TEXAS' ESTIMATED TOTAL TRANSPORTATION BILL FOR PASSENGER AND FREIGHT TRANSPORTATION

by

William F. McFarland
Research Economist

and

Stanley R. Holmes
Research Assistant

Texas Transportation Institute
Texas A&M University
College Station, Texas

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Overview

- This paper presents Texas' total transportation "bill" for the years 1967 and 1972, estimated using methods similar to those used by the Transportation Association of America to calculate the United States' total transportation bill. (Estimates presented in this paper are to be considered "preliminary estimates" and are currently being revised.)

- Texas' total transportation "bill" is comprised of the total private costs, including transportation-related taxes, of transporting passengers and freight in Texas. It is computed as the sum of the state's passenger transportation bill and the state's freight transportation bill.

- Texas' total transportation bill is estimated at $11,177 million in 1967 and $17,793 million in 1972. These amounts represent 27.88 percent and 28.50 percent of the Gross Texas Products of $40,089 and $62,437 in these respective years. (Gross Texas Product is the measure of the total value of goods and services produced in Texas.)

- Assuming that 1972 transportation costs, relative to total output, were the same in succeeding years as in 1972, preliminary estimates of Texas' total transportation bill in more recent years are: $19,658 million in 1973; $20,645 million in 1974; $22,472 million in 1975; and $25,073 million in 1976. Gross Texas Product for these years is: $68,976 million in 1973; $72,440 million in 1974; $78,848 million projected for 1975; and $87,974 million projected for 1976. (Considering recent cost increases for transportation vehicles, fuels, insurance, etc., these estimates probably are "conservative.")

- The Transportation Association of America's estimates for the U.S. transportation bills are as follows (in millions of dollars):

	1967	1972
Freight Transportation Bill	$ 72,092	$115,739
Passenger Transportation Bill	88,316	139,219
Total Bill	$160,408	$254,958

- The United States' total estimated transportation bills for 1967 and 1972 comprise 20.14 percent and 21.77 percent of the Gross National Products of $796,300 million and $1,171,100 million for these respective years. (Note: The TAA also reports percentages of 19.41 percent and 21.07 percent for these years; these percentages reflect exclusion of interest on the debt for private automobiles and also an adjustment for government expenditures, less duplications.)

- The percentages that Texas' transportation bills comprise of total output are considerably higher than the analogous national percentages (27.88% and 28.50% for Texas in 1967 and 1972 as compared to 20.14% and 21.77% for the United States), being 38% higher in 1967 and 31% higher in 1972. Texas' higher percentages reflect the geographic dispersion of the states' many metropolitan areas, the high level of mobility of Texans, and the role of Texas in providing freight transportation not only to transport Texas agriculture, livestock, petroleum, and other manufactured products but also to transport other states' products to the Gulf for shipment to other areas.

- The United States' transportation bill as a percentage of Gross National Product, has fluctuated slightly over time (usually considerably less than one percent from year to year) but also has shown a gradual increase over time, increasing over the last decade by about one percent relative to Gross National Product. This increase undoubtedly is the result of numerous trends in transportation and perhaps indicates a decline in efficiency in transportation, as measured by transportation costs. (Since no measure is included in these costs for "value of time" for passengers and freight, it is not truly a "total" cost, and this perhaps should be kept in mind.)

- Texas total transportation bill, as a percent of Gross State Product, increased by about 2.2 percent between 1967 and 1972. This may be indicative of a decrease in transportation efficiency (as measured in this one, albeit limited, way) or may simply be a cyclical variation.

- Texas' freight transportation bill is estimated at $5,041 million in 1967 and $8,006 million in 1972, representing 12.57 percent and 12.82 percent of Gross Texas Product in these respective years. Texas' estimated freight transportation bills are divided among modes as follows:

	1967	1972
Highway (truck and bus transport)	72.6%	76.0%
Rail	9.9	9.6
Water	6.8	5.5
Air	0.6	0.8
Oil Pipeline	7.5	6.4
Shipper and other costs	2.6	1.7
	100.0%	100.0%

- Texas' passenger transportation bill is estimated at $6,137 million in 1967 and $9,787 million in 1972, representing 15.31 percent and 15.68 percent of Gross Texas Product. Texas' estimated passenger transportation bills are divided among modes as follows:

	1967	1972
Automobile	93.0%	93.7%
Bus and Taxi	1.9	1.4
Air	5.0	4.9
Rail	0.1	0.0*
Total	100.0%	100.0%

*Less than 0.05 percent (i.e., 0.03 percent).

- Highway-related travel dominates Texas transportation, comprising as it does 76% of Texas' freight bill and almost 94% of Texas' passenger bill. Highway-related freight includes ICC regulated and non-regulated motor carriers, private trucking fleets, intrastate carriers, delivery and service trucks, and freight transport by bus. Highway-related passenger travel includes travel by automobiles, motorcycles, taxis, intercity buses, bus transit, and other highway vehicles.

- Although non-highway modes comprise a small percentage of the total transportation bill relative to highways, they nevertheless provide critical services to Texans and the Texas economy. Rail, water, and pipeline modes provide transportation for bulky and hazardous liquids and cargoes. Air transport provides fast, efficient transport for both passenger and freight.

- The overall importance of transportation is reflected in the cost of goods to consumers. About 41¢ of the average consumer dollar goes for production costs and 59¢ for distribution costs, including marketing expenses. Over half of this 59¢ goes for physical distribution (transportation and warehousing) and less than half goes to marketing.

Introduction

All modes of transportation have played an important role in economic growth and economic efficiency in Texas and the United States. The importance of transportation to the nation's economy is supported not only by numerous historical studies but also by close relationships among different transportation and economic statistics. For example, the Transportation Association of America (TAA) has developed data that show the close relationship between the nation's Gross National Product (GNP) and ton-miles of freight transported in the United States. A similar relationship can be shown between the analogous Gross Texas Product (GTP) and Texas' freight ton-miles and passenger miles.

Very few people would argue with the importance of all modes of transportation in the economy of the U.S. or Texas. Nevertheless, it is important not only to recognize this importance in general terms, but also to develop and interpret specific data and relationships that can be used by state and national officials in determining "where we are," "how we got there," and "where we should go" with respect to transportation.

Although studies at the national level by the Transportation Association of America have estimated the nation's freight and passenger transportation bills, no estimates have been made previously for Texas. This technical note presents the results of an attempt by researchers at the Texas Transportation Institute to fill this void. Although these estimates should be regarded as preliminary in nature, we feel confident that the general magnitudes are of sufficient accuracy to provide meaningful interpretative results.

Texas' Transportation Bill

Texas' transportation bill is estimated for the years 1967 and 1972 using, as closely as possible, the same method used by the Transportation Association of America the estimate the U.S. transportation bill in the publication entitled Transportation Facts and Trends. The TAA estimates the nation's transportation bill in two parts, the passenger bill and the freight bill, and similar components are developed herein for Texas. The years 1967 and 1972 are chosen for making preliminary estimates for Texas for two reasons. First, U.S. Census data that are available on some transportation expenses for these years are not available for other recent years. Second, an input-output study for Texas gives some data for 1967 that is not available for other years. In using the TAA method of calculating transportation costs, the perspective that is taken is essentially from the viewpoint of the private sector of transportation. Thus, there is no break-down of public transportation expenditures by different levels of government.

Estimates of Texas' Passenger Bill

Table 1 gives estimates of the total bills for transporting passengers in both private and for-hire transportation for the years 1967 and 1972. The largest component of Texas' passenger bill is private transportation. This category includes purchases in Texas of new and used autos, pickups, and motorcycles by consumers, businesses, and government. Also included are costs for fuel, parts, maintenance, and other costs of operating vehicles. Auto insurance costs are included to the extent that they exceed repair costs. Also included is an estimate of the interest payments that consumers in Texas pay on automobiles.

TABLE 1

TEXAS' ESTIMATED PASSENGER BILL FOR 1967 AND 1972
(in millions of dollars)

	1967	1972
Private Transportation*		
Automotive Dealer[1]	$3,290.2	$5,500.3
Gasoline Stations[1]	1,340.8	1,818.9
Auto Repair[1]	388.4	616.0
Auto Insurance[2]	248.5	429.7
Parking Meters[3]	3.4	5.3
Auto Registration[3]	74.2	101.4
Drivers Licenses[3]	6.7	9.8
Tolls[3]	10.2	17.1
Interest on Debt[4]	344.6	671.8
Total Private Passenger Bill	$5,707.0	$9,170.3
For-Hire Transportation		
Bus and Taxi[5]	$ 116.7	$ 134.0
Air[6]	306.7	479.8
Rail[7]	6.1	3.0
Total For-Hire Passenger Bill	$ 429.5	$ 616.8
TOTAL PASSENGER BILL	$6,136.5	$9,787.1

*"Private transportation" is mainly for automobile travel and is so denoted in the overview at the beginning of the paper and in Table 3.

Note: See Appendix A for References to Tables 1 and 2 and Appendix B for an explanation of the method used for calculating values appearing in Tables 1 and 2.

The for-hire category of passenger transportation includes revenues of intercity buses, bus transit, and taxis (which we have not yet separated out into separate categories) and revenues for air and rail passenger travel. The air travel cost is the sum of the costs for intrastate trips plus the cost of other trips enplaned in Texas. Rail travel cost is the cost of intrastate rail trips plus the cost of all other traips in Texas, with this latter cost being that which is allocated to Texas (as occurring in Texas) by the Texas Railroad Commission.

Estimates of Texas' Freight Bill

Table 2 gives estimates of the total bills for transporting freight in Texas by different transportation modes, for the years 1967 and 1972. The largest component of the state's freight bill is highway-related transport, which is divided into subcategories for intercity motor transport, local pickup and delivery and service calls by truck, and last and least is the estimated bill for bus freight. Estimates also are given for rail, water, and oil pipeline bills, each of which is of the same general magnitude. Air freight, which is the smallest, shows the largest percent increase, more than doubling between 1967 and 1972. The "other" category is an estimate of the transportation bills of freight forwarders, REA Express, and other shipper costs. The freight bill for gas transmission lines is not included in this estimate since TAA omits this category from their estimates.

Texas' Transportation Bill Relative to the U.S. Transportation Bill and Gross Texas Product

Table 3 gives a summary of Tables 1 and 2, and shows the percentage distribution of Texas' total transportation bill. Table 4 shows similar

TABLE 2

TEXAS' ESTIMATED FREIGHT BILL FOR 1967 AND 1972
(in millions of dollars)

	1967	1972
Highway		
Intercity[8]	$2,025.1	$2,918.3
Local[9]	1,630.7	3,158.2
Bus[10]	4.4	6.9
Total Highway	$3,660.2	$6,083.4
Rail[11]	$ 499.0	772.4
Water[12]	340.7	444.3
Air[13]	29.2	61.8
Oil Pipeline[14]	379.3	510.4
Other[15]	132.5	133.8
TOTAL FREIGHT BILL	$5,040.9	$8,006.1

TABLE 3

AMOUNT AND PERCENTAGE DISTRIBUTION OF TEXAS' TOTAL TRANSPORTATION BILL, FOR 1967 AND 1972

	1967		1972	
	Millions of Dollars	Percent of Total	Millions of Dollars	Percent of Total
Passenger Bill				
Automobile	$ 5,707.0	51.06%	$ 9,170.3	51.54%
Bus and Taxi	116.7	1.04	134.0	.75
Air	306.7	2.74	479.8	2.70
Rail	6.1	.05	3.0	.02
Total Passenger	$ 6,136.5	54.89%	$ 9,787.1	55.01%
Freight Bill				
Highway	$ 3,660.2	32.75%	$ 6,083.4	34.19%
Rail	499.0	4.47	772.4	4.34
Water	340.7	3.05	444.3	2.49
Air	29.2	.26	61.8	.35
Oil Pipeline	379.2	3.39	510.4	2.87
Other	132.5	1.19	133.8	.75
Total Freight	$ 5,040.8	45.11%	$ 8,006.1	44.99%
GRAND TOTAL	$11,177.3	100.00%	$17,793.2	100.00%

TABLE 4

AMOUNT AND PERCENTAGE DISTRIBUTION OF THE UNITED STATES' TOTAL TRANSPORTATION BILL FOR 1967 AND 1972

	1967		1972	
	Millions of Dollars	Percent of Total	Millions of Dollars	Percent of Total
Passenger Bill				
Automobile	$ 75,794	47.25%	$118,921	46.64%
Bus and Taxi	4,087	2.55	5,611	2.20
Air	7,579	4.73	14,003	5.49
Rail	520	.32	402	.16
Water	336	.21	282	.11
Total Passenger	$ 88,316	55.06%	$139,219	54.60%
Freight Bill				
Highway	$ 53,521	33.37%	$ 92,083	36.12%
Rail	10,148	6.33	13,105	5.14
Water	4,305	2.68	5,587	2.19
Air	1,063	.66	1,478	.58
Oil Pipeline	1,157	.72	1,583	.62
Other	1,898	1.18	1,903	.75
Total Freight	$ 72,092	44.94%	$115,739	45.40%
GRAND TOTAL	$160,408	100.00%	$254,958	100.00%

information for the U.S. for 1967 and 1972 as developed by the Transportation Association of America. Table 5 shows the percent that the transportation bills for Texas and the U.S. comprise of their respective gross products. The Gross Texas Product was $40,089 million in 1967 and $62,437 million in 1972. The Gross National Product for the United States was $796.3 billion in 1967 and $1,171.1 billion in 1972.

Table 6 shows the percent that Texas' transportation bills are of the United States' corresponding bills, in 1967 and 1972. Texas' total transportation bill for passengers and freight combined comprised 7.19 percent of the national bill in 1967 and 7.05 percent in 1972. Gross Texas Product, on the other hand, represented 5.03 percent of the Gross National Product in 1967 and 5.33 percent in 1972. However, both Texas' passenger bill and its freight bill declined as percentages of the national totals between 1967 and 1972 even though Gross Texas Product increased as a percentage of Gross National Product.

TABLE 5

TRANSPORTATION BILLS FOR TEXAS AND U.S. AS PERCENT OF THEIR RESPECTIVE TOTAL OUTPUTS FOR 1967 AND 1972

	1967		1972	
	Texas	U.S.	Texas	U.S.
Freight Bill	12.57%	9.05%	12.82%	9.88%
Passenger Bill	15.31	11.09	15.68	11.89
Total Transportation Bill	27.88	20.14	28.50	21.77

TABLE 6

TEXAS' TRANSPORTATION BILLS AND TOTAL PRODUCT AS PERCENT OF U.S. TOTALS FOR 1967 AND 1972

	1967	1972
Freight Bill	6.99%	6.92%
Passenger Bill	7.36	7.16
Total Transportation Bill	7.19	7.05
Total Product*	5.03	5.33

*This row shows Gross Texas Product as a percent of Gross National Product.

Concluding Remarks

There are several ways in which transportation's significance in the Texas economy is demonstrated. This paper is limited to a preliminary review of only one of these, the transportation "bill" for the state. Preliminary estimates of the state's transportation bills for passenger and freight transport calculated using the Transportation Association of America's method indicate transportation expenditures for Texas of $11,177.4 million in 1967 and $17,793.2 million in 1972, representing 27.88 percent and 28.50 percent of Gross Texas Product in these years. These Texas values can be compared to the analogous figures calculated by TAA for the entire U.S.; the U.S. freight and passenger bills were $160,408 million in 1967 and $254,958 million in 1972. These U.S. values represent 20.14 percent of Gross National Product in 1967 and 21.77 percent in 1972.

Thus, the Texas transportation bill as a percent of Gross Texas Product has been from about 30 to 40 (actually 31 to 38 for 1967 and 1972) percent higher than the U.S. transportation bill as a percentage of Gross National Product. That the state's percentage is considerably higher is indicative of the geographic dispersion of the state's many metropolitan areas, the high level of mobility of Texans, and the role of Texas in providing freight transportation not only to transport Texas agriculture, petroleum, and manufactured products but also to transport other states' products to the Gulf for shipment to other areas.

The overall importance of transportation is further reflected in the cost of goods to consumers. About 41¢ of the average consumer dollar goes for production costs and 59¢ for distribution costs, including marketing expenses. Over half of this 59¢ goes for physical distribution (transportation and warehousing) and less than half goes to marketing.

One factor that should perhaps be the cause of concern is the relatively low Texas public expenditures for transportation. Although Texas total transportation expenditures relative to total state product are about 30 to 40 percent higher than those for the nation as a whole, most states have considerably higher taxes than Texas and also receive back a higher relative percentage of federal aid for transportation. Also, the high benefit-cost ratios that are currently being given by transportation projects indicate a possible imbalance between public and private transportation expenditures in Texas. (There is an imbalance if increases in public expenditures cause corresponding, larger decrease in private expenditures.)

It is important that we improve our understanding of the overall cost of transportation and that we better determine the interrelationships between public and private expenditures for different transportation modes. This is especially important at present because we are now at a critical point in time with respect to making numerous decisions on transportation. Historical perspective is important to recognize that the benefits we currently derive from our transportation system are based on substantial investments that were made in facilities and equipment in previous years.

APPENDIX A

LIST OF SOURCES FOR TABLES 1 AND 2 IN TEXT

Sources for Tables 1 and 2

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APPENDIX B

EXPLANATION OF METHOD USED FOR CALCULATING TEXAS PASSENGER AND FREIGHT BILLS FOR 1967 AND 1972

Tables 1 and 2 represent estimates of the direct expenditures or "transportation bill" in Texas for the movement of people and freight respectively. The figures show the relative magnitude of the costs of various transportation modes and at the same time the relative magnitude of the costs of private versus for-hire transportation in the state for 1967 and 1972. Therefore, the information provided by the tables is due directly to the state level characteristics of the data. The following section is a documentation of the sources and methodology used in developing the tables of transportation expenditure data at the state level.

Estimates of the state's passenger bill and freight bill were obtained by employing methodology similar to that used by the Transportation Association of America (TAA) in their data collection for Transportation Facts and Trends (1). As with the TAA data, each transportation mode was examined separately. Figures were assembled in order to characterize as completely and accurately as possible each mode's direct contribution to the total Texas transportation expenditures.

The state's total passenger bill shown in Table 1 is composed of two major elements, private passenger transportation (automobile) and for-hire transportation (bus, rail and air). Under the heading of private transportation censal figures for initial automobile costs, auto maintenance, and operating expenses were gathered at the state level for the respective years (2). Other components of direct private transportation expenditures in the state such as tolls, auto registrations, and license fees were gathered from the U.S. Department of Transportation state level data (3). The auto insurance expenditures in private transportation were obtained from the state insurance commission (4). These figures represent insurance premiums paid net of repair claims made by the insured. Double counting of

insured auto repairs was avoided by using the net premium figure. Calculation of another large component of private passenger transportation, the interest on automobile owners debt not included in the initial automobile cost, was made possible by the use of TAA methodology (1). The interest figure was determined by using 15 percent of the annual new and used car sales. In consequence detailed pictures of the 1967 and 1972 total private passenger bill were constructed.

For-hire passenger transportation, however, was not as easily determined due to the lack of state level data. Bus, airline and railroad operations are not clearly defined at the state level. The exact criteria selected in order to define state operations and the non-availability of state level data created a diversion from the methodology employed by TAA. Although the method by which the figures were generated differs from the TAA approach, it achieved results similar to those that would have been generated using the TAA methodology.

In order to arrive at estimates of bus, taxi and city transit passenger bills in Texas for 1967 and 1972, the Texas input-output study figures were used (5). The 1967 figures come directly from the study while the 1972 estimates for Texas represent an updated 1967 figure. Bus, taxi and transit passenger bills for 1967 were multiplied by the proportion of 1967 to 1972 TAA bus, taxi and transit costs for the U.S. (6). As a result, the updated 1972 figure for Texas was derived assuming that the state passenger bill with respect to intercity and city transit changed the same as the nation.

Air passenger transportation expenditures in the state for both years were calculated by totaling the revenues attributable to Texas operations for each airline serving the state (7). Total airline revenues were

apportioned by the individual carrier's annual percentage of Texas enplaned passengers to total enplaned passengers (8).

Almost the entire rail passenger transportation bill was derived from AMTRAK data presented by TTI in 1972 (9). Estimates of 1972 rail passenger miles were obtained by adjusting 1975 rail passenger miles per line by the percentage change in ridership per line between 1972 and 1975. The AMTRAK portion of the total rail passenger expenditures for Texas was achieved by multiplying the estimated revenue per passenger mile in the same TTI study by the estimated 1972 passenger miles. A total figure for the Texas rail passenger bill for 1972 was calculated by adding the AMTRAK estimate to the passenger revenue data obtained by the Railroad Commission of Texas for non-AMTRAK passenger rail lines (10). The total rail passenger bill for 1967 was calculated simply by summing the passenger revenues for Class I and Class II rail carriers as reported to the Railroad Commission of Texas.

In this manner, the yearly components of the total for-hire passenger bill for the state and the private passenger bill for the state were calculated. By summing these two figures for 1967 and 1972, estimates of the total passenger bill for Texas as shown in Table 1 were achieved.

The freight bill for Texas was estimated for each transportation mode in a manner which used available data in approaches similar to those taken for the derivation of the state's passenger bill.

Highway freight expenditures were estimated separately for intercity and local transportation. The Texas intercity motor freight bill was estimated by multiplying the percentage of Texas to total U.S. special fuels consumed in 1967 and 1972 by the total U.S. intercity motor freight bill for the respective years (3). While special fuel figures were available from the Federal Highway Administration of the U.S. Department of Transportation,

the national intercity freight expenditures were readily obtainable from the ICC (11). Since the majority of intercity motor freight is carried by trucks operating on special fuels the methodology for obtaining the intercity estimate is sound.

Total local motor freight expenditures in the state were also derived from the U.S. Department of Transportation data. The yearly percentages of total urban truck miles to total urban vehicle miles were assumed the same at both the national and state levels (3). By applying the percentages to available state urban vehicle miles, estimates of annual Texas urban truck miles were achieved. From these figures the total urban freight miles were broken down into light truck and heavy truck categories. A percentage of panel and pickup truck total truck miles was calculated to arrive at total light truck miles (12). Variable vehicle expenses per mile (13) were added to driver cost per mile for light vehicles and multipled by light truck miles. The driver cost per mile was estimated for both years by updating the 1958 TAA estimate of 15¢ in proportion to the increase in the average hourly wage of truck drivers (14). Heavy truck cost per mile calculations included the same annual estimates of driver costs, however, the variables expenses were based upon Class I and Class II carrier average costs (15). The heavy truck (driver and variable) costs were summed and multiplied by heavy truck urban freight miles in order to arrive at the remaining component of local motor freight costs. By adding the light and heavy truck costs a total local highway freight bill figure resulted for each year.

Railway freight data was much more readily available at the state level. The transportation bill of freight by rails for Texas was obtained by summing the freight revenues of all Class I and Class II railroad line operations within the state (11).

Yearly estimates of the state's water transportation bill were basically drawn from the 1967 input-output study for Texas (5). The 1967 water transportation output was used for the 1967 water transportation bill while the 1967 water transportation output was updated to yield the 1972 estimates. The ratios of 1967 and 1972 wholesale price indexes (16) and port tonnage (17) were multiplied by the 1967 water transportation output figures in order to achieve the 1972 update.

Air freight transportation figures were calculated in a manner similar to the air passenger transportation bill mentioned earlier. The state's air freight expenditures represent a portion of total airline freight revenues (8) allocated on the basis of the percentage of state enplaned freight tons to total enplaned tons for each air carrier (7).

A method similar to that used to calculate the water transportation bill for both years was employed to arrive at the state's pipeline transportation bill for 1967 and 1972. For 1967 the input-output study dollar output figure was used (5). The figure was updated to 1972 by the proportional change in estimated state level revenues calculated for the two years. The estimated state revenues were based upon the known wages paid to pipeline workers in Texas (18) and the wage to revenue relationship for all pipeline companies in the U.S. for the respective years (19). Since total U.S. pipeline wages were known along with total U.S. pipeline revenues, the same ratio was assumed to hold for the state.

A category of "Other Freight Costs" was included which is analogous to the combined categories of "Other Carriers" and "Other Shipper Costs" found in the TAA study (6). The proportion of the total U.S. freight bill which excludes other carriers and other shipper costs to the costs mentioned in the two categories was calculated for the U.S. from TAA data. The calculated

annual proportions were then multiplied by the sum of all other freight bill categories for each respective year to reveal the "Other Freight Costs" for Texas.

Although a few small portions of the total state transportation bill may have been omitted, there are no good methods to arrive at accurate figures for them. The figures generated and presented in the study represent the major transportation modes and their respective freight bills. Added details in attempts to be more inclusive may lead to the employment of less desirable techniques in order to compensate for the lack of data availability.

APPENDIX C

SOURCES FOR GROSS TEXAS PRODUCT AND DISTRIBUTION COSTS

Sources for Gross Texas Product and Distribution Costs

Estimates of Gross Texas Product for the years 1967-1974 are taken from Adair (20). Gross Texas Product for 1975 and 1976 are estimated as 5.2% of Gross National Product for 1975 and 1976 as reported in Kellner (21).

Source of the estimate that distribution costs comprise 59¢ of the consumers dollar, with over half of this 59¢ going for physical distribution is Sampson and Farris (22).

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