Deming, N. Mex.	1,681	3	160,318	.86
Fabens, Tex.	1,453	3	153,916	.87
Lubbock, Tex.	1,273	3	147,765	.89
Big Springs, Tex.	1,253	3	147,008	.90
Galveston, Tex.	906	3	133,702	.94
Monroe, La.	658	3	115,162	1.03
Blytheville, Ariz.	583	3	106,936	1.07
Indianola, Miss.	570	3	105,707	1.08
Greenwood, Miss.	541	3	102,865	1.10
Memphis, Tenn.	530	3	101,749	1.11
Movements to New Orleans, La.				
From				
Blytheville, Ariz.	441	2	148,626	.88
Memphis, Tenn.	373	2	140,466	.91
Greenwood, Miss. (round trip)	492	1	152,245	.85
Movements to Long Beach, Calif.				
From				
Lubbock, Tex.	1,111	3	141,126	.92
Fabens, Tex.	818	3	125,284	.98
Deming, N. Mex.	703	3	117,128	1.02
Phoenix, Ariz.	386	2	142,171	.90
Bakersfield, Calif.	308	1	129,250	.93

[1]Highway mileages, which include pickup and delivery miles, are computed from Household Goods Carriers' Bureau, Mileage Guide, No. 11, March 1978.

The operating situation will influence the round-trip distance and the number of hours required for each round trip. For each day of layover waiting for a backhaul, the driver is allowed subsistence allowances. Although a layover is 24 hours, only 16 hours is added, as 8 hours rest per day was added earlier to compute annual off-duty time.

An example of the annual mileage computations follows using the Tulare, Calif. to Greenville, S.C., (2,398 miles) corridor movement.

<u>Assume Operating Situation 4</u> (1750+ miles):

(1) Pickup and delivery; fronthaul = 25 miles, 4 hours
backhaul = 25 miles, 4 hours

(2) Layover wait = 32 hours

(3) Equipment check = 0.5 hour

<u>To compute annual miles</u>:

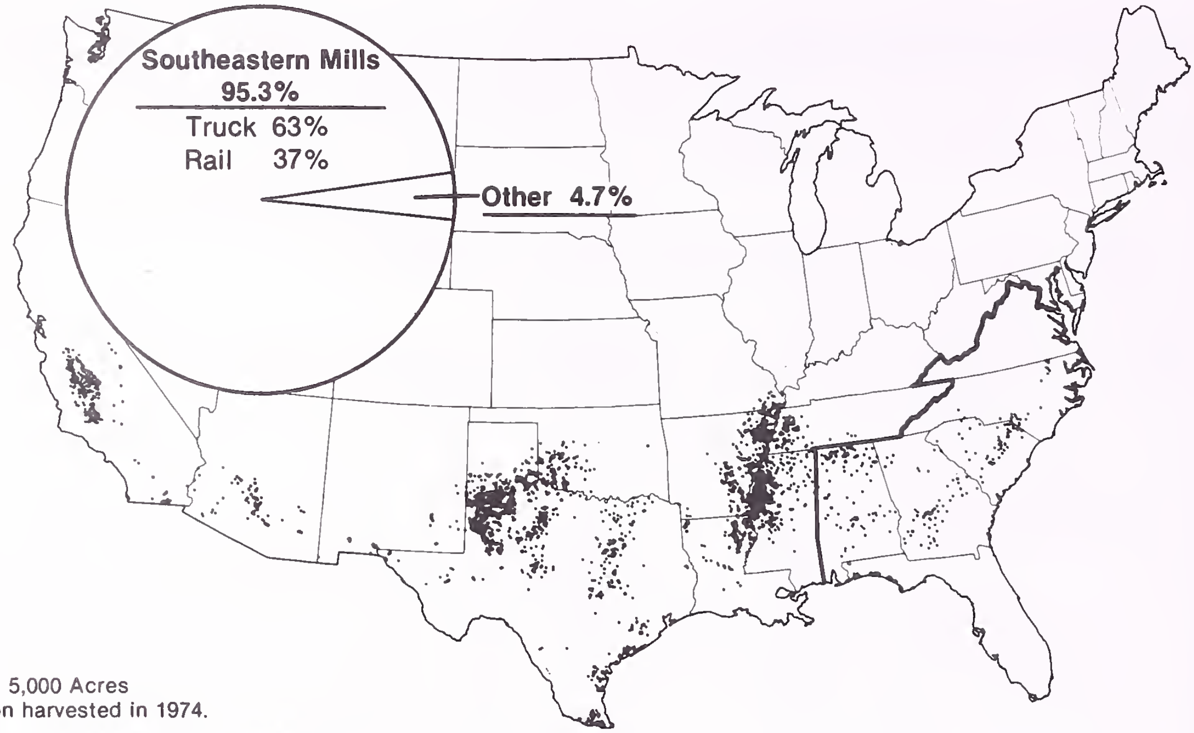
(1)	Round-trip miles	=	(Trip miles X 2) + Pickup + Delivery miles
	4,846 miles	=	(2,398 miles X 2) + 50 miles
(2)	Round-trip drive time	=	(Round-trip miles X 0.02 hour per mile
	96.92 hours	=	4,846 miles X 0.02 hour per mile
(3)	Hours per round trip	=	Drive time + Pickup & Delivery + Check time + Layover time
	133.17 hours	=	96.92 hours + 8 hours + 0.5 hour + 32 hours
(4)	Round trips per year	=	Work hours available ÷ hours per round trip
	26.64 trips	=	3,281.5 hours ÷ 133.17 hours
(5)	Annual mileage	=	Round trips per year X Round-trip miles
	119,412 miles	=	24.64 trips X 4,846 miles

Appendix 4 Shipments of cotton from warehouses, by mode, by major cotton-producing regions, 1975

Appendix 4 - Map A

Cotton Movements From Southeastern Origins - 1975

Percentage Shipments to Major Destinations and Modal Shares

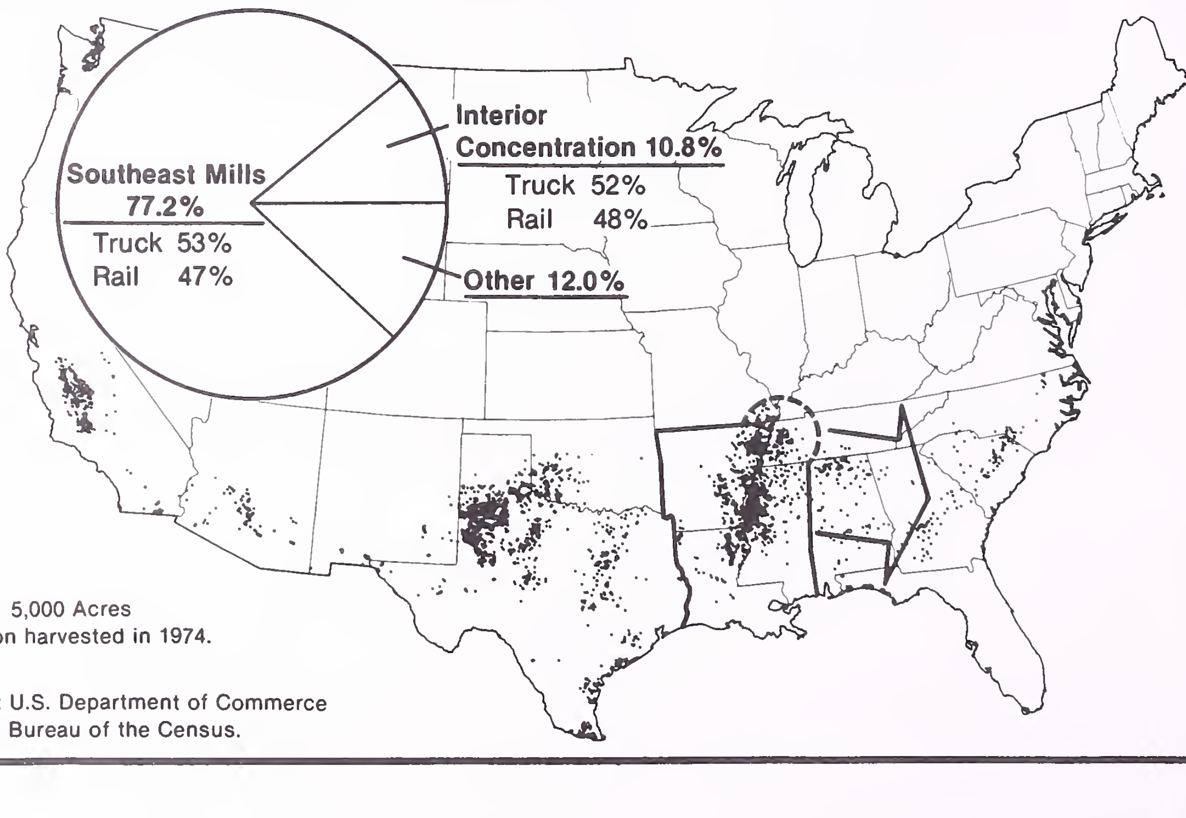


1 dot = 5,000 Acres
of cotton harvested in 1974.

Appendix 4 - Map B

Cotton Movements From Delta Origins - 1975

Percentage Shipments to Major Destinations and Modal Shares



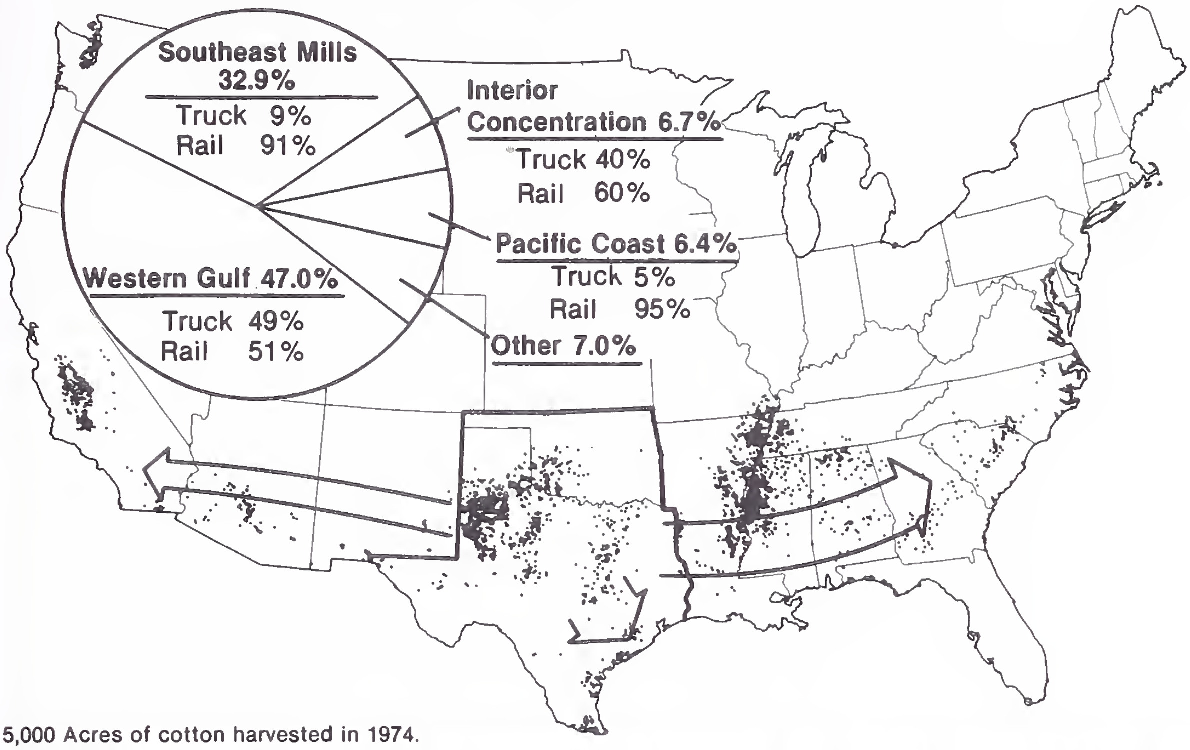
1 dot = 5,000 Acres
of cotton harvested in 1974.

Source: U.S. Department of Commerce
Bureau of the Census.

Appendix 4 - Map C

Cotton Movements From Southwest Origins - 1975

Percentage Shipments to Major Destinations and Modal Shares

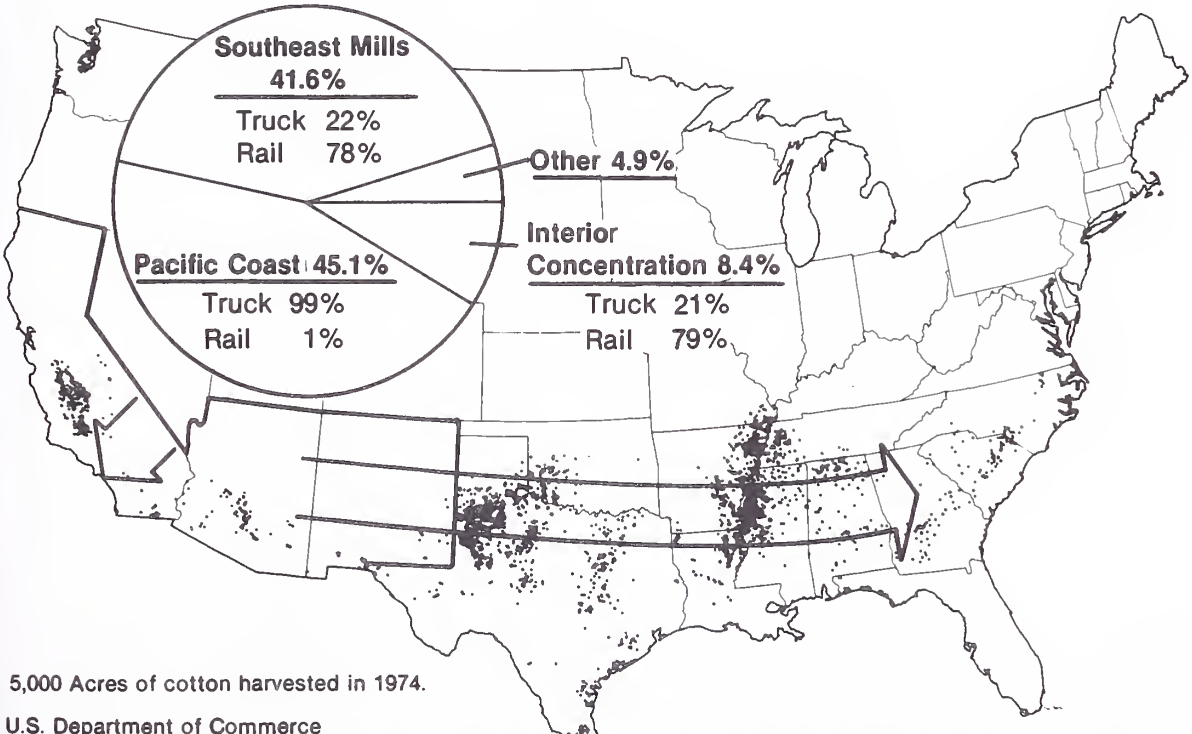


1 dot = 5,000 Acres of cotton harvested in 1974.

Appendix 4 - Map D

Cotton Movements From Western Origins - 1975

Percentage Shipments to Major Destinations and Modal Shares



1 dot = 5,000 Acres of cotton harvested in 1974.

Source: U.S. Department of Commerce
Bureau of the Census.

Appendix 5 List of selected contracts on file at the Interstate Commerce Commission provided by the ICC Contract Advisory Service.

The contracts listed below were selected to present the variety of approaches used by shippers and carriers to establish contracts designed to be mutually beneficial. Even though some contracts involve commodities and rail equipment that differ considerably from baled cotton and the general purpose, 50-foot boxcar commonly used for cotton movements, many of the contract provisions could be adapted to cotton movements.

Railroad Transportation Contracts Filed under the Staggers Rail Act of 1980

Railroad/Contract Tariff	Commodity or service	Summary
Seaboard Coast Line ICC-SCL-C-002 Effective 1/18/81	Phosphate Rock	This is a 5-year joint contract with the Illinois Central Gulf Railroad Co. and the Louisville and Nashville Railroad Co. for the movement of phosphate rock in covered hopper cars. The route miles are 1,350 and 1,400 miles with a base rate of 1,825 cents per net ton. The contract also contains provisions for annual volume, cancellation, rate adjustments, free time and detention, and penalty for nonperformance.
Seaboard Coast Line ICC-SCL-C-0003 (Short notice exemption under 49 U.S.C. 10505) Effective 1/18/81	Car Utilization	This is a 1-year contract providing a car utilization/mileage agreement that results in a refund of 25¢ per mile by the carrier for loaded miles in excess of empty miles, and a payment of 25¢ by the shipper for empty miles in excess of loaded miles, on the movement of multilevel flatcars moving on the SCL-L&N. The contract also contains special allowance and escalation features.
Chicago, Milwaukee, St. Paul & Pacific ICC-MILW-C-001 Effective 1/21/81	Corn, Soybeans	This is a joint line contract with the B&O, C&O, and MILW for the movement of corn and soybeans from 20 different origin stations located on the MILW in Iowa to Norfolk, VA and Baltimore, MD for export. The base rate of 106 1/2 cents/cwt. and 109 1/2 cents/cwt. will apply depending on origin. The contract also includes provisions covering annual volume requirements, guaranteed car supply, multiple origin loading, trainload rates, transit time commitments, future Ex Parte general increases, and fuel surcharges.

Railroad/Contract Tariff	Commodity or service	Summary
Norfolk and Western ICC-NW-C-5001 Effective 1/22/81	Coal	This is a contract by the railroad and the transshipper whereby each party would make service commitments designed to provide improved service in all phases of the coal transshipment process. The contract would cover numerous vessels loaded at Lamberts Point, VA with coal for export. The railroad would make commitments as to supplying cars, moving the cars, and berthing the vessel. The transshipper would make commitments as to loading the coal in a limited time from a limited number of mines and would guarantee to have a vessel available to load. These service commitments are intended to improve coordination between the parties and to improve utilization.
Consolidated Rail Corporation ICC-CR-C-0004 Effective 1/13/81	Service Charge	This 5-year contract provides Conrail a service charge of $107.00 per loaded car of miscellaneous commodities received or shipped on Conrail's system. Conrail in turn will rehabilitate and maintain a 3.5-mile section of track for the terms of the contract. The contract also contains a service failure penalty and an annual volume commitment.
Consolidated Rail Corporation ICC-CR-C-0005 Effective 2/1/81	Agricultural Implements	This 3-year contract on the movements of agricultural implements provides Conrail with a $300 charge per car shipped. This charge is subject to escalation in 1982, 1983 and 1984. The contract charge is in addition to existing line-haul rates. A refund of the charge will be made when any of the assigned cars move back to or via Conrail under load. Conrail will provide the shipper with approximately 380 assigned flatcars.

Railroad/Contract Tariff	Commodity or service	Summary
Atchison, Topeka and Sante Fe ICC-ATSF-C-0002 Effective 1/26/81	Corn Syrup	This contract provides for a 5-year annual volume rate on corn syrup, in shipper-owned or leased tank cars. The rates range from $2.37 per 100-pounds to $2.65 per 100-pounds for mileage ranging from 1,350 to 2,300 miles. The contract applies only via the Atchison, Topeka and Santa Fe, Chicago and North Western Railway and the Modesto and Empire Traction Company. The contract also provides that rates are to be subject to an escalation agreement and that rates and charges will allow one transit stop for storage purposes, subject to an additional charge.
Virginia & Maryland Railroad ICC-VAMD 4000 Effective 9/11/80	Imported steel wire and cable	A 6-month contract requiring a minimum movement of 14 carloads from Norfolk or Portsmouth, VA to Cape Charles, VA. Carrier guarantees car supply. Failure to provide cars result in carrier paying port terminal demurrage charges. Also, carrier will reimburse shipper up to $100 for each car not provided if shipper is forced to use other modes because of lack of cars.
Elgin, Joliet and Eastern ICC-EJE-4183 Effective 9/1/80	Sheet steel	A joint line contract (EJ&E and MILW) naming annual volume rates on sheet steel from East Chicago, Gary, and Indian Harbor, Ind., to Milwaukee. Carriers guarantee monthly car supply and shipper guarantees a minimum of 150,000 tons per year with lower rates for volumes exceeding 250,000 tons.
Detroit, Toledo & Ironton ICC-DTI-4426 Effective 9/1/80	Coke	A 5-year contract whereby shipper will route 95% of coke to its Trenton, Mich., plant via the DT&I. In return for the volume guarantee, DT&I will give shipper car allowances ranging from $5 to $8 per car paid entirely from DT&I's proportion of joint line revenues. DT&I will also pay $10 per car allowances on cars not meeting specified service schedules.

Railroad/Contract Tariff	Commodity or service	Summary
Milwaukee ICC-MILW-7015 Effective 9/10/80	Freight-all kind, TOFC	A 6-month contract whereby a shipper association will guarantee 1,250 trailer-loads during a 6-month period from Chicago to Twin Cities, Minn. Carrier guarantees a minimum of 17 trains per week to provide service to handle the TOFC traffic.
Southern Pacific ICC-SP-4575 Effective 2/2/81	Automobiles, Auto Parts	This 3-month contract with Chrysler Corporation requires a minimum volume of 900 carloads shipped over SP and SSW lines. The carriers will, at the end of each 30-day period, refund to Chrysler a sum equal to 5 percent of the total revenues derived from shipments under the agreement. If, at the end of the contract, Chrysler has not met the required volume, Chrysler shall return the refund to SP. SP requested and was granted permission to advance the effective date from 2/25/81 to 2/2/81.
Seaboard Coast Line- Louisville and Nashville ICC-SCL-7037-A Effective 9/23/81	Freight-all kinds, TOFC	A 1-year annual volume contract requiring a shipper association to ship 3,000 trailers from Charlotte, NC and Greenwood, SC to Chicago.
Conrail ICC-CR-4412	Mineral, wool	A 1-year contract whereby Owens Corning will pay Conrail an additional $250 charge per car and guarantee 500 carloads from Selkirk, NY to Chicago for further movement to West Coast points. Conrail will guarantee car supply and that guarantee shipments will be interchanged with the BN at Chicago within 70 hours. Under a credit/debit system, Conrail will pay Owens Corning $50 for each excess debit for late delivery to BN interchange. Conrail will also refund $50 per car for each car ordered but not supplied.

Railroad/Contract Tariff	Commodity or service	Summary
Missouri Pacific ICC-MP-C-0004 Effective 4/2/81	Freight-all-kinds, TOFC, COFC.	This contract between MP and 12 different shippers is to remain in effect until canceled by the shippers of the MP. The contract applies only in connection with shipments moving under Plans II-1/2 (FAK) and III (FAK) in TOFC/COFC service. The shipper agrees to ship a minimum of 100 trailerloads per month from 3 origins to 20 destination ramp locations for representative distances of 150, 350, 600, 1150, 1350 and 1600 miles. Initially one-half of the non-contract 70M lb. FAK two-trailer rate will be charged for each trailerload shipped. At the end of each month an additional charge will be assessed on weight in excess of an average trailerload weight of 35,000 lbs. Shipper pays carrier a penalty charge for each trailerload short of the monthly requirement. Adjustments are made at end of each month. The initial line haul charges are subject to X311S and future fuel surcharges authorized by the ICC. It is estimated that 187 "FC" type cars and 525 trailers/containers are sufficient to transport the mimimum monthly volume requirement. MP owns or leases approximately 310 "FC" type cars and approximately 2,775 general service vans. In addition, MP as a Trailer Train participant can draw on their national fleet of approximately 46,000 "FA" type cars.
Consolidated Rail Corp. ICC-CR-009 Effective 3/21/81	Various commodities	In this 3-year contract on various commodities, Conrail agrees to own, service, and maintain an industrial lead track and the shipper agrees to pay a $50 surcharge per car in addition to all rates and assessorial charges on inbound cars. A guaranteed annual volume clause and associated penalty charges are included. The service charge is subject to the AAR's escalation index.

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Office of Transportation

U. S. Department of Agriculture

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