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16. Abstract <p>This report provides estimates of the value of outputs, inputs, and markets served by elements of the transportation services industries in Washington State. The study is an extension of <u>The Washington State Input-Output Study for 1982</u> by the inclusion of a detailed examination (by mode of transport) of purchase-sales relationships. Portions of the report address the conceptual and empirical problems in measuring regional interindustry flows in the transport sectors, and particularly the methodological limitations surrounding synthetic I/O models and survey approaches.</p> <p>A gross flows matrix (62 x 64), direct requirements table (59 x 59), and output multiplier matrix with households endogenous are included. Impact multipliers (value added, earnings, jobs) for the transport sectors are included.</p> <p>The study provides estimates of the economic importance of the transportation industry in Washington. The model facilitates the evaluation of the impact of autonomous changes in the demand for transportation services upon the rest of the regional economy, and the estimation of the impacts of changes in the rest-of-the-economy upon the demand for transportation services in Washington State.</p>			
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**THE WASHINGTON STATE TRANSPORT-ORIENTED
INPUT-OUTPUT STUDY FOR 1982**

by

Philip J. Bourque

Graduate School of Business Administration
University of Washington
Seattle, Washington

Washington State Transportation Center
WSDOT Technical Monitor
John Doyle
Director of Research

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THE WASHINGTON STATE TRANSPORT I/O MODEL

by
Philip J. Bourque
University of Washington

Summary

This report describes the formulation of a transport-oriented input-output model for Washington state as an extension of a more general study published earlier this year.* In 1982 more than 80,000 jobs, representing 3.9% of all state employment, were directly involved in providing transportation services on a commercial basis. It accounts for nearly 5% of the gross domestic product of Washington State. Such statistics attest to the importance of the industry in this state. Yet, very little is known about the value of its output, its markets, or its procurement impacts. This report attempts to provide estimates of such activities, by mode of transport, and impact multipliers associated with the demand for transportation services.

The central foci of attention are the conceptual and empirical difficulties associated with measuring input-output flows of the transport sector within the Washington economy. The Transportation Services sector in any regional input-output model poses significant problems related to the meaning of the term "regional" in a sector in which the factors of production are mobile, of the appropriate definition of included activity, and how its regional output should be measured.

This paper begins by forming a geographic model of the activities

* Bourque, Philip J. The Washington State Input-Output Study for 1982, Graduate School of Business Administration, University of Washington (March 1987).

of a regional transportation sector compatible with the rules of input-output accounting. How other studies measure transportation sector flows is discussed briefly. There follows a description of the empirical procedures used for estimating output, inputs, and sources of revenue for the Washington Transportation Services sectors. From the gross flows table, some summary observations about the dimensions of the industry are made. The report concludes with a discussion of transport multipliers.

The Transport Sector: Problem of Regional Identity

For purposes of an input-output analysis it is necessary to develop estimates of the value of output of each industry sector, the distribution of outlays for operating inputs to support its output, and the disposition of that output to the various industries which use its product. These estimates of output, purchases, and sales must be within the context of conventions appropriate to regional input-output accounting. These accounting conventions are broadly derived from the principles of national income accounting. However, the particulars of their application to regional accounts, and to the accounts for the Transportation Services sector in particular, have not yet been examined (let alone standardized) in significant detail.

For the Transportation Services sector of a regional economy, the estimation of output, purchases, and markets present numerous conceptual and empirical problems. In the first instance is the difficulty of defining the output of the Transportation Services sector in a regional context. In principle, the output of a sector is measured by the operating revenue generated by the resources (capital, labor) employed within the region. However, important elements of the Transport

Services sector (e.g., rail, air, water) are institutionally organized and operated on a systems basis which cross regional boundaries. The factors of production engaged within the Transportation Services sector are spatially mobile and their "place of output" cannot be as easily defined as those of a factory. The inter-regional mobility of capital (e.g., airplanes) and labor (pilots) suggest that the very notion of regional identity of output is to some extent inappropriate. However, the demand for comprehensive economic information at the state level, where economic planning and policy analysis is so important, justifies the search for an accommodation to what (in the case of certain transportation services) is an unnatural geographic entity for economic accounting.

A second complication is that input-output accounting conventions specify that the flows of goods and services be measured in terms of producers' prices. This assures that the revenue received by a producer equals outlays by purchasers. To insure this equating of the cost of a purchaser to the revenue of the producer, transportation and distribution margins must be treated as a purchaser's expense. The rule may be succinctly put: the purchaser pays the freight. This accounting rule is often inconsistent with actual market transactions since goods are frequently sold by producers on a delivered cost basis. In reality, purchasers of goods often do not know how much of the markup over producers' costs is associated with the prices they pay for inputs. Transporters of goods do not usually know the identity of the users of goods since they pass through marketing channels, nor do purchasers know how much of the value of their outlays represent transport costs for the same reason. This makes the use of surveys of transportation agents

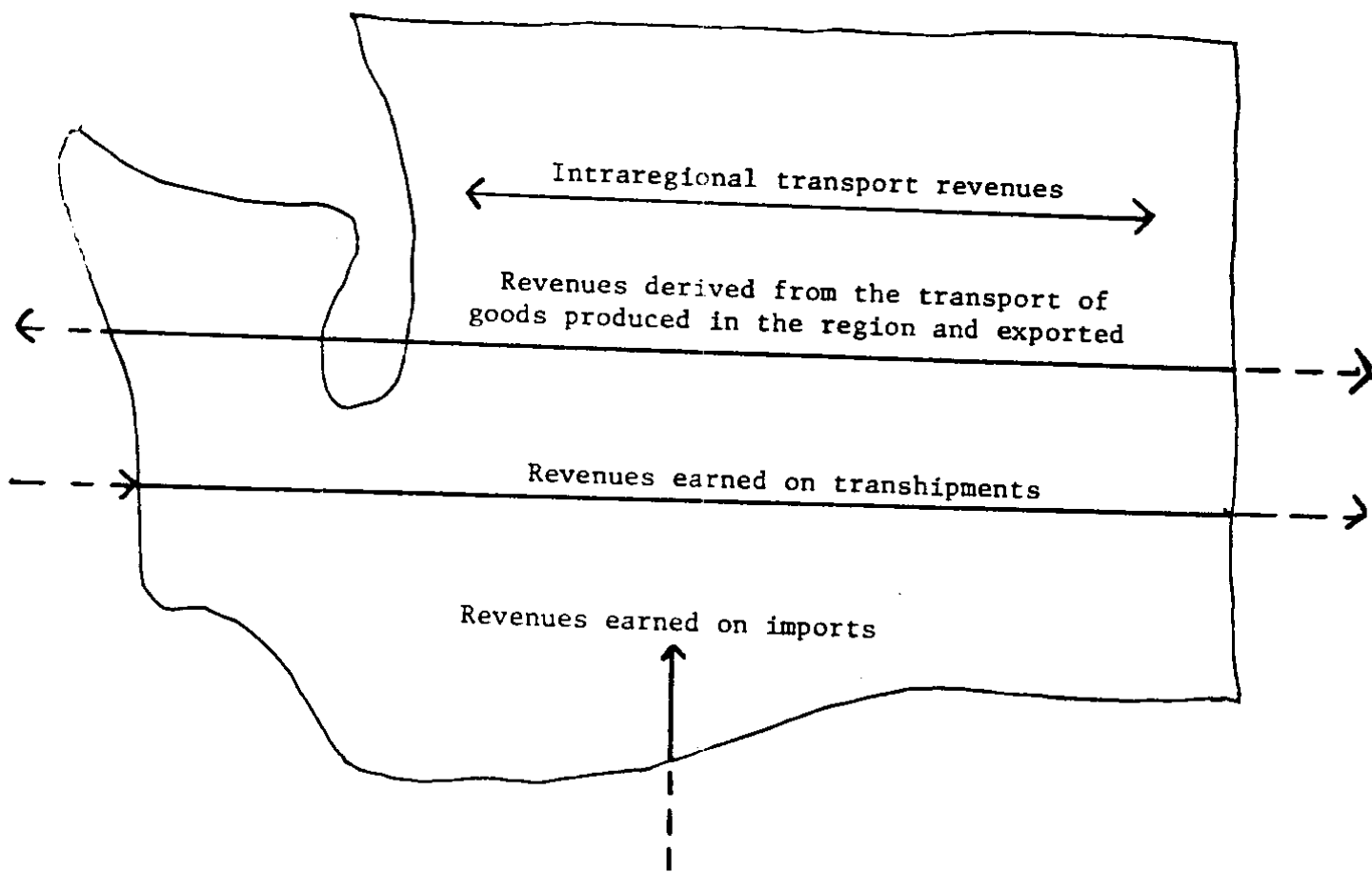
(for whom did you provide this service?) or recipients of delivered goods (how much of your purchase cost represented transport charges?) virtually meaningless.

Combining the notions that (a) the state is a desired geographic entity for the measurement of output, input, and markets, (b) the operating revenue of a sector is defined by its association with the resources employed within the state, and (c) the purchaser pays the freight, then a simple geographic model (Figure 1) of the Transport sector may be sketched. According to this scheme, the services provided by -- and hence operating revenues attributed to -- the Transport Services sector are derived from four sources, namely

- (a) Revenue from intra-regional traffic
- (b) Revenue from movement of goods produced within the region and exported to other regions
- (c) Revenue from movement of goods transshipped thru the region
- (d) Revenue from movement of goods produced outside the region and consumed within the region

The revenue sources shown in Figure 1 by solid lines represent revenue of the Washington Transportation Services sector because such movements take place within the state. Such transport revenues are either costs to purchasers within the state or they are costs attributable to out-of-state purchasers (the purchaser pays the freight). The dashed lines represent out-of-state transport services. These costs are imported transportation services by Washington purchasers, or they are non-Washington transportation services chargeable to out-of-state purchasers. Since input-output accounts are concerned with real flows, where and how payment for transport services

Figure 1: Revenue Sources of the Washington Transportation Services Sector



is made, the purely financial aspects (for example, ticket sales of airlines), are not germane. It is the revenue earned by the transport services provided by the resources employed within the region (and by whom and for whom) and the outlays to support that level of activity which count. In this scheme, the state of registration of capital (e.g., vehicle registration or vessel home port), or place of residence of labor, are not relevant; place of work is the dominating criterion.

Since transport carriers do not identify sources of revenue or operating expenditures within narrowly defined political borders, such a revenue scheme may appear quite artificial. As previously observed, transport carriers operate on a system basis, and systems may cross state lines. It is not a question of what portion of a carrier's operating revenue is received within the region, but what part could conceivably be apportioned to a region as a result of the labor and capital employed therein.

The principal value in the diagrammatic model of revenue flows is that it recognizes transportation services are associated with exports, imports, transshipments, and intra-regional movements. Unlike some methods of accounting for the activity of transport services, the model developed here recognizes that cross-hauling, or the simultaneous import and export of transportation services, occurs within a region. Out-of-state transport services associated with procurement by Washington business represent an import of transport services. Washington transport services rendered out-of-state buyers represents dollars of revenue derived from the export of transport services.

Alternative Approaches to Measurement

Given that regional input-output modelling has been the dominant framework in regional economic analysis for the past several decades, one might expect that accounting standards for measuring regional transportation services would have evolved. Yet, a survey of various input-output studies indicates only cursory attention to the measurement problems in the Transport Services sector.

There are two basic methods of construction of regional input-output tables. One of these is called the survey approach, although practically all such studies depend only partly upon surveys. Its identifying characteristic is that it exploits available regional information and minimizes reliance upon national relationships. However, such I/O studies have been extremely vague as to how information from field surveys facilitates the identification of export and import flows in the Transport Services sector. A perusal of several well-known regional studies of the survey variety were mute about how such survey information is actually used to measure the distribution of regional transport, output or sources of transportation industry revenue within a region. The reknown West Virginia study (1965) scarcely mentions the uniqueness of the transport sectors. Other survey-type studies, including those for Kansas (1965), St. Louis region (1967), and Tennessee (undated), do not discuss attendant details sufficiently to provide procedures others could emulate. The landmark Philadelphia study (1959) explicitly recognizes the desirability of distinguishing between transport revenues earned on intra-regional as contrasted to inter-regional shipments; recognizing the extreme difficulty of

obtaining appropriate information from transportation enterprises, that study used national transport cost coefficients, apparently unmodified.

As an alternative to survey models, less exacting, speedier, and low-cost non-survey techniques have dominated regional I/O modelling in recent years. I call these "synthetic" methods because such models are derived by manipulating of national input-output relationships to estimate regional flows and their derivative multipliers. Typically, as in RIMS II, simple location quotients (LQ's) are applied to national procurement patterns to derive proxy values for direct regional input-output coefficients. From the direct coefficients, estimates of multiplier relationships and inter-industry transactions may then be derived.

Synthetic models begin with the assumption that the total (or technical) procurement patterns in each sector in every region are identical to national purchase patterns, differing only in scale. This is patently untrue for every sector, even at the most highly detailed level of sector disaggregation for which national coefficients are available. Two examples of the technical structure from Washington State are illustrative: Washington's aircraft industry (dominated by Boeing) is largely final assembly work whose inputs differ significantly from those of aircraft parts producers; electricity production in Washington is uniquely dependent upon hydro-electric power sources with negligible inputs of coal, petroleum, or gas.

The use of national coefficients as the initial point of departure for estimating regional input patterns also adopts the national conventions in respect to the treatment of foreign imports. In the national table, comparable foreign imports (those with a domestically

produced counterpart) are treated as an addition to the output of the domestic producing industry and distributed to various users in the same pattern as the output of domestic producers is distributed. Applying national input coefficients to regions assumes a given industry in every region is equally dependent upon foreign sources of supply. This is almost certainly not so for industries proximate to seaports.

Perhaps the most problematical phase in attempting to deduce regional input-output flows from national I/O studies is found in the use location quotients (LQ's) to convert the borrowed national input pattern to deduce the regionally-supplied component. A location quotient is a measure of a region's self-sufficiency in some activity defined by

$$(1) \quad LQ_i^r = \frac{e_i^r/E^r}{e_i^n/E^n}$$

where e_i^r is a measure of the activity of the i th industry in region r

E^r is a measure of aggregate activity in region r

e_i^n is a measure of the activity of the i th industry nationally

E^n is a measure of aggregate activity nationally

Earnings or employment data are usually used to construct LQ's. If LQ_i^r is greater than one, then the output of the i th industry in the r th region is supposedly more than necessary to meet the needs of regional users and the excess is exported to other regions. If LQ is less than one, the assumption is made that using industries must be importing a portion that input.

Location quotients are next applied to national input coefficients to estimate regional procurement coefficients, as shown in equation (2).

$$(2) \quad \hat{r}_{ij} = LQ_i \cdot a_{ij}$$

where

\hat{r}_{ij} = estimated proportion of total output of the jth industry in the region which is delivered to the ith regional user

a_{ij} = national input coefficient of the ith industry acquired from the jth supplier

The most significant conclusion which may be drawn from the LQ procedure is that each industrial sector in an economy is either an export sector or it is not. The procedure does not permit any sector to be exporting its output and users of that product also importing it. This means there can be no cross-hauling of products or services among regions. This is contrary to general observation. The well-known dependence of the Washington aerospace industry upon imports of aerospace products (parts) from elsewhere while simultaneously exporting aerospace products (completed aircraft) is illustrative. The importation of fresh fruits and vegetables during the year while exporting the same products occurs because of seasonal differences in the maturation of crops. Tourism is still another illustration of cross-hauling.

Most relevant to the present inquiry, transport services, an important activity in every state, provide services to facilitate the export of goods to out-of-state purchasers. They also provide transshipment services by facilitating the movement of goods produced outside the state to users of those goods located outside the state. Furthermore, they provide transport services between producers and

customers located within the state. Finally, since Washington industries purchase inputs from suppliers elsewhere, including purchases from transport sectors elsewhere (the "purchasers pay the freight" rule), transport services are imported.

Simply put, transport services are both exported and imported, as well as providing local service.

The principal conclusion drawn from this brief methodological discussion is that neither field surveys of location quotient approaches can provide a satisfactory procedure for estimating the input-output patterns of regional transportation industries. Since the Rosetta stone for this purpose has yet to be discovered, the analysis in the following pages provides an approach to address the problem in a pragmatic fashion. In particular, the procedure attempts to identify levels of exports and imports of transportation industry services. Both turn out to be important to the Washington economy.

Defining the Transport Service Industry

For purposes of this study the Transportation Services sector is defined in accordance with the Standard Industrial Classification Manual (1972) to include "establishments providing to the general public or to other business enterprises passenger and freight transportation... and the U.S. Postal Services."

This definition of the Transportation Services sector includes all transport services provided for sale on a commercial basis, but excludes from its scope self-provided transportation (owner-operated trucks, buses, vessels, aircraft). It includes the U.S. Postal Service, water-related activities of public ports, marinas, ferries, public transport

and chartered buses (including contracted school business), but not school-provided bus transportation.

Excluded activities include self-provided transportation services by manufacturers (e.g., owner-operated vehicles) or households, government operated transport services provided without user charges, and public administration of transportation service activities by governments (e.g., Coast Guard, Sea-Tac Airport administration by Port of Seattle, Federal Aviation Administration).

Following the SIC system, elements of the Transportation Services sector are subdivided into major SIC groups as shown in Table 1. Also shown in this table are the corresponding I/O sector numbers assigned to these activities in the 58-sector Washington I/O model (See Appendix Table II for a complete listing of sectors). Hereafter, the designation "Transportation Services sector" or industry will refer to the combined modes of transport while sub-sectors will be designated by appropriate modifiers or I/O numbers.

Estimating Sector Outputs and Inputs

In principal, the gross output (or control total) of each sector should represent the sales, shipments, operating revenue, receipts, or margins earned which are related to the resources employed within the industry in Washington State. Such information is available for most sectors of the economy from the quinquennial industrial censuses.

TABLE 1

Modes of Transport in the Washington State Transport Model

<u>Brief Description</u>	<u>SIC Group</u>	<u>I/O Sector</u>
Railroad Transportation	40	43, includes AMTRAK
Local and Suburban Transit	41	44, includes public transit
Motor Freight & Warehousing	42	45
U.S. Postal Service	43	50
Water Transportation	44	46, includes ferries, public ports
Air Transportation	45	47
Pipelines	46	48
Transportation Services	47	49

However, the Census of Transportation for 1982 is a truck inventory and use survey. It provides information related to the physical condition and selected operational characteristics of the truck population but very little useful data for input-output studies. Compared to other sectors, the regional economic information system for the Transportation Services sector is nearly barren.

This study estimates the operating revenues for the various modes of transport using a variety of indirect estimation techniques. These estimates are, for the most part, based upon national revenue per employee or per dollar of payroll applied to the corresponding input variable in Washington State. The Washington Department of Revenue (DOR) gross income statistics have also been evaluated as a source for control totals but appear unsatisfactory for this purpose. This is because DOR reportedly includes in its gross income estimates all

revenues received by Washington transportation agencies regardless of place of activity. Another data source -- the Washington Public Utilities and Transportation Commission -- is fragmentary and generally does not identify regional operating revenue of important inter-state carriers.

The basis for estimating the operating revenues, value added, and the regional procurement pattern for each transportation sub-sector is summarized in the following sections.

Rail Transport, WAIO 43

The control total for the Washington Rail Transport sector is estimated to be \$640 million. This estimate was formed on the basis of national rail operating revenues (including AMTRAK) per dollar of wage disbursements applied to wage payments in Washington State. A similar estimate -- \$631 million -- is obtained by using national revenue of Class I railroads as reported by the Interstate Commerce Commission (Transport Statistics of the U.S., 1982). Track mileage ratios, sometimes used to estimate regional rail activity, provided higher estimates but are not deemed as useful an indicator for revenue estimation purposes.

The value-added component of operating revenues has been estimated as \$423 million based on the national value-added share calculated from the Yearbook of Railroad Facts (1982). Intermediate inputs from the USIO study for 1977 were used to estimate technical inputs, while procurement from Washington industries was initially estimated by taking into account the reported sales (from surveys) of other sectors to the Transport Services sector, and judgement. The final estimates of

regional inputs into the Rail Transport sector were modified in the balancing of the I/O table to achieve consistency among all sectors.

Passenger Transport, WAIO 44

Operating revenues of Passenger Transport Services were estimated from national revenue estimates and Washington employment and payrolls data. Various approximating methods yielded projections of Washington Passenger Transport operating revenues ranging from \$280 to \$407 million. An estimate of \$330 million was made, based on national bus revenue per employee applied to Washington State employment (including public employment) in this sector. Incorporated in this control total estimate are all commercially available motorized transport passenger service, including bus, taxi, and light rail (but excluding railroads) and contracted school busing. Self-operated transportation services by school districts or other government agencies, individuals, business firms, and other institutions are excluded.

Value-added is estimated to be \$200 million, based on the ratio of value-added to output as reported in the USIO study. Procurement estimates are based on the USIO study, the Transit Fact Book (American Public Transit Association), and National Transportation Statistics (U.S. Department of Transportation). Purchases from Washington suppliers were estimated on the basis of comments by two Washington passenger carriers and analysts' judgement, then adjusted to be consistent with the sales distribution of all other sectors in the balancing process.

Motor Freight, WAIO 45

This sector includes establishments primarily engaged in public transport of goods (common or contract carriers) and public warehousing. It does not include trucking or warehousing related to other businesses such as milk delivery or wholesale distributors.

Estimates of operating revenues were made by several procedures, separately for motor carriers and warehousing, using national operating revenue per employee or per dollar of payrolls, and Washington employment or payrolls data. These control total estimates ranged from \$1,089 to \$1,429 million. The estimate actually adopted is \$1,380 million, which is consistent with DOR revenue data.

The value-added estimate is based on the USIO/1977 study. The distribution of expenditures and regional procurement were made judgementally using USIO/1977 proportions and operating statistics of WUTC (Class I and Class II Motor Carriers of Property), and adjusted to be consistent with other sectors of the table in the balancing process.

Water Transportation, WAIO 46

Water transport is very significant in Washington State because of its large sea ports, and its ports upon the Columbia River. Private sector Water Transport in Washington accounts for 4.1% of national employment and 4.8% of national payrolls in that sector. Using the private sector payroll share applied to USIO output (projected to 1982) yields private sector operating income of \$1,296 million. Additionally, the output of this sector is defined to include the revenues of water related public port authorities of \$109 million (Governmental Finances, Vol. 4, No. 2, 1983) and operating revenues of the Washington State

Ferry System of \$45 million. The control total of all included activities in this sector is estimated to be \$1,450 million.

Inquiry made it apparent that the major water carriers could not identify outlays related to Washington-created transport services, and therefore the technical input distributions replicate that of USIO/1977. Regional purchase data for petroleum fuels, derived from the motor fuel distributions reported by the Washington Department of Licensing, aided in the distribution of in-state procurement, but other regional purchases were estimated judgementally.

Air Transportation, WAIO 47

Air Transportation Services includes the activities of certified and non-certified air carriers, airports, and airport terminal services. Absent relevant regional data to estimate regional operating revenues, the control total was estimated on the basis of national output per dollar of wage payments and Washington wage payments. This control total (\$918 million) was subsequently revised to \$1,151 in recognition of the large expenditures made by airlines for jet fuels (Department of Licensing) at Washington terminals. Other intermediate inputs were based on USIO/1977, and the purchases from within the region were judgementally estimated.

Pipelines, WAIO 48

Oil pipelines (Yellowstone, Olympic, Chevron) represent a relatively small activity in Washington State, involving but 87 employees. The operating revenues from within-state transmission services is estimated to be about \$34 million. Regional procurement is

based on national input coefficients and judgementally allocated between in-state and out-of-state.

Transportation Services, WAIO 49

This sector includes the activities of travel agencies, freight forwarders, transportation agents, and miscellaneous activities in support of actual transportation of goods or people. Operating revenues of \$197 million were estimated on the basis of national output per worker applied to Washington employment. In retrospect, this may be too low an estimate, given the labor and proprietor earnings for this sector as subsequently (August 1986) reported by the Bureau of Economic Analysis. As in other sectors, the procurement estimates are based on national coefficients and judgementally allocated between in-state and out-of-state suppliers.

U.S. Postal Services, WAIO 50

The control total for this segment of the Transportation Services industry is based on expenditures, as reported in Federal Expenditures by State for the Fiscal Year 1983 (Bureau of the Census, Office of Management and Budget). Employee compensation is taken as equivalent to value-added. The distribution of expenses is based on outlays reported by three district offices (Seattle, Tacoma, Spokane), while in-state purchases were judgementally allocated.

While the estimates of output and regional input for the components of the Transportation Services sector may appear to be ad hoc, substantial forbearance ought to be allowed in view of the shortcomings of regional statistical systems. Survey approaches, so

useful for most other sectors, appear unfruitful. This is because accounting systems in place do not match (for the most part) the geographic zone (Washington state) which is the center of interest in this regional study. While the estimates are crude, they are not without their redeeming features. One is that the estimates of regional inputs are confined by the estimate of total input. Another is that the analysts have considered each sector separately, so that for the combined Transportation Services sector the errors in the components will be partly offsetting. Third, the regional input estimates have been adjusted for consistency with the overall table so that some of the survey-validated flows to the Transportation Services sector become incorporated in the regional purchase estimates.

It is useful to recapitulate the estimates of output, value-added, jobs, and earnings for the Transportation Services sector. These estimates are shown in Table 2. Still further sector-by-sector linkages are shown in the Transport I/O Gross Flows Table, Appendix III of this report.

Sources of Revenue

The proceeding section of this report provides estimates of the operating revenues attributed to the resources engaged in the Transportation Sector within Washington State. But what are the sources of those revenues? Since "the purchaser pays the freight" is the input-output accounting rule, the question may be phrased another way: What are the transport costs to be charged to each Washington sector for the acquisition of goods it uses in production? How much does each sector "buy" from local transport providers, and how much is imported?

TABLE 2

Estimates of Gross Output, Value Added, Jobs, and
Earnings in the Transportation Services Sectors, 1982

<u>I/O Sector</u>	<u>Gross output (\$ millions)</u>	<u>Value Added (\$ millions)</u>	<u>Earnings¹ (\$ millions)</u>	<u>Jobs¹ (thousands)</u>
Rail, 43	\$ 640	\$ 423	\$ 247	7.8
Passenger, 44	300	202	177	8.4
Truck, 45	1,380	887	588	25.4
Water, 46	1,450	400	327	11.1
Air, 47	1,151	472	319	9.3
Pipelines, 48	34	22	3	0.1
Services, 49	197	132	140	7.3
Post Office, 50	<u>365</u>	<u>321</u>	<u>321</u>	<u>11.3</u>
Transportation Services, Total	\$5,517	\$2,859	\$2,122	80.7

¹BEA concepts; earnings include wages and salaries, other labor income, and proprietor income, and jobs include employees, self employed, and unpaid family workers. Both jobs and earnings include government activity transferred into these sectors.

Our experience has been that purchases of goods, producers of goods, and transportation agents, are unable to provide sufficient useful information to distribute regional transport costs. It is totally impractical, if not impossible, to use surveys on a systematic basis for determining regional transport outlays sector by sector.

Instead, an indirect procedure was used to estimate transport costs. The procedure involves three stages of calculation. First, total transport input costs were estimated by applying national transport cost coefficients to the value of output of each Washington industry. Next, the total transport costs were allocated regionally (in-state, out-of-state) according to the ratio of in-state purchases to total intermediate inputs. Third, estimates of the within region transport costs associated with imports were added. This estimate of total within-state transport expense was then inserted in each column of the regional input-output table, and other purchases reduced to accommodate these transportation costs within the control total constraint.

More specifically, the national transport input cost coefficients were borrowed from the USIO/1977 study, and applied to Washington output levels on a sector-by-sector basis, as shown in equation (3). This equation assumes that each sector's total transportation input costs per dollar of output in Washington are similar to the nation.

$$(3) \quad \hat{X}_{t,j}^W = a_{t,j}^{us} \cdot X_j^W$$

where t = transport sector
 $a_{t,j}^{us}$ = national transport input cost coefficient for j^{th} industry
 $X_{t,j}^w$ = estimate of j^{th} Washington industry transport charges

The transport costs for the j^{th} industry are then geographically distributed by the ratio of in-state to total intermediate purchases, or

$$(4) \quad \frac{\sum_1^{51} X_{i,j}^{w,w}}{\sum_1^{51} X_{i,j}^w} \cdot \hat{X}_{t,j}^w = \hat{X}_{t,j}^{w,w}$$

where $\sum_1^{51} X_{i,j}^{w,w}$ = intermediate inputs from Washington suppliers

$\sum_1^{51} X_{i,j}^w$ = intermediate inputs from all suppliers

$\hat{X}_{t,j}^{w,w}$ = estimated Washington within-state transport costs on goods supplied by Washington producers

Equation 4 is an approximation of transport input cost on locally produced goods purchased by Washington industries. It assumes that in-state transport costs, relative to total transport costs estimated in equation (3), vary with the fraction of intermediate inputs purchased from within-state suppliers. While the assumption underlying equation (3) probably understates total transport costs incurred by Washington industries (because of the remoteness of Washington state from centers of national production), equation (4) probably has a bias in the opposite direction (because it assumes transport costs per dollar are the same on local purchases as imports).

The third stage in the analysis of transport costs involves an estimate of within-state transport costs associated with imported intermediate inputs acquired by various industries. Logically, a portion of the transport costs on imports into the state must be assumed to be provided by Washington transporters. This is so because a substantial portion of transport costs are associated with the make-up and break-up of movements at each end of the traffic flow. We have assumed that one-half of the transport costs on imports are associated with services provided by the Washington transportation industry. This "rule of one-half" may exaggerate the in-state transport service cost on imports. Application of a gravity flow model, in which distance is a variable, might improve upon the estimate procedure used here but would require further information on the specific origin of imports into each sector. The principle of including locally provided transport services on imported goods does appear to be correct, in line with the scheme outlined in Figure 1. Thus, total transport costs are those associated with internal movements of goods within Washington plus a fraction of the transport costs on imported goods, or

$$(5) \quad \hat{X}_{t,j}^{w,w} = \hat{X}_{t,j}^{w,w} + 1/2 [\hat{X}_{t,j}^w - \hat{X}_{t,j}^{w,w}]$$

The final step involved accommodating these costs in the regional input structure of each sector. Since the various inputs into each sector were initially estimated on a "costs of materials consumed" basis which includes freight, the transport input costs were accommodated by "backing out" these charges from the costs of other inputs. Generally, the transport costs were accommodated by a scaler adjustment (downward) of other inputs. Margin adjustments for the trade sector were made at the same time, and both the trade and transport adjustments were

combined with the balancing, or reconciliation, of the table. In this process the expertise or background knowledge of analysts, who carried out the initial analysis for individual industries, played an important role. That knowledge explains why Logging and Saw-mill sectors are reported to make unusually large purchases from truck transportation (contract trucking and logging provided by independent truckers), or why Aluminium makes large purchases from Railroads (movement of alumina from port of entry to interior mills).

In the process of estimating transport cost by mode, a variety of special sources were drawn upon which provided hints rather than firm statistics. For agriculture, a study entitled Transport Needs of Washington Agriculture (K.L. Casavant and Frank Dooley, Washington State University, 1983) was valuable. Unpublished tabulations from the 1982 Census of Transportation relating to origin and destination of selected commodities (physical flows) were useful, as well as the Statistical Yearbook of the Western Lumber Industry, and the Washington State Transport Plan Update 1983-1985. But clearly, relevant published information is in short supply, and the information available is far from ideal.

Distribution of Transport Charges to Final Markets

Since outlays for Washington transportation services by the intermediate sectors totaled \$1,361 million while operating revenues are calculated to be \$5,517 million, then \$4,156 million of revenues is a residual which can be attributed to final demand. Final demand includes outlays of Washington consumers, investment, state and local government, and export sales. The latter includes exports to the rest-of-the-U.S., foreign exports, and the geographically undefined federal government.

The allocation of Washington-supplied transport costs to consumer, state and local governments, and investment followed procedures similar to those described earlier. The remainder, amounting to \$3,279 million, is indicative of the transport revenues associated with exports, including transshipment services. While these distributions, shown in Table 3, are orders-of-magnitude estimates, the distribution to exogenous markets have no influence upon the estimated multipliers for the Transport Services sector or any other Washington industry.

TABLE 3

Estimated Sales of Washington Transportation
Service Sectors to Intermediate and Final Demand
(millions of dollars)

Sector Name	Intermediate Sales	Final Sales						
		PCE	WA S&L	WA GPDI	FED	EXP-US	EXP-FOR	Total FD
Total	\$1,361	754	100	23	85	2,666	528	4,156
Rail	203	40	1	5	7	335	49	437
Bus	36	172	65	-	1	25	1	264
Truck	624	200	6	15	31	385	119	756
Water	230	50	2	2	15	903	248	1,220
Air	126	200	13	1	20	692	99	1,025
Pipelines	6	7	-	-	1	19	1	28
Services	36	10	1	-	-	140	10	161
U.S. Post	100	75	12	-	10	167	1	265

One impressive statistic stands out: the highly significant flow of total revenues of the Transport Services sectors associated with exports. Transport operating revenues associated with exports to the

rest-of-the-U.S. are estimated to be \$2,666 million, and those related to foreign exports are \$528 million. These important sources of the Washington transport system operating revenues are not really surprising to those familiar with the export-dependence of the industries within the Washington economy. Such export-oriented industries generate substantial traffic revenues for commodity carriers and for the arrangers of shipments (freight forwarders, shipping agents). Visible in the seaports, especially those of Seattle and Tacoma, are the cargo activities associated with the transshipments of commodities. Seattle is also a regional and international airline hub for both passenger and air freight services. The Washington Transportation Services sector is, indeed, an important "export sector" for the Washington economy.

The Washington Transport-Oriented Gross Flows Table

The Washington Transport-oriented Gross Flows Table, Appendix III, provides a detailed quantitative description of the transactions structure of the Washington economy, including the linkages between the Transportation Service sectors and others. Each column of the table shows the operating inputs acquired by each Washington industry from others within the state, the value-added by the resources employed within each industry, and its purchases from out-of-state suppliers. Each row of the table shows the Washington Markets of each sector and sales to final users.

Some highlights concerning the quantitative dimensions of the transport sectors -- believed to be reasonable approximations in terms of order-of-magnitude -- follows:

- The Transport Services sectors contributed nearly \$3 billion, or 4.9%, of the GSP created in Washington State during 1982.

The GSP originating (value-added created) within each sector of the transportation industry is shown in Table 5.

- The Transportation Services sectors are important markets for several Washington industries. They are a significant purchaser of the output of petroleum refiners, spending about \$664 million for fuels which represents about 14% of the output of the Petroleum sector. Service sector inputs into the Transportation sector were worth \$170 million. Lesser amounts were purchased from 35 of the other 48 sectors in the Washington state model.

- Every industrial sector in Washington depends, in varying degrees, upon Transportation Services. The leading transport-dependent industries are shown in Table 6.

- The Transportation Services sectors are important export sectors in the Washington economy, in that out-of-state users of the Washington transportation system contribute to its revenue. The export of transportation services (sales to rest-of-the-U.S., Exports-foreign, and sales to the Federal government) amounted to \$3.3 billion. These revenues are earned in the process of shipping Washington products to out-of-state customers, non-resident passenger services, and earnings from transshipments. The leading exporters of Transportation Services are shown in Table 7.

The export of Transportation Services accounted for 8% of total Washington State exports. Transportation Services accounted for about 6% of Washington's total foreign exports, and 11% of exports to the rest-of-the-U.S. The greater relative importance of the latter may be due to the greater inbound transshipments as compared to outbound.

Transportation Multipliers in the Washington Economy

From the Transportation I/O Gross Flows Table, Appendix III, it is possible to derive multipliers, by mode of transportation. Casual readers are warned that there are numerous multiplier concepts.

There is no such thing as "the" multiplier for an industry. There are different multipliers depending upon the form in which the multiplier is expressed, the range of repercussions encompassed by a multiplier model, and the particular theory (or theories) of interaction used to construct them.

In this presentation we avoid a technical discussion of all the options used in preparing multiplier estimates. Our discussion is limited to Leontief-type multipliers which measure the direct, indirect, and consumption-induced activity (called Type II multipliers). Even so, the size of such multipliers varies depending upon the particular variables in the numerator and denominator of multiplier ratios, and the particular theories of interaction used to derive them. A useful discussion of problems of this nature may be found in The Washington State Input-Output Study for 1982 (March, 1986).

Are Transportation Service Exports Exogenous?

Impact multipliers are postulated upon the export-base theory of regional change. This theory (briefly) argues that changes in exports of a sector leads endogenously to changes in the output of other sectors which supply inputs to the export industry. The ripple effects reverberate throughout the economy leading to a multiple expansion or contraction of output, employment, and income.

A representative I/O model used for the assessment of these impacts is of the form $X = (I - R)^{-1} Y$, where Y is a vector of final

TABLE 5

Rank Contribution of the Washington Transport Sectors,
by Mode, to the Washington GSP, 1982
(millions of dollars)

<u>Sector</u>	<u>GSP</u>
Motor Freight & Warehousing	\$ 887
Air Transportation	472
Railroad Transportation	423
Water Transportation	400
Postal Service	321
Local and Suburban Transit	202
Transportation Services	132
Pipelines	<u>22</u>
Total Transportation GSP	\$ 2,859
Total Washington GSP	58,487
Transport GSP as a percent of total	4.9%

TABLE 6

Leading Transport-dependent Industrial Sectors
in the Washington Economy, 1982
(millions of dollars)

<u>Sector</u>	<u>Transportation Inputs</u>
Wholesale & Retail Trade	\$ 200
Logging	150
Services	100
Construction	75
Aerospace	41
Aluminium	40
Canning and Preserving	40
All other industries*	<u>715</u>
Transport sales to Washington Industry	\$1,361

* Includes intra-sector transport sales of \$360 million.

TABLE 7
Leading Exporters of Transportation Services,
by Mode, Washington State, 1982
(millions of dollars)

<u>Sector</u>	<u>Revenue from Exports</u>
Water Transportation	\$1,166
Airline Transportation	811
Motor Freight and Warehousing	535
Railroad Transportation	391
All Other Transportation	<u>376</u>
Total Export Revenues	\$3,279

demand (including exports), R is a regional direct input coefficient matrix, and $(I - R)^{-1}$ is the interaction matrix. Such a model constitutes the basic framework for the estimation of multipliers in this report.

In a typical application, the multipliers of the interaction matrix are applied to a change in exports of the i th sector to estimate the total impact upon other sectors of the economy. Ordinarily, the export demands are assumed to be exogenous, and independent of one another.

However, exports of the Transportation Services sectors are, at least in part, dependent upon the exports of some other sector(s). This means that, in the assessment of multiplier impacts, consideration should be given to the joint effects of the impacts of the exports of a given sector Y_i , and the transportation exports Y_t simultaneously induced.

Whether this bias in the measurement of impact multipliers is important or not is not ascertainable. In the context of all the other difficulties (both empirical and conceptual) associated with the estimation of multipliers perhaps it deserves to be an issue buried with others as a "noise" factor. On the other hand, given the importance of Transportation Service exports as revealed in this study (they constitute 8% of Washington exports) it does seem potentially significant.

One possible means of addressing this problem is to consider any export demand in two parts. The first would be the export demand for the output of the i th industry, while the second would be the associated

transport exports. The total impact would be the sum of both components.

Estimates of the Transportation Services Multipliers

From among the various versions of impact multipliers, three are presented in Table 8. These are the value-added (or GSP) multipliers, the earnings multipliers, and the jobs multipliers. The value-added variable is defined as GSP originating, inclusive of labor compensation, rent, interest, profits before taxes and capital consumption allowances. The earnings variable is defined as the income of labor (wage and salary payments and other labor income) and proprietors income net of capital consumption allowances. Jobs are defined to include full and part-time employees, unpaid family workers, and self-employed persons.

Since all the multipliers shown in this report are Type II, the issue of closure by which household consumption is made endogenous to the model is important. The underlying theory of income and consumption for each of the three sets of multipliers is made explicit in the following statements:

$$\text{Value-added multipliers: } VA_i = v_i(X_i), C_i = c_i(\text{VA}), c_i = \frac{C_i}{\text{GSP}}$$

$$\text{Earnings multipliers: } \text{Earn}_i = e_i(X_i), C_i = c_i(\text{Earn}), c_i = \frac{C_i}{\text{YP}}$$

$$\text{Jobs multipliers: } \text{Jobs}_i = j_i(X_i), C_i = c_i(\text{Earn}), c_i = \frac{C_i}{\text{YP}}$$

None of these formulations of the multipliers is fully satisfactory. The value-added multipliers tend to exaggerate the size of multipliers in some sectors and understate them in others. The reasons for this is the varying degree to which the value-added in different sectors is linked to consumer expenditures within Washington state. By contrast, the earnings and jobs multipliers are systematically understated since consumer spending coefficients are

ratios of consumption to personal income, rather than consumption to earnings. Unfortunately, no estimates of consumption uniquely related to earnings are available.

Not only are there different theories of model closure, but there are different methods of stating multiplier relationships. The sectoral multiplier tables in the Appendix tables show the direct, indirect, and induced impacts per million dollars of final demand. By dividing the total impact per million dollars of final demand by the direct impact per million of final demand, these are restated into a more conventional form of total impact per unit of direct impact.

For all transport modes, the value-added multiplier is \$2.03. This means that for each one dollar of value-added directly created by the export of transportation service there is, on the average an additional \$1.03 created in other sectors of the economy indirectly and thru induced spending by households. The Transportation Services sector value-added multipliers tend to be somewhat smaller than the average of all sectors of the economy combined (\$2.79); this is because the direct value-added (the denominator of the value-added multiplier) for the Transportation Services sector is relatively high. The multipliers for individual modes of transportation tend to cluster around the average for all transport sectors combined.

The earnings multiplier averages \$1.53 for Transportation Services, as compared with \$2.08 average for all industries. The Pipelines earnings multiplier is unusually high; this reflects the fact that there is no proprietor income in Pipelines (all Pipeline systems are corporate) and direct labor income earned in this sector is very small relative to its revenue. Again, small denominators make for large

multipliers. The reverse situation applies to the Mail (Postal Service) sector: direct labor costs are high relative to revenues, and hence a small multiplier.

Table 8

Transport Sector Multipliers, 1982			
(Total impact per unit of direct impact for the named variables)			
<u>Sector</u>	<u>Value-added</u>	<u>Earnings</u>	<u>Jobs</u>
Rail	\$1.89	\$1.43	1.88
Bus	1.95	1.42	1.60
Truck	2.02	1.53	1.80
Water	2.14	1.56	2.13
Air	2.22	1.57	2.29
Pipelines	2.09	2.44	3.57
Services	2.00	1.45	1.58
Mail	<u>1.73</u>	<u>1.29</u>	<u>1.57</u>
All modes	\$2.03	\$1.53	1.86
All industries	2.79	2.08	2.73

again smaller than the all industry average of 2.73. The smallish multipliers for Bus (Passenger Transit) and for Mail result from the fact that these activities are labor intensive and, for Bus, a relatively large number of part-time jobs.

Caveats on the Use of Multipliers

There are many misconceptions about multipliers. Here are a few warnings that readers should consider.

1. There is no such thing as "the" multiplier for an industry. There are different multipliers depending upon the form in which the multiplier is expressed, the variable under consideration, the range of repercussions encompassed by the multiplier model, and the particular theory (or theories) of interaction used to construct them.
2. Multipliers for a variable can be made to look large or small depending on the unit of expression chosen for the denominator of the multiplier ratio. Jobs multipliers that express total jobs per direct job will be smaller (other things being equal) than multipliers that express jobs per million dollars of output exported.
3. It is often assumed that large multipliers mean large total economic impacts, forgetting that the size of impacts depends on both the size of the multiplier and the magnitude of the disturbance to be multiplied. Sectors with large multipliers are sometimes those in which significant market changes, such as changes in exports, are unlikely.
4. The size of the multiplier depends on the scope of interactions incorporated in the multiplier model. Multipliers with households endogenous will be larger than those that exclude the repercussions associated with household spending. Multipliers that include government spending or investment spending reactions will be larger still.
5. Avoid the pyramiding of multiplier impacts. Multipliers should be used to assess the impact of an event that is external to the multiplier process itself. Good examples include evaluating the

impacts of changes in exports, federal expenditures, and investment outlays.

6. Multipliers in static models are timeless. Production adjustments may take place in anticipation of changes in market demand; on the other hand, reaction lags may result in delayed multiplier responses.
7. Ready-made multipliers, such as those included in this report, are representative for establishments within each sector but are not applicable to any particular enterprise.
8. Multipliers in this study are applicable to the Washington economy, and not to its subdivisions (counties or cities).
9. Empirical estimates of multipliers are based on interindustry relationships observed in a particular historical context (in this case, 1982).

An enumeration of some of the common pitfalls associated with the use of multipliers may be helpful to readers, but in each potential application there is no substitute for sound economic analysis. That kind of analysis arises out of an understanding of the theoretical structure of input-output models in particular and economic analysis in general. Ready-made recipes are seldom applicable to particular instances that economists are called upon to analyze.

Positive uses of the Transport Services sector multipliers include the evaluation of the impacts of changes in the demand for transportation services. Examples which come readily to mind are:

- What is the impact upon the Washington economy of changes in operating revenue occasioned by the capture (or loss) of exports by this sector?

- If the regulatory environment should change the demand for transport services, how will the economy be effected? Which sectors will be effected most?
- What is the net effect upon each sector in the economy if one mode of transportation service displaces another?
- What are the effects of changes in the procurement patterns of the transportation modes (perhaps due to technology or price changes) upon other industries in the state?
- What happens to the demand for Transportation Services as a result of changes in the exports of other industries?
- What will be the impact upon the economy of the state as a result of new investment in the Transportation Services sector?

There are no simple answers to any of the above question; each requires ancillary analysis which may be rather involved. Yet, an input-output model of the kind developed here has been found to be the most effective instrument through which to examine the interindustry linkages which exist among industries, and to trace impacts of changes in one upon others. The Washington Transport-oriented Gross Flows Table, Appendix III, provides investigators with an empirical framework as a point of departure for analyzing interactions within the economy of the state.

Concluding Observations

The objective of this study has been to analyze the input-output structure of the Transportation Services industry in Washington state. The absence of a pre-existing conceptual framework applicable to the definition and measurement of output of the regional transportation

industries has complicated this endeavor. This report has drafted an analytical framework, consistent with the principles of regional accounting. This study also provides estimates of the sources of operating revenue and disposition of the outlays of the several modes of transport service. Much remains to be done to improve upon these estimates and the procedures used to make them. No apology needs to be made for the use of judgement when necessitated by the absence of quantitative evidence. The two-way (rows and columns) approach used in estimating transport sector flows imposes a discipline upon the process, but future improvements in statistical reporting of economic variables in the transport sectors could do much to further narrow the inevitable errors in the construction of the gross flows table.

Until regional analysts devote more of their ingenuity to addressing the specifics of regional accounting, regional input-output will become anchored to synthetic models which are empty of relevant definition, conceptually inappropriate, and empirically specious.

* * * * *

TABLE I

Washington Input-Output Sector Definitions, 1982

Sector No.	Industry Name	Standard Industrial Classification (SIC) System Codes
1	Field & Seed Crops	011, 013 (exc. 0134), pt. 019
2	Vegetables & Fruits	0134, 016, 107, pt. 019
3	Livestock & Products	02
4	Other Agriculture	018
5	Fisheries	09 (exc. 097)
6	Meat Products	201
7	Dairy Products	202
8	Canning & Preserving	203, 2091, 2092
9	Grain Mill Products	204
10	Beverages	208
11	Other Foods	205-207, 2095-2099
12	Textiles	22
13	Apparel	23
14	Mining	10-14
15	Forestry	08 (inc. national & state forests, christmas tree farms)
16	Logging	241
17	Sawmills	242
18	Plywood	2435, 2436
19	Other Wood Products	2431, 2434, 2439, 244, 245, 249
20	Furniture & Fixtures	25
21	Pulp Mills	261
22	Paper Mills	262
23	Paperboard, Other Paper	263-266
24	Printing & Publishing	27
25	Industrial Chemicals	281, 286, 287, 289
26	Other Chemicals	282-285
27	Petroleum	29
28	Glass Products	321-323
29	Cement, Stone & Clay	324-329
30	Iron & Steel	331, 332, 339
31	Other Nonferrous Metals	3331-3333, 3339, 334, 3351, 3356, 3357, 3362, 3369
32	Aluminum	3334, 3353-3355, 3361
33	Structural Metal Products	344
34	Other Fabricated Metals	341-343, 345-349
35	Nonelectrical Motive Equip.	351-353
36	Machine Tools & Shops	354, 359
37	Nonelectrical Industrial Equip.	355-358
38	Electrical Machinery	36
39	Aerospace	372, 376
40	Motor Vehicles	371, 374, 375, 379
41	Ship & Boat Building	373 (inc. Puget Sound Naval Shipyard)
42	Other Manufacturing	30, 31, 38, 39
43	Railroads	40 -- includes AMTRAK
44	Passenger Transit	41 -- includes public transit
45	Truck and Warehousing	42
46	Water Transport	44 -- includes ferries, public ports
47	Air Transport	45
48	Pipelines	46
49	Transport Services	47
50	Post Office	43
51	Electric Companies	491, pt. 493 (inc. BPA, PUDs & municipal electric utilities)
52	Gas Companies	492, pt. 493 (inc. municipal gas companies)
53	Other Utilities	Pt. 493, 494-497 (inc. public water, sewage, sanitary & irrigation systems)
54	Communications	48
55	Construction	15-17
56	Trade	50-59 (inc. state liquor stores)
57	Finance, Ins. & Real Estate	60-67
58	Services	07, 097, 70-89 (exc. public hospitals & schools)

Table II
Transport Jobs and Earnings Coefficients

I/O No	Name	Direct Jobs (thous)	Direct Earnings (mil.\$)	Sector Output (mil.\$)	Direct Earn/Job (\$)	Direct Jobs per mil.output	Direct Earn. per mil. output (thous \$)
43	Rail	7.8	\$247	\$640	\$31,667	12.2	\$386
44	Bus	8.4	177	300	21,071	28.0	590
45	Truck	25.4	588	1,380	23,150	18.4	426
46	Water	11.3	327	1,450	28,938	7.8	226
47	Air	9.3	319	1,151	34,301	8.1	277
48	Pipelines	0.1	3	34	30,000	2.9	88
49	Services	7.3	140	197	19,178	37.1	711
50	Post Office	11.3	321	365	28,407	31.0	879
--	All Modes	80.7	\$2,123	\$5,517	\$26,307	14.6	\$385

Note: Totals May Not Add Due to Rounding

III. The Washington Transport-Oriented Gross Flows Table 1982

\$ Mil.

I/O NUMBER & NAME	SECTOR	SECTOR	SECTOR	SECTOR
	1	2	3	4
1 FIELD CROPS	50	2	300	---
2 VEGGIES & FRUIT	---	10	3	---
3 LIVESTOCK	10	3	100	---
4 MISC. AG PRODUCTS	---	---	---	4
5 FISHING	---	---	---	---
6 MEAT PRODUCTS	---	---	---	---
7 DAIRY PRODUCTS	---	---	---	---
8 CANNING	---	---	---	---
9 GRAIN MILL	---	---	80	---
10 BEVERAGES	1	---	---	---
11 OTHER FOODS	---	---	1	---
12 TEXTILE MILL	---	---	---	---
13 APPAREL	---	---	---	---
14 MINING	1	1	---	---
15 FORESTRY	---	---	---	---
16 LOGGING	---	---	---	---
17 SAWMILL	---	---	---	---
18 PLYWOOD	---	---	---	---
19 MISC. WOOD	---	5	---	---
20 FURNITURE	---	---	---	---
21 PULPMILL	---	---	---	---
22 PAPERMILL	---	---	---	---
23 MISC. PAPER	---	2	2	---
24 PRINT & PUBLISH	---	---	---	---
25 INDUSTRIAL CHEMICALS	60	15	9	1
26 OTHER CHEMICALS	---	---	2	1
27 PETROLEUM	36	23	15	3
28 GLASS	---	---	---	---
29 CEMENT ETC.	---	---	---	---
30 FERROUS METALS	---	---	---	---
31 NONFERROUS	---	---	---	---
32 ALUMINUM	---	---	---	---
33 STRUCTURAL METALS	---	---	---	---
34 LIGHT METALS	1	1	1	---
35 FARM CONSTRUCTION MACH	---	---	---	---
36 MACHINE TOOLS	---	---	---	---
37 INDUSTRIAL EQUIPMENT	---	---	---	---
38 ELECTRICAL MACH	---	---	---	---
39 AEROSPACE	---	---	---	---
40 MOTOR VEH/RR CARS	---	---	---	---
41 SHIPBUILDING	---	---	---	---
42 OTHER MANUF.	---	1	1	---
TRANSPORTATION				
43 RAILROAD	2	1	4	0
44 PASSENGER TRANSIT	1	1	0	0
45 TRUCK & WAREHOUSE	5	3	2	1
46 WATER TRANSPORT	1	0	1	0
47 AIR TRANSPORT	0	1	0	0
48 PIPELINE	0	0	0	0
49 TRANS. SERVICES	0	0	0	0
50 POST OFFICE	0	0	0	0
51 ELECTRIC UTIL	11	15	13	1
52 GAS UTIL	---	---	1	---
53 OTHER UTIL	11	7	6	1
54 COMMUNICATIONS	3	5	4	4
55 CONSTRUCTION	8	5	1	---
56 TRADE	40	21	28	3
57 F.I.R.E.	9	4	3	1
58 SERVICES	16	5	3	1
SUBTOTAL	266	131	589	19
59 VALUE ADDED	746	592	291	116
60 IMPORTS, OTHER STATES	140	33	32	2
61 IMPORTS, FOREIGN	6	3	4	0
62 TOTAL	1158	759	916	136
	SECTOR	SECTOR	SECTOR	SECTOR
	1	2	3	4

	SECTOR 5	SECTOR 6	SECTOR 7	SECTOR 8	SECTOR 9	SECTOR 10	SECTOR 11
1	---	6	---	---	41	63	1
2	---	---	---	300	---	9	5
3	---	327	395	---	---	---	1
4	---	---	---	1	---	---	1
5	1	---	---	77	---	---	---
6	1	19	---	5	2	---	1
7	---	1	140	5	---	---	25
8	---	---	2	28	---	---	6
9	1	1	---	3	---	---	40
10	1	---	---	---	---	6	5
11	---	1	2	10	1	35	18
12	1	1	---	---	---	---	1
13	---	1	---	---	---	---	---
14	---	---	---	---	1	---	2
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---
19	---	1	---	1	---	---	1
20	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---
22	---	---	---	---	6	---	1
23	---	40	20	40	3	15	9
24	---	1	---	8	---	3	4
25	---	1	1	2	---	1	1
26	---	1	---	---	---	1	1
27	8	8	5	2	1	2	6
28	---	1	2	20	---	55	1
29	---	1	---	---	---	---	---
30	---	---	---	---	---	---	---
31	1	---	---	---	---	---	---
32	---	---	---	---	---	---	---
33	---	---	---	---	---	---	---
34	1	1	---	20	2	90	2
35	---	---	---	---	---	---	---
36	---	1	---	1	---	1	---
37	---	1	---	---	1	---	1
38	1	1	---	---	---	---	---
39	---	---	---	---	---	---	---
40	---	---	---	---	---	---	1
41	5	---	---	---	---	---	---
42	1	1	2	---	---	---	1
43	0	1	1	4	2	2	5
44	0	0	0	1	0	0	0
45	1	5	2	31	3	7	11
46	1	0	0	2	1	0	1
47	0	0	0	2	0	1	1
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	---	17	4	8	1	2	2
52	---	1	6	14	---	6	8
53	---	1	1	2	---	1	1
54	---	1	0	4	1	1	2
55	---	1	1	1	---	3	2
56	3	27	26	120	20	25	23
57	1	2	0	0	1	3	2
58	2	11	21	48	10	23	15
59	30	462	630	763	97	354	314
60	56	112	114	528	50	224	228
61	6	459	20	302	152	100	30
62	2	36	0	1	0	16	6
63	94	1091	790	1594	305	494	538
SECTOR	SECTOR	SECTOR	SECTOR	SECTOR	SECTOR	SECTOR	SECTOR
5	6	7	8	9	10	11	

	SECTOR 12	SECTOR 13	SECTOR 14	SECTOR 15	SECTOR 16	SECTOR 17	SECTOR 18
1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	1	1	---	---	---	---	---
4	---	---	---	2	---	---	---
5	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---
10	---	---	---	---	---	---	1
11	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---
13	---	1	---	---	1	---	---
14	---	---	4	---	2	2	---
15	---	---	---	18	460	55	---
16	---	---	---	2	383	424	18
17	---	---	1	---	---	100	88
18	---	---	---	---	---	1	10
19	---	---	---	---	---	---	24
20	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---
22	---	1	---	---	---	2	---
23	---	1	---	---	---	---	---
24	---	---	---	---	2	---	---
25	---	---	1	8	1	1	1
26	---	---	---	4	1	3	10
27	---	---	4	3	20	9	4
28	---	---	---	---	---	---	---
29	---	---	3	---	1	---	---
30	---	---	---	---	1	---	---
31	---	---	---	---	---	---	---
32	---	---	---	---	---	---	---
33	---	---	---	---	---	---	---
34	---	---	1	---	6	2	3
35	---	---	---	---	5	1	---
36	---	---	---	1	1	---	---
37	---	---	---	---	6	1	1
38	---	---	---	---	---	---	1
39	---	---	---	---	2	1	1
40	---	---	---	---	---	---	---
41	---	---	---	---	2	---	---
42	---	---	---	---	2	3	---
43	0	0	1	1	3	2	1
44	0	0	0	0	0	0	0
45	0	1	1	3	145	24	5
46	0	0	0	0	1	2	1
47	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	0	0	0	0	1	0	0
51	1	1	2	1	0	0	0
52	2	1	1	---	2	12	4
53	---	---	---	---	1	1	1
54	1	2	1	1	2	2	1
55	---	1	1	10	66	4	2
56	1	4	3	6	25	28	15
57	---	1	1	1	5	3	2
58	1	1	7	9	40	15	2
	7	22	32	76	1188	714	203
59	22	85	164	517	290	321	79
60	17	70	32	10	151	37	23
61	4	12	10	0	9	9	0
62	50	129	238	603	1732	1031	305
	SECTOR 12	SECTOR 13	SECTOR 14	SECTOR 15	SECTOR 16	SECTOR 17	SECTOR 18

	SECTOR 19	SECTOR 20	SECTOR 21	SECTOR 22	SECTOR 23	SECTOR 24	SECTOR 25
1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---
9	---	---	---	6	3	---	---
10	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---
12	1	1	---	---	---	---	1
13	---	---	---	---	---	---	1
14	---	---	---	1	---	---	1
15	---	---	---	---	---	---	1
16	15	---	13	79	77	---	---
17	52	2	30	250	98	---	---
18	17	1	5	---	---	---	---
19	20	1	---	1	---	---	---
20	---	1	---	---	---	---	---
21	---	---	---	19	2	---	2
22	---	2	1	4	104	70	1
23	4	1	4	6	153	2	4
24	---	---	---	---	---	3	1
25	1	---	20	40	20	1	32
26	1	1	---	1	1	1	2
27	1	1	40	40	27	1	6
28	---	---	---	---	---	---	1
29	2	---	---	1	---	---	---
30	1	---	---	---	---	---	---
31	---	---	---	---	---	---	---
32	---	---	---	---	---	---	---
33	4	---	---	1	---	---	---
34	2	1	1	1	---	3	5
35	---	---	---	---	---	---	---
36	1	1	1	1	---	---	---
37	---	---	---	---	---	---	---
38	1	---	---	---	---	---	1
39	---	---	---	---	---	---	1
40	---	---	---	---	---	---	5
41	---	---	---	---	---	---	---
42	1	4	---	5	---	---	1
43	---	---	---	---	---	---	---
44	5	1	2	18	10	1	4
45	0	1	0	0	0	1	0
46	4	0	6	18	20	4	5
47	1	0	1	1	1	0	0
48	0	0	0	0	0	0	0
49	0	0	1	1	0	0	0
50	0	0	0	0	0	0	0
51	0	0	0	0	0	2	0
52	2	1	15	50	25	3	13
53	1	5	35	15	17	2	25
54	4	---	7	4	2	---	4
55	4	1	1	2	2	10	2
56	2	1	3	10	6	2	2
57	23	---	20	60	55	28	30
58	5	1	2	5	5	4	2
59	10	10	5	20	20	63	50
60	186	45	211	661	648	213	182
61	167	84	92	382	314	491	543
62	134	34	24	186	77	76	130
63	12	1	28	24	2	35	0
64	499	154	355	1253	1041	615	857
	SECTOR 19	SECTOR 20	SECTOR 21	SECTOR 22	SECTOR 23	SECTOR 24	SECTOR 25

	SECTOR 26	SECTOR 27	SECTOR 28	SECTOR 29	SECTOR 30	SECTOR 31	SECTOR 32
1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---
15	---	2	5	20	1	1	1
16	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---
18	---	1	---	---	---	1	---
19	1	---	---	---	---	---	---
20	---	---	---	---	---	---	1
21	---	---	---	---	---	---	---
22	1	---	---	1	1	---	---
23	2	3	5	1	1	---	---
24	1	---	---	1	1	---	1
25	2	6	---	---	---	---	---
26	6	---	1	1	3	1	2
27	5	66	1	40	1	1	6
28	---	---	1	---	1	3	20
29	---	2	---	50	---	---	---
30	---	---	1	---	4	---	---
31	---	1	---	---	---	---	2
32	---	---	---	---	---	---	3
33	---	1	---	---	---	40	450
34	1	2	---	1	1	---	1
35	---	1	---	1	2	---	1
36	---	1	---	1	---	---	1
37	---	2	---	---	3	---	2
38	---	---	---	---	---	---	2
39	---	---	---	---	---	---	2
40	---	---	---	---	---	---	---
41	---	---	---	---	---	---	---
42	1	C	---	---	---	---	---
43	1	3	2	3	3	2	30
44	0	0	0	0	0	0	0
45	2	5	2	11	2	3	4
46	0	6	0	1	1	1	6
47	0	1	0	0	0	0	0
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	1	12	10	9	18	10	278
52	4	35	15	1	6	6	21
53	1	1	---	1	---	---	---
54	2	2	---	2	---	---	---
55	2	1	1	4	4	1	1
56	5	30	4	11	14	1	2
57	2	2	1	2	1	1	22
58	10	2	3	16	6	3	7
	50	193	53	176	73	75	699
59	59	564	52	194	162	60	470
60	75	2760	7	30	71	105	231
61	1	1112	4	13	0	16	400
62	183	4629	116	413	306	257	2050
	SECTOR 26	SECTOR 27	SECTOR 28	SECTOR 29	SECTOR 30	SECTOR 31	SECTOR 32

	SECTOR 33	SECTOR 34	SECTOR 35	SECTOR 36	SECTOR 37	SECTOR 38	SECTOR 39
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							1
16							
17							
18							2
19		1					1
20			1			1	1
21						1	1
22							
23	1					1	1
24		2				1	12
25		3	2				1
26	1	2	1				1
27	1	3	1			2	5
28				1	1	1	10
29		1					
30	25	20	5	2			1
31	5	1		1	2		1
32	20	40	1		6	1	3
33	13	1			2	1	2
34	3	5		1	2		2
35			6	1	3	25	13
36	3		14				
37	1	5	8	8	12	5	30
38			6		6	2	7
39	10		4		4	13	18
40	1					4	200
41			1		1		
42							
43		8	1	1	1	9	13
44	2	1	1	0	1		
45	0	0	0	0	0	1	10
46	3	2	2	1	1	2	1
47	0	0	0	0	0	2	7
48	0	1	0	0	0	0	0
49	0	0	0	0	1	2	20
50	0	0	0	0	0	0	0
51	0	0	0	0	0	0	1
52	2	2	1	0	0	1	2
53	2	1	2	1	1	2	20
54						1	10
55		1			1		5
56	2	3	2	1	3		
57	3	1	1		2	4	20
58	13	11	14	4	2	2	4
59	2	2	1	1	20	30	20
60	1	20	9	1	1	4	10
61				6	20	22	199
62	131	140	87	29	97	143	233
63	235	215	131	124	333	522	2700
64	153	102	108	43	146	200	5020
65	62	63	50	1	50	42	553
66	502	520	406	197	606	907	2936
SECTOR 33	SECTOR 34	SECTOR 35	SECTOR 36	SECTOR 37	SECTOR 38	SECTOR 39	

	SECTOR 40	SECTOR 41	SECTOR 42	SECTOR 43	SECTOR 44	SECTOR 45	SECTOR 46
1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	---	---	1	---	---	---	---
7	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---
11	---	---	1	---	---	---	---
12	---	---	1	---	---	---	---
13	---	1	1	---	---	---	---
14	---	---	---	1	---	1	1
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	---	2	4	---	---	1	---
18	---	2	1	---	---	---	---
19	1	7	1	---	---	1	---
20	2	5	---	---	---	---	---
21	---	---	---	---	---	---	---
22	---	---	1	---	---	---	---
23	1	---	1	---	---	1	---
24	1	1	1	10	1	1	1
25	1	1	1	1	---	---	---
26	1	2	25	---	---	1	---
27	1	5	1	70	17	50	70
28	---	---	---	---	---	---	---
29	---	1	1	---	1	1	1
30	1	4	---	2	---	---	1
31	---	2	1	---	---	---	1
32	1	1	10	---	---	---	---
33	1	5	---	---	---	---	---
34	4	2	2	1	1	1	6
35	---	2	---	---	---	---	2
36	1	2	2	1	---	1	2
37	---	2	1	---	---	---	4
38	1	2	2	---	1	1	2
39	4	5	---	---	---	---	---
40	1	1	---	2	1	1	---
41	---	2	---	---	---	---	30
42	2	2	20	---	---	---	1
43	1	2	2	2	---	5	---
44	0	0	1	---	2	1	---
45	1	2	6	1	1	27	---
46	0	1	1	---	---	1	129
47	0	0	2	---	---	1	---
48	0	0	0	---	---	---	---
49	0	0	0	1	---	4	2
50	0	1	1	---	1	1	---
51	2	10	3	2	2	4	9
52	1	1	1	1	1	---	1
53	1	2	1	1	1	---	---
54	2	2	5	2	---	10	10
55	1	12	1	12	1	2	4
56	12	26	25	2	10	22	9
57	1	1	2	2	4	7	10
58	0	15	5	10	9	55	46
	52	142	132	130	55	252	411
59	239	1260	702	423	202	227	400
60	239	479	174	77	41	215	506
61	2	3	114	10	2	10	170
62	502	1290	1136	640	300	1220	1450
	SECTOR 40	SECTOR 41	SECTOR 42	SECTOR 43	SECTOR 44	SECTOR 45	SECTOR 46

	SECTOR 47	SECTOR 48	SECTOR 49	SECTOR 50	SECTOR 51	SECTOR 52	SECTOR 53
1	---	---	---	---	---	---	---
2	1	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---
9	1	---	---	---	---	---	---
10	5	---	---	---	---	---	---
11	3	---	---	---	---	---	---
12	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---
14	---	---	---	---	50	---	---
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---
32	---	---	---	---	---	---	---
33	---	---	---	---	---	---	---
34	1	---	---	---	---	---	---
35	---	---	---	---	---	---	---
36	1	---	---	---	---	---	---
37	---	---	---	---	---	---	---
38	---	---	---	---	---	---	---
39	15	---	---	---	---	---	---
40	---	---	---	---	---	---	---
41	---	---	---	---	---	---	---
42	---	---	---	---	---	---	---
43	---	---	---	---	---	---	---
44	1	---	---	---	---	---	---
45	---	---	---	---	---	---	---
46	1	---	---	---	---	---	---
47	16	---	---	---	---	---	---
48	1	---	---	---	---	---	---
49	17	1	---	---	---	---	---
50	---	---	---	---	---	---	---
51	2	4	1	1	520	1	1
52	1	---	1	1	2	437	---
53	---	---	---	---	---	---	---
54	6	---	5	1	10	3	25
55	1	1	---	---	16	1	3
56	16	---	1	2	10	1	3
57	4	---	3	---	10	1	1
58	23	1	19	1	25	2	5
	581	7	33	25	567	501	50
59	472	32	132	321	1675	175	262
60	76	5	30	19	211	43	9
61	26	---	2	---	10	425	0
62	1151	54	197	365	2545	1144	327
	SECTOR 47	SECTOR 48	SECTOR 49	SECTOR 50	SECTOR 51	SECTOR 52	SECTOR 53

	SECTOR 54	SECTOR 55	SECTOR 56	SECTOR 57	SECTOR 58	SUBTOTAL (GOODS, SERV.)
1					80	483
2					1	323
3					3	841
4		20			1	39
5						38
6					2	33
7					3	115
8					4	141
9					5	123
10					6	125
11					7	1
12					8	10
13					9	10
14		40				10
15			1			552
16						1081
17		90				645
18		40			2	94
19		60	1		1	107
20		4	2			16
21						25
22	6		50		14	300
23	1	7	20	9	2	396
24	6	1	20	90	100	497
25		2	4	1	10	265
26	1	7	12	1	4	117
27	3	140	80	10	190	1522
28					1	89
29		230			1	349
30		90				153
31		3				33
32		1				570
33		150	2			207
34		16	3			237
35		2			6	23
36		2	4			13
37		1	1		15	130
38	12	13	1		3	56
39						96
40		1	1		2	242
41						19
42	4	31	20	6	56	338
43						209
44	1	22	14	2	15	203
45		2	12		11	36
46	1	40	100		14	624
47		5	1		1	230
48	2	4	31	3	28	126
49		1	1		1	6
50				1	1	36
51	2	1	40	14	29	100
52	3	11	220	50	125	1504
53	1	4	31	10	80	274
54	2	2	30	3	20	150
55	13	20	200	115	200	707
56	10	6	70	50	50	417
57	11	283	325	14	275	1927
58	12	14	200	280	200	373
59	91	250	1014	300	900	3519
	182	1722	2674	967	2413	21938
59	1500	3875	11000	2636	7308	45555
60	218	1480	1150	140	965	17517
61	12	48	150	7	50	3625
62	1912	6532	15000	3800	10736	62525
SECTOR 54	SECTOR 55	SECTOR 56	SECTOR 57	SECTOR 58	SUBTOTAL (GOODS, SERV.)	

	WA PERS. 1/70 NUMEE CONSUMP	WA STATE GOVT	FED GOVT	GROSS PRIV DOM INVEST	USA EXPORTS	FOREIGN EXPORTS	
1	FIELD CRC	10	1	---	108	62	494
2	VEGGIES &	79	4	---	43	260	50
3	LIVESTOCK	53	1	---	---	20	1
4	MISC. AG	87	5	---	---	15	---
5	FISHING &	9	1	2	---	4	---
6	MEAT PROD	490	11	11	---	530	16
7	DAIRY PROD	332	20	44	---	209	---
8	CANNING &	127	11	30	---	1065	300
9	GRAIN MIL	41	3	1	---	69	54
10	BEVERAGES	300	1	10	---	351	7
11	OTHER FOOD	400	27	20	---	70	6
12	TEXTILE M	3	---	---	---	38	1
13	APPAREL	55	3	1	---	111	4
14	MINING	4	4	5	50	40	3
15	FORESTRY	13	---	---	---	38	---
16	LOGGING	---	---	---	---	---	657
17	SAWMILL	---	---	---	---	300	136
18	PLYWOOD	---	---	---	---	200	11
19	MISC. WOOD	11	1	---	10	369	1
20	FURNITURE	40	10	3	12	83	---
21	PULPMILL	---	---	---	---	170	160
22	PAPERMILL	5	7	16	---	689	256
23	MISC. PAP	60	15	14	---	493	63
24	PRINT & P	180	75	5	---	100	2
25	INDUSTRIA	5	7	425	---	100	55
26	OTHER CHE	24	5	1	---	37	1
27	PETROLEUM	1198	76	120	12	1546	153
28	GLASS & B	2	3	5	---	20	3
29	CEMENT ET	6	2	---	---	37	19
30	FERROUS M	---	1	1	---	145	1
31	NONFERROU	---	---	---	---	172	50
32	ALUMINUM	1	---	---	---	1379	100
33	STRUCTURA	1	6	12	81	220	15
34	LIGHT MET	30	5	2	25	171	10
35	FARM CONS	---	2	30	40	200	109
36	MACHINE T	5	6	3	3	47	3
37	INDUSTRIA	1	2	---	10	404	143
38	ELECTRICA	2	1	19	13	712	65
39	AEROSPACE	---	---	1200	16	3921	355
40	MOTOR VEH	13	1	10	33	400	26
41	SHIPBUILD	50	1	1550	20	211	20
42	OTHER MAN	5	10	25	35	515	337
TRANSPORTATION							
43	RAILRO	40	1	7	5	335	49
44	PASSENG	172	65	1	---	25	1
45	TRUCK	200	5	31	15	325	119
46	WATER	50	2	15	2	903	248
47	AIR TR	200	13	20	1	692	92
48	PIPELI	7	---	1	---	19	1
49	TRANS.	10	1	---	---	140	10
50	POST & C	75	12	10	---	167	1
51	ELECTRIC	806	82	15	---	100	---
52	GAS UTIL	200	25	10	---	35	---
53	OTHER UTI	150	13	3	---	---	---
54	COMMUNICA	900	30	30	20	155	20
55	CONSTRUCT	155	2887	298	2775	---	---
56	TRADE & R	3000	100	90	250	3293	1440
57	F.I.R.E.	1438	135	5	---	1300	9
58	SERVICES	5500	550	200	---	385	82
SUBTOT							
		21565	4301	4320	3579	23957	8973
59	VALUE ADD	5159	4315	2458	---	---	---
60	IMPORTS	11822	875	---	1143	---	---
61	IMPORTS	852	30	---	367	---	---
62	TOTAL	40405	7523	5778	5029	23957	8973

1 row, 1 col
VA = f(x)

rho = f(58,488)

C:\LOTUS\TRANCONS.DIF

Direct Appendix Table IV
Requirements Table

	1	2	3	4	5	6	7	8
1	.0432	.0026	.3275	.0000	.0000	.0055	.0000	.0000
2	.0000	.0132	.0033	.0000	.0000	.0000	.0000	.1882
3	.0086	.0040	.1092	.0000	.0000	.2997	.5064	.0000
4	.0000	.0000	.0000	.0294	.0000	.0000	.0000	.0006
5	.0000	.0000	.0000	.0000	.0106	.0000	.0000	.0483
6	.0000	.0000	.0000	.0000	.0106	.0165	.0000	.0031
7	.0000	.0000	.0000	.0000	.0000	.0009	.1795	.0031
8	.0000	.0000	.0000	.0000	.0000	.0000	.0026	.0176
9	.0000	.0000	.0873	.0000	.0106	.0009	.0000	.0019
10	.0009	.0000	.0000	.0000	.0106	.0000	.0000	.0000
11	.0000	.0000	.0011	.0000	.0000	.0009	.0026	.0063
12	.0000	.0000	.0000	.0000	.0106	.0009	.0000	.0000
13	.0000	.0000	.0000	.0000	.0000	.0009	.0000	.0000
14	.0009	.0013	.0000	.0000	.0000	.0000	.0000	.0000
15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	.0000	.0066	.0000	.0000	.0000	.0009	.0000	.0006
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
22	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
23	.0000	.0026	.0022	.0000	.0000	.0000	.0000	.0000
24	.0000	.0000	.0000	.0000	.0000	.0367	.0256	.0251
25	.0518	.0198	.0098	.0074	.0000	.0009	.0000	.0050
26	.0000	.0000	.0022	.0074	.0000	.0009	.0013	.0013
27	.0311	.0303	.0164	.0221	.0851	.0073	.0064	.0013
28	.0000	.0000	.0000	.0000	.0000	.0009	.0026	.0125
29	.0000	.0000	.0000	.0000	.0000	.0009	.0000	.0000
30	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
31	.0000	.0000	.0000	.0000	.0106	.0000	.0000	.0000
32	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
33	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
34	.0009	.0013	.0011	.0000	.0106	.0009	.0000	.0125
35	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
36	.0000	.0000	.0000	.0000	.0000	.0009	.0000	.0006
37	.0000	.0000	.0000	.0000	.0000	.0009	.0000	.0000
38	.0000	.0000	.0000	.0000	.0106	.0009	.0000	.0000
39	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	.0000	.0013	.0011	.0000	.0532	.0000	.0000	.0000
43	.0017	.0013	.0044	.0000	.0106	.0009	.0026	.0000
44	.0009	.0013	.0000	.0000	.0000	.0009	.0013	.0025
45	.0043	.0040	.0098	.0074	.0106	.0046	.0051	.0194
46	.0009	.0000	.0011	.0000	.0106	.0000	.0000	.0013
47	.0000	.0013	.0000	.0000	.0000	.0000	.0000	.0013
48	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	.0000	.0000	.0000	.0001	.0000	.0000	.0000	.0000
51	.0095	.0198	.0142	.0074	.0000	.0156	.0051	.0050
52	.0000	.0000	.0011	.0000	.0000	.0009	.0077	.0088
53	.0095	.0092	.0066	.0074	.0000	.0009	.0013	.0013
54	.0026	.0066	.0044	.0074	.0000	.0009	.0026	.0025
55	.0069	.0066	.0011	.0000	.0000	.0009	.0013	.0006
56	.0345	.0277	.0306	.0221	.0319	.0247	.0333	.0753
57	.0078	.0053	.0033	.0074	.0106	.0018	.0038	.0019
58	.0138	.0066	.0055	.0074	.0213	.0101	.0269	.0301
59	.6442	.7800	.3177	.8529	.5957	.1027	.1462	.3312

VA -> 59

	41	42	43	44	45	46	47	48
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0009	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0000	.0009	.0000	.0000	.0000	.0000	.0026	.0000
7	.0000	.0000	.0000	.0000	.0000	.0000	.0009	.0000
8	.0000	.0000	.0000	.0000	.0000	.0000	.0009	.0000
9	.0000	.0000	.0000	.0000	.0000	.0000	.0009	.0000
10	.0000	.0000	.0000	.0000	.0000	.0000	.0043	.0000
11	.0000	.0009	.0000	.0000	.0000	.0000	.0026	.0000
12	.0000	.0009	.0000	.0000	.0000	.0000	.0000	.0000
13	.0005	.0009	.0000	.0000	.0007	.0007	.0000	.0000
14	.0000	.0000	.0016	.0000	.0000	.0000	.0000	.0000
15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
17	.0011	.0035	.0000	.0000	.0007	.0000	.0000	.0000
18	.0011	.0009	.0000	.0000	.0000	.0000	.0000	.0000
19	.0037	.0009	.0000	.0000	.0007	.0000	.0000	.0000
20	.0026	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
22	.0000	.0009	.0000	.0000	.0000	.0000	.0000	.0000
23	.0000	.0009	.0000	.0000	.0007	.0000	.0000	.0000
24	.0005	.0009	.0156	.0033	.0007	.0007	.0009	.0000
25	.0005	.0009	.0016	.0000	.0000	.0000	.0000	.0000
26	.0011	.0220	.0000	.0000	.0007	.0000	.0000	.0000
27	.0026	.0009	.1094	.0567	.0362	.0483	.3892	.0000
28	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
29	.0005	.0009	.0000	.0033	.0007	.0007	.0000	.0000
30	.0021	.0000	.0031	.0000	.0000	.0007	.0000	.0000
31	.0011	.0009	.0000	.0000	.0000	.0007	.0000	.0000
32	.0005	.0088	.0000	.0000	.0000	.0000	.0000	.0000
33	.0026	.0000	.0000	.0000	.0000	.0000	.0000	.0000
34	.0016	.0026	.0016	.0033	.0007	.0041	.0009	.0000
35	.0011	.0000	.0000	.0000	.0000	.0014	.0000	.0000
36	.0011	.0026	.0016	.0000	.0007	.0034	.0009	.0000
37	.0011	.0009	.0000	.0000	.0000	.0028	.0000	.0000
38	.0016	.0018	.0000	.0033	.0007	.0014	.0000	.0000
39	.0026	.0000	.0000	.0000	.0000	.0000	.0130	.0000
40	.0005	.0000	.0031	.0033	.0007	.0000	.0000	.0000
41	.0016	.0000	.0000	.0000	.0000	.0207	.0000	.0000
42	.0011	.0176	.0000	.0000	.0000	.0007	.0000	.0000
43	.0011	.0018	.0125	.0000	.0036	.0000	.0000	.0000
44	.0000	.0009	.0000	.0067	.0007	.0000	.0009	.0000
45	.0011	.0053	.0016	.0033	.0630	.0000	.0035	.0000
46	.0005	.0009	.0000	.0000	.0007	.0000	.0009	.0000
47	.0000	.0018	.0000	.0000	.0007	.0000	.0139	.0000
48	.0000	.0000	.0000	.0000	.0000	.0000	.0009	.0000
49	.0000	.0000	.0016	.0000	.0029	.0055	.0148	.0294
50	.0005	.0009	.0000	.0033	.0007	.0000	.0000	.0000
51	.0053	.0026	.0031	.0067	.0029	.0062	.0017	.1176
52	.0005	.0009	.0016	.0033	.0000	.0007	.0009	.0000
53	.0011	.0009	.0016	.0033	.0000	.0000	.0000	.0000
54	.0011	.0053	.0031	.0033	.0072	.0069	.0052	.0000
55	.0063	.0009	.0188	.0033	.0014	.0028	.0009	.0294
56	.0190	.0220	.0031	.0333	.0203	.0062	.0156	.0000
57	.0005	.0018	.0031	.0133	.0051	.0069	.0035	.0000
58	.0085	.0044	.0156	.0300	.0406	.0317	.0243	.0294
59	.6667	.6232	.6609	.6733	.6428	.2759	.4101	.6471

	49	50	51	52	53	54	55	56
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
5	.0000	.0000	.0000	.0000	.0000	.0000	.0031	.0000
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
8	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
9	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
11	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
12	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
13	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
14	.0000	.0000	.0195	.0000	.0000	.0000	.0061	.0000
15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0138	.0000
19	.0000	.0000	.0000	.0000	.0000	.0000	.0061	.0000
20	.0000	.0000	.0000	.0000	.0000	.0000	.0092	.0000
21	.0000	.0000	.0000	.0000	.0000	.0000	.0006	.0000
22	.0000	.0027	.0004	.0000	.0000	.0031	.0000	.0000
23	.0000	.0027	.0012	.0009	.0000	.0005	.0011	.0020
24	.0051	.0027	.0012	.0009	.0031	.0031	.0002	.0171
25	.0000	.0000	.0004	.0000	.0000	.0000	.0003	.0003
26	.0000	.0000	.0004	.0000	.0000	.0005	.0011	.0008
27	.0051	.0219	.0004	.0009	.0061	.0016	.0214	.0053
28	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
29	.0000	.0000	.0000	.0000	.0000	.0000	.0429	.0000
30	.0000	.0000	.0000	.0000	.0000	.0000	.0122	.0000
31	.0000	.0000	.0004	.0000	.0000	.0000	.0012	.0000
32	.0000	.0000	.0004	.0000	.0000	.0000	.0002	.0000
33	.0000	.0000	.0000	.0000	.0000	.0000	.0291	.0000
34	.0000	.0000	.0008	.0000	.0000	.0000	.0024	.0003
35	.0000	.0000	.0004	.0000	.0000	.0000	.0003	.0000
36	.0000	.0027	.0004	.0000	.0000	.0000	.0003	.0003
37	.0000	.0000	.0004	.0000	.0000	.0000	.0002	.0001
38	.0000	.0000	.0004	.0000	.0000	.0063	.0023	.0001
39	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0001
41	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	.0000	.0000	.0004	.0000	.0000	.0021	.0047	.0013
43	.0000	.0027	.0004	.0000	.0000	.0005	.0034	.0009
44	.0000	.0000	.0000	.0000	.0000	.0000	.0003	.0008
45	.0000	.0055	.0004	.0000	.0000	.0005	.0061	.0067
46	.0000	.0000	.0000	.0000	.0000	.0000	.0008	.0001
47	.0051	.0110	.0004	.0000	.0000	.0010	.0006	.0021
48	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0001
49	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001
50	.0000	.0000	.0012	.0009	.0031	.0010	.0002	.0027
51	.0051	.0027	.0027	.0017	.0275	.0047	.0017	.0147
52	.0051	.0027	.0008	.4257	.0000	.0005	.0006	.0021
53	.0000	.0000	.0004	.0000	.0765	.0010	.0003	.0020
54	.0254	.0027	.0039	.0026	.0061	.0068	.0031	.0133
55	.0000	.0000	.0062	.0009	.0092	.0052	.0009	.0047
56	.0051	.0055	.0039	.0009	.0031	.0058	.0433	.0150
57	.0152	.0000	.0039	.0009	.0031	.0063	.0061	.0133
58	.0964	.0027	.0097	.0017	.0153	.0476	.0383	.0676
59	.6701	.8795	.6530	.1530	.8226	.7845	.5014	.7333

	9	10	11	12	13	14	15	16
1	.1344	.0908	.0017	.0000	.0000	.0000	.0000	.0000
2	.0000	.0043	.0084	.0000	.0000	.0000	.0000	.0000
3	.0000	.0000	.0017	.0200	.0053	.0000	.0000	.0000
4	.0000	.0000	.0017	.0000	.0000	.0000	.0033	.0000
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0066	.0000	.0017	.0000	.0000	.0000	.0000	.0000
7	.0000	.0000	.0418	.0000	.0000	.0000	.0000	.0000
8	.0000	.0000	.0100	.0000	.0000	.0000	.0000	.0000
9	.0000	.0000	.0669	.0000	.0000	.0000	.0000	.0000
10	.0000	.0086	.0084	.0000	.0000	.0000	.0000	.0000
11	.0033	.0504	.0301	.0000	.0000	.0000	.0000	.0000
12	.0000	.0000	.0017	.0000	.0000	.0000	.0000	.0006
13	.0000	.0000	.0000	.0000	.0053	.0000	.0000	.0012
14	.0033	.0000	.0033	.0000	.0000	.0168	.0000	.0000
15	.0000	.0000	.0000	.0000	.0000	.0000	.0299	.2647
16	.0000	.0000	.0000	.0000	.0000	.0000	.0033	.2204
17	.0000	.0000	.0000	.0000	.0000	.0042	.0000	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	.0000	.0000	.0017	.0000	.0000	.0000	.0000	.0000
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
22	.0197	.0000	.0017	.0000	.0053	.0000	.0000	.0000
23	.0098	.0216	.0151	.0000	.0053	.0000	.0000	.0012
24	.0000	.0043	.0067	.0000	.0000	.0000	.0017	.0000
25	.0000	.0014	.0017	.0000	.0000	.0042	.0133	.0006
26	.0000	.0014	.0017	.0000	.0000	.0000	.0066	.0006
27	.0033	.0029	.0100	.0000	.0000	.0168	.0133	.0115
28	.0000	.0793	.0017	.0000	.0000	.0000	.0000	.0000
29	.0000	.0000	.0000	.0000	.0000	.0126	.0000	.0006
30	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0006
31	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
32	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
33	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0035
34	.0066	.1297	.0033	.0000	.0000	.0042	.0000	.0029
35	.0000	.0000	.0000	.0000	.0000	.0000	.0017	.0006
36	.0000	.0014	.0000	.0000	.0000	.0000	.0000	.0035
37	.0033	.0000	.0017	.0000	.0000	.0000	.0000	.0000
38	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0012
39	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	.0000	.0000	.0017	.0000	.0000	.0000	.0000	.0012
41	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	.0000	.0000	.0017	.0000	.0000	.0000	.0000	.0012
43	.0066	.0029	.0084	.0000	.0000	.0042	.0017	.0017
44	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
45	.0098	.0101	.0184	.0000	.0053	.0042	.0050	.0834
46	.0033	.0000	.0017	.0000	.0000	.0000	.0000	.0006
47	.0000	.0014	.0017	.0000	.0000	.0000	.0000	.0000
48	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0006
50	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
51	.0033	.0029	.0033	.0200	.0053	.0084	.0017	.0012
52	.0000	.0086	.0134	.0400	.0053	.0042	.0000	.0000
53	.0000	.0014	.0017	.0000	.0000	.0000	.0000	.0006
54	.0033	.0014	.0033	.0200	.0106	.0042	.0017	.0012
55	.0000	.0043	.0033	.0000	.0053	.0042	.0166	.0380
56	.0656	.0360	.0468	.0200	.0212	.0126	.0100	.0144
57	.0033	.0043	.0050	.0000	.0053	.0042	.0017	.0035
58	.0328	.0403	.0251	.0200	.0370	.0294	.0149	.0230
59	.1639	.3228	.4982	.4400	.4497	.6891	.8574	.2244

Direct Requirements Table

	17	18	19	20	21	22	23	24
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
8	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
9	.0000	.0033	.0000	.0000	.0000	.0048	.0029	.0000
10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
11	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
12	.0000	.0000	.0020	.0061	.0000	.0000	.0000	.0000
13	.0019	.0000	.0000	.0000	.0000	.0000	.0000	.0000
14	.0000	.0000	.0000	.0000	.0000	.0008	.0000	.0000
15	.0509	.0590	.0000	.0000	.0000	.0000	.0000	.0000
16	.3922	.2885	.0301	.0000	.0366	.0630	.0740	.0000
17	.0925	.0328	.1042	.0122	.0845	.1995	.0941	.0000
18	.0009	.0787	.0341	.0061	.0141	.0000	.0000	.0000
19	.0000	.0000	.0401	.0061	.0000	.0008	.0000	.0000
20	.0000	.0000	.0000	.0061	.0000	.0000	.0000	.0000
21	.0019	.0000	.0000	.0000	.0000	.0152	.0019	.0000
22	.0000	.0000	.0000	.0122	.0028	.0032	.0997	.0809
23	.0000	.0000	.0080	.0061	.0113	.0048	.1470	.0023
24	.0000	.0033	.0000	.0000	.0000	.0000	.0000	.0092
25	.0009	.0033	.0020	.0000	.0563	.0319	.0192	.0012
26	.0028	.0328	.0020	.0061	.0000	.0008	.0010	.0012
27	.0083	.0131	.0020	.0061	.1127	.0319	.0259	.0012
28	.0000	.0000	.0000	.0000	.0000	.0000	.0500	.0000
29	.0000	.0000	.0040	.0000	.0000	.0008	.0000	.0000
30	.0000	.0000	.0020	.0000	.0000	.0000	.0000	.0000
31	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
32	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
33	.0019	.0098	.0080	.0000	.0000	.0008	.0000	.0000
34	.0009	.0000	.0040	.0061	.0028	.0008	.0000	.0035
35	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
36	.0009	.0033	.0020	.0061	.0028	.0008	.0000	.0000
37	.0000	.0033	.0000	.0000	.0000	.0000	.0000	.0000
38	.0009	.0033	.0020	.0000	.0000	.0000	.0000	.0000
39	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	.0023	.0000	.0020	.0244	.0000	.0040	.0000	.0000
43	.0019	.0033	.0060	.0061	.0056	.0144	.0096	.0012
44	.0000	.0000	.0000	.0061	.0000	.0000	.0000	.0012
45	.0222	.0197	.0080	.0000	.0169	.0144	.0192	.0046
46	.0019	.0033	.0020	.0000	.0028	.0008	.0010	.0000
47	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0023
48	.0000	.0000	.0000	.0000	.0023	.0008	.0000	.0000
49	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0023
51	.0111	.0131	.0040	.0061	.0423	.0399	.0240	.0035
52	.0009	.0164	.0020	.0305	.0986	.0120	.0168	.0023
53	.0009	.0033	.0020	.0000	.0197	.0032	.0019	.0000
54	.0019	.0033	.0080	.0061	.0028	.0016	.0019	.0116
55	.0037	.0066	.0060	.0061	.0085	.0080	.0058	.0023
56	.0352	.0492	.0561	.0427	.0563	.0479	.0530	.0324
57	.0074	.0066	.0100	.0061	.0056	.0048	.0048	.0046
58	.0139	.0066	.0200	.0610	.0085	.0160	.0107	.0786
59	.2969	.2590	.3347	.5122	.2592	.3049	.2017	.5675

	25	26	27	28	29	30	31	32
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
8	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
9	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
11	.0012	.0000	.0000	.0000	.0000	.0000	.0000	.0000
12	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
13	.0012	.0000	.0000	.0000	.0000	.0000	.0000	.0005
14	.0012	.0000	.0004	.0431	.0484	.0033	.0039	.0000
15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
17	.0000	.0000	.0000	.0000	.0000	.0000	.0039	.0000
18	.0000	.0000	.0002	.0000	.0000	.0000	.0000	.0000
19	.0000	.0054	.0000	.0000	.0000	.0000	.0000	.0005
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.0023	.0000	.0000	.0000	.0000	.0000	.0000	.0000
22	.0012	.0054	.0000	.0000	.0000	.0000	.0000	.0000
23	.0047	.0108	.0006	.0431	.0024	.0033	.0000	.0000
24	.0012	.0054	.0000	.0000	.0000	.0000	.0000	.0005
25	.0373	.0108	.0013	.0000	.0000	.0098	.0039	.0039
26	.0023	.0324	.0000	.0086	.0024	.0033	.0039	.0039
27	.0070	.0270	.0143	.0086	.0969	.0033	.0117	.0098
28	.0012	.0000	.0000	.0086	.0000	.0000	.0000	.0000
29	.0000	.0000	.0004	.0000	.1211	.0000	.0000	.0000
30	.0000	.0000	.0000	.0086	.0000	.0131	.0000	.0010
31	.0000	.0000	.0002	.0000	.0000	.0000	.0000	.0015
32	.0000	.0000	.0000	.0000	.0000	.0000	.1556	.2195
33	.0000	.0000	.0002	.0000	.0000	.0033	.0000	.0005
34	.0058	.0054	.0004	.0000	.0024	.0065	.0000	.0005
35	.0000	.0000	.0002	.0000	.0000	.0000	.0000	.0005
36	.0000	.0000	.0002	.0000	.0024	.0098	.0000	.0015
37	.0012	.0000	.0004	.0000	.0000	.0000	.0000	.0010
38	.0012	.0000	.0000	.0000	.0000	.0000	.0000	.0010
39	.0058	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	.0012	.0054	.0011	.0000	.0000	.0000	.0000	.0020
43	.0047	.0054	.0006	.0172	.0073	.0098	.0078	.0146
44	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
45	.0058	.0108	.0011	.0172	.0266	.0065	.0117	.0020
46	.0000	.0000	.0013	.0000	.0024	.0033	.0039	.0029
47	.0012	.0000	.0002	.0000	.0000	.0000	.0000	.0000
48	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
51	.0210	.0054	.0026	.0862	.0218	.0588	.0359	.1356
52	.0292	.0216	.0076	.1293	.0024	.0196	.0233	.0102
53	.0047	.0054	.0002	.0000	.0024	.0000	.0000	.0000
54	.0023	.0108	.0004	.0000	.0048	.0000	.0000	.0005
55	.0070	.0103	.0002	.0086	.0097	.0131	.0039	.0015
56	.0350	.0270	.0065	.0345	.0266	.0458	.0039	.0127
57	.0023	.0108	.0004	.0086	.0048	.0033	.0039	.0034
58	.0233	.0541	.0004	.0259	.0367	.0196	.0117	.0073
59	.6336	.3129	.1218	.4483	.4697	.5294	.2325	.2293

Direct Requirements Table

	33	34	35	36	37	38	39	40
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
8	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
9	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
11	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
12	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
13	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
14	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0000
15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
17	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0000
19	.0000	.0019	.0025	.0000	.0000	.0011	.0001	.0020
20	.0000	.0000	.0000	.0000	.0000	.0011	.0001	.0040
21	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
22	.0000	.0000	.0000	.0000	.0000	.0011	.0001	.0000
23	.0017	.0077	.0000	.0000	.0000	.0011	.0013	.0020
24	.0000	.0000	.0025	.0000	.0000	.0000	.0001	.0020
25	.0000	.0058	.0049	.0000	.0000	.0000	.0001	.0020
26	.0017	.0038	.0025	.0000	.0000	.0022	.0006	.0020
27	.0017	.0058	.0025	.0051	.0017	.0011	.0011	.0020
28	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
29	.0000	.0019	.0000	.0000	.0000	.0000	.0001	.0000
30	.0430	.0385	.0123	.0102	.0132	.0000	.0001	.0020
31	.0086	.0019	.0000	.0051	.0099	.0011	.0003	.0000
32	.0344	.0769	.0025	.0000	.0033	.0011	.0002	.0020
33	.0309	.0019	.0000	.0051	.0033	.0000	.0009	.0020
34	.0086	.0096	.0197	.0051	.0050	.0276	.0017	.0080
35	.0000	.0000	.0345	.0000	.0000	.0000	.0000	.0000
36	.0052	.0115	.0197	.0406	.0198	.0055	.0034	.0020
37	.0017	.0000	.0148	.0000	.0099	.0022	.0008	.0000
38	.0000	.0000	.0099	.0000	.0066	.0198	.0020	.0020
39	.0172	.0000	.0000	.0000	.0000	.0044	.0224	.0080
40	.0017	.0000	.0025	.0000	.0017	.0000	.0000	.0020
41	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	.0000	.0154	.0025	.0051	.0017	.0099	.0015	.0040
43	.0034	.0019	.0025	.0000	.0017	.0011	.0011	.0020
44	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0000
45	.0052	.0038	.0049	.0051	.0017	.0022	.0008	.0020
46	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
47	.0000	.0019	.0000	.0000	.0017	.0022	.0022	.0000
48	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0000
50	.0000	.0000	.0000	.0000	.0000	.0011	.0002	.0000
51	.0034	.0038	.0025	.0051	.0017	.0022	.0022	.0040
52	.0034	.0019	.0049	.0000	.0000	.0011	.0011	.0020
53	.0000	.0019	.0000	.0000	.0017	.0000	.0006	.0020
54	.0034	.0058	.0049	.0051	.0050	.0044	.0022	.0040
55	.0052	.0019	.0025	.0000	.0033	.0022	.0004	.0020
56	.0223	.0212	.0345	.0203	.0330	.0331	.0022	.0239
57	.0052	.0038	.0025	.0051	.0017	.0044	.0011	.0020
58	.0172	.0385	.0222	.0305	.0330	.0243	.0223	.0120
59	.4055	.4135	.3966	.5294	.5495	.5755	.3021	.4163

	57	58	59
1	.0000	.0019	.0002
2	.0000	.0001	.0014
3	.0000	.0003	.0009
4	.0000	.0001	.0015
5	.0000	.0000	.0002
6	.0000	.0002	.0084
7	.0000	.0003	.0057
8	.0000	.0004	.0022
9	.0000	.0002	.0007
10	.0000	.0006	.0051
11	.0000	.0002	.0068
12	.0000	.0001	.0001
13	.0000	.0001	.0009
14	.0000	.0000	.0001
15	.0000	.0000	.0002
16	.0000	.0000	.0000
17	.0000	.0002	.0000
18	.0000	.0001	.0000
19	.0000	.0000	.0002
20	.0000	.0000	.0007
21	.0000	.0000	.0000
22	.0005	.0013	.0001
23	.0024	.0002	.0010
24	.0211	.0093	.0031
25	.0003	.0009	.0001
26	.0003	.0006	.0004
27	.0026	.0177	.0205
28	.0000	.0001	.0000
29	.0000	.0001	.0001
30	.0000	.0000	.0000
31	.0000	.0000	.0000
32	.0000	.0000	.0000
33	.0000	.0000	.0000
34	.0000	.0006	.0005
35	.0000	.0000	.0000
36	.0000	.0014	.0001
37	.0000	.0005	.0000
38	.0000	.0003	.0000
39	.0000	.0000	.0000
40	.0000	.0005	.0002
41	.0000	.0000	.0009
42	.0016	.0052	.0001
43	.0005	.0014	.0007
44	.0000	.0010	.0029
45	.0000	.0013	.0034
46	.0000	.0001	.0009
47	.0008	.0026	.0034
48	.0000	.0001	.0001
49	.0003	.0001	.0002
50	.0037	.0027	.0013
51	.0132	.0116	.0138
52	.0026	.0075	.0034
53	.0021	.0019	.0026
54	.0305	.0186	.0154
55	.0158	.0047	.0027
56	.0037	.0256	.1368
57	.0737	.0186	.0249
58	.0789	.0838	.0940
59	.7068	.6807	.1053

Transport
 $VA = f(x)$

$$pce = f(58,488)$$

C:\LOTUS\TRANCONS.DIF

Total Appendix Table V
 Requirements Table

	1	2	3	4	5	6	7	8
1	1.0544	.0106	.4050	.0065	.0093	.1311	.2522	.0077
2	.0027	1.0163	.0063	.0031	.0026	.0026	.0055	.1966
3	.0213	.0169	1.1376	.0130	.0146	.3502	.7064	.0146
4	.0022	.0024	.0021	1.0323	.0020	.0012	.0021	.0026
5	.0004	.0004	.0004	.0004	1.0111	.0002	.0005	.0500
6	.0116	.0129	.0120	.0136	.0221	1.0233	.0118	.0142
7	.0100	.0111	.0098	.0117	.0095	.0067	1.2287	.0132
8	.0032	.0035	.0031	.0037	.0030	.0018	.0064	1.0208
9	.0036	.0034	.1012	.0031	.0137	.0327	.0638	.0058
10	.0081	.0080	.0074	.0085	.0177	.0041	.0073	.0072
11	.0102	.0112	.0115	.0118	.0102	.0070	.0141	.0157
12	.0001	.0002	.0001	.0001	.0109	.0010	.0001	.0007
13	.0014	.0015	.0014	.0016	.0014	.0017	.0014	.0013
14	.0023	.0030	.0023	.0013	.0011	.0015	.0022	.0021
15	.0009	.0013	.0012	.0009	.0009	.0029	.0030	.0025
16	.0016	.0030	.0026	.0016	.0017	.0087	.0085	.0071
17	.0016	.0029	.0025	.0016	.0017	.0069	.0069	.0058
18	.0002	.0004	.0002	.0001	.0002	.0001	.0002	.0002
19	.0005	.0075	.0005	.0006	.0007	.0013	.0005	.0025
20	.0010	.0011	.0010	.0011	.0011	.0005	.0010	.0009
21	.0002	.0001	.0002	.0001	.0001	.0002	.0003	.0002
22	.0034	.0039	.0058	.0037	.0035	.0073	.0088	.0071
23	.0045	.0078	.0084	.0048	.0050	.0476	.0438	.0357
24	.0118	.0126	.0120	.0131	.0113	.0080	.0127	.0169
25	.0579	.0226	.0346	.0094	.0018	.0133	.0245	.0077
26	.0013	.0014	.0038	.0092	.0016	.0026	.0031	.0015
27	.0723	.0745	.0711	.0674	.1252	.0414	.0687	.0502
28	.0009	.0009	.0008	.0009	.0016	.0014	.0040	.0137
29	.0011	.0011	.0009	.0008	.0008	.0016	.0010	.0008
30	.0004	.0004	.0004	.0003	.0009	.0003	.0004	.0009
31	.0001	.0001	.0001	.0001	.0109	.0001	.0001	.0006
32	.0005	.0006	.0006	.0004	.0039	.0004	.0006	.0018
33	.0006	.0006	.0005	.0004	.0005	.0004	.0005	.0005
34	.0036	.0040	.0047	.0026	.0150	.0031	.0039	.0160
35	.0000	.0001	.0001	.0000	.0001	.0000	.0001	.0001
36	.0007	.0007	.0007	.0007	.0010	.0015	.0008	.0015
37	.0003	.0003	.0006	.0003	.0004	.0012	.0005	.0003
38	.0005	.0006	.0005	.0005	.0115	.0013	.0005	.0010
39	.0004	.0003	.0003	.0002	.0003	.0001	.0002	.0002
40	.0005	.0005	.0005	.0005	.0005	.0003	.0005	.0005
41	.0012	.0013	.0012	.0014	.0552	.0007	.0012	.0038
42	.0020	.0035	.0033	.0021	.0133	.0026	.0062	.0030
43	.0042	.0038	.0087	.0024	.0024	.0048	.0084	.0057
44	.0054	.0063	.0047	.0052	.0042	.0026	.0046	.0050
45	.0137	.0139	.0236	.0177	.0202	.0164	.0263	.0324
46	.0023	.0016	.0033	.0016	.0123	.0014	.0026	.0031
47	.0060	.0079	.0059	.0069	.0058	.0034	.0060	.0071
48	.0002	.0002	.0002	.0002	.0002	.0001	.0002	.0002
49	.0004	.0005	.0005	.0005	.0005	.0003	.0005	.0005
50	.0033	.0036	.0033	.0038	.0032	.0019	.0035	.0032
51	.0483	.0633	.0604	.0487	.0349	.0494	.0608	.0465
52	.0169	.0165	.0180	.0165	.0160	.0128	.0353	.0332
53	.0163	.0160	.0175	.0142	.0051	.0079	.0147	.0084
54	.0333	.0401	.0367	.0425	.0297	.0205	.0385	.0328
55	.0153	.0153	.0122	.0087	.0078	.0076	.0129	.0099
56	.2382	.2510	.2523	.2556	.2261	.1562	.2750	.2684
57	.0539	.0555	.0523	.0602	.0548	.0302	.0556	.0460
58	.1862	.1945	.1849	.2040	.1868	.1136	.2172	.1951
59	1.3531	1.5039	1.3229	1.5852	1.2834	.7393	1.3179	1.2090

VA →

	9	10	11	12	13	14	15	16
1	.1449	.1022	.0292	.0117	.0059	.0054	.0065	.0055
2	.0014	.0072	.0133	.0018	.0018	.0026	.0031	.0026
3	.0095	.0122	.0431	.0299	.0134	.0107	.0130	.0109
4	.0011	.0020	.0038	.0014	.0015	.0021	.0061	.0035
5	.0002	.0003	.0009	.0002	.0002	.0004	.0004	.0004
6	.0127	.0101	.0129	.0077	.0078	.0112	.0136	.0114
7	.0053	.0112	.0617	.0066	.0067	.0096	.0117	.0098
8	.0017	.0033	.0136	.0021	.0021	.0031	.0037	.0031
9	1.0021	.0062	.0745	.0037	.0024	.0026	.0031	.0026
10	.0039	1.0162	.0154	.0048	.0049	.0070	.0085	.0071
11	.0026	.0612	1.0412	.0067	.0067	.0097	.0113	.0099
12	.0001	.0002	.0019	1.0001	.0001	.0001	.0002	.0009
13	.0008	.0012	.0013	.0009	1.0062	.0013	.0016	.0029
14	.0042	.0052	.0050	.0012	.0008	1.0190	.0013	.0016
15	.0024	.0025	.0022	.0005	.0012	.0017	1.0330	.3515
16	.0068	.0069	.0060	.0010	.0031	.0038	.0062	1.2866
17	.0068	.0057	.0053	.0010	.0030	.0061	.0019	.0027
18	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0005
19	.0003	.0009	.0024	.0003	.0004	.0005	.0007	.0011
20	.0005	.0008	.0009	.0006	.0007	.0009	.0011	.0010
21	.0004	.0002	.0002	.0000	.0002	.0001	.0001	.0001
22	.0232	.0069	.0092	.0023	.0022	.0031	.0037	.0035
23	.0144	.0357	.0255	.0028	.0090	.0040	.0048	.0060
24	.0075	.0157	.0186	.0077	.0080	.0109	.0145	.0122
25	.0095	.0099	.0058	.0015	.0014	.0057	.0153	.0071
26	.0008	.0041	.0032	.0008	.0008	.0012	.0085	.0046
27	.0214	.0454	.0521	.0259	.0268	.0563	.0590	.0639
28	.0004	.0815	.0034	.0005	.0005	.0007	.0009	.0007
29	.0006	.0013	.0010	.0004	.0007	.0155	.0016	.0043
30	.0005	.0063	.0006	.0002	.0002	.0005	.0005	.0022
31	.0001	.0004	.0001	.0000	.0000	.0001	.0001	.0002
32	.0009	.0135	.0009	.0002	.0002	.0008	.0004	.0011
33	.0003	.0002	.0005	.0002	.0004	.0005	.0009	.0066
34	.0081	.1347	.0076	.0015	.0015	.0065	.0028	.0064
35	.0000	.0001	.0000	.0000	.0000	.0000	.0018	.0014
36	.0006	.0039	.0003	.0004	.0005	.0007	.0008	.0055
37	.0035	.0003	.0022	.0002	.0002	.0002	.0003	.0003
38	.0003	.0005	.0005	.0004	.0004	.0004	.0005	.0022
39	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0003
40	.0002	.0005	.0022	.0003	.0003	.0005	.0005	.0021
41	.0007	.0010	.0012	.0008	.0008	.0012	.0014	.0012
42	.0015	.0042	.0040	.0013	.0015	.0020	.0022	.0039
43	.0087	.0079	.0120	.0015	.0016	.0064	.0042	.0056
44	.0025	.0040	.0042	.0029	.0030	.0043	.0052	.0045
45	.0174	.0234	.0313	.0057	.0118	.0132	.0156	.1251
46	.0042	.0015	.0033	.0009	.0009	.0014	.0016	.0022
47	.0033	.0071	.0074	.0039	.0040	.0057	.0069	.0060
48	.0001	.0002	.0002	.0001	.0001	.0002	.0002	.0002
49	.0003	.0004	.0005	.0003	.0003	.0004	.0005	.0015
50	.0019	.0030	.0032	.0022	.0023	.0031	.0035	.0033
51	.0271	.0490	.0399	.0480	.0302	.0436	.0411	.0371
52	.0093	.0496	.0400	.0788	.0190	.0211	.0167	.0147
53	.0046	.0077	.0076	.0037	.0036	.0050	.0061	.0060
54	.0211	.0303	.0332	.0404	.0316	.0335	.0364	.0333
55	.0062	.0139	.0117	.0052	.0107	.0118	.0252	.0624
56	.1781	.2242	.2445	.1529	.1563	.2062	.2442	.2237
57	.0293	.0474	.0489	.0301	.0365	.0480	.0539	.0510
58	.1317	.2046	.1932	.1335	.1540	.1942	.2116	.2106
59	.8948	1.1571	1.2363	.3940	.9041	1.3074	1.5856	1.3267

Total Requirements Table

	17	18	19	20	21	22	23	24
1	.0057	.0058	.0044	.0050	.0043	.0056	.0059	.0054
2	.0027	.0025	.0020	.0023	.0020	.0023	.0025	.0025
3	.0114	.0106	.0086	.0099	.0085	.0097	.0105	.0105
4	.0030	.0027	.0018	.0019	.0018	.0021	.0023	.0020
5	.0004	.0003	.0003	.0002	.0003	.0003	.0003	.0003
6	.0119	.0111	.0090	.0102	.0089	.0101	.0110	.0109
7	.0102	.0095	.0077	.0087	.0076	.0087	.0094	.0094
8	.0033	.0030	.0025	.0028	.0024	.0028	.0030	.0030
9	.0028	.0061	.0022	.0025	.0022	.0072	.0065	.0029
10	.0074	.0069	.0056	.0063	.0055	.0063	.0068	.0068
11	.0103	.0096	.0078	.0088	.0077	.0088	.0095	.0094
12	.0005	.0004	.0023	.0063	.0002	.0002	.0002	.0001
13	.0041	.0019	.0014	.0013	.0014	.0019	.0019	.0013
14	.0016	.0016	.0013	.0011	.0022	.0031	.0022	.0012
15	.2106	.1843	.0415	.0059	.0348	.0658	.0621	.0062
16	.5580	.4243	.1186	.0152	.1043	.1968	.1976	.0178
17	1.1044	.0415	.1238	.0197	.0976	.2247	.1498	.0200
18	.0015	1.0858	.0388	.0071	.0156	.0007	.0005	.0002
19	.0008	.0010	1.0423	.0069	.0005	.0015	.0007	.0005
20	.0010	.0010	.0008	1.0070	.0008	.0009	.0009	.0009
21	.0021	.0002	.0003	.0003	1.0005	.0158	.0044	.0014
22	.0037	.0042	.0040	.0162	.0072	1.0072	.1213	.0856
23	.0052	.0053	.0134	.0112	.0173	.0102	1.1776	.0072
24	.0129	.0161	.0104	.0112	.0103	.0114	.0125	1.0211
25	.0059	.0084	.0045	.0021	.0609	.0369	.0301	.0055
26	.0064	.0397	.0053	.0084	.0023	.0034	.0036	.0026
27	.0625	.0638	.0387	.0433	.1501	.0774	.0804	.0432
28	.0008	.0007	.0006	.0007	.0006	.0007	.0008	.0007
29	.0026	.0023	.0060	.0011	.0014	.0026	.0018	.0009
30	.0013	.0016	.0032	.0007	.0007	.0008	.0007	.0004
31	.0002	.0003	.0002	.0001	.0002	.0001	.0001	.0001
32	.0009	.0012	.0013	.0013	.0007	.0007	.0006	.0007
33	.0053	.0138	.0104	.0008	.0015	.0028	.0020	.0006
34	.0053	.0041	.0067	.0035	.0055	.0041	.0035	.0058
35	.0007	.0006	.0002	.0001	.0002	.0003	.0003	.0001
36	.0039	.0062	.0036	.0073	.0041	.0025	.0017	.0009
37	.0003	.0039	.0004	.0003	.0004	.0003	.0003	.0002
38	.0023	.0048	.0030	.0006	.0008	.0010	.0009	.0005
39	.0002	.0004	.0003	.0001	.0005	.0004	.0003	.0002
40	.0012	.0010	.0006	.0005	.0005	.0007	.0008	.0005
41	.0013	.0012	.0010	.0011	.0010	.0011	.0012	.0011
42	.0061	.0030	.0045	.0273	.0023	.0070	.0033	.0027
43	.0060	.0074	.0090	.0085	.0085	.0180	.0163	.0046
44	.0046	.0043	.0035	.0101	.0034	.0039	.0043	.0054
45	.0859	.0715	.0307	.0101	.0377	.0470	.0559	.0163
46	.0039	.0053	.0036	.0013	.0043	.0027	.0030	.0014
47	.0062	.0058	.0048	.0054	.0048	.0054	.0059	.0082
48	.0002	.0002	.0002	.0002	.0030	.0010	.0003	.0003
49	.0010	.0009	.0005	.0004	.0006	.0006	.0007	.0005
50	.0035	.0033	.0027	.0021	.0029	.0031	.0034	.0036
51	.0526	.0538	.0364	.0403	.0859	.0868	.0784	.0419
52	.0173	.0467	.0171	.0678	.1883	.0390	.0524	.0202
53	.0069	.0095	.0068	.0049	.0260	.0090	.0035	.0054
54	.0356	.0354	.0340	.0346	.0285	.0304	.0334	.0418
55	.0370	.0347	.0188	.0143	.0209	.0254	.0253	.0113
56	.2569	.2577	.2242	.2228	.2205	.2386	.2631	.2269
57	.0585	.0545	.0492	.0480	.0434	.0486	.0534	.0494
58	.2130	.1924	.1656	.2184	.1511	.1807	.2014	.2480
59	1.3816	1.2829	1.0429	1.1811	1.0300	1.1745	1.2751	1.2378

	25	26	27	28	29	30	31	32
1	.0054	.0036	.0010	.0060	.0052	.0049	.0028	.0035
2	.0026	.0016	.0005	.0025	.0024	.0023	.0013	.0017
3	.0108	.0069	.0019	.0102	.0101	.0097	.0055	.0070
4	.0021	.0014	.0004	.0020	.0020	.0019	.0011	.0014
5	.0004	.0002	.0001	.0003	.0003	.0003	.0002	.0002
6	.0112	.0072	.0020	.0107	.0106	.0101	.0058	.0073
7	.0097	.0061	.0017	.0092	.0091	.0087	.0049	.0063
8	.0031	.0020	.0006	.0029	.0029	.0028	.0016	.0020
9	.0027	.0017	.0005	.0027	.0025	.0024	.0013	.0017
10	.0070	.0045	.0013	.0154	.0066	.0063	.0036	.0046
11	.0109	.0062	.0018	.0097	.0092	.0088	.0050	.0063
12	.0001	.0001	.0000	.0001	.0001	.0001	.0001	.0001
13	.0025	.0009	.0002	.0013	.0013	.0012	.0008	.0015
14	.0029	.0009	.0007	.0476	.0578	.0059	.0062	.0050
15	.0013	.0019	.0002	.0035	.0012	.0012	.0013	.0006
16	.0030	.0052	.0005	.0103	.0027	.0028	.0030	.0012
17	.0028	.0049	.0004	.0083	.0028	.0028	.0052	.0012
18	.0002	.0004	.0003	.0002	.0002	.0002	.0001	.0001
19	.0005	.0062	.0001	.0006	.0006	.0006	.0004	.0010
20	.0009	.0006	.0002	.0009	.0009	.0009	.0005	.0006
21	.0025	.0002	.0000	.0003	.0001	.0002	.0001	.0001
22	.0051	.0097	.0006	.0085	.0062	.0068	.0017	.0023
23	.0099	.0160	.0015	.0556	.0072	.0078	.0024	.0037
24	.0126	.0139	.0020	.0117	.0111	.0107	.0060	.0078
25	1.0405	.0131	.0016	.0030	.0019	.0118	.0057	.0063
26	.0037	1.0346	.0002	.0103	.0040	.0046	.0055	.0061
27	.0462	.0552	1.0214	.0502	.1510	.0392	.0351	.0395
28	.0020	.0005	.0001	1.0101	.0007	.0007	.0004	.0005
29	.0011	.0011	.0006	.0019	1.1398	.0014	.0007	.0007
30	.0006	.0006	.0001	.0093	.0006	1.0142	.0004	.0016
31	.0001	.0001	.0002	.0001	.0001	.0002	1.0004	.0020
32	.0010	.0009	.0002	.0006	.0007	.0012	.1997	1.2821
33	.0006	.0007	.0003	.0007	.0007	.0042	.0004	.0010
34	.0084	.0073	.0009	.0037	.0052	.0089	.0014	.0024
35	.0000	.0000	.0002	.0001	.0001	.0001	.0002	.0008
36	.0008	.0006	.0004	.0009	.0036	.0111	.0007	.0026
37	.0015	.0002	.0005	.0003	.0003	.0003	.0004	.0015
38	.0017	.0004	.0001	.0005	.0005	.0004	.0005	.0017
39	.0063	.0001	.0000	.0001	.0001	.0002	.0001	.0001
40	.0005	.0003	.0001	.0005	.0005	.0004	.0003	.0004
41	.0012	.0007	.0002	.0011	.0012	.0011	.0007	.0008
42	.0033	.0074	.0014	.0021	.0022	.0020	.0015	.0039
43	.0071	.0075	.0010	.0207	.0108	.0122	.0120	.0205
44	.0043	.0028	.0008	.0041	.0041	.0039	.0022	.0028
45	.0150	.0184	.0027	.0290	.0408	.0151	.0174	.0082
46	.0013	.0009	.0016	.0014	.0042	.0045	.0052	.0046
47	.0070	.0039	.0013	.0056	.0056	.0053	.0030	.0038
48	.0002	.0001	.0000	.0002	.0002	.0002	.0001	.0001
49	.0004	.0003	.0001	.0005	.0005	.0004	.0003	.0003
50	.0032	.0023	.0006	.0034	.0031	.0030	.0017	.0023
51	.0609	.0308	.0093	.1444	.0639	.1056	.0999	.2398
52	.0672	.0498	.0158	.2432	.0199	.0478	.0518	.0326
53	.0104	.0096	.0011	.0051	.0079	.0047	.0027	.0034
54	.0321	.0318	.0057	.0300	.0345	.0274	.0158	.0208
55	.0149	.0170	.0016	.0182	.0188	.0208	.0089	.0084
56	.2300	.1555	.0414	.2344	.2159	.2229	.1067	.1437
57	.0464	.0415	.0083	.0526	.0483	.0438	.0278	.0341
58	.1900	.1695	.0299	.1706	.2061	.1724	.0996	.1196
59	1.3034	.8315	.2357	1.2392	1.2326	1.1801	.6709	.8532

Total Requirements Table

	33	34	35	36	37	38	39	40
1	.0038	.0042	.0038	.0051	.0046	.0048	.0024	.0034
2	.0018	.0019	.0018	.0024	.0022	.0023	.0011	.0016
3	.0075	.0082	.0075	.0101	.0092	.0095	.0048	.0067
4	.0015	.0016	.0015	.0019	.0018	.0018	.0009	.0013
5	.0002	.0003	.0002	.0003	.0003	.0003	.0002	.0002
6	.0079	.0086	.0078	.0106	.0096	.0099	.0050	.0070
7	.0067	.0073	.0067	.0091	.0082	.0085	.0043	.0060
8	.0022	.0024	.0022	.0029	.0026	.0027	.0014	.0019
9	.0018	.0020	.0018	.0024	.0022	.0023	.0012	.0016
10	.0049	.0053	.0049	.0066	.0060	.0062	.0031	.0044
11	.0068	.0074	.0068	.0092	.0083	.0086	.0043	.0061
12	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
13	.0009	.0011	.0009	.0012	.0011	.0012	.0006	.0008
14	.0012	.0015	.0009	.0011	.0010	.0009	.0006	.0007
15	.0007	.0012	.0007	.0007	.0007	.0009	.0005	.0007
16	.0015	.0030	.0015	.0013	.0013	.0019	.0011	.0016
17	.0015	.0027	.0015	.0013	.0013	.0019	.0011	.0016
18	.0001	.0002	.0002	.0001	.0001	.0002	.0002	.0002
19	.0004	.0025	.0031	.0004	.0004	.0017	.0003	.0024
20	.0007	.0007	.0007	.0009	.0008	.0020	.0005	.0046
21	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0001
22	.0027	.0036	.0027	.0030	.0028	.0042	.0016	.0025
23	.0052	.0125	.0031	.0037	.0034	.0051	.0033	.0050
24	.0081	.0089	.0108	.0105	.0098	.0101	.0050	.0091
25	.0017	.0082	.0066	.0014	.0013	.0014	.0007	.0030
26	.0031	.0059	.0037	.0013	.0012	.0037	.0011	.0030
27	.0295	.0378	.0297	.0404	.0347	.0353	.0189	.0257
28	.0005	.0006	.0005	.0007	.0006	.0006	.0003	.0005
29	.0008	.0029	.0007	.0006	.0007	.0008	.0004	.0005
30	.0457	.0399	.0144	.0114	.0144	.0014	.0004	.0026
31	.0091	.0022	.0004	.0054	.0102	.0013	.0004	.0001
32	.0484	.1005	.0058	.0022	.0073	.0049	.0008	.0037
33	1.0326	.0026	.0006	.0058	.0040	.0005	.0011	.0024
34	.0109	1.0119	.0228	.0075	.0073	.0304	.0022	.0096
35	.0001	.0001	1.0257	.0000	.0000	.0000	.0000	.0000
36	.0068	.0133	.0225	1.0431	.0217	.0069	.0039	.0027
37	.0020	.0003	.0157	.0002	1.0102	.0025	.0009	.0002
38	.0004	.0005	.0109	.0004	.0072	1.0207	.0023	.0024
39	.0182	.0002	.0002	.0002	.0002	.0047	1.0230	.0083
40	.0021	.0004	.0029	.0004	.0021	.0004	.0002	1.0023
41	.0008	.0009	.0008	.0011	.0010	.0010	.0005	.0007
42	.0017	.0177	.0046	.0073	.0037	.0125	.0025	.0055
43	.0063	.0057	.0044	.0021	.0037	.0031	.0021	.0035
44	.0030	.0033	.0030	.0041	.0037	.0038	.0020	.0027
45	.0121	.0116	.0117	.0133	.0091	.0099	.0045	.0075
46	.0012	.0015	.0010	.0013	.0012	.0012	.0006	.0008
47	.0041	.0064	.0042	.0054	.0067	.0075	.0049	.0036
48	.0001	.0002	.0001	.0002	.0002	.0002	.0001	.0001
49	.0003	.0004	.0003	.0004	.0004	.0004	.0003	.0003
50	.0023	.0025	.0023	.0030	.0027	.0029	.0016	.0020
51	.0397	.0510	.0289	.0386	.0331	.0329	.0176	.0265
52	.0186	.0180	.0194	.0132	.0125	.0142	.0021	.0124
53	.0036	.0061	.0037	.0047	.0061	.0045	.0029	.0053
54	.0246	.0291	.0265	.0330	.0305	.0308	.0154	.0225
55	.0114	.0088	.0082	.0070	.0098	.0088	.0037	.0068
56	.1618	.1734	.1737	.2036	.1997	.2051	.0836	.1457
57	.0369	.0387	.0340	.0468	.0396	.0436	.0207	.0296
58	.1367	.1694	.1430	.1874	.1766	.1722	.0765	.1163
59	.9153	.9918	.9110	1.2330	1.1146	1.1516	.5825	.8177

	41	42	43	44	45	46	47	48
1	.0049	.0050	.0051	.0054	.0054	.0026	.0050	.0056
2	.0023	.0023	.0024	.0026	.0025	.0012	.0029	.0027
3	.0099	.0100	.0102	.0108	.0106	.0050	.0091	.0112
4	.0019	.0019	.0020	.0021	.0021	.0010	.0015	.0023
5	.0003	.0003	.0003	.0004	.0004	.0002	.0003	.0004
6	.0104	.0111	.0107	.0112	.0111	.0052	.0106	.0117
7	.0089	.0087	.0092	.0096	.0095	.0045	.0080	.0101
8	.0026	.0028	.0029	.0031	.0031	.0014	.0031	.0032
9	.0024	.0024	.0025	.0026	.0026	.0012	.0030	.0027
10	.0064	.0063	.0067	.0070	.0069	.0033	.0094	.0073
11	.0090	.0097	.0093	.0097	.0096	.0045	.0098	.0101
12	.0001	.0010	.0001	.0001	.0001	.0001	.0001	.0001
13	.0017	.0021	.0012	.0013	.0021	.0013	.0009	.0014
14	.0011	.0010	.0028	.0013	.0011	.0007	.0010	.0041
15	.0013	.0018	.0009	.0008	.0010	.0004	.0006	.0009
16	.0028	.0042	.0017	.0015	.0020	.0007	.0011	.0017
17	.0030	.0057	.0018	.0015	.0024	.0008	.0011	.0019
18	.0015	.0011	.0003	.0001	.0002	.0001	.0002	.0003
19	.0043	.0015	.0006	.0005	.0012	.0003	.0003	.0007
20	.0035	.0008	.0009	.0010	.0009	.0005	.0007	.0010
21	.0001	.0001	.0001	.0001	.0001	.0000	.0000	.0001
22	.0029	.0040	.0041	.0035	.0032	.0016	.0024	.0031
23	.0036	.0049	.0038	.0040	.0048	.0019	.0034	.0042
24	.0104	.0108	.0260	.0149	.0119	.0062	.0089	.0113
25	.0018	.0025	.0031	.0014	.0013	.0007	.0016	.0014
26	.0022	.0243	.0011	.0012	.0019	.0006	.0008	.0012
27	.0366	.0360	.1477	.0955	.0768	.0668	.4270	.0392
28	.0007	.0007	.0007	.0007	.0007	.0003	.0009	.0008
29	.0015	.0017	.0016	.0047	.0016	.0013	.0007	.0022
30	.0027	.0004	.0038	.0004	.0003	.0012	.0003	.0006
31	.0012	.0010	.0001	.0001	.0001	.0008	.0001	.0002
32	.0015	.0123	.0005	.0007	.0004	.0008	.0004	.0005
33	.0033	.0004	.0009	.0004	.0004	.0003	.0004	.0012
34	.0037	.0049	.0036	.0057	.0030	.0054	.0032	.0024
35	.0011	.0000	.0001	.0000	.0000	.0015	.0001	.0001
36	.0016	.0034	.0023	.0007	.0015	.0041	.0015	.0007
37	.0013	.0011	.0002	.0002	.0002	.0030	.0004	.0003
38	.0020	.0023	.0004	.0039	.0012	.0017	.0004	.0005
39	.0029	.0001	.0001	.0001	.0001	.0001	.0136	.0001
40	.0009	.0004	.0036	.0038	.0012	.0002	.0003	.0005
41	1.0027	.0011	.0011	.0012	.0012	.0213	.0008	.0012
42	.0028	1.0197	.0019	.0021	.0020	.0019	.0019	.0021
43	.0030	.0039	1.0147	.0021	.0059	.0011	.0017	.0022
44	.0040	.0048	.0041	1.0110	.0050	.0020	.0039	.0045
45	.0087	.0137	.0095	.0118	1.0753	.0039	.0100	.0084
46	.0018	.0021	.0014	.0014	.0021	1.0007	.0023	.0014
47	.0052	.0070	.0055	.0058	.0065	.0028	1.0183	.0061
48	.0002	.0002	.0002	.0002	.0002	.0001	.0010	1.0002
49	.0004	.0004	.0020	.0004	.0035	.0057	.0153	.0298
50	.0033	.0037	.0029	.0066	.0039	.0016	.0022	.0033
51	.0366	.0348	.0352	.0417	.0363	.0239	.0269	.1511
52	.0132	.0146	.0169	.0200	.0138	.0085	.0166	.0141
53	.0057	.0056	.0064	.0087	.0050	.0024	.0037	.0052
54	.0275	.0317	.0308	.0332	.0371	.0214	.0266	.0314
55	.0130	.0077	.0258	.0108	.0088	.0065	.0061	.0376
56	.1970	.1971	.1882	.2273	.2128	.0978	.1542	.2024
57	.0403	.0411	.0445	.0582	.0492	.0283	.0349	.0462
58	.1580	.1527	.1718	.1967	.2073	.1118	.1430	.2036
59	1.2055	1.1794	1.2456	1.3086	1.2927	.6093	.9140	1.3648

	49	50	51	52	53	54	55	56
1	.0057	.0062	.0060	.0019	.0065	.0060	.0048	.0061
2	.0026	.0030	.0028	.0009	.0031	.0028	.0022	.0029
3	.0111	.0125	.0120	.0039	.0131	.0118	.0095	.0121
4	.0021	.0024	.0023	.0007	.0025	.0023	.0050	.0023
5	.0004	.0004	.0004	.0001	.0004	.0004	.0003	.0004
6	.0116	.0131	.0125	.0041	.0137	.0124	.0099	.0126
7	.0099	.0112	.0108	.0035	.0117	.0106	.0085	.0108
8	.0032	.0036	.0034	.0011	.0038	.0034	.0027	.0035
9	.0027	.0031	.0029	.0009	.0032	.0029	.0023	.0030
10	.0073	.0082	.0078	.0025	.0085	.0077	.0062	.0079
11	.0100	.0114	.0108	.0035	.0118	.0107	.0086	.0109
12	.0001	.0001	.0001	.0000	.0001	.0001	.0001	.0001
13	.0013	.0015	.0015	.0005	.0016	.0014	.0012	.0016
14	.0011	.0011	.0260	.0004	.0019	.0012	.0097	.0015
15	.0008	.0012	.0010	.0004	.0010	.0011	.0052	.0015
16	.0015	.0026	.0020	.0008	.0017	.0023	.0130	.0033
17	.0015	.0025	.0020	.0007	.0018	.0024	.0182	.0034
18	.0001	.0001	.0002	.0000	.0002	.0002	.0071	.0002
19	.0004	.0005	.0005	.0002	.0006	.0005	.0100	.0006
20	.0010	.0011	.0010	.0003	.0011	.0010	.0015	.0012
21	.0001	.0001	.0001	.0000	.0001	.0001	.0001	.0002
22	.0037	.0066	.0040	.0014	.0038	.0068	.0033	.0105
23	.0040	.0076	.0060	.0032	.0047	.0049	.0052	.0068
24	.0172	.0148	.0132	.0053	.0161	.0152	.0108	.0301
25	.0014	.0016	.0020	.0005	.0015	.0015	.0019	.0020
26	.0012	.0012	.0017	.0004	.0013	.0018	.0029	.0022
27	.0462	.0691	.0418	.0147	.0510	.0429	.0616	.0491
28	.0008	.0008	.0008	.0003	.0009	.0008	.0006	.0009
29	.0007	.0007	.0014	.0003	.0012	.0009	.0497	.0011
30	.0002	.0003	.0004	.0001	.0004	.0003	.0141	.0003
31	.0001	.0001	.0006	.0000	.0001	.0001	.0016	.0001
32	.0003	.0004	.0012	.0001	.0004	.0004	.0025	.0004
33	.0003	.0004	.0006	.0002	.0007	.0005	.0307	.0007
34	.0022	.0025	.0035	.0008	.0026	.0025	.0051	.0029
35	.0000	.0000	.0005	.0000	.0001	.0000	.0004	.0000
36	.0007	.0035	.0012	.0002	.0007	.0007	.0015	.0011
37	.0003	.0002	.0007	.0001	.0003	.0003	.0005	.0003
38	.0006	.0005	.0010	.0002	.0005	.0069	.0028	.0006
39	.0002	.0003	.0001	.0000	.0001	.0002	.0006	.0002
40	.0005	.0005	.0005	.0002	.0005	.0005	.0006	.0006
41	.0012	.0014	.0013	.0004	.0014	.0013	.0010	.0013
42	.0023	.0020	.0025	.0006	.0021	.0043	.0069	.0038
43	.0021	.0050	.0028	.0007	.0023	.0027	.0061	.0034
44	.0045	.0050	.0047	.0015	.0052	.0047	.0041	.0057
45	.0081	.0151	.0094	.0029	.0095	.0093	.0173	.0165
46	.0013	.0015	.0014	.0005	.0016	.0014	.0022	.0015
47	.0112	.0176	.0068	.0020	.0069	.0074	.0058	.0087
48	.0002	.0002	.0002	.0001	.0002	.0002	.0003	.0003
49	1.0005	.0006	.0004	.0001	.0005	.0005	.0004	.0006
50	.0034	1.0034	.0048	.0026	.0070	.0045	.0031	.0064
51	.0407	.0404	1.2901	.0153	.0758	.0416	.0353	.0559
52	.0234	.0200	.0163	1.7459	.0157	.0157	.0149	.0194
53	.0053	.0057	.0060	.0018	1.0887	.0066	.0051	.0079
54	.0571	.0356	.0368	.0149	.0414	1.0391	.0304	.0474
55	.0079	.0080	.0156	.0040	.0185	.0132	1.0092	.0133
56	.2046	.2292	.2194	.0708	.2370	.2184	.2189	1.2329
57	.0624	.0496	.0530	.0170	.0557	.0546	.0466	.0640
58	.2720	.1890	.1924	.0611	.2126	.2286	.1911	.2571
59	1.3428	1.5255	1.4597	.4720	1.5926	1.4400	1.1496	1.4632

	57	58	59
1	.0065	.0083	.0068
2	.0030	.0030	.0032
3	.0126	.0123	.0137
4	.0025	.0024	.0026
5	.0004	.0004	.0005
6	.0132	.0124	.0143
7	.0113	.0109	.0123
8	.0037	.0038	.0039
9	.0031	.0031	.0033
10	.0083	.0082	.0089
11	.0114	.0108	.0124
12	.0002	.0002	.0002
13	.0015	.0015	.0017
14	.0016	.0014	.0011
15	.0013	.0011	.0009
16	.0028	.0022	.0016
17	.0028	.0023	.0015
18	.0003	.0003	.0001
19	.0007	.0005	.0005
20	.0011	.0010	.0012
21	.0001	.0001	.0001
22	.0064	.0057	.0035
23	.0076	.0047	.0047
24	.0361	.0225	.0128
25	.0020	.0027	.0015
26	.0017	.0020	.0013
27	.0482	.0609	.0453
28	.0009	.0010	.0009
29	.0016	.0011	.0007
30	.0005	.0004	.0003
31	.0001	.0001	.0001
32	.0004	.0005	.0004
33	.0009	.0005	.0004
34	.0027	.0031	.0026
35	.0000	.0000	.0000
36	.0008	.0023	.0007
37	.0003	.0007	.0002
38	.0007	.0009	.0005
39	.0001	.0002	.0001
40	.0006	.0010	.0005
41	.0014	.0013	.0015
42	.0043	.0078	.0020
43	.0031	.0037	.0023
44	.0051	.0058	.0054
45	.0097	.0104	.0096
46	.0015	.0015	.0016
47	.0072	.0091	.0071
48	.0002	.0003	.0002
49	.0008	.0006	.0005
50	.0078	.0064	.0037
51	.0568	.0516	.0375
52	.0214	.0287	.0159
53	.0084	.0077	.0061
54	.0685	.0524	.0354
55	.0259	.0133	.0064
56	.2330	.2379	.2428
57	1.1318	.0688	.0536
58	.2846	1.2707	.2009
59	1.5349	1.4215	1.6660

Appendix Table VI

Value Added Multipliers

$C=f(YP)$, $EARN=f(X)$

I/O NAME & NUMBER	Direct Value Added per mil. \$ of output	Total Value Added per mil. \$ of Direct Exports	Total Value Added per \$ of Direct Value Added
FIELD CROPS 1	\$644 thous	\$1,353 thous	\$2.10
VEGGIES & FRUIT 2	780	1,504	1.93
LIVESTOCK 3	318	1,323	4.16
MISC. AG PRODUCTS 4	853	1,585	1.86
FISHING 5	596	1,283	2.15
MEAT PRODUCTS 6	103	739	7.20
DAIRY PRODUCTS 7	146	1,318	9.01
CANNING 8	331	1,209	3.65
GRAIN MILL 9	164	695	4.24
BEVERAGES 10	323	1,157	3.58
OTHER FOODS 11	498	1,237	2.48
TEXTILE MILL 12	440	894	2.03
APPAREL 13	450	904	2.01
MINING 14	689	1,307	1.90
FORESTRY 15	857	1,586	1.85
LOGGING 16	224	1,327	5.91
SAWMILL 17	297	1,382	4.65
PLYWOOD 18	259	1,283	4.95
MISC. WOOD 19	335	1,043	3.12
FURNITURE 20	512	1,181	2.31
PULPMILL 21	259	1,030	3.97
PAPERMILL 22	305	1,175	3.85
MISC. PAPER 23	302	1,276	4.23
PRINT & PUBLISH 24	568	1,268	2.23
INDUSTRIAL CHEMICALS 25	634	1,303	2.06
OTHER CHEMICALS 26	319	832	2.61
PETROLEUM 27	122	236	1.94
GLASS 28	448	1,239	2.76
CEMENT ETC. 29	470	1,233	2.62
FERROUS METALS 30	529	1,180	2.23
NONFERROUS 31	234	671	2.87
ALUMINUM 32	229	853	3.72
STRUCTURAL METALS 33	406	915	2.26
LIGHT METALS 34	414	992	2.40
FARM CONSTRUCTION MACH	397	991	2.50
MACHINE TOOLS 36	629	1,233	1.96
INDUSTRIAL EQUIPMENT 37	550	1,115	2.03
ELECTRICAL MACH 38	576	1,152	2.00
AEROSPACE 39	302	583	1.93
MOTOR VEH/RR CARS 40	416	818	1.96
SHIPBUILDING 41	667	1,206	1.81
OTHER MANUF. 42	623	1,179	1.89
RAIL 43	661	1,246	1.88
BUS 44	673	1,309	1.94

TRUCK 45	643	1,293	2.01
WATER 46	276	609	2.21
AIR 47	410	914	2.23
PIPELINES 48	647	1,365	2.11
TRANSPORT. SERVICES 49	670	1,343	2.00
POST OFFICE 50	880	1,526	1.73
ELECTRIC UTIL 51	653	1,460	2.24
GAS UTIL 52	153	472	3.08
OTHER UTIL 53	823	1,593	1.94
COMMUNICATIONS 54	785	1,440	1.84
CONSTRUCTION 55	501	1,150	2.29
TRADE 56	733	1,463	2.00
F.I.R.E. 57	707	1,535	2.17
SERVICES 58	681	1,422	2.09

Appendix Table VII

Earnings Multipliers

C=f(YP), EARN=f(X)

I/O NAME & NUMBER	Direct Earnings per mil. \$ of Output	Total Earnings per mil. \$ of Direct Exports	Total Earnings per \$ of Direct Earnings
FIELD CROPS 1	\$301 thous	\$493 thous	\$1.64
VEGGIES & FRUIT 2	414	603	1.46
LIVESTOCK 3	194	551	2.84
MISC. AG PRODUCTS 4	640	881	1.38
FISHING 5	575	863	1.50
MEAT PRODUCTS 6	83	344	4.17
DAIRY PRODUCTS 7	83	566	6.79
CANNING 8	159	501	3.16
GRAIN MILL 9	98	309	3.14
BEVERAGES 10	131	430	3.28
OTHER FOODS 11	243	491	2.03
TEXTILE MILL 12	360	517	1.44
APPAREL 13	407	594	1.46
MINING 14	693	958	1.38
FORESTRY 15	46	118	2.54
LOGGING 16	235	585	2.49
SAWMILL 17	297	753	2.54
PLYWOOD 18	256	678	2.65
MISC. WOOD 19	375	724	1.93
FURNITURE 20	317	566	1.78
PULPMILL 21	211	504	2.38
PAPERMILL 22	191	551	2.89
MISC. PAPER 23	192	601	3.13
PRINT & PUBLISH 24	373	641	1.72
INDUSTRIAL CHEMICALS 25	307	491	1.60
OTHER CHEMICALS 26	216	420	1.94
PETROLEUM 27	18	35	1.95
GLASS 28	259	525	2.03
CEMENT ETC. 29	303	608	2.01
FERROUS METALS 30	281	473	1.68
NONFERROUS 31	280	464	1.66
ALUMINUM 32	159	353	2.22
STRUCTURAL METALS 33	282	471	1.67
LIGHT METALS 34	189	380	2.01
FARM CONSTRUCTION MACH	313	518	1.65
MACHINE TOOLS 36	503	731	1.46
INDUSTRIAL EQUIPMENT 37	360	556	1.55
ELECTRICAL MACH 38	264	425	1.61
AEROSPACE 39	308	434	1.41
MOTOR VEH/RR CARS 40	114	201	1.77
SHIPBUILDING 41	414	569	1.37
OTHER MANUF. 42	306	450	1.47
RAIL 43	386	553	1.43
BUS 44	590	834	1.41

TRUCK 45	426	653	1.53
WATER 46	226	360	1.59
AIR 47	277	441	1.59
PIPELINES 48	88	220	2.50
TRANSPORT. SERVICES 49	711	1,024	1.44
POST OFFICE 50	880	1,136	1.29
ELECTRIC UTIL 51	125	255	2.05
GAS UTIL 52	38	96	2.55
OTHER UTIL 53	211	333	1.58
COMMUNICATIONS 54	376	547	1.46
CONSTRUCTION 55	466	727	1.56
TRADE 56	447	653	1.46
F.I.R.E. 57	487	805	1.65
SERVICES 58	623	936	1.50

Appendix Table VIII

Jobs Multipliers

$C=f(YP)$, $EARN=f(X)$

I/O NAME & NUMBER	Direct Jobs per mil. \$ of Output	Total Jobs Created per mil. \$ of Exports	Total Job Created per Direct Job
FIELD CROPS 1	14.0	26.4	1.88
VEGGIES & FRUIT 2	33.7	46.3	1.37
LIVESTOCK 3	32.5	55.8	1.72
MISC. AG PRODUCTS 4	66.9	84.2	1.26
FISHING 5	112.8	132.3	1.17
MEAT PRODUCTS 6	3.7	26.7	7.21
DAIRY PRODUCTS 7	2.4	44.9	18.71
CANNING 8	9.4	36.9	3.93
GRAIN MILL 9	4.3	17.4	4.05
BEVERAGES 10	4.9	22.4	4.58
OTHER FOODS 11	10.7	27.1	2.53
TEXTILE MILL 12	24.0	34.9	1.45
APPAREL 13	34.4	47.3	1.37
MINING 14	18.1	35.7	1.97
FORESTRY 15	9.1	13.7	1.51
LOGGING 16	8.2	30.0	3.65
SAWMILL 17	13.8	40.2	2.91
PLYWOOD 18	12.1	36.6	3.02
MISC. WOOD 19	17.8	39.2	2.20
FURNITURE 20	20.1	36.4	1.81
PULPMILL 21	6.2	23.2	3.74
PAPERMILL 22	5.7	26.3	4.61
MISC. PAPER 23	6.6	29.2	4.42
PRINT & PUBLISH 24	19.2	36.6	1.91
INDUSTRIAL CHEMICALS 25	9.1	20.8	2.29
OTHER CHEMICALS 26	9.7	22.8	2.35
PETROLEUM 27	0.4	1.5	3.64
GLASS 28	12.1	27.2	2.25
CEMENT ETC. 29	13.1	30.6	2.34
FERROUS METALS 30	10.5	22.5	2.15
NONFERROUS 31	9.3	19.5	2.09
ALUMINUM 32	4.0	13.6	3.41
STRUCTURAL METALS 33	10.3	21.7	2.10
LIGHT METALS 34	7.9	19.3	2.44
FARM CONSTRUCTION MACH	10.6	23.4	2.21
MACHINE TOOLS 36	18.8	33.8	1.80
INDUSTRIAL EQUIPMENT 37	14.5	27.3	1.88
ELECTRICAL MACH 38	11.8	22.3	1.89
AEROSPACE 39	8.5	16.8	1.98
MOTOR VEH/RR CARS 40	3.6	9.3	2.57
SHIPBUILDING 41	13.8	24.2	1.75
OTHER MANUF. 42	15.7	25.1	1.60
RAIL 43	12.2	23.0	1.88
BUS 44	28.0	44.7	1.60
TRUCK 45	18.4	33.2	1.81

WATER 46	7.8	16.6	2.13
AIR 47	8.1	18.5	2.29
PIPELINES 48	2.9	10.4	3.57
TRANSPORT. SERVICES 49	37.1	58.8	1.58
POST OFFICE 50	31.0	48.6	1.57
ELECTRIC UTIL 51	3.4	10.2	3.00
GAS UTIL 52	1.3	4.2	3.23
OTHER UTIL 53	18.4	26.7	1.45
COMMUNICATIONS 54	12.8	24.5	1.91
CONSTRUCTION 55	17.3	35.3	2.04
TRADE 56	30.2	46.0	1.52
F.I.R.E. 57	40.0	61.6	1.54
SERVICES 58	44.9	66.3	1.48