Final Report

Transport Flows in the State of Indiana:

Commodity Database Development and Traffic Assignment, Phase 2

by

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In cooperation with the
Indiana Department of Transportation
and the
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The opinion, findings and conclusions expressed in this publication are those of the author and not necessarily those of the Indiana Department of Transportation or the Federal Highway Administration.

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Final Report

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TRANSPORT FLOWS IN THE STATE OF INDIANA: COMMODITY DATABASE DEVELOPMENT AND TRAFFIC ASSIGNMENT

PREFACE

This project was undertaken with the primary objective of creating a database of commodity flows into and out of the counties of Indiana and to allocate this commodity traffic to the transportation network of the state. Such a database would form the foundation of a general transportation model for Indiana that would assist state decision-makers in evaluating the various alternatives for public investment in the transportation infrastructure of the state.

The project had two phases. The first phase was completed in 1993 [1]. It was recently described as "one of the most sophisticated modeling exercises done by or for state transportation departments." [2]. The study sought to model the flow of several manufactured products that are important to the state. This phase also looked at the flow of agricultural products (corn, wheat, soybeans and oats) and coal. Models used to estimate the flow of manufactured goods were calibrated using data from the 1977 Census of Transportation, the last database compiled on commodity flows for the United States at the time of the phase one study. Such models were necessary since more than 15 years had passed since the last commodity flow census and it was desirable to estimate "current" flows. In addition, the various transportation censuses never go to the county level, and it is always necessary to estimate flows for this level. Estimation models were not developed for coal and grain flows since these were viewed as relatively stable over the short time spans of interest to the state. The production and attraction of these latter flows were allocated to the state's counties on the basis of other variables, e.g., total corn production per county in the case of shipments of corn. All flows were geographically distributed between origins and destinations and then assigned to the highway and rail networks as appropriate for the base year 1990.

This report covers the second phase of the project. To some extent it seeks to correct any shortcomings of the previous study. For example, some of the agricultural flows were for 1985 and there were no plans to collect these data again by the agency responsible for their initial compilation. Another approach to these flows was necessary. In addition, the coal flows used in the phase one report were from the Energy Information Administration reports, but these reports include only the coal used for energy production. They exclude coal used to heat schools and institutions or as part of a manufacturing process, e.g., coal used in steel production. Other flows of interest had no comparable data source available at the time, e.g., solid waste, produce, livestock, and non-metallic minerals. The flow of documents and mail by the U.S. Postal Service or an express mail company was also excluded from the phase one study. Lastly, certain manufactured goods were viewed as minor in the phase one study, e.g., photographic equipment and medical instruments, and were excluded from that earlier study.

The appearance of parts of the 1993 Commodity Flow Survey made it possible to include the flows of all commodities thought to be important to the state of Indiana. Where this new study fell short, e.g., intrastate solid waste flows, mail flows, or express mail, methods were developed to estimate these flows.

The intrastate highway network used for assigning flows has significantly improved in quality and has considerably more detail and geographic accuracy than previously.

In effect, the present study examines the flows of all manufactured goods, all other commodities of importance, e.g., grains, coal and minerals, and mail with a more up-to-date set of flow data and more detailed Indiana highway and rail networks than have ever been used before for flow modeling in the state. It also transforms these flows, originally published in tons, to motor carrier and rail car equivalents based on commodity density.

The organization of this report follows a classical transportation planning process. It begins with an identification of the study area and the existing transport network, or networks in the present case. This is followed by a discussion of the commodities examined and the commodity traffic generation for the counties of Indiana. The models developed for estimating the production and attraction of these commodity flows are also presented and discussed. Distribution of the traffic from origins to destinations is accomplished using a common type of traffic distribution model, i.e., the fully-constrained gravity model. This is followed by the use of a modal split procedure, which allocates traffic to specific modes of transport on the basis of historical (1993) patterns of mode use. The final component of this process is an assignment of the distributed traffic to links of the appropriate modal network. This process was undertaken here for nineteen groups of manufactured products that include the entire range of manufactured goods, coal, farm products, non-metallic minerals, and waste products. There is also some analysis of mail flows, although much of this is at a rudimentary level of analysis due to a lack of data on these flows.

The end result of the above process is a database that can be used to estimate future flows on the Indiana's rail and highway networks. This estimation of future commodity traffic flows will also be accomplished here with traffic projections for 2005 and 2015.

An obvious question is: "How accurate are the procedures used here and the databases developed?" This is a difficult question to answer in many cases. Of course, when actual flow data are used, the results are as good as the census or survey that collected the data. Beyond that data set the flows presented here represent "best" estimates. Going beyond the question, one could ask, "How accurate do the estimates have to be?" Perfect estimates are not worth the effort it would take to achieve them. The interest in most policy- and decision-making is in the relative magnitude of different flows, e.g., the major corridors for the export of the state's major products or the import of products to satisfy the state's major needs. The real question is whether the database created will reveal those tendencies; the answer is that it will.

Before proceeding a few words are in order on the geographic information system (GIS) used in the preparation of this report. The system used was TransCAD [3], a GIS system developed primarily for transportation applications. Most of the databases developed here were generated by this system, which will be cited where appropriate. Although independent estimation procedures, such as multivariate regression analysis and entropy-based gravity model algorithms, were used in several cases, TransCAD was used for network creation, updating, and assignment of traffic as well as for the maps included here.

This study is in many ways the state or multistate version of the transportation plans undertaken thirty years ago for the nation's urban and metropolitan areas. It includes 145 "traffic analysis zones", two modes, two networks (70,000 miles of highways and more than 100,000 miles of railway), and the equivalent of 21 trip purposes (commodities here). It is no exaggeration to say that this study was made possible primarily because of the availability of TransCad. It has made the most complex transport and mapping problems manageable.

Although this report represents the primary "public" output from the study, the data identified or estimated here will be made available to the State on diskette for use with other studies.

One final comment is in order before proceeding, and that concerns the actual nature of the research and analysis undertaken. A study of this magnitude has never been performed for the state of Indiana. Most of the studies that do exist concern small areas, a single mode, or a few products. This study examines flows for all manufactured goods and significant other commodities produced or consumed within the state, and transported over the highways and railways of the state. The scale of this examination is the county and significant geographic detail is available in the results presented here.

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[1] Black, W.R. and Palmer, J.A. (1993) *Transport Flows in the State of Indiana: Commodity Database Development and Traffic Assignment, Phase 1.* Bloomington, IN: Transportation Research Center, Indiana University.

[2] Transportation Research Board (1997) *A Guidebook for Forecasting Freight Transportation Demand, NCHRP Report 388*, Washington, D.C.: National Academy Press.

[3] Caliper Corporation (1996) *TransCAD: Transportation GIS Software,* User's Guide, Version 3.0 for Windows, Newton, Mass.: Caliper Corporation.

Chapter 1

STUDY AREA AND NETWORK DEFINITION

The primary study area for this research is the state of Indiana and its ninety-two counties. A map of the state and its counties appears on the following page (Figure 1.1) and may be useful for reference in relation to some of the data presented later in this report. While the flows to, from, and between these counties are of interest, we can not look only at these; the analysis cannot be limited to intrastate flows.

A significant amount of the commodity traffic in Indiana has neither an origin nor destination in the state, but instead represents goods or materials that are passing through the state. As the 1998 state's 1998 automobile license plate proclaims, Indiana is the "crossroads of America." This overhead traffic may contribute little to the state's economy, but it adds to urban congestion, air pollution, wear and tear on the highways, and rail traffic. Therefore, what happens beyond the state's borders must also be examined here. As a result, this study includes, in addition to the 92 counties of Indiana, several major terminals outside the state. The latter group consists of 48 nodes representing the contiguous 47 states (excluding Indiana, since it is represented as a series of 92 areas) and the District of Columbia, as well as additional nodes for contiguous states: two for Ohio, and one in Illinois, Kentucky, and Michigan.

A transport network consists of nodes and route segments. There are actually four major transport networks that serve the state: the highway system, the railway system, the air transport system and the waterway network. This study is concerned primarily with the highway and railway systems. Flows on the other networks are considered implicitly if motor carriers or rail are used in part of the movement.

The Highway Network

During Phase 1 of this project the highway network used for flow analysis was the 1992 digital network developed for the Federal Highway Administration (FHWA) by the Oak Ridge National Laboratory. This network was based on TIGER (topographically integrated geographic encoding and referencing) files. The digital network also included a considerable amount of attribute data, e.g., length, speed, travel time, and so forth. Detection of border effects during

Figure 1.1 The Counties of Indiana

flow assignments led the study staff to use a large circular ring of highways centered on Indianapolis and extending out 200 miles. It was believed that the use of such a ring would eliminate the aforementioned boundary effects.

This Phase 2 study uses a similar national highway network in digital form. It also makes use of the circular ring of highways to eliminate bias attributable to the state boundary. However, the state portion of the highway network differs significantly from the Phase 1 digital network.

The Indiana Department of Transportation wanted this project to use a much more detailed state highway network than was available in a compatible format at the time the project began. The detailed network of interest included the links in the State Roadway Inventory [1]. This database contains a wealth of information on links of the state's highways, but there were certain technical problems that had to be overcome before the network could be used within TransCAD, the transport GIS technology adopted for the project [2]. Two of the major problems encountered were that (1) the state's digital highway network was not in a format compatible with the format used by TransCAD, and (2) the connectivity of the state's network was erroneous. On this latter point a word of explanation may be in order. All that is meant by connectivity is that the links are connected to each other allowing movement to take place from one link to the next. This means the endnode of one link must also be the endnode of a second link, otherwise the links will never touch each other and movement will not be possible. Quite often links appear to be connected on maps, but if we enlarge the map sufficiently we find that the links never really touch each other. Resolving these problems took considerable time. After several false starts during the fall of 1996 a digital highway network for Indiana was received.

Preliminary evaluation of the network revealed that it had significant connectivity problems within Indiana. Programs were written by the project staff to check the network for breaks. In effect, the programs examined all endnodes and assessed whether they were connected to other endnodes less than twice. If so, this would indicate a break in the network. Some of these would be expected, e.g., where a highway goes to a state boundary and stops, but those in the middle of the state usually signaled a connectivity break. These were repaired usually by extending existing links to close the break.

In order to use only part of the FHWA network and all of the "new" Indiana highway network, the Indiana portion of the FHWA network had to be removed. In addition, the attributes and geographic data for both networks had to be put into the same format. The attribute data were kept to a minimum and included only those items such as link length, speed, travel time, and highway name, for which comparable and complete data were available in both the FHWA and Indiana network databases.

After a few false starts and network revisions the Indiana digital state highway network was "woven" into the FHWA digital national highway network. If one were concerned only with

displaying a map of the FHWA and state highway networks, this could be accomplished with most GIS (geographical information systems) programs available. The two networks could be displayed as two different layers in the GIS or the files could be merged and displayed as a single layer. Once again, for mapping this is all that would have to be done. However, if the analysis is to assign traffic to links of the network connecting all different parts of the mapped surface, then the topology (connectivity) of the map must be correct. In this case, topology is making sure that shipments from all nodes to all nodes over the links of the network are possible. For example, all the border links of the Indiana highway network must be joined to links of the FHWA national highway network used here. Should that not be the case, there would be no flow between the nation and this state. Flows would not even pass over the state's links moving from Illinois to Ohio, but would move through Illinois and Kentucky into Ohio, or possibly north to Michigan's upper peninsula and then down through that state into Ohio. It would be as if Indiana had no highways, which from a computational and assignment perspective, it would not. Therefore, the "weaving" of the networks is critical if the new network is to be used later for traffic assignment as this one was.

As a check the program noted earlier for identifying breaks in the Indiana highway network was rerun on the merged highway system to identify any Indiana links that were not connected to the FHWA national highway system. To the surprise of the project staff the program identified several breaks, not in the area where the two networks merged, but in other parts of the FHWA digital national highway network. The breaks were very significant, e.g., all Interstate Highways from California into Arizona were broken, it was impossible to leave Florida via any of their Interstate Highway links, and several neighboring states in the Midwest had breaks in their Interstate Highway links. All of the breaks were fixed before the analysis continued.

The FHWA digital network used was the most complete available in terms of attribute data, when the project began. It is believed this is still the case although a new network is in preparation. One wonders how many states have performed analyses with this network that would clearly give erroneous results. Such a network should never have been released by FHWA if it had so many faults since there is a tendency to accept these federally issued digital networks as accurate.

After all of the corrections and modifications noted above, the resulting network consisted of 34,154 links, 31,557 nodes and 70,620 miles of highway. Of these amounts, 15,074 links, 14,330 nodes, and 11,319 miles of highway network were for these elements of Indiana's State Roadway Inventory. The network resulting from connecting these two networks is displayed in Figure 1.2. The map also displays the location of the highway centroids which were used to represent the various states of the U.S. and counties of Indiana. Figure 1.3 is a map of only the Indiana portion of the digital highway network used here. The 145 nodes (centroids) used for the highway network are identified in Table 1.1. along with their identification number, longitude, latitude, and name.

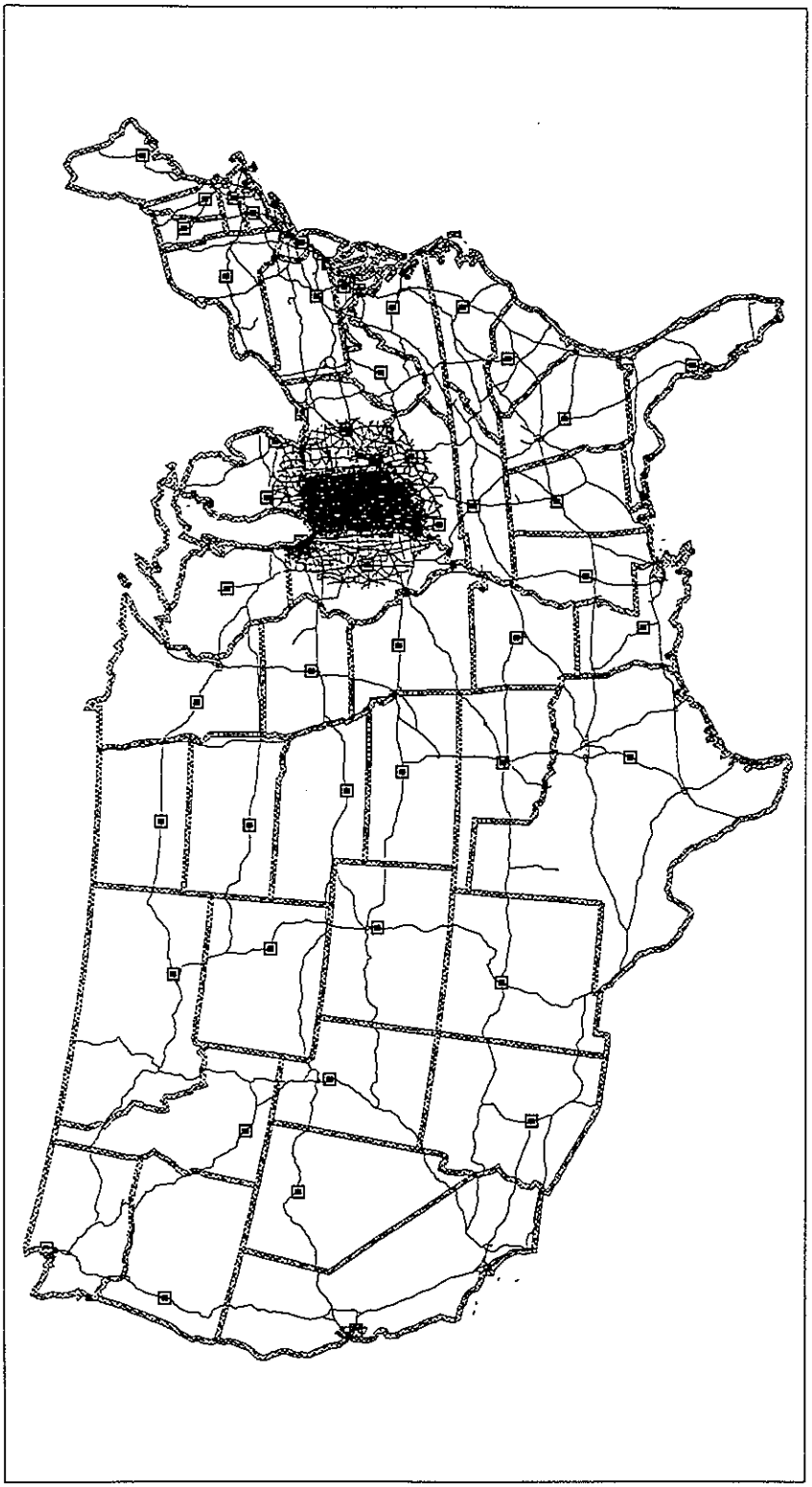

Figure 1.2 Digital Highway Network - United States

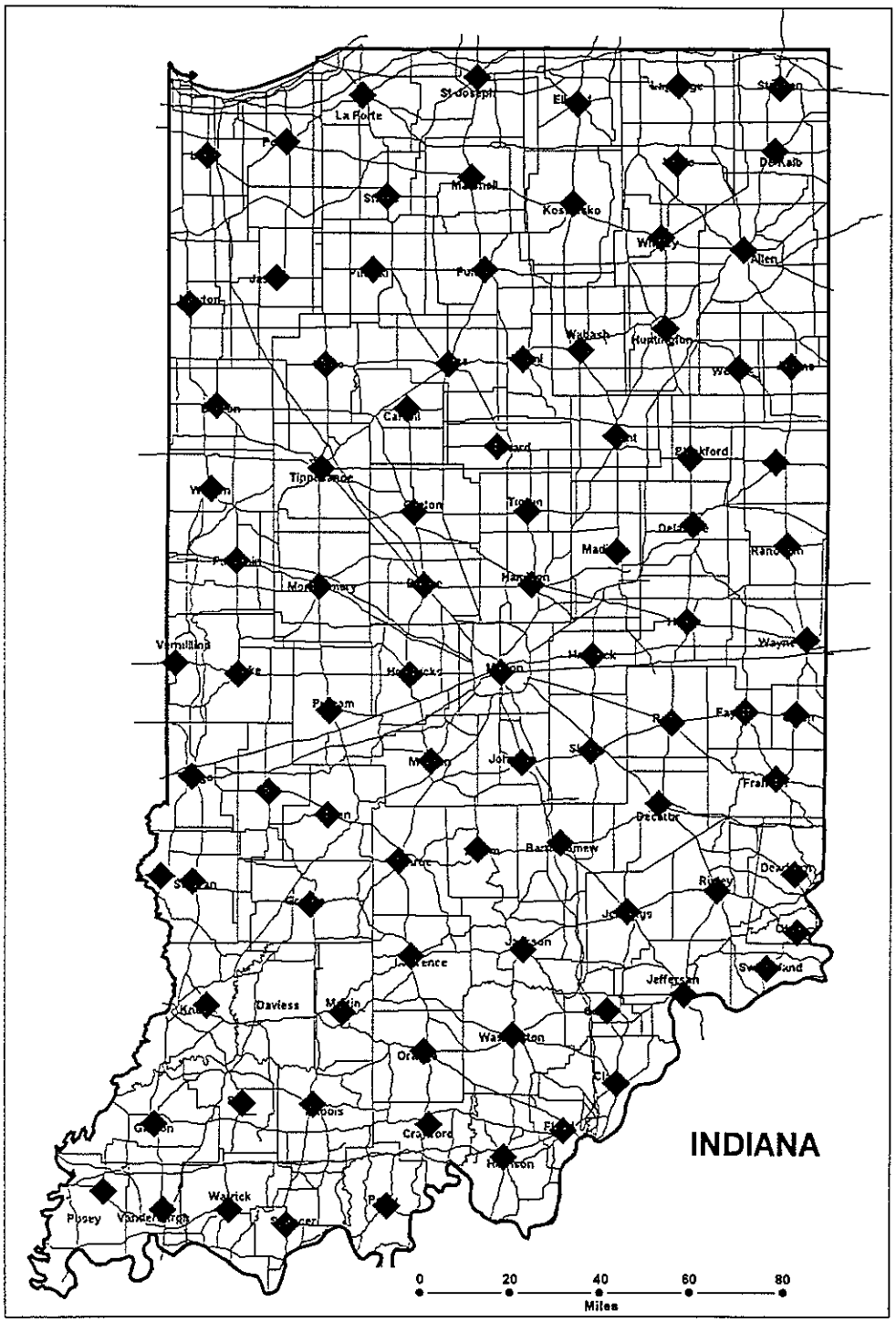

Figure 1.3 Digital Highway Network - Indiana Portion

Table 1.1. Highway Nodes, Identification Numbers, Names, Longitude and Latitude

25375	Alabama	-87001450	33365780
25611	Arizona	-112037048	33448071
21974	Arkansas	-92408600	38959728
25777	California	-122092819	37644886
26345	Colorado	-10460497	39380070
31177	Connecticut	-72658195	41751236
30101	Delaware	-75603958	39704002
30077	District of Columbia	-77024315	38882244
21644	Florida	-82323914	28325239
27569	Georgia	-83733505	32833076
20574	Idaho	-114702713	42766361
17770	Illinois - north	-87714119	41994698
14633	Illinois - south	-88977463	39847240
03836	Indiana - Adams	-84953967	40744473
14196	Indiana - Allen	-85148587	41118175
11673	Indiana - Bartholomew	-85903035	39222601
08068	Indiana - Benton	-87326211	40618931
13110	Indiana - Blackford	-85370096	40451196
01855	Indiana - Boone	-86469084	40046711
07041	Indiana - Brown	-86247071	39203114
09536	Indiana - Carroll	-86539242	40608626
07691	Indiana - Cass	-86573053	39164669
11319	Indiana - Clark	-85671152	38453826
04894	Indiana - Clay	-87110776	39386469

06941	Indiana - Perry	-86620766	38061157
04384	Indiana - Pike	-87217829	38391349
08451	Indiana - Porter	-87036379	41461809
05970	Indiana - Posey	-87789903	38110515
10483	Indiana -Pulaski	-86679595	41055577
05652	Indiana - Putnam	-86859290	39643906
02055	Indiana - Randolph	-84966811	40172013
11629	Indiana - Ripley	-85256717	39069851
03024	Indiana - Rush	-85444638	39608347
10275	Indiana - St Joseph	-86249850	41667982
11298	Indiana - Scott	-85709914	38686226
11809	Indiana - Shelby	-85776982	39517418
05003	Indiana - Spencer	-87036571	38002938
08237	Indiana - Starke	-86620661	41288219
12556	Indiana - Steuben	-84999421	41635083
04637	Indiana - Sullivan	-87425050	39101031
11245	Indiana - Switzerland	-85053397	38822028
09837	Indiana - Tippecanoe	-86893161	40418129
04231	Indiana - Tipton	-86040879	40282280
03213	Indiana - Union	-84930931	39634368
06125	Indiana - Vanderburgh	-87544332	38050425
06732	Indiana - Vermillion	-87494652	39796918
06623	Indiana Vigo	-87427728	39434457
12735	Indiana - Wabash	-85820532	40796973
01439	Indiana - Warren	-87347490	40351615

06210	Indiana - Warrick	-87274270	38049971
00570	Indiana - Washington	-86100700	38608602
02008	Indiana - Wayne	-84888193	39872212
13800	Indiana - Wells	-85171534	40737703
08146	Indiana - White	-86875335	40749237
04087	Indiana - Whitley	-85488392	41156847
22080	Iowa	-93570801	41877880
22354	Kansas	-98061325	38870941
16105	Kentucky - west	-87498459	37348721
16817	Kentucky - east	-84508781	38050552
21018	Louisiana	-92177246	30768177
31646	Maine	-68780128	44785629
30036	Maryland	-76745453	39348721
31276	Massachusetts	-71803101	42245346
28889	Michigan - west	-85590714	42972660
30252	Michigan - east	-83085312	42483574
22743	Minnesota	-94952209	45720459
21341	Mississippi	-90068771	32611351
22043	Missouri	-92544838	38959728
20912	Montana	-107989990	45986740
22288	Nebraska	-98951050	40686829
20255	Nevada	-116904617	40619709
31469	New Hampshire	-71526314	43193218
24764	New Jersey	-74451385	40404953
26460	New Mexico	-106635727	35085262

01888	Indiana - Clinton	-86510932	40279584
00374	Indiana - Crawford	-86448299	38321404
04558	Indiana - Daviess	-87555899	39117615
10940	Indiana - Dearborn	-84937265	39122123
11933	Indiana - Decatur	-85497244	39347288
12521	Indiana - DeKalb	-85019938	41433312
13423	Indiana - Delaware	-85356645	-40238854
05795	Indiana - Dubois	-86927213	38387268
14114	Indiana - Elkhart	-85834230	41584910
03220	Indiana - Fayette	-85142406	39640097
02636	Indiana - Floyd	-85890756	38303455
08872	Indiana - Fountain	-87242952	40124244
03172	Indiana - Franklin	-85012472	39427393
02330	Indiana - Fulton	-86217424	41055096
06287	Indiana - Gibson	-87582319	38325040
13545	Indiana - Grant	-85673310	40520759
00670	Indiana - Greene	-86937418	39026818
00126	Indiana - Hamilton	-86023308	40046949
11908	Indiana - Hancock	-85769989	39821176
00291	Indiana - Harrison	-86136789	38218227
00753	Indiana - Hendricks	-86526276	39760715
12205	Indiana - Henry	-85381696	39931634
02087	Indiana - Howard	-86167401	40487727
12159	Indiana - Huntington	-85470687	40864580
00829	Indiana - Jackson	-86057140	38880308

09227	Indiana - Jasper	-87078124	41027313
12452	Indian - Jay	-85015618	40438266
02751	Indiana - Jefferson	-85392979	38738783
02912	Indiana - Jennings	-85627011	39003602
07355	Indiana - Johnson	-86063722	39480040
04362	Indiana - Knox	-87365299	38701941
03989	Indiana - Kosciusko	-85852545	41266345
12900	Indiana - Lagrange	-85417783	41642410
08981	Indiana - Lake	-87364515	41416929
10282	Indiana - LaPorte	-86721856	41610473
05528	Indiana - Lawrence	-86522335	38860978
13671	Indiana - Madison	-85672046	40153712
01192	Indiana - Marion	-86150306	39766680
02318	Indiana - Marshall	-86273639	41350024
05124	Indiana - Martin	-86805100	38680895
02273	Indiana - Miami	-86059999	40766532
07161	Indiana - Monroe	-86573053	39164669
07664	Indiana - Montgomery	-86901226	40042734
00948	Indiana - Morgan	-86439723	39482832
08399	Indiana - Newton	-87435513	40940673
12877	Indiana - Noble	-85423933	41395492
03377	Indiana - Ohio	-84925942	38937571
05350	Indiana - Orange	-86468058	38556489
05471	Indiana - Owen	-86865692	39312617
00164	Indiana - Parke	-87236190	39762655

29054	New York	-75205978	43111839
24237	North Carolina	-78561661	35608601
19670	North Dakota	-100709396	46835499
29431	Ohio - north	-82021896	41464378
18974	Ohio - central	-82987137	40087891
17175	Ohio - south	-84517738	39221035
27879	Oklahoma	-97575577	35511169
25960	Oregon	-123048782	44044090
30129	Pennsylvania	-76921181	40316608
31188	Rhode Island	-71490356	41666729
23926	South Carolina	-80994827	34404919
19361	South Dakota	-100705467	43883072
28659	Tennessee	-86857758	36152271
21115	Texas	-97268593	31266665
26255	Utah	-111724930	40311611
24899	Vermont	-72608063	44114300
23751	Virginia	-78052666	37902699
20021	Washington	-122303139	48297894
24113	West Virginia	-80740097	38656830
23424	Wisconsin	-89595581	44567215
26563	Wyoming	-106270157	42853634

The Railway Network

At the time of the Phase 1 study there was no generally accessible railway network in digital form. As a result that study used TIGER files to define a rail network within the state of Indiana. Connectivity to the remainder of the U.S. was accomplished using an abstract graph of these connections. This approach was reasonable for the time. In the interim the Federal Railroad Administration (FRA) has released a network of the rail system of the United States in digital form.

The rail network developed by the FRA is based on topographic maps with a scale of 1:2,000,000. The accuracy of such a map is approximately 1,200 meters, about three quarters of a mile, in terms of root-mean square. There are other networks available at a scale of 1:100,000, but these did not contain some of the data necessary for analysis purposes in this study. For this reason the 1:2,000,000 network was used here. It consists of approximately 16,000 links and 11,500 nodes (see Figure 1.4).

A little more detail can be mapped for Indiana, including ownership of the rail lines (see Figure 1.5). This is a very dynamic area and as the tracks of the Consolidated Rail Corporation (Conrail) are sold to the Norfolk Southern and CSX corporations in the near future ownership of these lines will change.

Among the attribute data available in this network are a link identification code, origin and destination end nodes for each link, owner of the link, abandonment status, and traffic density. It was this latter variable that was critical to later analysis. It is used as one of the key variables in assigning traffic to the rail system.

Partly as a precaution the connectivity program used earlier was rerun to assess this aspect of the FRA digital rail system. However, rail networks are different than highway networks in terms of isolated nodes. Although one rarely sees naturally occurring isolated nodes in a highway network, these are very common in rail networks where every branch line ends with such an isolated node. Running the program for the rail network revealed a substantial number of these across the country, as expected. However, there is a section of the central United States where no isolated endnodes were found. This goes through Indiana and even where there are obviously branch lines with isolated end nodes, these were not identified by the program. The program was checked for accuracy and was found to be without fault. At the same time isolated end nodes on branch lines were not being identified, which meant that these end nodes were connected to two nodes. The only way this could occur is if the data were appearing twice in the database. A simple sort of all link endnodes revealed that a substantial amount of the network had been entered twice by FRA or their contractors. This problem was also corrected.

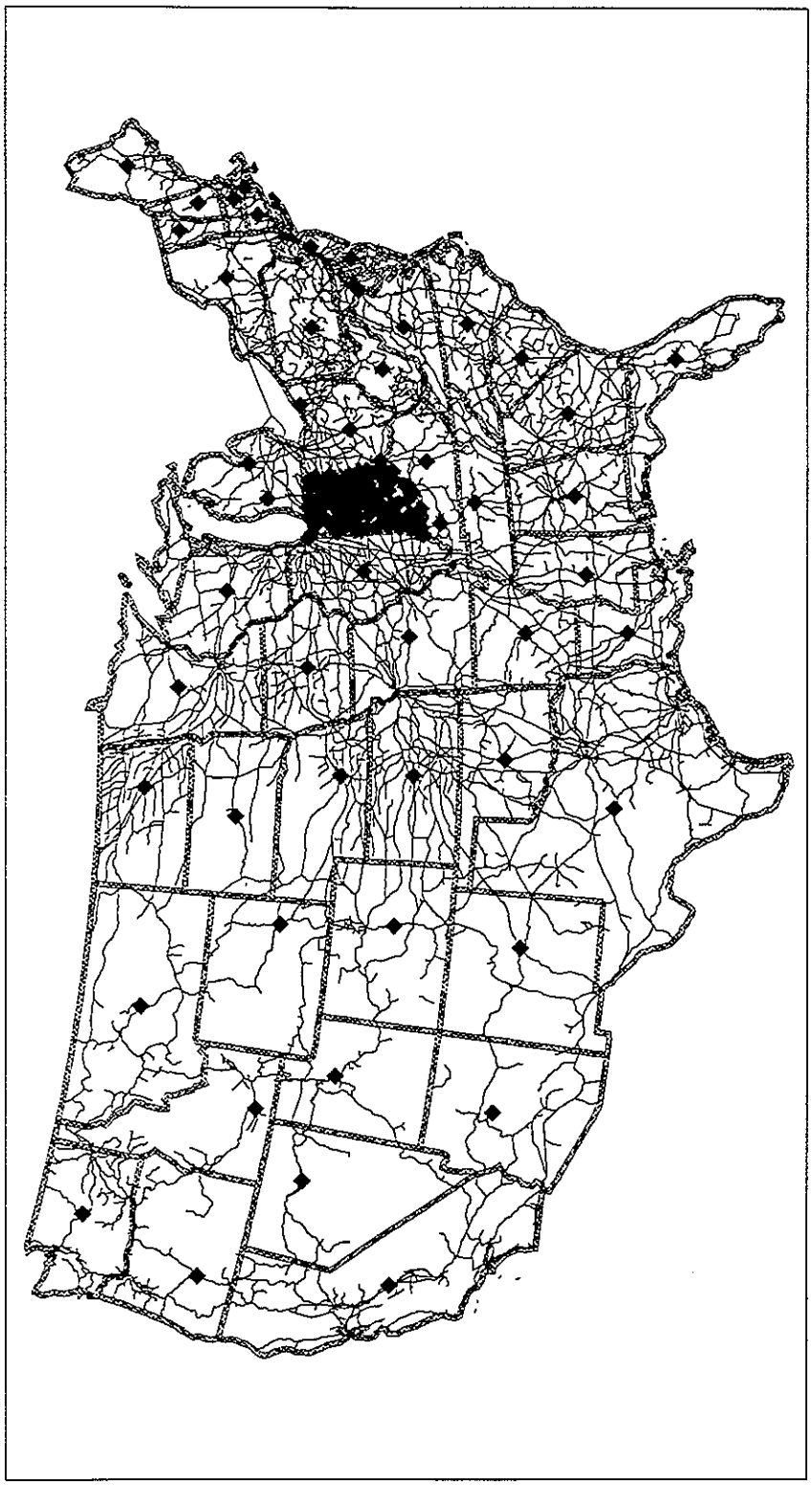

Figure 1.4 Digital Railway Network - United States

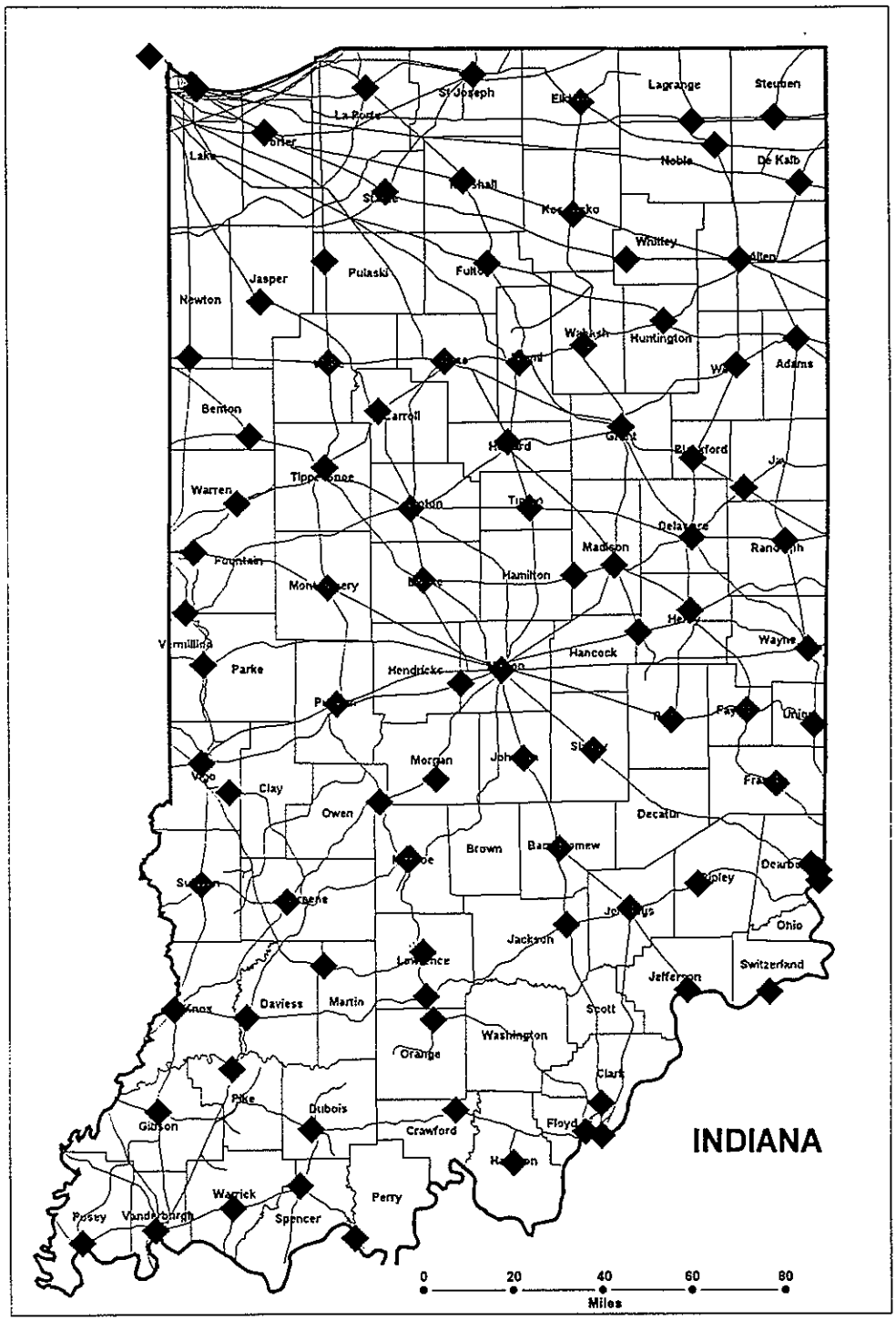

Figure 1.5 Digital Railway Network - Indiana Portion

The 145 longitudes and latitudes of the nodes (centroids) of the railway network used here are displayed in Table 1.2. In some cases the node for a county in Indiana is not located in that county. This is because the county has no rail service or the digitized rail network has no node in the county. Keeping with reality the assumption was made that these places would be served by a nearby rail line with the final portion of the move occurring by truck.

Other Networks

Digital representations of the air and waterway networks were also considered for inclusion here at the beginning of the project, but changes in the design of the project by the study advisory committee made these superfluous. The waterway network is used primarily to move bulk raw materials, such as grains and minerals beyond the borders of Indiana, i.e., the Indiana portion of the move is by rail or motor carrier and was implicitly covered by the study. The air transport system moves some freight, but it is primarily a passenger system. Intercity air travel was also dropped from this phase of the study and this resulted in the dropping of the air transport network. In addition, as is true of waterways, the Indiana portion of air freight shipments is included here as a highway move.

Conclusion

After corrections for errors the highway and rail networks used here are among the best available for regional transport planning purposes. It would be desirable to have more complete attribute data available in both networks, but this is beyond the scope of the present study. It is also true that correcting the two network databases were beyond the scope of this study, but these were actually preventing the study from being completed.

The digital rail network could be increased to the 1:100,000 scale. Such a network already exists, but it has virtually no attribute data. It is reasonable to assume that FRA will increase the amount of attribute data in this network database in the near future.

Table 1.2. Railway Nodes, Identification Numbers, Names, Longitude and Latitude

679608	Alabama	-86872877	32795406
243152	Arizona	-112055000	34792780
939180	Arkansas	-92273060	34737780
94488	California	-120013890	36974720
403437	Colorado	-104810550	38869170
1990777	Connecticut	-72772500	41618330
1867145	Delaware	-75576670	38928330
1860688	District of Columbia	-77004008	38901899
730522	Florida	-82035550	28867220
764752	Georgia	-83555560	32704440
277697	Idaho	-113677220	42600560
1403247	Illinois - north	-87599170	41733610
1277657	Illinois - south	-89288060	40003610
1454441	Indiana - Adams	-84926390	40827500
1459831	Indiana - Allen	-85161110	41083330
1430919	Indiana - Bartholomew	-85916110	39197220
1391298	Indiana - Benton	-87193890	40517220
1449897	Indiana - Blackford	-85356390	40444440
1415250	Indiana - Boone	-86477500	40057220
1378411	Indiana - Brown	-86533890	39165280
1412020	Indiana - Carroll	-86661110	40596940
1415298	Indiana - Cass	-86385560	40758060
1427425	Indiana - Clark	-85741862	38278012
1374674	Indiana - Clay	-87285000	39378890

1412004	Indiana - Clinton	-86528050	40285280
1378251	Indiana - Crawford	-86348050	38360000
1369860	Indiana - Daviess	-87215550	38658890
1437115	Indiana - Dearborn	-84842356	39127172
1431039	Indiana - Decatur	-84872500	39144440
1459919	Indiana - DeKalb	-84912220	41326950
1454369	Indiana - Delaware	-85361110	40193610
1369884	Indiana - Dubois	-86947780	38298330
1454521	Indiana - Elkhart	-85813330	41585830
1431055	Indiana - Fayette	-85135830	39641110
1378331	Indiana - Floyd	-85809450	38290000
1391226	Indiana - Fountain	-87425830	40146110
1445057	Indiana - Franklin	-85015000	39404450
1422726	Indiana - Fulton	-86205000	41071670
1365891	Indiana - Gibson	-87580830	38354720
1449841	Indiana - Grant	-85651660	40545560
1370060	Indiana - Greene	-87048060	39027780
1449769	Indiana - Hamilton	-85851110	40070000
1431015	Indiana - Hancock	-84883330	39835560
1378291	Indiana - Harrison	-86107780	38189720
1378491	Indiana - Hendricks	-86321699	39725853
1449921	Indiana - Henry	-85368330	39958060
1415290	Indiana - Howard	-86122780	40498890
1449905	Indiana - Huntington	-85474720	40885000
1378467	Indiana - Jackson	-85885280	38952780

1405559	Indiana - Jasper	-87147500	40948060
1454385	Indiana - Jay	-85145840	40349720
1430943	Indiana - Jefferson	-85386836	38745996
1430911	Indiana - Jennings	-85623890	39005000
1385289	Indiana - Johnson	-86062500	39487500
1366019	Indiana - Knox	-87513050	38684720
1422750	Indiana - Kosciusko	-85848890	41230000
1459935	Indiana - Lagrange	-85354450	41524720
1409342	Indiana - Lake	-87408060	41629440
1419815	Indiana - LaPorte	-86706950	41631940
1378323	Indiana - Lawrence	-86480830	38866660
1449761	Indiana - Madison	-85682250	40103126
1378483	Indiana - Marion	-86152220	39770000
1422694	Indiana - Marshall	-86305000	41337500
1378339	Indiana - Martin	-86894170	38824440
1415338	Indiana - Miami	-86075280	40751950
1378395	Indiana - Monroe	-86547230	39163020
1411972	Indiana - Montgomery	-86872500	40032220
1378451	Indiana - Morgan	-86424720	39419450
1391322	Indiana - Newton	-87440830	40770560
1459735	Indiana - Noble	-85261110	41448890
1437107	Indiana - Ohio	-84838893	39093558
1378307	Indiana - Orange	-86441110	38650280
1378379	Indiana - Owen	-86659450	39348330
1374746	Indiana - Parke	-87388050	39786390

1374826	Indiana - Perry	-86769450	37951390
1369836	Indiana - Pike	-87277780	38493060
1410589	Indiana - Porter	-87126110	41489720
1363101	Indiana - Posey	-87895519	37937228
1415362	Indiana - Pulaski	-86880840	41079170
1374770	Indiana - Putnam	-86837220	39661670
1454401	Indiana - Randolph	-84977220	40181110
1430951	Indiana - Ripley	-85341110	39083890
1430991	Indiana - Rush	-85448610	39610000
1422806	Indiana - St Joseph	-86261390	41675560
1427441	Indiana - Scott	-85744720	38381390
1430959	Indiana - Shelby	-85773610	39513050
1374794	Indiana - Spencer	-86995830	38118060
1415434	Indiana - Starke	-86626950	41301390
1459951	Indiana - Steuben	-85015231	41537597
1370012	Indiana - Sullivan	-87399720	39082780
1430895	Indiana - Switzerland	-85045000	38739170
1391274	Indiana - Tippecanoe	-86882230	40418060
1415274	Indiana - Tipton	-86034720	40286670
1431071	Indiana - Union	-84859170	39594170
1363205	Indiana - Vanderburgh	-87592602	37977215
1388072	Indiana - Vermillion	-87459720	39952500
1374658	Indiana - Vigo	-87396940	39471670
1449881	Indiana - Wabash	-85806110	40807780
1391266	Indiana - Warren	-87248528	40303011

1365955	Indiana - Warrick	-87274440	38047500
1374850	Indiana - Washington	-86468890	38725830
1445105	Indiana - Wayne	-84883330	39835560
1454409	Indiana - Wells	-85175830	40744450
1412012	Indiana - White	-86865840	40753610
1454473	Indiana - Whitley	-85628050	41081670
1107371	Iowa	-93447414	42027780
862094	Kansas	-98243890	38513050
1358953	Kentucky - east	-84801110	37585280
1323859	Kentucky - west	-87492770	37337220
596679	Louisiana	-92418050	31330830
2060946	Maine	-69018060	4531670
1863233	Maryland	-76775000	39009170
2026476	Massachusetts	-71795000	42257220
1569778	Michigan - east	-83932220	43439170
1558742	Michigan - west	-85660000	42974720
1142580	Minnesota	-94225000	46348610
650121	Mississippi	-90039720	32615000
997476	Missouri	-92238050	38618060
327607	Montana	-109798060	46926670
886260	Nebraska	-98322220	40931950
232406	Nevada	-116466288	40593036
2033555	New Hampshire	-71583890	43451950
1961110	New Jersey	-74708340	40152780
337744	New Mexico	-105213470	34610695

2002329	New York	-75234440	43110550
1769102	North Carolina	-79285840	35565560
1038047	North Dakota	-99122220	47458330
1661951	Ohio - central	-82996670	39972220
1740527	Ohio - north	-81610280	41488610
1443420	Ohio - south	-84536110	39115550
808526	Oklahoma	-97511950	35480000
145996	Oregon	-121777780	43215560
1850726	Pennsylvania	-78239720	40672780
1996059	Rhode Island	-71439720	41808330
1621721	South Carolina	-81049450	33973060
461272	South Dakota	-100348890	44371110
1323995	Tennessee	-86748340	36126670
506462	Texas	-99365840	31782500
254561	Utah	-111618060	40157780
2021471	Vermont	-72612780	44271110
1790836	Virginia	-78938330	37668610
198082	Washington	-120327220	47450280
1719825	West Virginia	-80586390	38588610
1518461	Wisconsin	-89754450	44583330
439681	Wyoming	-105201110	42651670

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[1] Indiana Department of Transportation, *INDOT Road Inventory Computer Print-Out Supplement, A Users Guide,* Indianapolis: Indiana Department of Transportation, Roadway Inventory Section, Division of Program Development, undated.

[2] Caliper Corporation (1996), *TransCAD: Transportation GIS Software,* User's Guide, Version 3.0 for Windows, Newton, Mass: Caliper Corporation.

Chapter 2

COMMODITIES EXAMINED AND DATA SOURCES

It is desirable to have the commodities in a flow study be as detailed as possible. There is a very good reason for this. If the commodity groups are too general it is possible to get nonsensical results during flow modeling. These results are due to the supply and demand vectors (productions and attractions) being made up of heterogeneous goods. For example, if one region produces television sets and another region produces radios a commodity classification system might very well place both industries in the same group. An examination of the flows of this commodity group might raise the question of why these areas would trade with each other. While the actual reason is obvious the vagueness of the grouping of industries might make it less so. So detail is desirable whenever possible.

Unfortunately, with detailed commodity groupings one loses a considerable amount of information. There are two reasons for this. First, publication of such data might reveal confidential aspects of the involved firms' operations, e.g., salaries, volume of production, and market areas. The various censuses have handled this problem by placing a (D) in any data cell that would "disclose" such proprietary information. Second, it is possible that the low number of instances of a specialized firm could result in sampling errors, and the expansion of such sampled data could introduce further errors into the analysis. Therefore, some censuses publish an (S) to indicate this potential sampling problem. As a result, the selection of data categories is always a compromise between detail and availability.

For this study, all two-digit categories of the Standard Transportation Commodity Code (STCC) were examined in terms of their significance to Indiana's economy. A set of 18 commodity groups was identified. An additional set of five groups was included in what is called "STCC 50" here. These additional manufactured goods categories include tobacco products (STCC 21), printed matter (STCC 27), rubber and miscellaneous plastic products (STCC 30), leather and leather products (STCC 31), instruments, including medical and photographic, as well as watches and clocks (STCC 38), and miscellaneous products of manufacturing (STCC 39) (see Table 2.1). These goods were excluded as individual groups primarily because they are not located in Indiana counties in high enough concentrations to have their data published, or because too few firms are involved in production or use of the commodity and for these reasons data are

Table 2.1 Major Commodity Groups Included in the Study

STCC Code	Commodity Group
01	Farm Products
11	Coal
14	Non-metallic Minerals
20	Food and Kindred Products
22	Basic Textiles
23	Apparel
24	Lumber and Woods Products
25	Furniture and Fixtures
26	Pulp and Paper Products
28	Chemicals and Allied Products
29	Petroleum and Coal Products
32	Stone, Clay and Glass Products
33	Primary Metal Products
34	Fabricated Metal Products
35	Machinery, except Electrical
36	Electrical Machinery
37	Transportation Equipment
40	Waste Products
50*	Other Manufactured Goods
60**	U.S. Mail Flows
70**	Express Mail Flows

* Category 50 is not an STCC group. It includes STCC 21 (Tobacco Products), STCC 27 (Printed Matter), STCC 30 (Rubber and Miscellaneous Plastic Products), STCC 31 (Leather and Leather Products), STCC 38 (Instruments, including Medical and Photographic, as well as Watches and Clocks), and STCC 39 (Miscellaneous Manufacturing Products).

** Categories 60 and 70 are not STCC groups; these numbers are used only for data coding.

not generally released for the flows.

The components of the 18 STCC industry groups, and the heterogeneous group identified as STCC 50 appear in Table 2.2. This table gives the reader an idea of the complexity of the commodity classification problem. For example, the broadest categories of the classification system for manufactured goods are STCC 2 and 3. The commodities in this study are examined at the two digit level (see Table 2.1). Table 2.2 includes commodities to the three digit level of detail, so the reader will have a better understanding of the components of the industries examined here. The STCC system actually goes to five digits in complexity.

Also examined here are the flows of mail by the U.S. Postal Service and overnight express mail operations of companies such as FedEx. In these cases the analysis is of movements not covered by the other analyses, e.g, the movement of manuscripts, contracts, magazines, and the like.

Data Sources

The length of this project has resulted in a legion of data sources in comparison to those initially conceived of in the project design. That design anticipated using primarily models derived from the 1977 Census of Transportation to estimate the volume of goods produced or attracted by counties in Indiana and the states of the United States. This design was chosen because the most recent commodity flow data available was from that former census. There was no other census of such multimodal flow traffic available, although a commodity flow survey was underway at the time this project began. The data of that commodity survey was to become available in 1996, but this project was scheduled for completion much earlier than that.

In effect, much of what is included here in the way of modeling was done on the 1977 data. This could not be redone with the 1993 data simply because much of this is not available even now.[1] On the other hand all of the discussion of commodity flows into, through or within, and out of Indiana pertains to the 1993 data.

In addition to using elements of the 1977 Census of Transportation [1], and portions of the 1993 Commodity Flow Survey [2], this study also made use of the various years of County Business Patterns [3] and the carload waybill sample on CD-ROM [4] in the modeling. Exactly how each of these was used is left to a later chapter that discusses the methodology of the project.

[1]There is a tendency to think that the 1993 Commodity Flow Survey has been published, but in reality only the U.S. Summary and about half the state volumes are available at this time (May 1, 1997). This prevents a duplication of the earlier modeling. In addition, certain data needed for the attraction side of that modeling will apparently not be published in the near future.

Table 2.2 Major Commodity Groups and Standard Transportation Commodity Codes

STCC code	Descriptive title
01	Farm Products
011	Field Crops
012	Fresh Fruits or Tree Nuts
013	Fresh Vegetables
014	Livestock or Livestock Products
015	Poultry or Poultry Products
019	Miscellaneous Farm Products
11	Coal
111	Anthracite Coal
112	Bituminous Coal and Lignite
14	Non-metallic Minerals
141	Dimension Stone, Quarry
142	Crushed or Broken Stone
144	Gravel or Sand
145	Clay, Ceramic or Refractory Minerals
147	Chemical or Fertilizer Minerals
149	Miscellaneous Non-metallic Minerals
20	Food and Kindred Products
201	Meat, Poultry or Small Game, Fresh or Chilled
202	Dairy Products
203	Canned or Preserved Fruits Vegetables or Seafood
204	Grain Mill Products

205	Bakery Products
206	Sugar Beet or Cane
207	Confectionary or Related Products
208	Beverages or Flavoring Extracts
209	Miscellaneous Food Preparations or Kindred Products
21	Tobacco Products, excluding Insecticides
211	Cigarettes
212	Cigars
213	Chewing or Smoking Tobacco
214	Stemmed or Redried Tobacco
22	Textile Mill Products
221	Cotton Woven Fabrics
222	Man-Made Fibre or Silk Broad Woven Fabrics
223	Wool Broad-Woven Fabrics
224	Narrow Fabrics, Cotton, Silk, Wool or Glass or Other
225	Knit Fabrics
227	Floor Coverings
228	Thread or Yarn
229	Miscellaneous Textile Goods
23	Apparel, or Other Finished Textile Products or Knit Apparel
231	Men's, Youths, or Boys Clothing or Uniforms
233	Women's, Misses', Childrens, or Infants Clothing
235	Caps, Hats, or Millinery, or Hat Bodies
237	Fur Goods
238	Miscellaneous Apparel or Accessories

239	Miscellaneous Fabricated Textile Products
24	Lumber or Wood Products, excluding Furniture
241	Primary Forest or Wood Raw Materials
242	Sawmill or Planing Mill Products
243	Millwork or Prefabricated Wood Products or Plywood or Veneer
244	Wooden Containers
249	Miscellaneous Wood Products
25	Furniture of Fixtures
251	Household or Office Furniture
253	Public Building or Related Furniture
254	Lockers, Partitions, or Shelving
259	Miscellaneous Furniture and Fixtures
26	Pulp, Paper, or Allied Products
261	Pulp or Pulp Mill Products
262	Paper
263	Fibreboard, Paperboard, or Pulpboard
264	Converted Paper or Paperboard Products
265	Containers or Boxes, Paperboard, Fibreboard or Pulpboard
266	Building Paper or Building Board
27	Printed Matter
271	Newspapers
272	Periodicals
273	Books
274	Miscellaneous Printed Matter
276	Manifold Business Forms

277	Greeting Cards, Seals, Labels, or Tags
278	Blank books, Loose-leaf Binders, or Devices
279	Service Industries for Printing Trades
28	Chemicals or Allied Products
281	Industrial Inorganic or Organic Chemicals
282	Plastic Materials or Synthetic Fibers, Resins or Rubber
283	Drugs
284	Soap or Other Detergents, Cleaning Preparations, Cosmetics, Perfumes
285	Paints, Enamels, Lacquers, Shellacs, or Varnishes
286	Gum or Wood Chemicals
287	Agricultural Chemicals
289	Miscellaneous Chemical Products
29	Petroleum or Coal Products
291	Products of Petroleum Refining
295	Paving or Roofing Materials
299	Miscellaneous Coal or Petroleum Products
30	Rubber or Miscellaneous Rubber Products
301	Rubber Tires and Inner Tubes
302	Rubber or Plastic Footwear
303	Reclaimed Rubber
304	Rubber or Plastic Hose or Belting
306	Miscellaneous Fabricated Rubber Products
307	Miscellaneous Plastic Products
31	Leather or Leather Products
311	Leather

312	Industrial Leather Belting
313	Boot or Shoe Cut Stock or Findings
314	Footwear, Leather or Other Material
315	Leather Gloves or Mittens
316	Luggage, or Handbags, Leather or Other material
319	Leather Goods, not elsewhere classified
32	Clay, Concrete, Glass, or Stone Products
321	Flat Glass
322	Glass and Glassware, Pressed and Blown
324	Hydraulic Cement
325	Structural Clay Products
326	Pottery and Related Products
327	Concrete, Gypsum, and Plaster Products
328	Cut Stone and Stone Products
329	Abrasives and Asbestos Products
33	Primary Metal Products
331	Steel Works and Rolling Mill Products
332	Iron and Steel Castings
333	Nonferrous Metal Primary Smelter Products
335	Nonferrous Metal Basic Shapes
336	Nonferrous Metal Castings
339	Miscellaneous Primary Metal Products
34	Fabricated Metal Products, except Ordnance, Machinery, Transportation
341	Metal Cans
342	Cutlery, Hand Tools and General Hardware

343	Plumbing Fixtures and Heating Apparatus
344	Fabricated Structural Metal Products
345	Bolts, Nuts, Screws, Rivets, and Washers
346	Metal Stampings
348	Miscellaneous Fabricated Wire Products
349	Miscellaneous Fabricated Metal Products
35	Machinery, except Electrical
351	Engines and Turbines
352	Farm Machinery and Equipment
353	Construction, Mining, Materials Handling Machinery and Equipment
354	Metalworking Machinery and Equipment
355	Special Industry Machinery
356	General Industrial Machinery and Equipment
357	Office, Computing and Accounting Machines
358	Refrigeration and Service Industry Machines
359	Miscellaneous Machinery and Parts
36	Electrical Machinery, Equipment, and Supplies
361	Electrical Transmission Equipment
362	Electrical Industrial Apparatus
363	Household Appliances
364	Electric Lighting and Wiring Equipment
365	Radio and Television Receiving Sets
366	Communication Equipment
367	Electronic Components and Accessories
369	Miscellaneous Electrical Machinery. Equipment and Supplies

37	Transportation Equipment
371	Motor Vehicles and Equipment
372	Aircraft and Parts
373	Ships and Boats
374	Railroad Equipment
375	Motorcycles, Bicycles, and Parts
379	Miscellaneous Transportation Equipment
38	Instruments, Photographic and Medical Goods, Watches and Clocks
381	Engineering, Scientific and Laboratory Instruments
382	Measuring and Controlling Instruments
383	Optical Instruments and Lenses
384	Surgical, Medical, Dental Instruments and Supplies
385	Ophthalmic and Opticians Goods
386	Photographic Equipment and Supplies
387	Watches, Clocks, Clockwork Operated Devices and Parts
39	Miscellaneous Products of Manufacturing
391	Jewelry, Silverware and Plated Ware
393	Musical Instruments and Parts
394	Toys, Amusement, Sporting and Athletic Goods
395	Pens, Pencils, Other Office and Artists Materials
396	Costume Jewelry, Novelties, Buttons, and Notions
399	Miscellaneous Manufactured Products
40	Waste or Scrap Material
401	Ashes
402	Waste or Scrap

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[3] Bureau of the Census (1977), *County Business Patterns*, Washington, DC: U.S. Department of Commerce.

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Chapter 3

EXISTING FLOWS OF MANUFACTURED GOODS

In this chapter we will examine some attributes of commodity flows into, through, and from the state of Indiana. The discussion will focus in large part on the nineteen commodity groups and two types of mail noted in the previous chapter. These are also the commodity groups that will be involved in the subsequent analysis, modeling, and forecasting of manufactured and other goods for Indiana. Databases for two other types of commercial traffic are available and are included here for completeness. The first of these is the movement of container traffic through East Coast ports that originated or terminated in Indiana. The second is the movement of solid waste that originates in Indiana and moves to various landfill sites in Indiana counties or nearby states.

All Commodities

Based on the 1993 Commodity Flow Survey, Indiana originated commodity flows valued at $178.7 billion. These flows weighed in excess of 285.8 million tons. The major commodities involved in these moves in terms of value were transportation equipment (19.2%), primary metal products (9.8%), food and kindred products (9.5%), electrical machinery (8.9%) and chemicals and allied products (6.4%). The major products in terms of weight were slightly different: petroleum and coal products (21.9%), non-metallic minerals (20.1%), farm products (14.0%), primary metal products (9.8%), stone, clay and glass products (7.7%), food and kindred products (7.4%), and chemicals and allied products (4.2%) (see Table 3.1).

Destinations of Indiana Shipments

Data are not published at this time on the destinations of Indiana's commodity shipments as such. Data are published on the destinations for "all shipments."[1] For these data the major destinations in terms of value were Michigan, Illinois, Ohio, California, and Kentucky. The

[1]The 1993 Commodity Flow Survey also looked at the transport of other goods (forest products, fresh fish, metal ores, petroleum, and ordnance) as well as freight forwarding activities. These were not included here because they are insignificant in Indiana (e.g., fish) or data quality was too inferior (e.g., petroleum).

Table 3.1 Value and Tonnage of Major Commodity Groups Originating in Indiana

STCC Code	Value (millions)	Tons (thousands)	Commodity Group
01	$ 5,794	39,902	Farm Products
11	281	10,759	Coal
14	463	57,341	Non-metallic Minerals
20	16,958	21,039	Food and Kindred Products
22	275	93	Basic Textiles
23	7,795	553	Apparel
24	3,235	4,131	Lumber and Woods Products
25	3,120	734	Furniture and Fixtures
26	3,194	2,814	Pulp and Paper Products
28	11,474	11,957	Chemicals and Allied Products
29	9,008	62,500	Petroleum and Coal Products
32	2,748	21,972	Stone, Clay and Glass Products
33	17,485	27,881	Primary Metal Products
34	10,363	4,572	Fabricated Metal Products
35	9,504	1,023	Machinery, except Electrical
36	15,914	1,909	Electrical Machinery
37	34,401	6,731	Transportation Equipment
40	703	4,474	Waste and Scrap Material
50*	14,811	2,421	Other Manufactured Products

* Category 50 here includes STCC 21 (Tobacco Products), STCC 27 (Printed Matter), STCC 30 (Rubber and Miscellaneous Plastic Products), STCC 31 (Leather and Leather Products), STCC 38 (Instruments, including Medical and Photographic, as well as Watches and Clocks), and STCC 39 (Miscellaneous Products of Manufacturing). However, no data are included here for STCC 27 due to sampling and definitional problems regarding shipments in the *1993 Commodity Flow Survey*.

major destinations in terms of weight were Illinois, Michigan, Ohio, Kentucky, and Louisiana. As one might expect, Indiana was the major destination of its own shipments in terms of value or weight. This is typical of most states.

Modal Choices

Mode choices for all shipments originating in Indiana were primarily truck (77.3% in terms of value), but it is considerably higher than that for some of the manufactured goods examined here as will be noted below. Parcel and express mail account for 7.1% (based on value) of the shipments and these are most likely all manufactured goods. Rail moved only 6.9% of the traffic based on value and 15.2% based on weight. Air freight (excluding parcels) and truck-air moves accounted for only 1.9% of the value and .05% of the weight moved. These numbers are not consistent with other national figures in part due to the nature of the data collected. The figures are based on traffic originating in Indiana. Traffic passing through Indiana (or the U.S.) or traffic originating outside the country are not included here.

Individual Commodities

In this section we will briefly examine the flows of the 19 sets of commodities and the two types of mail examined here. These discussions will focus primarily on flows terminating in Indiana, i.e., on the state's role as a consumer of manufactured goods. There is also some discussion of the state's role as a producer or shipper of goods. This is primarily an aggregate-level discussion, as opposed to a geographically disaggregated discussion, i.e., the focus is the state, not its counties. Much of the latter information would be based on the modeling done here and is less reliable, though certainly not unreliable, in comparison to the state-level data which is drawn from the 1993 Commodity Flow Survey.

Farm Products

Indiana receives the bulk of its farm products from itself. In 1993 these shipments were valued at $2.5 billion (for 16.6 million tons). Illinois and Ohio were a distant second and third with shipments of $309 million and $213 million, respectively.

Aside from supplying itself Indiana exports farm products to other states valued at about $3.3 billion. While a significant amount of farm products are exchanged with neighboring states, $667 million finds its way to Louisiana. It is assumed that this is grain, probably corn, for export via the Gulf ports. Other major destination states are Georgia with $312 million, North Carolina with $217 million, Tennessee with $156 million, and Alabama with $135 million. Possibly all of these states use the grain for feeding poultry, but that is conjecture as the data are not refined enough to confirm this.

It is worth noting that although Indiana is viewed by many as an agricultural state, the farm products commodity category ranks 11th among the commodities produced here (see Table 3.1).

For Indiana's shipments of farm products the modal market is evenly split between rail and truck with about 42% each. Inland water picks up the remaining traffic; probably in the form of grain flows south over the Ohio-Mississippi River system.

Coal

Indiana shipped 10.7 million tons of coal in 1993, valued at $281 million. Although the state has substantial amounts of coal, most of this has a high sulfur content. Environmental Protection Agency regulations result in low-sulfur coal be added to the Indiana coal to reduce the overall sulfur content per ton. This cleaner coal comes to the state from Colorado, Virginia, and Wyoming. Indiana's shipments tend to be to power plants in the state; it consumes 9.3 million tons of its own coal shipments.

Mode use for Indiana originated coal shipments is about 25% motor carrier and 75% railroad. This is unusual given that the average length of a one ton shipment is 85 miles.

Non-metallic Minerals

Non-metallic minerals as used here include stone, gravel, sand, clay, fertilizer and chemical minerals and miscellaneous minerals. Fuel minerals are excluded, but the group is very diverse. At $11.58 per ton non-metallic minerals cannot cover the cost of long distance transport unless their value is on the extreme right end of this distributional mean. As a result Indiana consumes $341 million of its $463 million in shipments. It imports the remainder of its needs from neighboring states of Michigan, Illinois, and Ohio. On average, these minerals are consumed very close to their point of production; the average shipping distance for the state's shipments is 44 miles. Nationally this figure is 87 miles. Approximately 94% of the traffic that originates in Indiana moves by motor carriers.

Food and Kindred Products

Indiana receives the majority of its food and kindred products from itself. This amounts to $7.6 billion in product value for approximately 9 million tons of goods. The other key origin states are Illinois ($2.5 billion), Michigan ($1.4 billion), Ohio ($1.2 billion), and Kentucky ($.9 billion). This illustrates the presence of regionally based manufacturing firms fulfilling localized demand.

As noted above Indiana is a major origin for shipments of food and kindred products to itself. It also ships 12 million tons of these products, with a value of $9.3 billion to other states.

It is the third most important product, in terms of value, manufactured and shipped from the state.

Modal distribution of this product class is primarily accomplished by trucks over all distance ranges, but this mode is very dominant at distances less than 250 miles where the proportion of traffic using motor carriers is between 92% and 96%. Rail has a 40% market share at distances between 1500 and 2000 miles.

Textile Mill Products

Textile mill products are not among the state's major products, and it ranks third with its $125 million in shipments to itself. More important as origins for shipments to Indiana are South Carolina ($151 million) and Georgia ($135 million), while slightly less important is North Carolina ($106 million). The primary products here are clothing textiles, except for Georgia, which may represent primarily carpet fabrics.

Indiana only exports about $150 million worth of basic textiles, this makes it the least significant of the state's manufactured goods.

This is primarily a motor carrier transported product with the percentage of the goods moved by this mode never falling under 92%. It is probable that the use of railroads for transporting textile mill products will drop from the picture completely in the next decade and recent forecasts have excluded it from analysis [1].

Apparel

Apparel destined for Indiana originates from across the United States, but approximately $2 billion worth comes from Ohio. Indiana is the second highest supplier of its own demand with $858 million, and California is third with $520 million.

Indiana ships a significant amount of this product to other states. The value of these exports is a little less than $7 billion, for 553 thousand tons. In general Indiana does not have a reputation as an apparel manufacturer, but its numbers in this area are impressive.

Motor carriers are the dominant mode again with these goods. Its proportions never fall below .95 of the market.

Lumber and Wood Products

Indiana has numerous lumber and wood related industries, primarily in the southern part of the state. The state is its own major supplier of these products, with $1.5 billion in shipments in 1993. This represents more than 2.2 million tons of these products. A distant second as a

supplier of Indiana's demand is Kentucky with $215 million in shipments to Indiana.

Indiana exported approximately, $1.7 billion in lumber and wood product shipments outside the state in 1993 weighing 1.9 million tons.

Modal dominance belongs to motor carriers over all distance ranges except the 1000 to 1500 mile range and distances in excess of 2000 miles, where rail captures 55% and 67 %, of the traffic, respectively.

Furniture and Fixtures

Indiana's demand for furniture and fixtures is satisfied primarily by its own shippers and industries. This represents about $605 million for 145 thousand tons of product. Michigan and North Carolina stand out as second and third in this supply chain with $177 million and $148 million, respectively.

Indiana exports substantial amounts of furniture and fixtures; these amounted to $2.5 billion in shipments in 1993. The state has always had a reputation as a producer of furniture, but this industry is not as important as it once was.

Motor carriers move more than 97% of this product at distances less than 1000 miles. Rail picks up some traffic at longer distances, but shipments in excess of 2,000 miles represent only 6% of the total shipping market here.

Pulp, Paper, and Allied Products

Indiana is the major origin for a substantial amount of the pulp, paper, and allied products it received in 1993. These shipments were valued at $1.3 billion. Other major supplying states were Illinois, Ohio, Wisconsin and Michigan.

An additional $2.5 billion of this commodity group was exported by Indiana to other states.

Modal dominance in the pulp and paper industries rests with motor carriers, but railroads still move a substantial amount of product - in the 40% to 48% range - at distances beyond 750 miles.

Chemicals and Allied Products

There are significant amounts of chemical related products shipped to Indiana. Indiana supplies most of its needs in that regard with more than $3.7 billion of its product going toward

satisfying its own demand. Illinois and Ohio are also among the lead states suppling Indiana, with $2.02 and $1.3 billion, respectively.

Indiana exports approximately $7.7 billion dollars worth of chemicals to other states. This makes this commodity group one of the state's more important products.

Chemicals are transported by nearly all modes in this country. Motor carriers remain dominant up to about 500 miles, with railroads becoming dominant after that point.

Petroleum and Coal Products

Indiana is the primary supplier of its needs in the area of petroleum and coal products, which include goods ranging from gasoline to asphalt roof shingles. A little less than $5 billion and 38 million tons of these products originate in the state. This does not mean that the coal of other states are missing from the raw materials used for these products; it means the production occurs here. Additional sources are Illinois ($1.3 billion) and Ohio ($259) million.

Shipments of petroleum and coal products to other states from Indiana are valued at $4 billion in 1993. This represents about 24 million tons of product.

This commodity is moved primarily by motor carriers at distances up to 100 miles. This mode remains dominant up to 250 miles, but it begins sharing the products with both rail and water modes. Rail moves nearly 70% of these products at distances between 1500 and 2000 miles. A clear pattern does not emerge for water carriage simply because it requires the water to be where the shipments need to go, and this is often not the case.

Clay, Concrete, Glass, or Stone Products

These products are of generally low value and as a result are unable to absorb high transport costs. As a result the origins are usually nearby. Indiana is clearly the major satisfier of its needs with approximately $1.1 billion and 16.3 million tons. Ohio supplies $412 million dollars worth of products that weigh slightly more than 1.1 million tons. Pennsylvania and Illinois supply Indiana with $153 million and $148 million worth of products in this category, respectively.

Indiana ships more than $1.6 billion of this product class to other states. This is probably crushed limestone or cut stone for the most part.

Motor carriers are the dominant transport mode for this group with nearly 100% of this commodity being moved by this mode at distances less than 100 miles. Its dominance continues through all distance ranges.

Primary Metal Products

As a major producer of iron and steel it is natural that Indiana should be able to satisfy a significant portion of its demand for primary metal products; the state supplies $3.8 billion or 6.5 million tons of their demand for these products. This category also includes non-ferrous metal products, which are also produced in the state. Secondary sources of these products are Ohio ($1.9 billion) and Illinois ($1.5 billion) for 2.6 million and 2.8 million tons, respectively.

About $13.6 billion worth of primary metal products are shipped from Indiana to other states. These shipments weighed more than 20 million tons in 1993. Indiana is a major supplier of this product to other states.

Modal dominance of this product's transport is held by motor carriers at distances up to 1,000 miles, beyond that rail is dominant reaching 61% in the 1,000 to 1500 mile range.

Fabricated Metal Products

When it comes to fabricated metal products, such as cans, tools, plumbing fixtures, bolts, nuts, wire and nails, Indiana supplies $2.8 billion (1.4 million tons) of its demands. Once again the neighboring states of Michigan, Illinois and Ohio pick up the slack with about 1.2 million tons valued at $3.1 million.

Indiana supplies $7.6 billion in fabricated metal products to other states. These exports weigh in excess of 3.1 million tons reflecting a higher value product per unit of weight. This also explains the dominance of its movement by motor carriers over all distance ranges.

Non-electrical Machinery

Indiana supplies $2.6 billion of its own demands in the area of non-electrical machinery, which includes everything from farm machinery to refrigeration systems. Other sources of note are Ohio ($972 million), Illinois ($923 million), Michigan ($650), and California ($340 million).

Indiana also ships a considerable amount of non-electrical machinery to other states. These exports were valued at $6.9 billion in 1993. This is also a high-value good per unit of weight and this explains the modal dominance of motor carriers in its transport. This modal share never falls below 88%.

Electrical Machinery

Including everything from electrical wire to television sets and communication equipment, Indiana supplies much of its own needs. This amounted to $3.2 billion or 566 thousand tons.

Other major supply states are California ($996 million or 33 thousand pounds), Illinois ($888 million and 73 tons), and Ohio ($489 million and 50 tons).

State exports of electrical machinery were valued at $12.7 billion in 1993. This represented about 1.4 million tons of product. Its unit value ensures that it will be transported by motor carriers over all distance ranges.

Transportation Equipment

Indiana supplies the bulk of its transportation equipment needs. These include all modes from motor vehicles to bicycles, including aircraft and ships. Obviously, Indiana does not manufacture some of these, at the same time it has no demand for some of these items. Indiana's supplies to itself are about $5 billion in value for a total of 1.2 million tons. Other major suppliers are Ohio ($2.7 billion), Michigan ($2.7 billion), and Illinois ($2.3 billion). Less important suppliers are New York ($ .7 billion), Missouri ($ .5 billion), Maryland ($ .5 billion) and Missouri ($ .5 billion).

Approximately $29 billion worth of these products are exported from Indiana to other states. These exports weigh about 5.5 million tons. This is a product that could be moved by rail, but rail has little of the market share. It remains a product class moved primarily by motor carriers over all distances according to the 1993 commodity flow survey.

All Other Manufactured Goods

This collection of minor industries in terms of tonnages is referred to STCC 50 elsewhere in this report. It includes STCC 21 (Tobacco Products), STCC 27 (Printed Matter), STCC 30 (Rubber and Miscellaneous Plastic Products), STCC 31 (Leather Products), STCC 38 (Instruments including medical and photographic as well as watches and clocks), STCC 39 (Miscellaneous Products of Manufacturing). In general data for these industries are withheld due to sampling or disclosure problems. We will only note the major source for each of the components as published in the census commodity survey. Indiana supplies $805 million of its own demand for tobacco products, most of these products would come from states where one or two firms dominate the industry and as a result their data are not disclosed. Printed matter runs into definitional problems. A weekly news magazine delivered to a home is the same as 10,000 copies of the magazine delivered to a warehouse for distribution; both are shipments. As a result no information has been published on this item. It is included in the STCC 50 category only for completeness.

Products of rubber and plastics are supplied primarily by Indiana, Ohio, and Illinois, although nearly every state supplies some of this product. Leather products are so minor in value and tons that much of their data are withheld. The instruments category is supplied by Indiana,

Illinois, California and are valued at $874 million, $618 million, and $299 million, respectively. The final category here includes items from jewelry to silverware to artists supplies. For Indiana's demand most of the shipments of this final set come from Indiana ($935 million) and Ohio ($221).

It will be recalled that this category was assembled from several groups that were not among the state's dominant industries. As a result, the group is very heterogeneous. This probably explains its strange pattern of mode use. Shorter distances are primarily handled by motor carriers with rail becoming important between 750 and 1500 miles along with a nearly 13% mode share going to air transport. Beyond 1500 miles we again see motor carriers as dominant. One should not over analyze these mode shares that are created by grouping diverse industries. They are fine for analysis purposes.

Waste and Scrap Material

The transport of waste and scrap material is a somewhat controversial topic; environmentalists would prefer if Indiana did not import any waste. However, much of what is included here is actually going toward recycling.

Some components of this commodity, (e.g., ashes) are unlike any other commodity examined here. It is a product which the shipper wants to give away, but usually ends up paying the consumer to take. This being the case the shipper clearly wants to minimize the transportation cost on the shipment. At the same time nearby consumers do not always want to acquire the product, even if they are paid to do so. Other components have economic value, e.g., metal scrap that can be recycled. All of this creates some rather strange circumstances for flow modeling.

Indiana consumed an estimated 5,848,000 tons of waste and scrap in 1993. Slightly more than 2 million tons of this came from the state with the remainder coming from elsewhere. The elsewhere in this case is Illinois (1.1 million tons), Michigan (.4 million tons), Ohio (.7 million tons). The state also receives waste from Pennsylvania, Wisconsin, Kentucky and Missouri.

Indiana is not just a receiver of waste and scrap. It actually produces 4.5 million tons of this waste. About 2.5 million tons is shipped to other states by Indiana: .7 million tons to Illinois, .3 million tons to Pennsylvania, .2 million tons to Ohio, and small amounts to several other states.

The dominant transport mode for waste and scrap shipments is the motor carrier with 54% of the traffic. Rail is second with 30% of the market, and Inland Water follows this with a little more than 5% of the market.

Mail and Delivery Systems

For many small communities in the United States the only regular motor carrier traffic is the arrival of a U.S. mail contract motor carrier. These communities may also see the occasional overnight express delivery truck, e.g., FedEx, UPS, Emery, DLH, and so forth. If the items being sent are economic goods in the sense of a manufactured product or a retail item, these were included implicitly in the 1993 Commodity Flow Survey as such a good shipped by parcel and delivered by any of the aforementioned services or the U.S. mail. There are some exceptions to this statement; these are printed matter. Books, magazines, newspapers, and the like were not included in the survey. We would like to try and capture this traffic.

Also not included in the 1993 survey was just the regular mail. Included here would be the letter from home, the weekly news magazine, an item from a book club, catalogs, bills, or junk mail. Although the quantity is measurable very few of us can quote the pounds of mail we get per week or month. At the same time the U.S. Postal Service is not willing to release such data. We must estimate its amount and the method of doing this is discussed below.

The growth of express or overnight delivery services has been nothing short of phenomenal in the last decade. As noted above, economic goods shipped in this manner are generally included in the study (except for printed matter), but non-economic goods are often missed. Perhaps a major component of this category would be manuscripts between universities, law firms, corporations, and the like. There is some irony that the express mail delivery service has grown along with electronic mail, but this may say something about the quality of the latter during its early years. Exactly how much is being moved by these express mail carriers is generally unknown and such information is proprietary. We will also try to estimate this flow component here.

U.S. Mail

Although the U.S. Postal Service does not generally release information on mail it does release information on postal revenues for selected cities. A 1991 release of this information indicated a postal revenue rate per capita that ranged from $131.80 for Los Angeles to $1092.50 for Atlanta. Taking the lowest value and assuming this is accumulated at the rate of 32 cents per ounce results in 412 pieces of mail per capita per year or about 1.4 ounces per day (298 delivery days assumed). Annually this is about 25.7 pounds per family member. This is the expansion factor that was used on the population of the 145 areas examined here to estimate mail traffic. The conversion of this to delivery vehicles will be explained later.

Express Mail

Private corporations involved in express or overnight mail are a bit more secretive than

even the U.S. Postal Service. Some of the corporations involved in this sector have their own fleet of aircraft and this provided the basis for our estimation procedure. The largest of the overnight delivery service companies is FedEx (formerly Federal Express). This company flies into a number of small communities where it appears to be the only delivery service reaching these locations by air. Examining several of these small communities revealed that their cargo weighed about 3.6 pounds per capita for the community served. It is generally stated in the trade literature that FedEx has approximately 53% of the overnight delivery service. Expanding the 3.6 pounds to account for the remaining 47% of the market reveals a delivery rate of 6.8 pounds for all such services annually. This was the expansion factor applied to population to estimate express mail traffic.

Container Traffic

Some data are available on the movement of goods by container between Indiana and East Coast ports. Indiana also receives and ships containerized traffic through West Coast ports, but data are not available on these flows. This study has not examined container flows as such. It simply regards these as rail or truck flows from Indiana to the various export states and whether the good is enclosed in a trailer or container is not explicitly of interest to the highway traffic situation, which is the focus here.

Nevertheless, the container flows available for East Coast ports indicates an overwhelming export dominance for Indiana's industries. Containerized exports weighed 104 thousand tons in comparison to imports of 53 thousand tons. Actual containers in this situation were 14.5 thousand for export and 6.3 thousand for import. The map on the following page (Figure 3.1) illustrates containerized exports and imports by county for Indiana.

The contents of the various containers is proprietary. The density of goods may be of interest to researchers. This density factor is 8.48 tons per container for imports and 7.15 tons per container for exports.

Indiana Solid Waste

In contrast to the earlier discussion of waste and scrap, most solid waste has no economic value. As a result the transportation of this waste is done in such a way as to minimize cost. Data on the movement of solid waste in Indiana are collected by the Indiana Department of Environmental Management (IDEM) from each solid waste facility in the state. The reports are prepared quarterly for each landfill or transfer station and give the total solid waste tonnage received, as well as the components of this tonnage, i.e., municipal waste, construction waste, and other waste. Other waste includes items such as rubber, sludge, and medical waste. The data used here were compiled from individual reports submitted to the Indiana Department of Environmental Management for the year 1991.

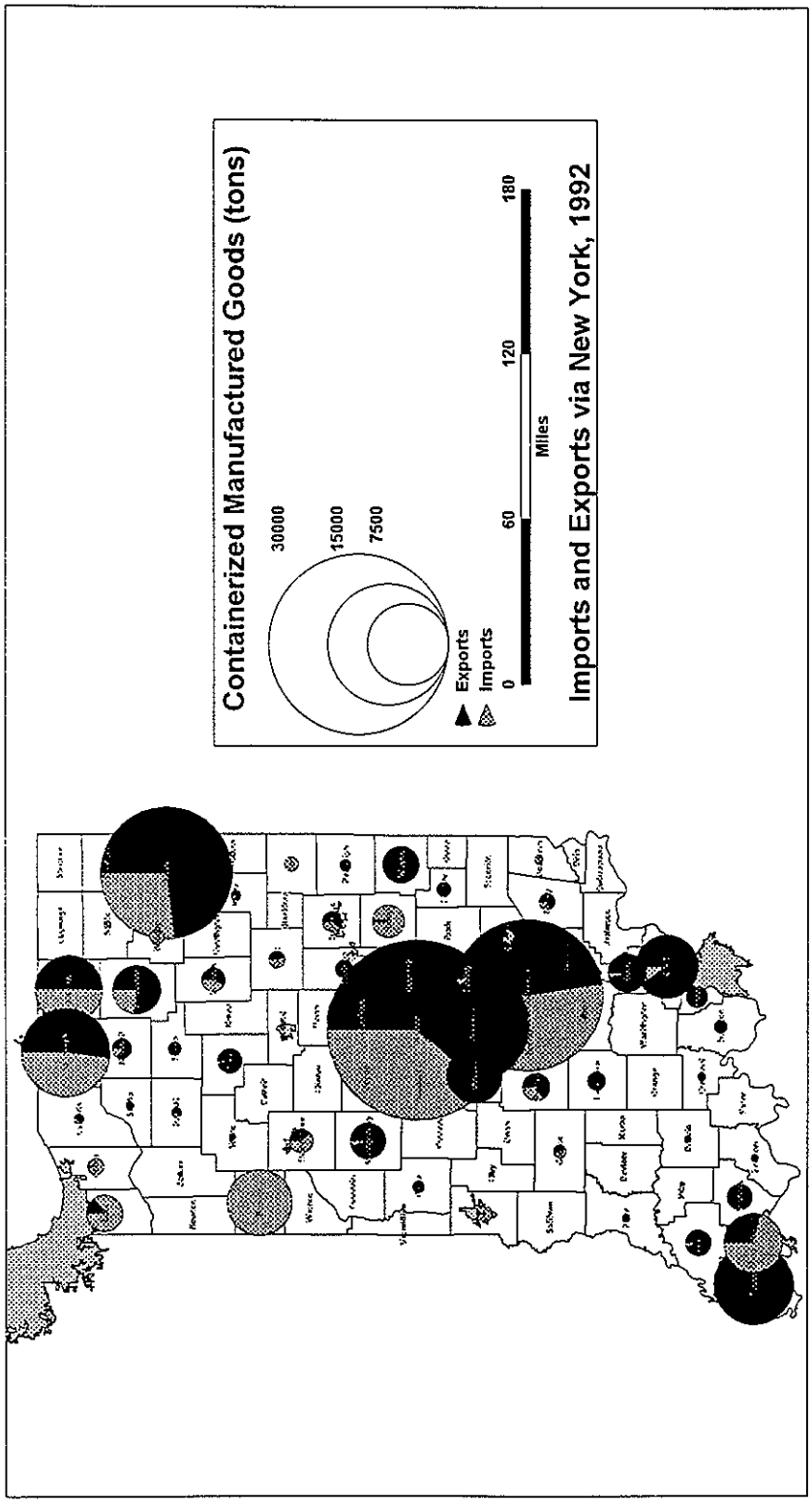

Figure 3.1 Containers Imported and Exported from Indiana's Counties, 1992

Productions and attractions of total solid waste by county in Indiana were analyzed to determine correlates of these variables for the counties of Indiana (N=92). Although a detailed analysis involving numerous variables was undertaken the findings of this research were not that surprising. Sixty-three percent of the variation in solid waste production (correlation coefficient or r = .79) is statistically explainable by the magnitude of population in the county where the waste is produced. The waste attracted to each county is a function of the landfill space available there; eighty-five percent of the variation in total waste attraction can be explained by this variable (r = .92). Although the components of solid waste were compiled separately, it is probably sufficient to collect only data on municipal waste in future studies since it is highly related to total waste (r = .995).

Figure 3.2 is a map of the actual origins and destinations, sometimes called desire lines, for the movement of total solid waste in Indiana from generating locations to landfills.

Data on solid waste flows and its components are usually impossible to find for research purposes. It is for this reason that the county level data collected for this project are reproduced in an appendix of this final report. Researchers interested in working with this data should contact the author for additional details.

Intermodal Traffic

There is considerable interest today in traffic shipments that are intermodal. Without a doubt this area has seen significant growth over the past two decades and the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 was in part a response to that growth. Barriers to efficient transport were seen as quite significant to the movement of this traffic by the drafters of ISTEA. A complete discussion of intermodal transport is beyond the scope of this report and intermodal transport problems in Indiana are being addressed elsewhere in a study by Booz Allen and Hamilton. Nevertheless, a brief discussion of the importance of this traffic is merited here.

It is probable that the major intermodal traffic of Indiana passes through the state as part of the "land bridge" between Asia and Europe. Shippers on these latter continents have found it efficient to move manufactured goods in containers by ocean transport to the East and West Coasts of the U.S. and then cross the North American continent by rail. Railroads have entered into agreements that allow the blocking of entire trains of containers, thus eliminating the need to move this traffic through congested railroad classification yards. Competitive alternatives to this routing would take smaller container ships through the Panama Canal or larger container ships around the southern edge of South America. This traffic has little economic significance for the state since it is overhead rail traffic. It does explain the heavy volume of traffic on the northern Indiana east-west rail lines.

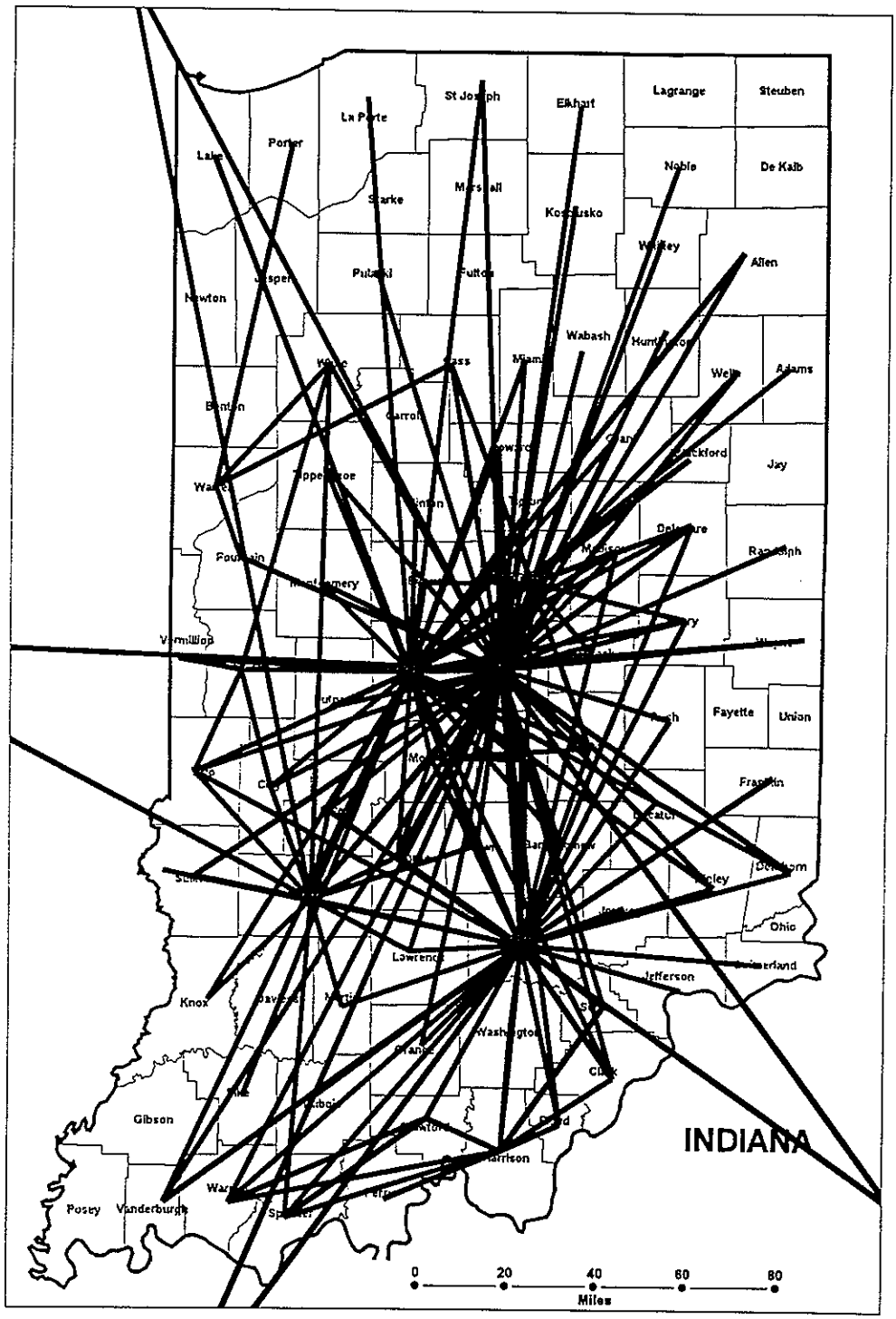

Figure 3.2 Desire Lines of Solid Waste Flows Between Generators and Landfills

These high volumes of the "land-bridge" are not apparent in the data presented in this report. Recall that the 1993 Commodity Flow Survey is shipper-based and since the shippers in each case are located outside the U.S., the flows are not included in the survey.

For Indiana as a whole intermodal transport is practically insignificant according to the 1993 flow survey. In terms of tonnage, intermodal traffic represented less than a quarter of one percent of the total. This is looking at truck-rail, truck-air, and truck-water moves. If we throw in private truck-for hire trucks as intermodal, the percentage climbs to just under 1.25. Intermodal traffic volume represents about 3.6% of the total traffic originated in the U.S.

If we look at the value of goods the numbers increase as one would expect. In this case intermodal traffic has 3.2% of the total shipment value in Indiana. For the nation this statistic is 4.7% of the total shipment value. Nearly half of these values come from intermodal truck-air transport.

Data disclosure problems prevent complete discussion of intermodal traffic by commodity for Indiana. Published data on the value of shipments originating in the state suggest that truck-air moves are the most important for shippers of machinery of all types (STCC 35 and STCC 36) and transportation equipment (STCC 37). In both cases it is quite likely that the item being transported would be parts, rather than machinery or vehicles.

Intermodal Facilities in Indiana

If we look around the state there is considerably more intermodal traffic than the 1993 data would suggest. We could categorize all parcel traffic as intermodal (the commodity flow survey did not), since it usually involves at least truck and air. This sector accounts for 7.1% of the value of shipments, but less than 2% of the tonnage.

The major intermodal facilities in Indiana can be broken down into three sets: water ports that require a change of mode from water carrier to truck or rail (or vice versa), airport based facilities involving air-motor carrier intermodal traffic, and rail transfer facilities where traffic is interchanged between truck and rail or rail and truck. The first of these facilities involves bulk goods, the second involves parcels, and the third involves usually containerized manufactured/consumer goods. Let's examine each of these.

The Ports

The Southwind Maritime Center is located in southwestern Indiana on the Ohio River. It is the largest of Indiana's ports in terms of total tonnage (inbound and outbound). This high tonnage is due in large part to the high volume of coal it handles. This was 3.3 million tons in 1993 according to data compiled by IUPUI in 1994. The origin of this coal is not known, but it

may have come from the Rocky Mountain deposits over the Missouri, Mississippi, and Ohio Rivers. Once it arrives in Indiana it is probably transferred to rail or motor carrier for movement to its final destination.

Other major commodities that contributed to the 4.9 million tons handled in 1993 were grain (1.2 million tons), and fertilizer (271 thousand tons). The grain is most likely destined for areas of the lower Mississippi River for export abroad.

Burns International Harbor on Lake Michigan ranks second in terms of tonnage handled. As can be seen in Table 3.2 on the following page, the major commodities passing through the port's facilities are steel and primary metals (39.6%), coal and coke (17.5%) and grain (13.5%). Once again, details on the breakdown of this tonnage between inbound and outbound is not available.

The smallest of Indiana's ports is Clark Maritime Center on the Ohio River on the Indiana side of the Louisville metropolitan area. Total traffic through the port was 1,406,599 tons in 1993 according to an IUPUI study. The breakdown of traffic was grain (79.2%), dry fertilizer (13.0%), gypsum (2.7%), salt (1.6%), steel and steel coil (1.4%), and all other (2.1%). The Clark facility is undergoing significant growth and its traffic between 1992 and 1993 nearly doubled. However a large part of this growth is attributable to a significant increase in corn yields.

In nearly every case above the traffic arriving or departing from these ports is in bulk form. This would suggest that shipments come from their Indiana origins or arrive at their Indiana destinations as rail moves. All three ports have on-dock rail facilities and are able to handle containers as well. Exceptions to this general statement might include some steel imports and exports that could go to their final destinations by motor carrier. It is also conceivable that some grain destined for shipment out of the state might be trucked to facilities near these ports.

There are several other private ports that handle traffic on Lake Michigan and the Ohio River. The former include: Inland Steel, LTV Steel and USX Steel. Data are not available on their operations, but it is reasonable to assume that they receive iron ore and export steel. Some coal may also come in over the lake. Other river ports include the two private ports of Mulzer Stone Company, one at Newburgh and the other at Evansville. It is assumed they import and export stone and stone related products.

Airport Facilities

All air freight traffic would appear to be intermodal since it usually arrives or departs from the airport via motor carrier. The state has some major traffic centers in this category. One of these is the FedEx facility at Indianapolis, there are probably several others. Other facilities

Table 3.2 Burns International Harbor Traffic, 1993

Commodity	Tonnage	Percent
Liquid fertilizer	87,735	3.8
Dry fertilizer	12,552	.5
Potash	113,843	5.0
Coal/coke	400,266	17.5
Silicone ore	4,072	.2
Limestone	120,217	5.2
Pig iron	40,993	1.8
Specialty ore	43,054	1.9
Slag	68,971	3.0
Salt	52,504	2.3
Grain	310,349	13.5
General	130,588	5.7
Steel & primary metal	908,278	39.6
TOTAL	2,293,422	100.0

receiving air freight include Indianapolis International Airport, Hulman Regional Airport (Terre Haute), Michiana Regional Center (South Bend), Fort Wayne International Airport, and Evansville Regional Airport. Indications are that air freight facilities at Chicago, Louisville, and Cincinnati also serve portions of the state. Data were not explicitly examined on these air freight facilities since air freight was not examined as a single mode in this study, but rather as a mode that also used highway transport as part of its moves.

Intermodal Rail Facilities

There is significant ambiguity when it comes to identifying the importance of different rail-truck intermodal facilities in the state. On the one hand most data available are not detailed enough to examine the question. Some data sources, that appear reliable, yield traffic data that are not consistent with expectations, e.g., the carload waybill sample. It does appear that the major rail-truck facilities in Indiana are as listed below:

Norfolk Southern Triple Crown Facility, Fort Wayne
General Motors Roanoke Facility, near Fort Wayne
Toledo, Peoria and Western's (BN-SF) Hoosier Lift, Remington
Conrail's Avon Yards, west of Indianapolis
CSX, Evansville

As can be seen from this list the facilities are controlled by individual companies and the data tend to be proprietary. Data are available in the public use waybill sample, but even these data yield nonsensical results in comparison to known facts.

Summary

The various commodity groups (excluding the mail services, containers, and solid waste) that are included in this study of traffic flows represent 93.7% of the value of all products shipped from Indiana and 93.9% of the value of all products shipped in the United States according to the 1993 Commodity Flow Survey. In terms of weight the commodity groups represent 98.9% of the originating tons in Indiana and 96.0% of the originating tons nationally based on the same 1993 survey.

In terms of commodity shipments this study is very comprehensive. Aside from the commodities left out because they are not very significant for Indiana, there are a few other flows worth noting. The discussion of containers in this chapter notes that we have little information on import flows to Indiana from abroad. This is because the 1993 Commodity Flow Survey is shipper based and (for obvious reasons) only shippers in the U.S. were surveyed. Therefore, we get exports from Indiana, but we get no imports since the shippers of these are in foreign countries. We take a step toward solving this problem later in the report.

There are other components of the traffic stream that are not examined here. One of these is household moving vans. Twenty percent of the population in the U.S. moves each year and many of these use established moving companies. Data on these companies were once compiled by the Interstate Commerce Commission; it is not clear that data are compiled on individual moves, but it may be possible to estimate this from the decennial census.

A second component of the commercial vehicle traffic stream not examined here is service transport. Armored trucks moving bank receipts, tow trucks moving disabled vehicles, carpet cleaner vehicles, commercial laundry vehicles, construction vehicles, plumbers, lawn care vehicles, and many more are included in this service transport sector. It is a sector that has all but been ignored by transport planners, yet these are the commercial vehicles that make urban area arterials significantly more congested than rural arterials. If such vehicle moves are addressed at all in urban transportation studies, they are frequently handled by a growth factor (e.g., ten percent additional vehicles to account for trucks) or as a component of traffic counts (e.g., ten percent of the flow is trucks). This data shortcoming is far beyond the scope of this study to correct. It should be addressed first at the national level by a group such as the Transportation Research Board, which could undertake an examination of common practices by state transport planning agencies.

These are relatively minor components for a study of interstate and intercounty commercial transport flows involving Indiana. One can feel confident that the major non-local commercial vehicle flows are included here.

Although specific data on intermodal freight transport are important to any study of this type, the quality of these data leave much to be desired. The *1993 Commodity Flow Study* gives us very little to go on at the state level. One could say it is useless at this level even though the data categories are there. Data are not released because of disclosure problems or sampling problems. The Carload Waybill Sample covering rail traffic is also all but useless at this level of detail. Although this study had access to some proprietary data from the waybill sample, it is still a sample and substantial amounts of traffic are missed at this level. Expansion factors do not work well if a single waybill covers traffic via a unit train to a rail-truck intermodal facility. In addition, conversations with rail officials would suggest that there is some ambiguity regarding what constitutes an intermodal unit, e.g., if we have two twenty-foot containers on a single flat car, is this one unit, or two units? The containers should be counted, but this does not appear to be the case based on data we have seen. Clearly improvements are necessary in the data available in this area.

References Cited

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Chapter 4

MODELING THE FLOWS

This chapter examines the methodologies used in estimating coal, non-metallic mineral, farm products, and manufacturing commodity flows for the state of Indiana. We will begin with an overview of the research design used here. This will be followed by specific discussions of the procedures used in the commodity production and attraction phases of the traffic generation analysis. The distribution of traffic, identifying the origins and destinations of commodity flow shipments, is discussed next. Once the origins and destinations of flows are known the next concern is estimating the modes taken by these flows; the method of splitting this distributed traffic between modes is discussed next. The final step in the analysis is to assign the traffic to the appropriate transport networks. In this case these are the highway and railroad networks discussed earlier in this report.

Comments on Research Design

The brief discussion above outlines the major steps in the planning process that were undertaken here. It appears to be quite similar to the urban transportation planning process, and it is. It is different in that studies of this scale are not undertaken very often. This has implications for the analysis that separates it from comparable studies of urban areas. For example, trip production and attraction in the urban transportation planning process is almost routine and standards exist for identifying these values for families of different size or with different levels of automobile ownership. In the regional commodity flow case examined here such standards do not exist and they had to be developed here; they were developed for urban transport studies nearly a quarter century ago.

Similarly the distribution of traffic is reasonably well understood in urban transport planning and model parameters (e.g., friction factors) for the movement of people are known to some extent. The distribution of goods is not so well understood and little help is available in this area from urban transport planning since the latter often uses a constant proportion to represent movement of goods or commodities. This can be an advantage. In the present case it has resulted in the use of a flow model that offers much better estimates than the traditional approaches one would encounter in urban transport studies.

Modal split of commodity traffic is an area of few generalizations in the area of regional transport analysis. It is generally recognized that bulk goods are moved by rail if distances are in excess of 700 miles and by trucks if the mileages are less than this. However, the primary, though not exclusive focus here, is manufactured goods and these bulk commodity generalizations are weak in this context. There are mathematical models available that could be used to determine such modal splits, but it is not clear that such models offer any real advantages over current patterns of modal traffic. For example, the criteria used by shippers are not necessarily the same for motor carriers and rail carriers. Motor carriers tend to cost more than rail carriers, but are faster than rail as well. In some cases it is not clear that these modes are competitive on a cost or time basis. In any event, this project uses 1993 patterns based on the Commodity Flow Survey of that year [1]. The procedure used recognizes the assignment of a commodity to a specific mode is a function of the type of commodity and the length of the shipment.

Traffic assignment in a regional transport context is also an area where little research has been undertaken. How do we assign commodity traffic to a rail system when it is the rail carrier's objective to keep traffic on its system as long as possible to enhance its revenue divisions? How should commodity traffic be assigned to the highway system? Do truckers look for only the fastest routes, or is minimizing distance (e.g., fuel consumption) also important? This is an area that has not seen a lot of research in recent years.

Another particularly difficult problem is: How do we evaluate the assignments undertaken? Initially, this study was to examine all traffic flows, personal travel as well as commodity flows. This would have allowed comparison of the assigned traffic with road vehicle counts. Looking at only commodity traffic results in assignments that have no known distribution. Data are available on commercial traffic, but this would include far more types of traffic than the commodities examined here. It is assumed here that the assigned commodities on a highway segment should bear a linear relationship to the total commercial traffic on that highway segment. It is also assumed that such a relationship can be used to estimate total commercial traffic in the future.

The use of statistical analysis to assess the pair-wise interrelationship between observed and modeled highway volumes is very ambitious. The author knows of no transport study at this scale that has used this approach. Urban transport studies of the past were usually satisfied to simply compare the trip length frequency distributions. If the distributions were "similar" the study's modeling was accepted. If the distributions were "dis-similar" usually more data would be collected in the apparent belief that something was missing. No one would think of looking at the actual counts and the assigned (modeled) flows; this was far too rigorous a standard.

In the following section there is an introduction to the commodity traffic generation used here. The reader should be aware that the methods used here are in part from earlier modeling in the Phase 1 report. Nevertheless, all estimates throughout this report are in terms of 1993

commodity tonnages, dollars, and trucks or carloads.

Traffic Generation

As part of this commodity flow study it was necessary to identify the traffic originating and terminating within geographic areas across the United States. When this study began these data were not available for any year after 1977, the year of the last Census of Transportation that included commodity flow data [2]. The more recent data that were available, the Federal Railroad Administration and Interstate Commerce Commission's carload waybill sample, are for the transportation of commodities by rail.

In order to get some idea of what is moving by the various modes, it is necessary to get some idea of the total amount of each commodity that is transported. Two approaches are possible to obtain estimates of total flow by commodity. The first would take the rail traffic available in the ICC waybill sample for each commodity of interest and expand this based on relationships that existed at the time of the 1977 census. For example, if the 1977 census stated that a total of 50,000 tons of commodity x were transported and railroads moved 25,000 tons of this total, this results in an expansion factor of 2 (i.e., 50,000/25,000). One could take the 1993 rail traffic for commodity x based on the ICC sample and expand it by 2 to get the total amount of that commodity moving in 1993.

A second approach is to determine the functional relationships that existed between production and attraction of commodity traffic and key variables capable of statistically explaining these flow variables. It is well established that the total flow of a commodity from a given place is statistically related to the total amount of the commodity produced there. Similarly, total flows to an area are related to measures of local markets. The objective then is to model these productions and attractions.

In order to model productions and attractions, it is necessary once again to work with the flows of 1977. The flows existing at that time are statistically explained by using the levels of related variables at that time. The models derived can then be used with the level of the explanatory variables for 1993 to yield 1993 productions and attractions.

Both of these approaches have recognized shortcomings. In the first approach, there is the assumption that the relationship between the modal share moved by rail maintains a constant relationship to the total amount of the good that is transported. Given the massive rail abandonments in the U.S. since 1977 and deregulation in the motor carrier area, this is a disturbing assumption. In addition to such institutional changes, there are changes occurring in manufacturing processes, e.g., flexible manufacturing and just-in-time delivery practices, that have changed the share of traffic attributable to the different modes. Therefore, it is unlikely that the modal relationships have held constant during the period from 1977 to 1993.

The second approach assumes the relationship between traffic production and industrial production indicators, as well as the relationship between traffic attraction and local market indicators, remain constant over time. If one uses employment as an indicator of industrial productivity, this implies constant productivity per worker for more than fifteen years. Once again the changes in industrial production processes (automation, robotics, computerization) suggest that these linear relationships are probably not stable. One was nevertheless forced to accept one of these approaches since other flow data were unavailable.

This research relied primarily on the second of the two approaches noted above. It utilized multiple regression analysis to develop traffic production and attraction models for each of the nineteen commodity groups examined here.

As noted above, data on the flow of manufactured goods were not available on a current basis when this project started. As a result, this project proposed to estimate these flows based on models derived from the state-level data of 1977. The U.S. Census of Transportation compiled information on the level of tons shipped and received by state manufacturers in that year. These data were compiled and the process of developing traffic generation and production models was undertaken. A few comments are in order on the nature of these models.

The exporting of a manufactured commodity from an area is a function of the level of production of that commodity within the area or its supply. Unfortunately, commodity production data are also not available. Nevertheless, it has been demonstrated repeatedly that an excellent indicator of a sector's production is employment in the sector. Therefore, a key variable in the traffic production models developed is employment in the sector of interest or related sectors. Some of the commodity may never leave the production area since it is consumed locally. To incorporate this tendency, use is made of a population variable to represent this consumer market in several cases.

Flows of manufactured commodities into an area or the attractiveness of an area is a function of the demand for the product. For most manufactured goods there are two markets: the personal consumer market and the industrial market. With regard to the personal market, it is not meant that the manufacturing firms deal directly with consumers; they will most often go through a retailer or wholesaler. Nevertheless, the magnitude of this market is best reflected by the level of local population. The industrial market is often more difficult to identify. As an example, consider a commodity group such as food and kindred products. This group includes all the processed foods consumed by individuals as well as all the ingredients used in preparing other foods. As a result the level of manufacturing in these further stages of manufacturing also represent a market. Once again, employment is used as an indicator of this industrial market.

Returning to the problem at hand, the 1977 production and attraction levels formed the basis for models of the same based on 1977 population estimates derived by the U.S. Census and

employment data derived from the 1977 *County Business Patterns* [3]. Models of non-manufactured goods (coal, non-metallic minerals, farm products, and waste) were not developed in the Phase 1 study for reasons previously noted. Models were developed for these sectors here using the 1993 CFS and census data.

The models derived along with an indicator of model accuracy appear as Table 4.1. While other variables important in explaining the levels of production and attraction will no doubt come to mind, there has been a conscious effort made here to keep the variable base limited and readily accessible. All of the models have used only variables on employment by sector, population, or some economic indicators. Forecasting the variables used into the future may be required and all of these have series available from the aforementioned *County Business Patterns*, from population forecasts, or from other government censuses. On a couple of occasions the variables used are a function of other variables estimated. For example, the level of lumber and wood product flows into an area is a function of the level of traffic production in that sector. Derivation of these models yielded a method of estimating traffic produced and attracted by sector for all states of the United States and counties of Indiana in 1993.

Overall the models tend to be accurate based on the adjusted coefficients of determination presented. There are a few of these values that are in the .55 to .70 range; these are low. But the intent here is to get at the major direction and magnitude of the interrelationship. There will always be residuals when one attempts to keep the variable inputs forecastable as well as manageable. It is believed that these models capture the basic relationships reasonably well. It does seem to be worthwhile though to pursue research in the area of commodity traffic generation for future studies.

The appearance of the 1993 commodity flow survey changed the need to use the models derived for estimating state level productions and attractions to some extent. No data were published on the activities at the county level and as a result the models were used to generate Indiana county level productions and attractions.

The 1993 Commodity Flow Survey

As noted previously a commodity flow survey was undertaken in 1993. It was a survey of approximately 200,000 firms in the United States. It was not expected the data would be available for use in this study and this is part of the reason why the alternative methods noted above were developed. As the progress of the study slowed it became apparent that at least some of the data from the survey might be available before the project was over. The United States summary volume appeared in November of 1996 and some state volumes (including Indiana's) have also been published. In January of 1997 a CD-ROM was released by the Bureau of Transport Statistics of the U.S. Department of Transportation that gave among other things data on the amount of commodities produced (in a traffic generation sense) for the nearly all of the

Table 4.1 Models of Production and Attraction

Model Number	Model	Adjusted R^2
(1)	PROD01 = 1445 -.523 AGSER + .0048 CASH	.562
(2)	ATTR01 = .819 PROD01	.660
(3)	PROD11 = 7.6 COAL	.650
(4)	ATTR11 = 3.1 COAL + 5.3 MIN	.657
(5)	PROD14 = .078 MAN	.658
(6)	ATTR14 = .997 PROD14	.977
(7)	PROD20 = .282 FOOD	.940
(8)	ATTR20 = .832 POP + .162 FOOD	.965
(9)	PROD22 = .016 TEX	.931
(10)	ATTR22 = .003 APP + .0001 ALL	.743
(11)	PROD23 = .004 APP	.919
(12)	ATTR23 = .002 APP + .011 POP	.926
(13)	PROD24 = .668 LUM	.808
(14)	ATTR24 = .728 PROD24	.805
(15)	PROD25 = .017 FURN	.906
(16)	ATTR25 = .033 POP + .002 FURN	.960
(17)	PROD26 = .103 PULP + .056 LUM	.886
(18)	ATTR26 = .085 PULP + .259 POP	.953
(19)	PROD28 = .150 CHEM + 1.164 PET	.758
(20)	ATTR28 = .077 CHEM + .455 PET +.683 POP	.851
(21)	PROD29 = 6.857 PET	.945
(22)	ATTR29 = 4.007 PET + 1.881 POP	.938

(23)	PROD32 = 2.882 POP	.851
(24)	ATTR32 = 2.914 POP	.871
(25)	PROD33 = .085 MET	.982
(26)	ATTR33 = .093 MET + .061 FAB	.923
(27)	PROD34 = .013 MET + .034 FAB	.927
(28)	ATTR34 = .035 FAB	.861
(29)	PROD35 = .013 MAC	.883
(30)	ATTR35 = .010 MAC	.878
(31)	PROD36 = .004 MET + .004 FAB + .003 ELEC	.826
(32)	ATTR36 = .005 FAB + .034 POP	.915
(33)	PROD37 = .040 TRAN	.753
(34)	ATTR37 = .027 TRAN	.837
(35)	PROD40 = .00048 POP	.704
(36)	ATTR40 = .0067 MAN	.791
(37)	PROD50 = 1.097 ATTR50	.858
(38)	ATTR50 = .245 POP	.857

Notes: Most of the explanatory variables above are employment in specific STCC (SIC) industrial classes according to County Business Patterns. Exceptions are the PROD and ATTR variables which represent tons of product shipped or received by STCC, e.g., PROD01 is the tons of farm products shipped and ATTR01 is the tons of farm products received. Other variables are defined as follows: AGSER = employment in SIC 07; ALL = total employment; APP = employment in SIC 23; CASH = gross cash receipts (in $1,000s) from farming; CHEM = employment in SIC 28; COAL = employment in SIC 11; ELEC = employment in SIC 36; FAB = employment in SIC 34; FOOD = employment in SIC 20; FURN = employment in SIC 25; LUM = employment in SIC 24; MAC = employment in SIC 35; MAN = total employment in Manufacturing, SIC 2 and SIC 3; MET = employment in SIC 33; MIN = employment in SIC 14; PET = employment in SIC 29; POP = total population; PULP = employment in SIC 26; TEX = employment in SIC 22; TRAN = employment in SIC 37.

industrial sectors of interest here.

After considering the quality of the data being released it was clear that the 1993 data being released was of a much higher quality than the 1977 Census of Transportation data. This was due in large part to the fact that the 1977 commodity flow data was based on a sample of 20,000 shippers and the 1993 data was based on a survey of 200,000 firms. The latter study is also much more aware of the statistical nature of the data collected, e.g., coefficients of variation are presented for most data and "unstable" data (usually based on small numbers in the sample) are not published. It seemed logical to use production and attraction data from the 1993 flows if this was at all possible.

A portion of the data released to date makes it very clear that flows are examined primarily from the traffic origination side. Tables are available that give traffic production by STCC codes for the industrial production of interest here. These data were extracted and used in their published form.

Traffic attractions presented more of a problem. Recall that all of the state volumes have not been released. It is not clear that this would solve the problem or not. The problem quite simply is that there do not appear to be any figures given for total attractions by state and industry. There are tables on the CD-ROM that yield flows from an origin state to destination states by commodity and this might appear to yield a route to the data of interest, i.e., one could add the flows of each commodity of interest from all states to the destination state and get total attractions. This would be quite possible if all the data appeared on the CD-ROM, but interstate flows are often very scarce and the data are withheld for proprietary reasons. These same proprietary concerns would not enter into consideration if the data included the total traffic attracted by industrial sector. In other words the Bureau of Transport Statistics has the data and could do a special aggregation of the data for state modeling purposes.

There was not sufficient time to pursue negotiations for the release of attraction data by the Bureau of Transport Statistics. Instead two pieces of aggregate information were used along with the regression models previously noted to estimate the traffic attracted to destinations. In the first case the models were run to estimate the "volume" that would be attracted to each state. The sum of these estimates by commodity was equated with the total attractions by commodity for the country; the latter total attractions is one of the pieces of aggregate information that kept the system in line with actual data.

The second piece of information was the total traffic attracted by commodity for the state of Indiana. This piece of data was used in the same manner as the other national data were used. In effect, the aforementioned models were run to estimate attractions for Indiana counties and the total attraction for the state became the flow limit for allocating commodity traffic to destination areas.

The result of these various operations can be summarized succinctly as follows: the total flows produced by the states are equal to the total flow produced by the nation; the total flows attracted by the states are equal to the total flow attracted by the nation; these same statements also apply to the counties of Indiana and the sum of their productions and attractions are equal to these values for the state. These controls enhance the accuracy of the methods used here.

Traffic Distribution

The distribution of traffic in the Phase 1 report was accomplished by developing several statistical models for traffic generation, as described in the previous section, and using these models to identify the production and attraction vectors for input to a fully constrained gravity model. The latter model is also sometimes called an entropy model (see Wilson [4] and [5]). Such a model can, given productions and attractions and an average length of shipment, yield estimates of the flow between all origins and destinations. It does this in such a way that the estimated traffic volume from any origin is equal to the value inputted to the model, the estimated traffic volume to any destination is equal to the value inputted to the model, and, in general the average shipping distance of the estimated flows is equal to the value inputted to the model. In effect, the outcome is constrained to meet all of the initial input parameters of the problem. This tends to yield the most accurate results of any general flow model currently in use.[1] One could alter the output of any model and get more accurate results. But the basis for such alterations is not clear, nor is it usually defensible.

This model has the general form:

$$S_{j\,k} = A_j\ B_k\ O_j\ D_k\ exp\ (-\beta\ c_{j\,k})$$

where $S_{j\,k}$ =the amount of a given commodity shipped from origin area *j* to destination area k;

O_j = the amount of a given commodity available for shipment at origin *j;*

D_k = the amount of a given commodity demanded by destination *k;*

$c_{j\,k}$ = a measure of the cost or impedance of moving from *j* to *k.*

[1] Some research was undertaken at the beginning of this project to determine whether artificial neural network models would yield results that were more accurate than the fully constrained gravity model used here. Initial results working with small flow matrices were very promising (see [6]). There does seem to be some difficulty in fitting these models to large sets of data of the type examined here. This statement is based primarily on unpublished research undertaken by Garth Banninga on solid waste flows in Indiana and by Jirong Xie on passenger travel on the Amtrak system.

In addition,

$$A_j = [\Sigma\ B_k\ D_k\ exp\ (-\beta\ c_{j\,k})]^{-1}$$

and

$$B_k = [\Sigma\ A_j\ O_j\ exp\ (-\beta\ c_{j\,k})]^{-1}$$

The above formulation is rather straightforward. Some comments are in order on the impedance or cost of movement factor, c_{jk}. This factor is defined here as the distance between a location j and a location k. Obviously other functions could be used, but this seemed as good as any [7]. The purpose of the impedance factor is to exercise a negative influence on interaction at increasing distances, other things being equal. Some researchers believe that this function should be actual road distance between places. If it were this would certainly complicate subsequent analysis which in part tries to identify the need for additional roads.

The distribution model above is available in the form of a FORTRAN computer program that operates on desktop personal computers. The FORTRAN code for this program appears in the appendix as GUNNAR5; it was prepared during Phase 1 of this project.

A few comments are in order about accuracy of this fully constrained gravity model. The model should not be viewed as something that is capable of a perfect replication of a set of existing flows or shipments. To begin with, we rarely know what the actual flows look like. Actual flows are almost always based on a sample of cases that is expanded, e.g., the rail carload waybill sample (a proportional sample of 1% to 4%), the 1993 commodity flow survey (a sample of the shipping practices of 200,000 firms), airline traffic city pair data (10% of all tickets sold), commuting flows of the 1990 census (1 in 6 households), and others. As a result even the "actual" data is subject to considerable error and it would be unreasonable to expect this data to be perfectly reflected by the model.

Instead, the model should be viewed as capable of replicating major shipping patterns in the area of interest; this is the United States and Indiana in the present instance. In effect, if certain aspects of the flow are known this model should yield what could be called the most probable set of flows given this information. This is sometimes called the most probable macrostate. This yields the major patterns of flow, which should be the major concern of the analysis.

As noted above several delays in the project slowed its progress to the point that reports began to appear for the 1993 Commodity Flow Survey. When the project began it was expected that it would be completed long before these data were available. This was part of the reason for using the modeling approach to estimate productions and attractions at the state level for Phase 2. Given that the primary concern here were the flows of 1993, it seemed reasonable that these 1993 Commodity Flow Survey results should be included as much as possible.

As a result the study took the state-level traffic produced by each manufacturing sector of interest here. These data have not all been published at this time, but they are available by state of origin (for the flows) on a CD-ROM released by the Bureau of Transportation Statistics in 1997. Terminating traffic as previously noted is not available for individual states in any form at this time. It was assumed that the sum of the flows originating by commodity in the states of the U.S. is equal to the sum of the flows terminating by commodity in those states. Let's examine this assumption a little further.

The 1993 Commodity Flow Survey examined shipping data supplied by 200,000 manufacturing firms in the United States. These firms supplied information on their shipping to all possible destinations in the U.S. and the destinations included consumer markets and industrial markets. If goods were being shipped to California for possible export via Long Beach or Los Angeles, they appear in the data as shipments to California. On the other hand there are some flows that originate outside the U.S. and are imported for sale in the U.S. market. Since these latter shippers are outside the country they are excluded from the survey. The flow survey is moot on the potential volume of flow that this might include.

In 1993 the United States exported $465 billion in goods and it imported $581 billion in goods. However, for manufactured goods the situation is worse than this. As of 1995 U.S. exports were valued at $452 billion while imports were at $630 billion. By assuming that total traffic terminating is equal to total traffic originating we will pick up $452 billion dollars in imports that otherwise would be lost to the analysis. There will still be $178 billion dollars in traffic that is excluded from the analysis. In addition, it is not possible to assume that the goods being imported are equal to the goods being exported. In 1995 the U.S. exported $15 billion in automobiles, while it imported $50 billion worth of automobiles. Nevertheless, the assumption of equality picks up a substantial amount of traffic that would otherwise be lost.

The project also used actual data for Indiana to refine the modeled estimates for the counties of the state, i.e., the sum of the county estimates for each category was set equal to the state total. As a result the following statements can be made with regard to commodity flows examined in this study:

(1) Total flows from all states as used by the gravity model are equal to actual traffic productions by manufacturing category for

those states.
(2) Total flows from Indiana and total flows to Indiana, by commodity, as generated by the model are equal to the actual flows as given in the commodity census.
(3) The sum of the total flows as generated by the states for productions and attractions are equal to national totals for these.

One might reasonably ask what can differ between the actual and the estimated traffic. One thing is the modal split in traffic. Although the earlier Phase 1 study used several modal categories, this Phase 2 study uses an extensive array of modal categories and assigns traffic to modes based on what it is and the length of move involved. These assignments are based on traffic by distance categories as published in the 1993 census. This could account for some minor errors in the analysis.

A second possible source of error may be due to the values used for the average length of shipments as used in the gravity model. Recall that this is one of the constraints used by the fully-constrained gravity model in fitting the flow data. The 1993 commodity census does publish an average shipment distance for each commodity. However, the problems with this should be apparent. Let us assume that a shirt manufacturer ships a gross of shirts to a store in Indianapolis. The average length of the shipment is the distance from the manufacturer's plant to Indianapolis. Let us assume this distance is 800 miles. Now let us assume that an individual in the Indiana capitol orders a shirt from a different manufacturer that is 400 miles away. The average length of the shipment is 800 miles plus 400 miles divided by two shipments, or 600 miles. This is obviously not what we want.

This method of calculating the average shipment distance created significant problems for the census in the manufacturing category of printed matter. It resulted in all copies of a weekly news magazine being shipped to a state distributor for retail sales counting as one shipment, while an individual's mailed copy would also be counted as a single shipment. The census did not release any data on state activity in this category.

In order to overcome this problem a decision was made to examine average shipping distance per ton of a given commodity. The census publishes data on the total amount shipped in tons and the total ton-miles for each commodity. Dividing total ton-miles by total tons gives an average shipping distance per ton of the commodity. This seemed like a perfectly reasonable value and so it was the average shipping distance used in the gravity model. But there were still two additional problems.

The first of these is a problem of geographic scale. The total tons and ton-miles are based on actual distances moved. This planning effort abstracts from that reality and says that for most states there is a single origin and destination for commodity shipments in the state. This can

create a problem. To illustrate it, assume only four western states trade a commodity and the distance between their centroids (the single origin and destination points) ranges from 400 to 500 miles. If all of the actual parties making and selling this product are located within 200 or 300 miles of each other, then the average shipping distance per ton will be somewhere between 200 and 300. There is no way that a gravity model could be fitted to these data since all possible interstate shipment distances would be too great. The model might assume that each of the four states traded only with itself resulting in an average shipment distance of 200 to 300 miles. It would be possible to calibrate this model, but this would not be an accurate representation of the flow occurring.

A second problem was that there was no way to be certain that a gravity model calibrated to state and Indiana county data would represent Indiana flows in an adequate way. The flows generated are a type of average picture of what is happening in the country. In a similar manner we can say the per capita income for the United States is a reasonable average, which when expanded by total population yields total personal income for the nation. However, it may not give a reasonable indication of what the per capita incomes are in the counties of Mississippi. So although we may get a reasonable picture for the nation it may not give us a reasonable picture of flows in the state. The question was how to overcome this problem or put another way, how could we be reasonably sure the flows were approximately what is going on for Indiana.

The solution to this problem was found in the 1993 commodity census. That census gives very good data on Indiana as an origin of shipments for the commodities examined here. It gives tons and ton-miles and as a result it is possible to look at the average length of shipments from Indiana by commodity ton. In effect, the gravity model was fitted to the national system of flows and the average shipping distance per ton was calculated as part of this process. The program used was modified to then calculate the average shipping distance per ton for all goods from Indiana to all of its destinations. This in turn was checked against the average shipping distance per ton of commodity for Indiana. Equality of the two means was not expected, but significant differences would lead to some adjustment to the national figure in an attempt to bring the means closer together.

The actual average shipping distance per ton for the nation and Indiana and the model generated averages are given in Table 4.2. As the reader can see the numbers are reasonably close. One might be tempted to try to perfectly replicate the national figures, but the reader should bear in mind that the commodity census is a sample of 200,000 firms, and it could also be subject to error in data reported by the firms.

The primary item being modeled here is tonnage of commodities shipped between origins and destinations in the United States for the year of 1993. As a result these flows are annual tonnages. In order to have something to compare average daily traffic with, it was necessary to reduce the flows to a daily basis. An examination of the *Highway Capacity Manual* [8] revealed

Table 4.2 Actual and Modeled Average Shipment Distance per Ton of Commodity

Commodity STCC	Actual U.S. Average	Modeled U.S. Average	Actual Indiana Average	Modeled Indiana Average
01	434	434	435	432
11	432	432	85	436
14	87	116	44	122
20	315	311	333	311
22	458	445	236	489
23	658	420	391	397
24	182	190	220	222
25	591	592	794	563
26	464	313	313	314
28	434	345	280	294
29	152	153	89	140
32	105	202	124	189
33	365	365	356	361
34	359	358	342	345
35	559	500	472	473
36	649	505	481	483
37	560	487	449	446
40	211	211	181	243
50	560	507	426	465

Notes: The actual average distances were derived from ton-mile and tonnage data in the 1993 CFS. They differ from the published average distances which are average length of shipments. Shipments may be considerably less than a ton in many cases for manufactured products. The Indiana average is the length of "originated" shipments from Indiana derived using ton-miles and tonnages as above.

that truck traffic generation was approximately equal from Monday through Friday, but on the week end the truck traffic generation rate appears to be about 44%. Adding five days and two days at .44 each yields 5.88 days per week or 306 days per year of trucking. Therefore, dividing the total annual flow by 306 yields a good estimate of commodity truck trips per weekday. Multiplying this weekday rate by .44 gives a reasonable estimate of the traffic on a Saturday or Sunday.

Modal Split

Once traffic is distributed between origins and destinations there remains a question of the modes selected for the movement of that traffic. In the Phase 1 report this modal split was handled by examining the modes used for the movement of product-specific traffic at the time of the 1977 Census of Transportation. These modal proportions were then used to assign traffic to specific modes. The available modes were limited in the 1977 census and consisted of rail, motor carrier, air freight, parcel, water transport, and pipelines. When the Phase 2 project started the project staff was going to use the same computer program and the same categories for allocating the 1993 flows. The project staff had concerns about this, but no reasonable alternative was available.

The concerns were primarily that the transport environment had changed significantly since 1977. Notably, the motor carrier and railroad industries had been deregulated and this has created numerous changes in these modes. For example, there are far more independent carriers in motor carrier transport today than there were in 1977, and backhauling is practiced far more than it once was. It was assumed that several of these changes could be incorporated in the analysis by minor changes in the modal assignment weights, but such changes would lack rigorous definition and justification, and were viewed as undesirable.

Delay of the project by network definition problems resulted in the initial publication of the 1993 Commodity Flow Census volumes during the last several months of the project. Among those volumes was the United States summary; this includes the proportion of traffic shipped by various modal combinations for different distances. A decision was made to update the modal split model and incorporate new weights from the 1993 census.

The new modal split computer model was named NEWMODE and a listing of it appears in Appendix C of this report. Rather than a half dozen modes this 1993 data includes data on nine single modes and eight multiple mode categories as indicated by Table 4.3. While additional detail is always desirable it sometimes creates problems as well. The primary areas of interest in this document are highway and rail traffic. It would simplify the project if only truck and rail were given, but this would ignore several modal combinations that seemed to be rather common, e.g., truck and rail or truck and air. So that this traffic would not be lost all seventeen categories

Table 4.3 Modal Categories for Traffic Split

Single Modes
Parcel, U.S. Postal Service, or courier
Private truck
For-hire truck
Air
Rail
Inland water
Great Lakes
Deep sea water
Pipeline
Multiple Modes
Private truck and for-hire truck
Truck and air
Truck and rail
Truck and water
Truck and pipeline
Rail and water
Inland water and Great Lakes
Inland water and deep sea

were used in the modal split. In addition, the two principal categories of highway and rail also included the other modes such as truck and rail in recognition that sometimes the trucking may take place on the origin side of the trip and sometimes it may take place on the destination side of the commodity move. This created an obvious problem of over-counting since the traffic was attributed to both rail and highway. This overlap was minor, but it is the reason for a slight discrepancy between the sum of the traffic and the sum of the traffic by modal categories.

The computer program NEWMODE splits traffic by examining the lengths of the shipment and knowing the product of interest. In other words each of the fifteen commodity groups examined here has a set of distances (less than 50 miles, 50 to 99 miles, 100 to 249 miles, 250 to 499 miles, 500 to 749 miles, 750 to 999 miles, 1000 to 1499, 1500 to 1999, and 2000 or more miles) and for each distance group there are seventeen modal categories, plus some summary classes such as highway, or rail. Let us assume we are looking at 1,000 tons of primary metal products being shipped 800 miles. The shipment has a .626 probability of moving by highway, a .366 probability of moving by rail, and .008 probability of moving by an unknown mode (due to errors in reporting). NEWMODE assigns 626 tons to a highway mode, and 366 tons to a rail mode. The remaining 8 tons are ignored since they can not be assigned to a mode with any confidence. Obviously, if this shipment is from a single plant the move will go by either rail or highway, and it is unlikely that it would be split in this fashion. However, over the millions of tons shipped this allocation procedure would be capable of replicating the flows that did occur in 1993 based on the reported census data.

Commodity Density

The modal split to this point has dealt exclusively with tons of commodities. However, our major interest is in motor carriers and rail cars. In other words it is necessary to assign the traffic to vehicles representing each of these modes. Unfortunately, we must move away from the 1993 census data since it is moot on the question of how many tons of different commodities will fit into a rail car or a tractor trailer motor carrier.

The volume of a commodity that will fit into a given space is its commodity density. Density values for the Phase 1 report were obtained from a 1976 Interstate Commerce Commission study. However, that source was also viewed as unreliable since rail cars have increased in size, as have motor carriers. A more recent source of data was seen as the 1993 carload waybill sample.

To obtain new density factors the tonnages of the 19 commodities coming into Indiana, and leaving Indiana by rail according to the expanded Waybill Sample were aggregated by commodity and rail carloads. Division of the former by the latter yields tons, by commodity, per carload, or commodity density. As one might expect these density factors differ based on whether they are in inbound or outbound and this may reflect the commodity's stage in the manufacturing

process. A weighted average of these inbound and outbound density factors was calculated for rail cars and these appear as Table 4.4.

The density factor was estimated for STCC 23 (Apparel) since none of that commodity appears to have moved by rail. In addition the factor for STCC 25 (Furniture and Fixtures) is based only on the export (outbound) traffic since there was no inbound traffic for this sector.

The density factors for motor carrier traffic assume that a rail car can handle 100 tons and a truck can carry 40 tons or 80,000 pounds, or 40% of the same product. In other words it was assumed that the motor carriers could handle 40% of the density factor of a rail car by commodity, and this is the source of the motor carrier density factor in the table. One could argue that some states permit vehicles with weights in excess of 80,000 pounds, but there is also a considerable amount of highway traffic moving in vehicles smaller than this. As a result, assuming all motor carriers are 40 ton vehicles seems a reasonable standard for use here.

Two other computer programs were written to handle the allocation of tonnages by rail and highway motor carriers. These programs, entitled ALLORWY and ALLOHWY (see Appendix C), read data from the output of NEWMODE and create a set of flows by origin and destination and mode. These files can be used to create a flow matrix which can then be assigned to the appropriate transport network.

In addition to translating the tons into rail cars or motor carriers, ALLORWY and ALLOHWY also create files of tons and dollars. The former could be used as a point of departure for other traffic analyses of interest to the state. The latter after it is assigned to the network enables planners to know the dollars by commodity coming into the state or leaving the state, by route and mode. These monetary values are derived from average values per ton of commodity according to the 1993 Commodity Flow Census (see Table 4.5). These may also be useful for further analyses.

Mail Density

It was noted in an earlier chapter that estimates have been made of the amount of personal mail and express mail moving between Indiana counties, as well as between those counties and the rest of the United States. It is necessary to know the density of mail in order to determine the number of vehicles that would be involved in its transport. This is only part of the problem, but let us address it first.

Mail arriving in your local community usually arrives by a contact mail carrier operating a tractor-trailer or semi. Included in the trailer are bags of mail that can weigh no more than 70 pounds. Most are filled to this limit. A typical trailer can hold an estimated 450 bags or 31,500 pounds of mail. This translates into 15.75 tons per motor carrier. This is a maximum rather than

Table 4.4 Traffic Density Factors for Rail Cars and Motor Carriers by Commodity

Commodity STCC	Import rail traffic	Export rail traffic	Weighted rail density (tons)	Weighted truck density (tons)
01	94.90	96.20	96.13	38.44
11	100.60	99.10	100.42	40.17
14	97.10	97.40	97.20	38.88
20	77.35	80.36	79.52	31.81
22	25.00	15.00	18.33	7.33
23	-------	-------	*10.00	*4.00
24	73.88	55.50	72.27	28.91
25	-------	15.00	15.00	6.00
26	64.82	50.64	62.10	24.84
28	85.11	90.11	87.58	35.03
29	63.20	77.16	65.90	26.36
32	86.70	77.10	81.15	32.46
33	87.48	85.21	85.82	34.33
34	28.40	16.16	19.76	7.90
35	68.75	21.70	28.42	11.37
36	18.80	16.25	16.69	6.68
37	19.93	23.40	22.50	9.00
40	75.40	82.60	78.47	31.39
**50	92.85	14.88	86.56	34.62

* Estimated values

** There is no STCC 50. It is used here to represent STCC 21, 27, 30, 31, 38 and 39.

Table 4.5 Commodity Value per Ton

Commodity STCC	Value per Ton
01	$ 224
11	21
14	12
20	997
22	4128
23	19252
24	191
25	4193
26	898
28	977
29	191
32	114
33	858
34	2795
35	12954
36	13630
37	7447
40	139
50	7855

a minimum because the mail comes to your local community in theory if there are only a few pieces of mail to be delivered there. So all communities get one motor carrier as a minimum and the maximum is determined by the number of motor carriers necessary to move the mail with a limit of 15.75 tons each. It is assumed that the same operating scenario also applies to private express mail companies.

Some counties may receive considerably more trucks than estimated here. That does not mean that our estimates are off. We are looking only at non-commercial mail (letters, manuscripts, photographs from your children or parents, contracts and the like). Other mail that may include commercial materials, e.g., a shirt from a mail order house, or some fresh fruit from a popular West Coast mail order firm, are included as parcel moves in the commodity flows examined elsewhere in this report.

Traffic Assignment

This section describes the procedures used in the traffic assignment portion of the study. It should be noted at the outset that the purpose of traffic assignment is to *assign* flows that exist or flows that have been predicted or forecasted by a model to the transportation network of interest. In the present case the networks of interest are primarily the highway and rail networks of the United States with particular interest in these networks within Indiana.

Methods of assigning traffic are numerous. The simplest of these methods is referred to as "all or nothing" assignment. In this procedure the methodology assigns traffic moving between some area j and some area k to the shortest path (route) between this origin and destination. All possible pairs of origins and destinations have their traffic assigned in exactly the same manner. There is no consideration given to the capacity of links in the paths selected or whether travel time on the links will be affected by congestion.

"All or nothing" traffic assignment has more than a few critics against its use in urban transportation planning, however the focus here is on regional or statewide transportation planning and most of the criticisms seem inappropriate in the regional context. For example, nearly everyone in Indianapolis that found they suddenly had to drive to Chicago would take Interstate 65 simply because of the shortest travel time of this route. In an urban context there might be some question about your route in getting to this interstate highway, and probably other assignment procedures would be appropriate for this portion of the trip. It does not matter in this study because the flows being examined are intercounty and interstate trips.

Another traffic assignment technique is called "capacity restraint" assignment. In this case one can make use of a capacity limit on traffic to be assigned to the links of a path between an origin and destination. The assignment procedure uses the same "shortest path" approach that the

"all or nothing" approach uses, but once a link's capacity is reached traffic is diverted to the "second shortest path," and then on to the "third shortest path" having the capacity to handle the traffic. The recognition of capacity as having an impact on route selection is a positive attribute of this method.

A third traffic assignment approach is "stochastic user equilibrium" or SUE. This approach is not deterministic like the previous two methods, but rather allows users of a transport network to vary their behavior. All users are faced with decisions as to what routes to take between an origin and destination of interest. Each of these routes has a certain probability of being selected based on capacity, travel time, congestion, or whatever variables are specified by the modeler. Selecting one of these routes may lead to congestion and increases in travel time, so the situation faced by the next traffic to be assigned is different from the situation encountered by the previously assigned traffic. Theorists find this approach to traffic assignment more attractive because it recognized the choice nature of urban travel. In a regional context where congestion and capacity are rarely problems the method has less appeal.

There are numerous variations on these traffic assignment techniques, but these are representative of the approaches in use. Each of these was evaluated for use in the present study. In addition there are several steps common to each of these techniques. Let us briefly examine the process further and the results of this effort.

The Highway Network and Cost of Movement

Each of the traffic assignment techniques requires the construction of a network over which movement can take place. This network connects all origins to all destinations and includes the "cost" of movement over the links and in some cases the capacity of the links to hold traffic. Cost may be a misleading term because the measure used is rarely in dollars and cents. Instead studies over the years have used distance, travel time, or traffic flow functions related to distance or travel time. This project used travel time as its initial measure of travel cost. For large scale studies over an area the size of the United States travel time is rarely known. Instead it is approximated by the following:

$$Traveltime=(Length)/(Speed)$$

Here the length is in miles and the speed is in miles per hour. This results in travel time being measured in hours or parts of hours.

Until quite recently the highest speed throughout the United States was found on the Interstate Highway System and it was 65 miles per hour. This was the case in 1993, the year of this study. Unfortunately from a modeling point of view, the next speed found in most states was

55 miles per hour. This had the effect of making 65 mile per hour highways very attractive in most traffic assignment procedures. Put another way, models that seek to lean toward shortest path solutions in assignment of traffic find the Interstate Highway System to include these paths and this results in the bulk of the traffic being assigned to these links. Given the network defined for this study - a detailed state network connected to a circular regional network, and an Interstate Highway network connecting these to the rest of the United States - this may have resulted in some bias, i.e., flows from outside the circular region were assigned to the Interstate Highway System and this is the way they entered that region.

One final point on the network is that whenever the cost of travel, or the way in which it is being measured, changes, or whenever the links in the network change for some reason, it is necessary to generate a new network for assignment purposes since the network expects to move flows between centroids, the network nodes must be consistent with the defined network.

Target Flows

The flows used by the traffic assignment procedures were the flows for all goods examined in this study. In other words, it included shipping the total highway tonnage of all 15 manufacturing groups and the four resource based commodities and two types of mail included in this study. This represented the sum of the 21 gravity model distributions by O-D pair. The reason for evaluating the traffic assignment routine using total flow was that this was the only variable that came close to existing data on actual flows. Existing traffic count data are actually expanded numbers of commercial vehicles per day on Indiana's highways over the period from 1991 to 1994. This became the target to which the traffic assignment had to demonstrate a relationship.

It goes without saying that commercial vehicle count data is not the best measure of manufactured or primary commodity traffic on the highways. After all commercial traffic includes the movement of delivery and large service vehicles, as well as empty trucks. We have not examined the empty tractor trailer combinations here. The major implication of this is that the target flows were larger than the flows to be assigned. In addition, this study looked at intercounty flows, not intracounty flows, and as a result the target flows were generally larger within an origin or destination county.

One other point noted above is that the digital highway network of Indiana used here is not as complicated as the actual highway network. Flows generated by models must be assigned to the digital network and this may result in higher flow volumes than the actual flows observed on highways of the state, since the digital network excludes thousands of miles of lesser roads that in reality may move some traffic.

The above points are not open to argument or debate; they are simply reasons why we

generated in this assignment appear as Figures 4.1 and 4.2. The first map shows the traffic volume as reflected by the width of the bands on the highways. The second map shows these volumes numerically. Figure 4.3 illustrates the band width appearance of the national flows. This latter map would not be accurate outside the Indiana region due to the minimal number of external nodes, however it does illustrate the way these flows reach the state of Indiana.

Evaluation of traffic assignment results is not an easy matter. A researcher's first impulse is to simply undertake a correlation and regression analysis of the statistical relationship between the assigned flows and the target flows from the total commercial vehicle road counts. In general this is not done in transportation planning studies at the scale of this study. Instead planners look at the distribution of trips and retain the assignment if it is "close" to the observed distribution. Nevertheless, a statistical analysis was undertaken here with that analysis demonstrating no significant relationship between these two variables.

This was surprising initially, but an examination of the patterns of flows from the actual road counts clarified the picture somewhat. As noted the actual flows (road counts) include far more than the manufactured goods examined here. The latter do not include the delivery of goods or products to distribution or retail centers. This results in significantly higher volumes around urban areas for urban goods delivery. In addition, there are several types of commercial traffic that are not included here. An examination of the road counts data collection sites also revealed a large number of these located within urban areas, which would result in less of a relationship with the assigned flows.

The original research design to be used here called for the comparison of assigned flows with the road counts at locations around the states boundary. The more complex network, the 1993 Commodity Flow Survey, and the availability of a much larger and more detailed database of road counts led to the modification of that design. In addition, the original design would have included "all" travel which would have yielded more stable flows. It was expected that inclusion of all flows would have resulted in assigned flows that would be larger than the expected (actual) flows based on road counts, since the network to which the traffic would be assigned was much less complete than the final network adopted for use here.

It still seemed desirable to do some type of statistical comparison of the assigned flows and the road counts data. A sample of 40 locations in rural areas of the state, but including all types of highways, was drawn. A map of the location of the data collection sites for these data appears as Figure 4.4. A table of the relevant data for these sites appears as Table 4.6. There is some clustering of the sites, but the sample counts in these cases were for different roads or highways in these cases.

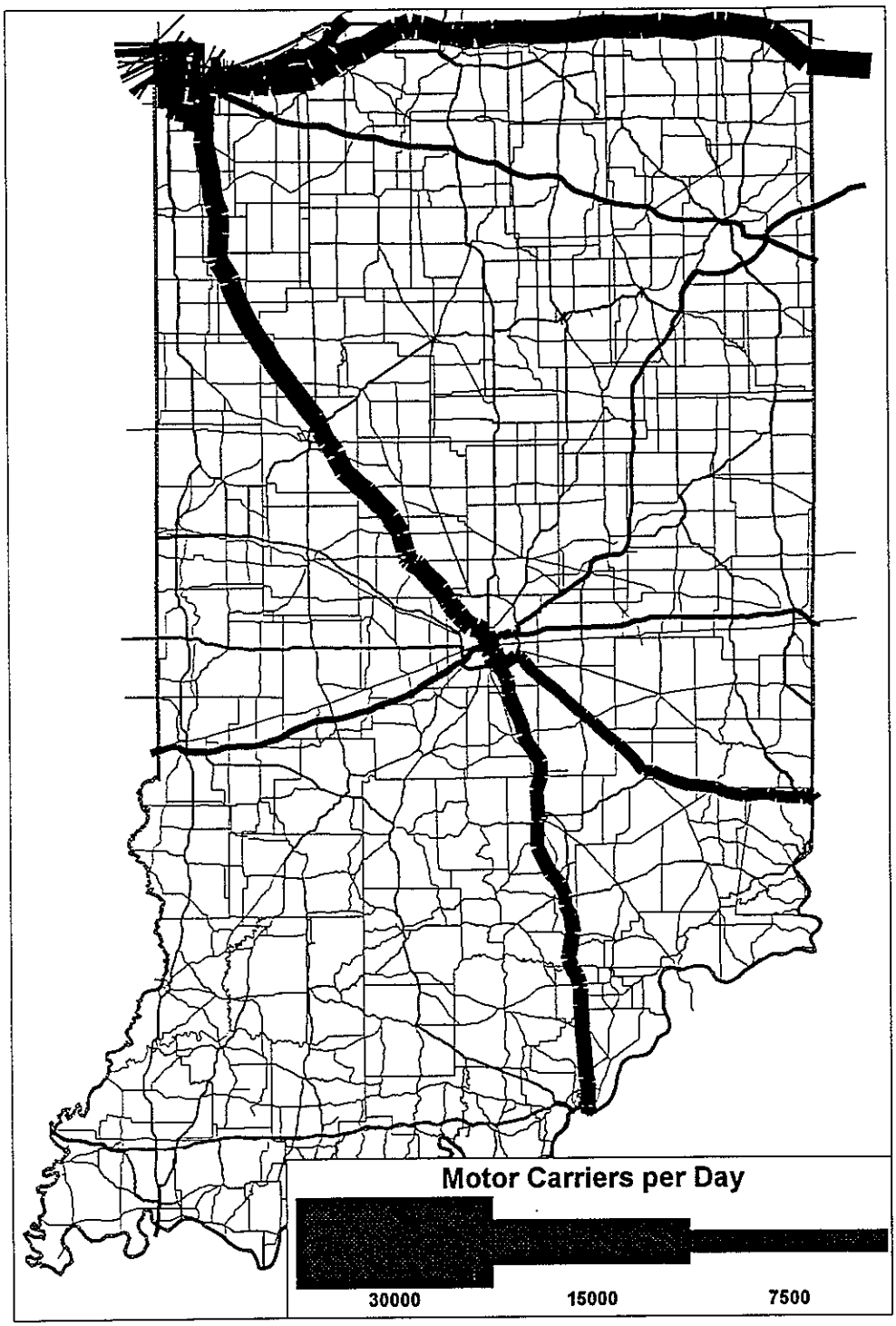

Figure 4.1 The Assignment of Total Daily Truck Traffic to Indiana Highways

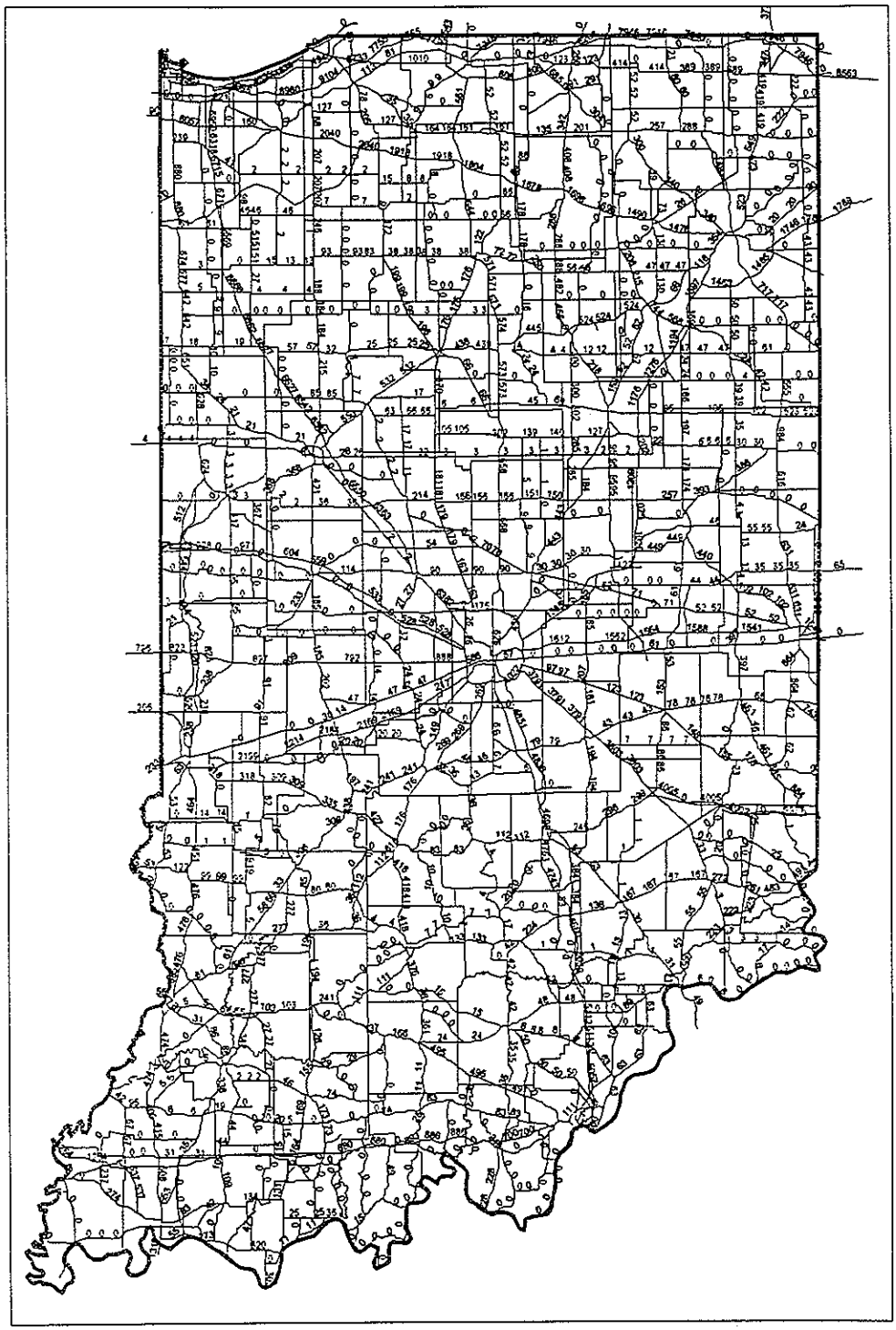

Figure 4.2 Daily Traffic Volumes Based on Modeling

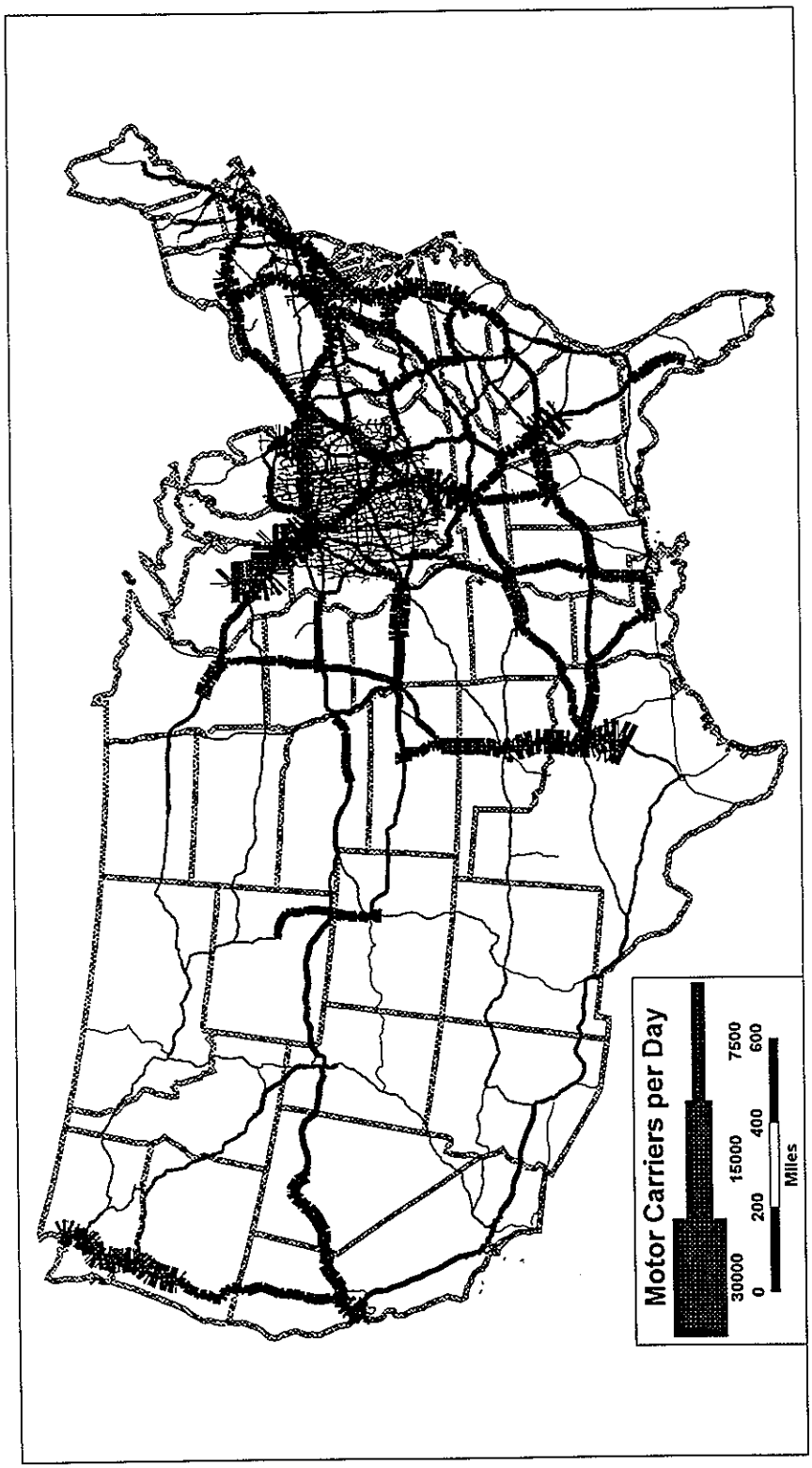

Figure 4.3 An Assignment of the Total Daily Truck Traffic to the National Highway Network

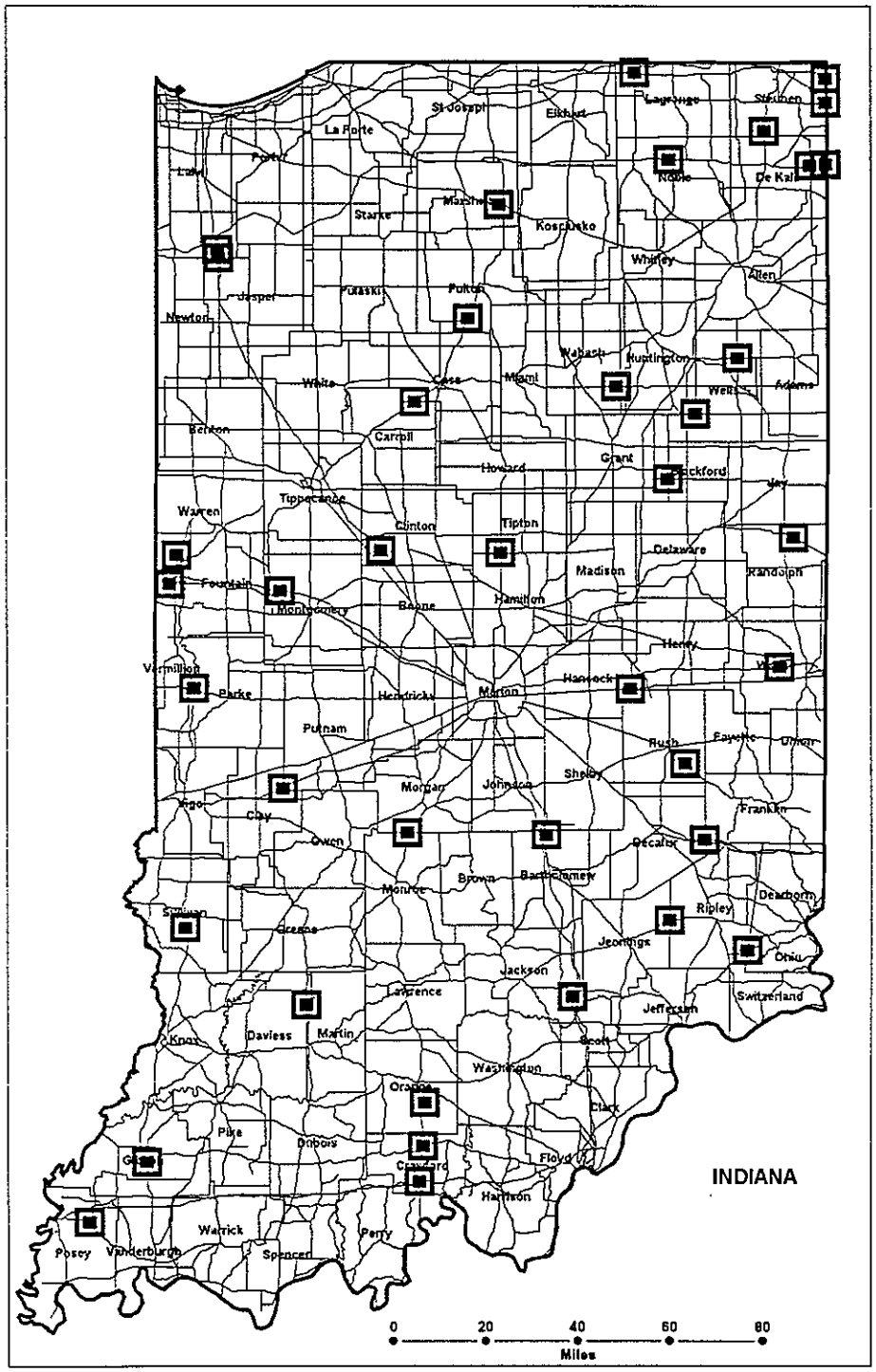

Figure 4.4 Data Sites Used for Evaluating the Modeled Daily Motor Carrier Traffic

Table 4.6 Highway Locations of the 40 Data Sites

Station ID	Location	Highway
4401	ON SR 66 0.50 MI W OF SR 165	ST-066-65-01
4737	ON US 41 4.00 MI S OF BR 4616/SR 64	US-041-26-01
6201	ON US 41 0090 MI S OF OLD SR 54 LT	US-041-77-01
7057	ON US 36 0.11 MI E OF VERMILLION CO LINE	US-036-61-01
8137	ON I-64 6.43 MI E OF DUBOIS C/L	INTST-064-13-01
8313	ON SR 64 1.44 MI E OF SR 37	ST-064-13-01
8337	ON SR 37 7.31 MI N OF CRAWFORD C/L	ST-037-59-01
8737	ON US 231 0.50 MI S OF SR 645	US-231-51-01
9337	ON I-70 0.10 MI E OF CLAY CO LINE	INTST-070-67-01
9633	ON SR 37 0.10 MI NORTH OF MONROE CO LINE	ST-037-55-01
10993	ON I-74 1.00 MI W OF SR 63	INTST-074-83-01
11057	ON SR 63 4 MI N OF SR 263	ST-063-86-01
12521	ON SR 10 0.20 MI E OF NEWTON C/L	ST-010-37-01
12593	ON I-65 100 FT S OF NEWTON C/L	INTST-065-37-01
13193	ON I 74 100' E OF BR 4938 IR 19/WESLY RD	INTST-074-54-01
13745	ON I 65 4.60 MI N OF BOONE CO LINE	INTST-065-12-01
14921	ON US 31 0.10MI NORTH OF HAMILTON CO LN	US-031-80-01
15153	ON SR 25 0.10 MI N OF CARROLL CO LN	ST-025-09-01
16841	ON SR 25 1 MI N OF SR 114	ST-025-25-01
17337	ON US 30 0.88 MI WEST OF SR 331	US-030-50-01
18857	ON US 31 0.60 MI S OF SR 250	US-031-36-01
19345	ON I-65 1.00 MI SOUTH OF SHELBY CO. LINE.	INTST-065-03-01
19753	ON US 40 0.10 MI W OF HENERY CO. LINE	US-040-30-01
19921	ON US 50 0.10 MI E OF JENNINGS CO LINE	US-050-69-01
20025	ON I 74 0.10 MI WEST OF FRANKLIN CO LINE	INTST-074-16-01
20073	ON SR 62 0.10 MI EAST OF RIPLEY CO LINE	ST-062-15-01
20377	ON US 52 5 MI W OF FRANKLIN CO LINE	US-052-70-01
22321	ON SR 124 0.20 MI W OF HUNTING C/L	ST-124-85-01
23065	ON I 70 0.10 MI E OF CENTERVILLE RD	INTST-070-89-01
23185	ON SR 28 3 MI E OF US 27	ST-028-68-01
23209	ON SR 26 0.10 M W OF BLACKFORD CO. LN	ST-026-27-01
23417	ON SR 218 0.10 MI WEST OF WELLS CO LINE	ST-218-35-01
23777	ON US 224 0.10 MI E OF SR 1	US-224-90-01
24745	ON SR 120 0.10 MI E OF SR 5	ST-120-44-01
25329	ON US 6 0.10 MI W OF SR 9	US-006-57-01
25641	ON I 69 1.11 MI N OF DEKALB CO LINE	INTST-069-76-01
26001	ON SR 1 0.42 MI NORTH OF US 6	ST-001-17-01
26025	ON US 6 0.10 MI WEST OF OHIO STATE LINE	US-006-17-01
26057	ON US 20 0.10 MI WEST OF OHIO STATE LINE	US-020-76-01
26065	ON SR 120 0.10 MI W OF MICHIGAN STATE LI	ST-120-76-01

Revised Counts Comparisons: Manufactured Goods

Table 4.7 gives the essential statistical results from the comparison of the assigned total manufactured goods flows with each of the truck types included in the road count data. The overall model "explains" about 48% of the variation in total commercial traffic using the flows assigned here to the 40 rural locations. This is a very significant result. Nevertheless, a higher level of explained variation would have been desirable for the overall relationship examined here.

Models derived for the nine types of motor carriers included here were in some cases better and in some cases worst than the overall relationship above. They range from extremely low level relationships for four axle trucks that would be used for deliveries to retail outlets and home deliveries of large retail items (e.g., furniture or appliances), to high relationships for four and five axle trucks with trailers, the most common types of trucks for the movement of manufactured goods. There are some higher and some lower relationships, but these are for motor carriers encountered less often, e.g., some multitrailer vehicles.

This variation in the relationship of the manufactured commodity flows to the road counts for different types of vehicles is not that surprising. Table 4.8 presents the intercorrelations between motor carriers of different sizes and axle configuration. In effect, what the table illustrates is that there are significant differences in these interrelationships and it would be very unlikely for any variable to do a good job at estimating all of these vehicle types.

Revised Counts Comparisons: Total Goods

A further evaluation of the traffic assignments was undertaken using the assignments of all goods (not just manufactured goods) to the Indiana highway network. The overall relationship dropped slightly yielding an adjusted coefficient of determination of .435. This gives an F statistic of 31.07, which is significant at the .001 level. A scattergram of the relationship appears as Figure 4.5.

The Highway Assignments

Given the general acceptability of the cost metric and the assignment obtained for total highway traffic, the next step was to undertake these assignments for each of the manufactured commodities of interest here. This was done and some of major maps resulting for the 1993 flows are displayed in Figure 4.6 through Figure 4.11. Unfortunately, there is no way to check the accuracy of the individual assignments and one is left with accepting or rejecting them based on their appearance. Before doing the latter the reader should bear in mind the statistical tests that were undertaken to verify the assignment procedure.

Table 4.7. Comparison of Assigned Flows with Truck Flows at 40 Selected Locations

Variable	Mean	Stand. Dev.	Coefficient	Intercept	F	R^2
Total Commercial Flow	2635	3525	1.27	1273	34.8	.49
Two axle Trucks	198	183	.054	139	18.6	.31
Three axle Trucks	102	113	.036	63	23.0	.38
Four axle Trucks	19	20.5	.004	15	5.3	.12
Four axle Trucks w/trailer	259	320	.137	111	78.4	.67
Five axle Trucks w/trailer	1671	2429	.977	624	56.0	.60
Six axle Trucks w/trailer	69	117	.022	45	5.65	.13
Five axle Trucks with Multi trailer	292	1416	.021	269	.032	.00
Six axle Trucks with Multi trailer	13	24	.011	1	97.9	.72
Seven axle Trucks with Multi trailer	13	41	.008	4.2	6.05	.14

Table 4.8. Intercorrelations of the Motor Carrier Types Based on 2417 Locations

	Vt-5	Vt-6	Vt-7	Vt-8	Vt-9	Vt-10	Vt-11	Vt-12	Vt-13	Tot Com Veh
Vt-5	1.00	.58	.49	.65	.62	.40	.24	.48	.15	.71
Vt-6	.58	1.00	.62	.64	.59	.46	.20	.48	.15	.67
Vt-7	.49	.62	1.00	.45	.42	.31	.14	.29	.06	.48
Vt-8	.65	.64	.45	1.00	.83	.58	.33	.73	.16	.89
Vt-9	.62	.59	.42	.83	1.00	.65	.37	.83	.19	.98
Vt-10	.40	.46	.31	.58	.65	1.00	.23	.61	.39	.68
Vt-11	.24	.20	.14	.33	.37	.23	1.00	.37	.09	.44
Vt-12	.48	.48	.29	.73	.83	.61	.37	1.00	.24	.83
Vt-13	.15	.15	.06	.16	.19	.39	.09	.24	1.00	.25
Tot Com Veh	.71	.67	.48	.89	.98	.68	.44	.83	.25	1.00

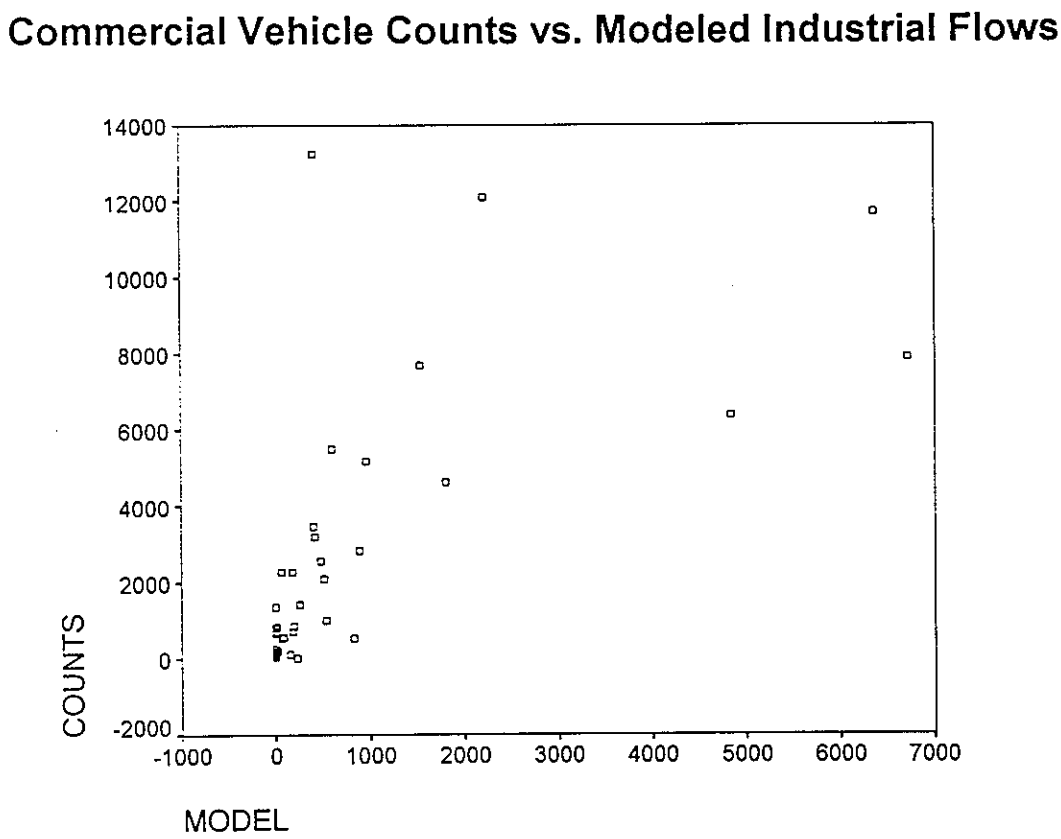

Figure 4.5 Scatter Diagram of Relationship of Model Estimates and Counts

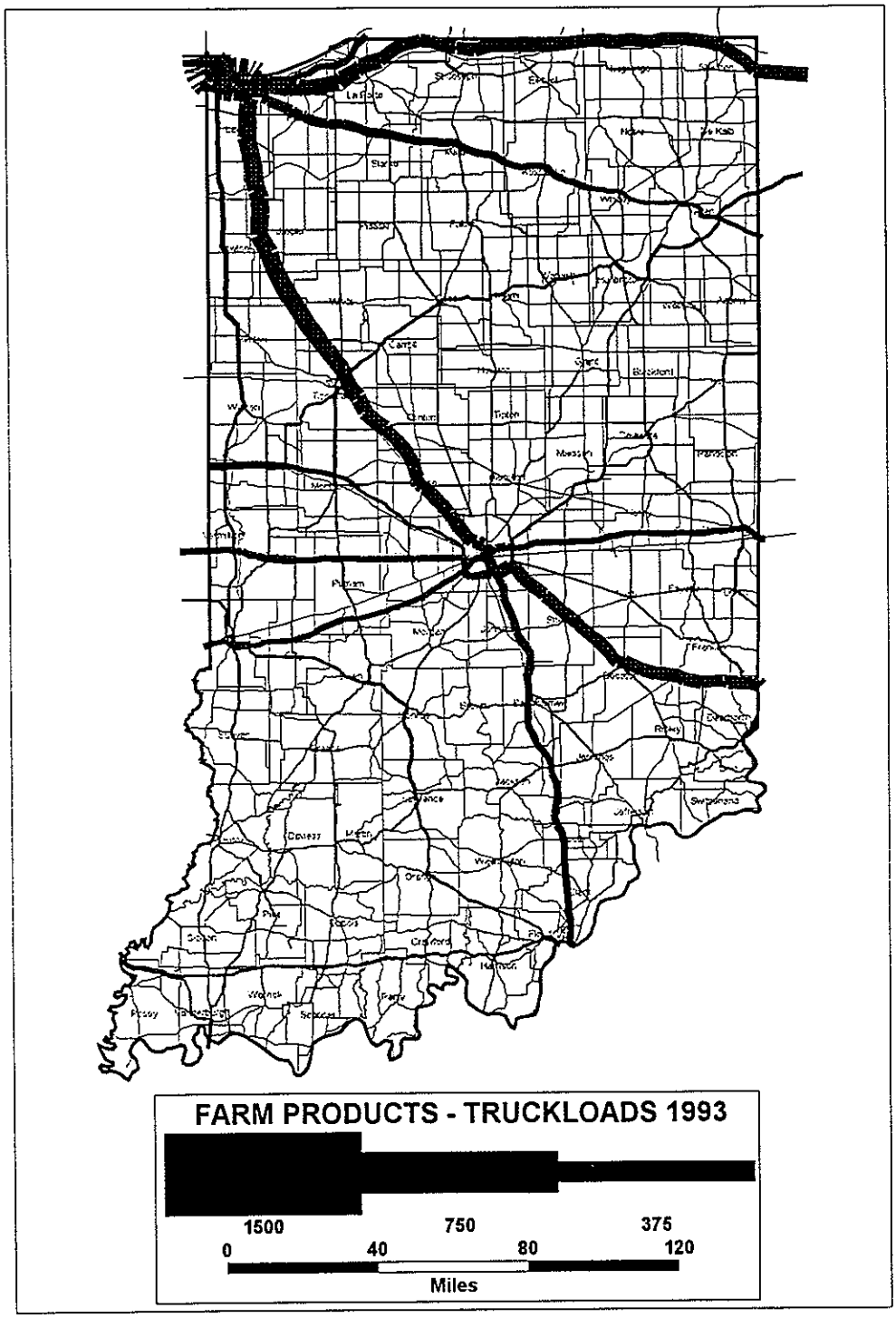

Figure 4.6 Daily Motor Carrier Volumes - Farm Products 1993

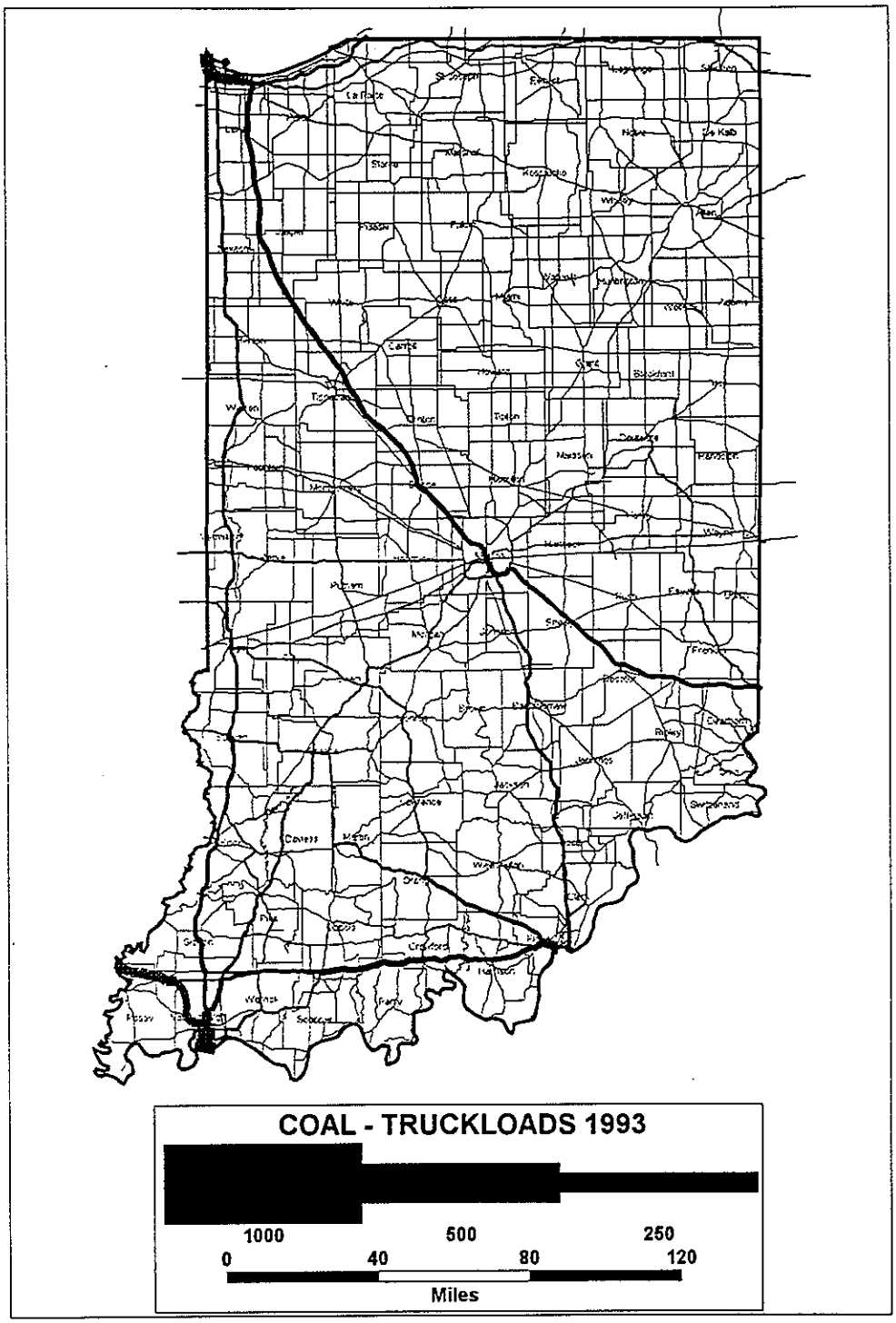

Figure 4.7 Daily Motor Carrier Volumes - Coal 1993

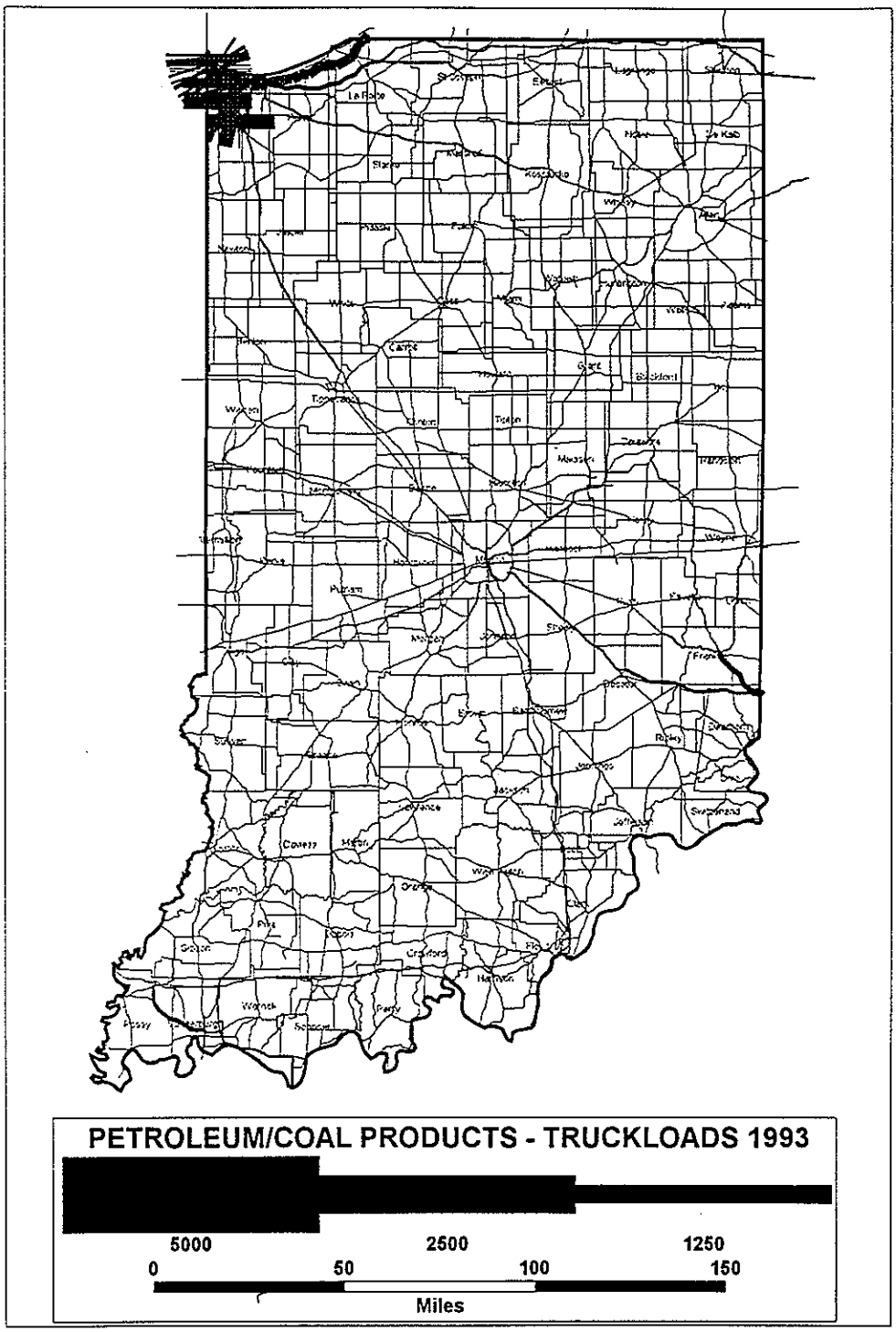

Figure 4.8 Daily Motor Carrier Volumes - Petroleum and Coal Products 1993

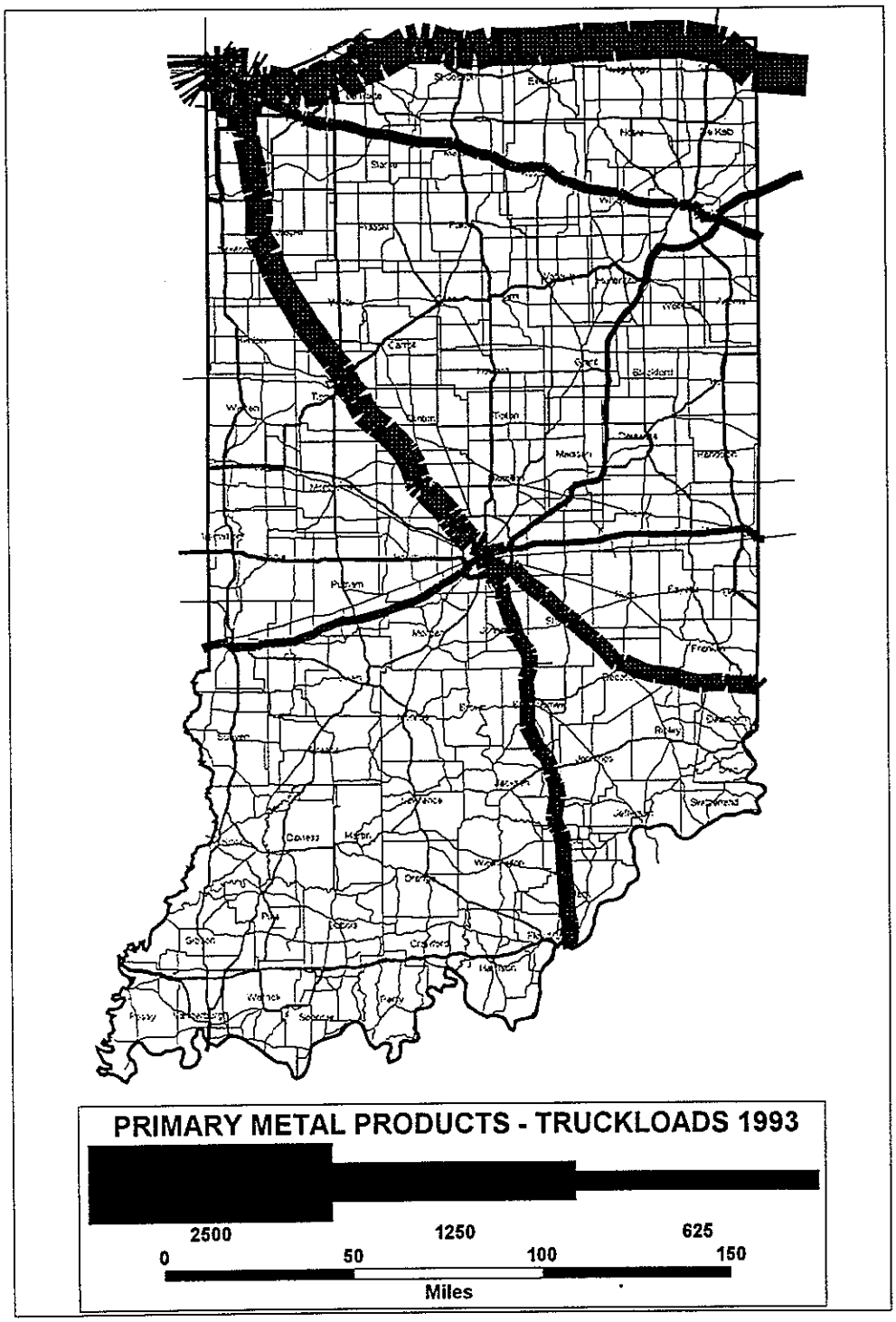

Figure 4.9 Daily Motor Carrier Volumes - Primary Metal Products 1993

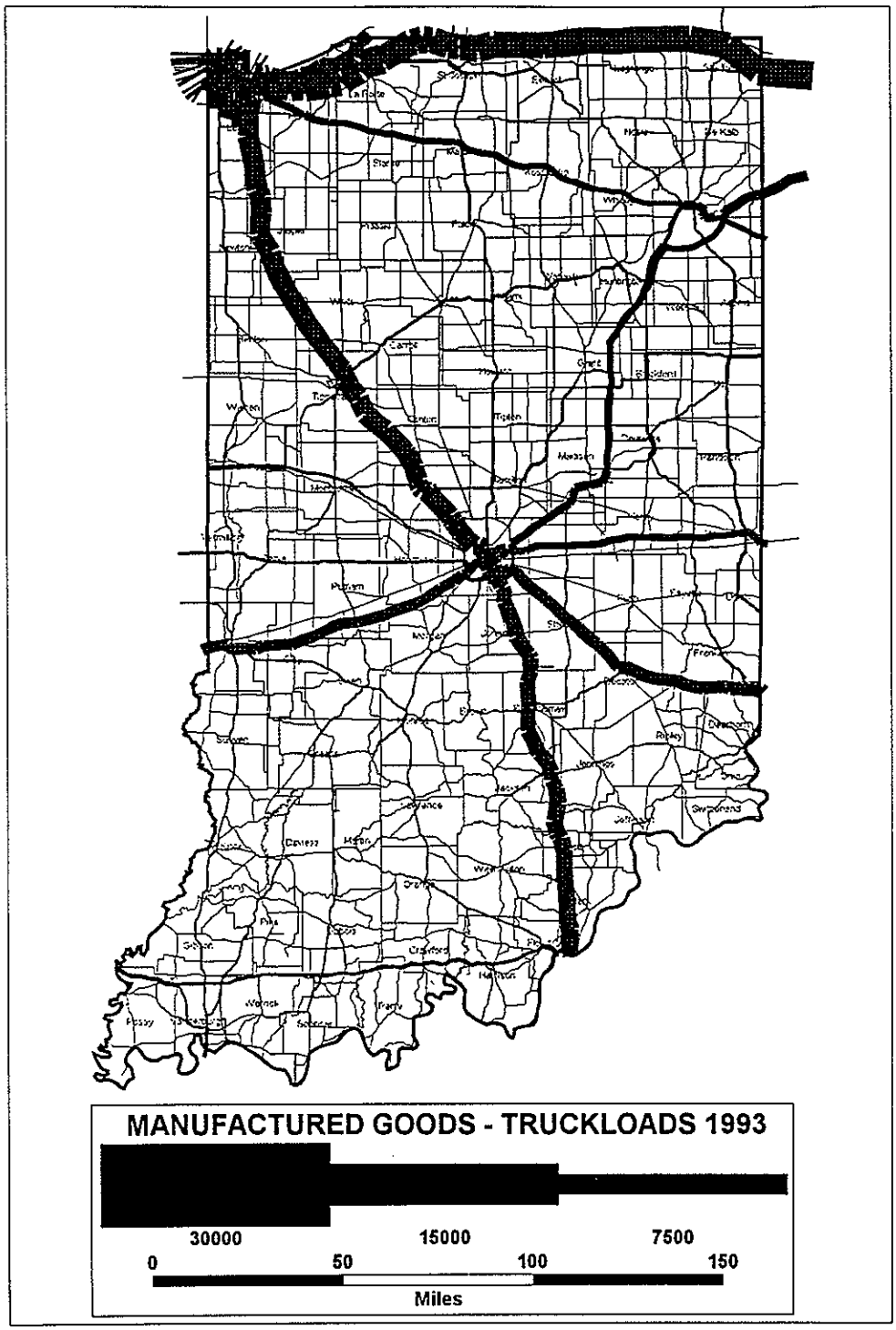

Figure 4.10 Daily Motor Carrier Volumes - Manufactured Goods 1993

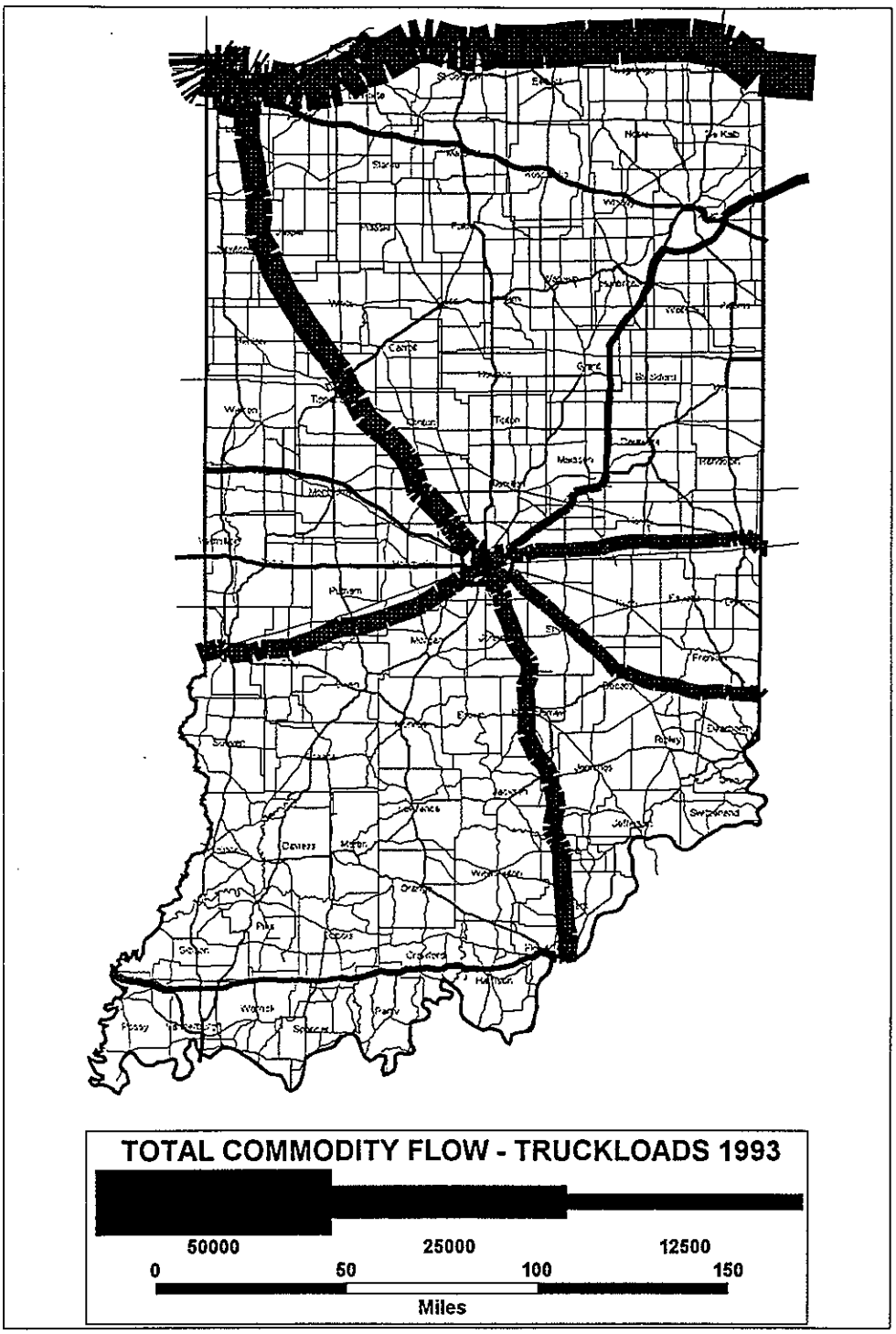

Figure 4.11 Daily Motor Carrier Volumes - Total Traffic 1993

Sources of Errors in the Assignments

It is reasonable to offer some explanation for the errors observed in the assignment process, but in order to do this it is also necessary to examine possible sources of error throughout the planning and analysis effort undertaken here. Some of these reasons have been stated previously, but they are restated here simply as a catalog of items that should be considered in future applications.

Network and Nodal Definition

The network used in this study is an abbreviated representation of the state highway network. In other words there are places in Indiana where a substantial amount of travel occurs on local or county roads. This study includes no county roads and not all highways or major urban streets were included. These factors suggest that higher volumes may have been assigned to some of the roads included here, i.e., the roads where the traffic actually occurs are not included here.

A second network related problem resulted in some highways of the state simply ending at the state border. Although all of the FHWA digital highway planning network contiguous to the state's border were included in the analysis, the network within Indiana was much more detailed than the FHWA network. This resulted in some Indiana highways ending at the border. The problem could have been remedied by digitizing new links into the FHWA network, but this was beyond the scope of this project.

Still another source of error related to the network is the placement of external nodes. More specifically, this study assigned all traffic in the states and counties to a point or centroid, although not necessarily the geometrical center of these areas. States bordering Indiana were given additional nodes under the premise that it was desirable to allocate traffic to more than a single centroid for states very close to Indiana. For example, allocating all of the traffic generated by Ohio to Columbus, Ohio, would not represent the Toledo-Cleveland area of the north or the Cincinnati area in the south. Some research is necessary on the placement of these nodes, since it can clearly impact the results here. Unfortunately, a database that would enable planners to research this problem does not exist, unless the 1993 Commodity Flow Survey could be modified to answer this question

A related point is that beyond the circular highway network that surrounds Indiana all of the highways are part of the Interstate Highway System. It was believed that the circular network would eliminate bias in the traffic assignments, but the impact of all the traffic coming into this region on links of the Interstate Highway System may make it more attractive to simply stay on these routes. This would also result in less traffic finding its way to lesser routes. In addition, the use of single centroids for states and the use of the Interstate Highway System may cause

another source of bias in that traffic may be "loaded" onto the network in the wrong location, e.g., all traffic from California is loaded onto the Interstate System near San Francisco, as opposed to a node in Southern California and this results in southern Interstate Highways (Interstates 40, 10 or 20) being used less by the assignment process.

Traffic Generation: Production and Attraction

This study made use of the 1993 Commodity Flow Survey. Numerous sources of error attributable to traffic generation models were avoided. In particular the data used in the traffic production portion of the study used those data at the state level in virtually the same form in which they were published. Errors in this section would be the errors of the sampling and data expansion process used. Models were used to distribute the manufacturing flows produced or attracted by Indiana's counties, but the aggregate amount of these were constrained to the totals derived from the 1993 Commodity Flow Survey. Nevertheless, the models used for Indiana traffic are not perfect, and this could also result in some error in the estimates of production and attraction.

All manufacturing traffic produced in the United States is included in this study. Even traffic that is produced in the U.S. and destined for Japan or another Asian country via Los Angeles or another port in that state is included here as a shipment to California. On the other hand manufactured goods shipped to the U.S. from a foreign country is missing in the data used here, to some extent. It was noted previously that the value of all imports was assumed to be equal to the value of all exports. This results in slightly larger allocations of traffic being attributed to some states. Nevertheless, since the U.S. tends to import more manufactured goods than it exports, this traffic is lost to the modeling since the origin and destination of such flows are not generally available. These data are collected for some port cities and may be purchased, but their costs were beyond the resources allocated to this project.

Traffic Distribution

The fully-constrained gravity model used here yields flow estimates that are consistent with the initial inputs to the modeling process. Traffic produced and attracted according to the model are equal to the actual values used in the modeling. In addition, the average shipment length observed tends to be replicated (in most cases) by the modeling process.

This project did not perfectly replicate the average shipping distance. The major reason for this is the average shipping distances between states in the western U.S. It is not possible to constrain flows if distances between places are very large, relative to observed averages. In some cases this was not a critical point, but in others the average value could not be constrained. Even in those cases where the flow distances are constrained to inputted values, it is possible that the actual flows may differ from those generated by the model. This is not a likely outcome, but it

is a possible outcome.

This study actually went further than any other study completed to date in that it examined the average length of shipments originating for a subarea. This was Indiana originated flows in this case. The modeling was in no way constrained to replicate Indiana's average length of shipments, but this piece of information was generated and compared with data from the 1993 Commodity Flow Survey used here. In some cases errors were permitted in the U.S. flow portion of the study so that the Indiana average could be closer to the observed average value for this.

In effect, the distribution modeling does not seem to be a major source of error here. It may be one of the more accurate portions of the study.

Modal Split of the Traffic

The NEWMODE modal split program developed for this project assigns traffic to a variety of modes based on observed patterns in the 1993 Commodity Flow Survey. The major modes of interest here are highways and railroads. Some of the mode choices available involved two modes, e.g., rail and highway, or air transport and highway. These were assigned to both of the principle modes (rail or highway), if appropriate. This results in slightly higher total flows, but this difference is not very significant as the reader can see by examining the modal assignment probabilities in the appendix.

All of the modal allocations were made in tons. After these allocations the traffic is divided by density factors consistent with specific classes of manufactured goods. In some cases the density factors (tons per vehicle unit) are quite different for goods received by a state and for goods shipped by that same state. For example, there are significant differences in the weights of television components and completed television sets, but these are both in the same manufactured goods STCC group. Weighted average density values were used here, but these could result in more or less vehicle units depending on whether the density values are too low or too high.

Aside from these points this does not appear to be a major source of potential error in the modeling undertaken here. While errors are possible here they appear to have only minor impacts on the model outputs.

Traffic Assignment

There was a substantial discussion of traffic assignment earlier in this chapter. The reader was informed of the different assignment routines that could have been used, and the decision to use an "all or nothing" assignment procedure here. This method is not the most popular because it fails to consider link capacity or the consequences of congestion on route choice by highway

users. These are certainly valid criticisms for the urban application of these methods, but in large scale regional studies covering multi-state areas it seems an appropriate technique since congestion and capacity are of less concern at that scale, particularly in the Midwest.

There are an infinite number of ways to measure the cost of transport, it is not possible to say that the method selected here is as good as another not evaluated [8]. There is no indication that the cost selected resulted in any errors.

It might be viewed as desirable to add capacities to all the links examined here. However, none of the state's flows were close to their known capacity. Also, these values were not known for the highways outside of Indiana.

It actually seems that traffic flows at the scale examined here are in need of a new traffic assignment method. This method would look at the three or four best (e.g., lowest cost) routes that could be taken between an origin and a destination and assign probabilities to these. Trucks would be assigned in a Monte Carlo fashion with assignments proportional to their probabilities. For example, truckers passing through Chicago en route to Pittsburgh may consider Interstates 80, 65-70, or even U.S. 30. The proposed method would consider all of these as possible choices. This would overcome some of the shortcomings of the single least cost route of "all or nothing" assignments being selected all the time.

The Railway Network and the Cost of Movement

It may appear anticlimactic, but in this section we will examine the assignment of traffic to the railway network. Many of the points made in the previous section with regard to the highway traffic assignments also apply here; this is particularly true with regard to the sources of possible errors in the assignment process. At the same time the entire rail traffic assignment process is different enough that it merits its own discussion.

As noted in Chapter 2 the digital rail network used here is the 1:2,000,000 rail network prepared by the Federal Railroad Administration. Although other digital representations of the U.S. rail network exist, these generally lack attribute data that are necessary for use of the networks in traffic assignment. It is for this reason that this older network, dating from 1992, was used here.

Although highway traffic assignment is controlled by travel time and the user's desire to minimize this, or a cost version of the travel time, railway operations are not so preoccupied with this. It is certainly true that railroads want to move from origin to destination quickly, but speed is usually measured in days for railroads as compared to hours for highways. However, the problem is actually more complex than this.

The movement of a primary or manufactured product from an origin to a destination generates a waybill, which is a statement of the charges to the shipper for the move. It is a statement of the total rail transport charges. The actual move may have been made by a single railroad, which was responsible for picking up the rail car at the origin station or siding, moving it over its system, and terminating it, or dropping it off, on the destination side. Or the move could have been made by multiple rail carriers, one on an origin branch line, two railroads that handled the move across the country, and a fourth railroad on some destination branch line. Or perhaps six or seven railroads were involved in the move. All of these possible scenarios create problems for the assignment of traffic to the rail network.

Each of the railroads involved in transporting a rail car of goods and products is interested in maximizing their income. They wish to have the lion's share of the charges on the above mentioned waybill. However, the railroads involved in the move "divide" these charges into what are called "divisions," and this represents the income the railroad makes from the move. In general, the originating railroad may get anywhere from 8% to 20% of the revenue, a terminating railroad would get a similar division, and the carriers responsible for the majority of the miles between the origin branch line and the destination branch line would divide that portion of the revenue remaining based on the miles that each transported the rail car. If the intervening distance is 1,000 miles, and carrier A handled it for 800 miles and carrier B handled it for 200 miles, the two railroads would split the revenue 80% to 20%. It should be apparent that each of the intermediate railroads want to hold onto the traffic as long as possible, in a distance sense, since this would increase their income, other things being equal. Of course there are limits to the total mileage charges, but railroads nevertheless have a lot of freedom in routing traffic.

In this environment it should be apparent that the carriers do not follow a shortest path approach to routing traffic. The logical approach to rail traffic assignment would appear to be something like a shortest path route, with turning penalties. In other words if carrier A picks up traffic it would move it from the origin to the destination in such a manner as to minimize distance traveled, assuming the destination is on its system. If this is not the case the turning penalty (assuming it is set reasonably high) will prevent the traffic from being passed over to a second carrier until the last possible minute. If local or regional railroads were responsible for the originating or terminating traffic, such an assignment process would have little impact on that portion of the move. The rail car must go onto these originating and terminating carriers lines. A series of experiments with shortest paths including turning penalties carried out during an earlier rail planning project suggested that this approach to rail traffic assignments was non-workable [9].[2]

[2]It is quite possible that the failure of this algorithmic approach to the problem - minimal path with turning penalties - failed because of a significant duplication of rail links in the Midwest area. In effect for a large section of the region each rail line had another rail line on top of it connecting the same endpoints, but identified as a different link. The use of turning penalties were useless in that assignment process, and this may have been due to the fact that traffic would be assigned to the underlying link if the top link had a turning penalty. This problem was not recognized in that earlier study, but became apparent during this project.

As a result of the failure of the turning penalties to work, an alternative approach to rail traffic assignment was pursued.

Although there is some desire on the part of rail carriers to minimize the length of haul, they have a tendency to use mainline trackage even though secondary lines may be more direct. The question was how to represent this tendency with the rail data available for the digital network. Track condition plays a part in such decisions, but this is a very dynamic variable that would change more frequently than the database available. It seemed a new measure of spatial separation was necessary. The new measure of spatial separation would still incorporate an attempt to minimize shipping distance, but it would also pick those routes that the railroads tend to use.

Short line or regional railroads that originate or terminate traffic are not important in this methodology, since the origin and destination of shipments must be reached. In other words these moves can be replicated by any methodology regardless of the cost attached to it simply because the endnodes of these moves are used as input to the methods.

The measure finally adopted had the form

$$I = (L\ (1/(D+1)))$$

where I = the index of spatial separation;
L = the length of the line segment of the network; and,
D = the traffic density of the line in millions of gross ton-miles per year.

This measure diminishes the length of line segments by dividing the segment by its traffic density, i.e., by gross ton-miles per year. Typical traffic density values vary from 0 to about six million gross ton-miles per mile of line.

If we have five route segments of 100 miles in length each with traffic density ranging from 0 to 1 to 2 to 3 to 4, the index of spatial separation would be 100, 50, 33, 25, and 20. When used on lines with high traffic density these routes "become shorter" and are always selected. Lines of low traffic density, do not become "longer" since their traffic density always has a unit value added to it. Lines of 0 traffic density would become lines of 0 length, if it were not for this correction factor.

The transport cost matrix used for assigning rail traffic was defined using the length-density index described above. Although it is beyond the scope of the present study, it would be desirable to have a study undertaken that would evaluate a broad array of indices (including the one utilized here) and methods of assigning traffic to a rail network. Such a study would require the existence of a set of actual flows, referred to in the highway case as target flows, but these are generally not available in the rail case.

Target Flows

Target flows in the highway case are actually road counts of vehicles. In some cases the vehicles are broken into groups, e.g., commercial vehicles, and these may be used as a variable that assigned flows should resemble. In the railway case there are no target values that are route segment specific. Data that are made available in the public use carload waybill sample are too gross to be used for this purpose. Very detailed information that would allow comparisons are available in a complicated fashion for flows involving the movement to, from, or through the state of Indiana, but translating compiled data into this format is difficult.[3] As a result one must visually examine the flows to see if they are consistent with expectations.

Flows Assigned

The primary and manufactured commodities assigned to the rail network do not come from the carload waybill sample mentioned previously, but are a product of this project and programs developed by it. More specifically, the traffic assigned is the product of NEWMODE.EXE, a computer program that splits commodity specific traffic between modes based on the length of haul. The basis for these splits is data published for the United States in the 1993 Commodity Flow Survey. In the case of some manufactured goods this is a very small amount of traffic since railroads during the latter part of the 20th century have loss significant market share for many manufactured goods to motor carriers.

The graphic results of the traffic assignment process for total rail traffic appears as Figure 4.12. Traffic assignments for five other major commodity groupings appear as Figures 4.13 to 4.17.

Sources of Error

The sources of error are in many cases the same as they are in the highway case. These include problems in defining the network and the nodes on it, problems in estimating traffic produced and attracted, problems with the distribution model used or the modal split procedures, or simply problems with the assignment process used to represent the routes taken by the traffic examined here. In the best of all worlds these sources of error would be eliminated, but this would require access to proprietary railroad data that the industry is unwilling to release due to the potential negative impacts this could have on competition and modal share. In the case of railroads this is not an irrelevant point since they are no longer the dominant mode for any manufactured goods transported today and in some cases account for a very small fraction of the traffic moved.

[3] It has come to our attention that Caliper Corporation, Inc., the developers of TransCAD are currently working on this problem for the Federal Railroad Administration of the U.S. Department of Transportation.

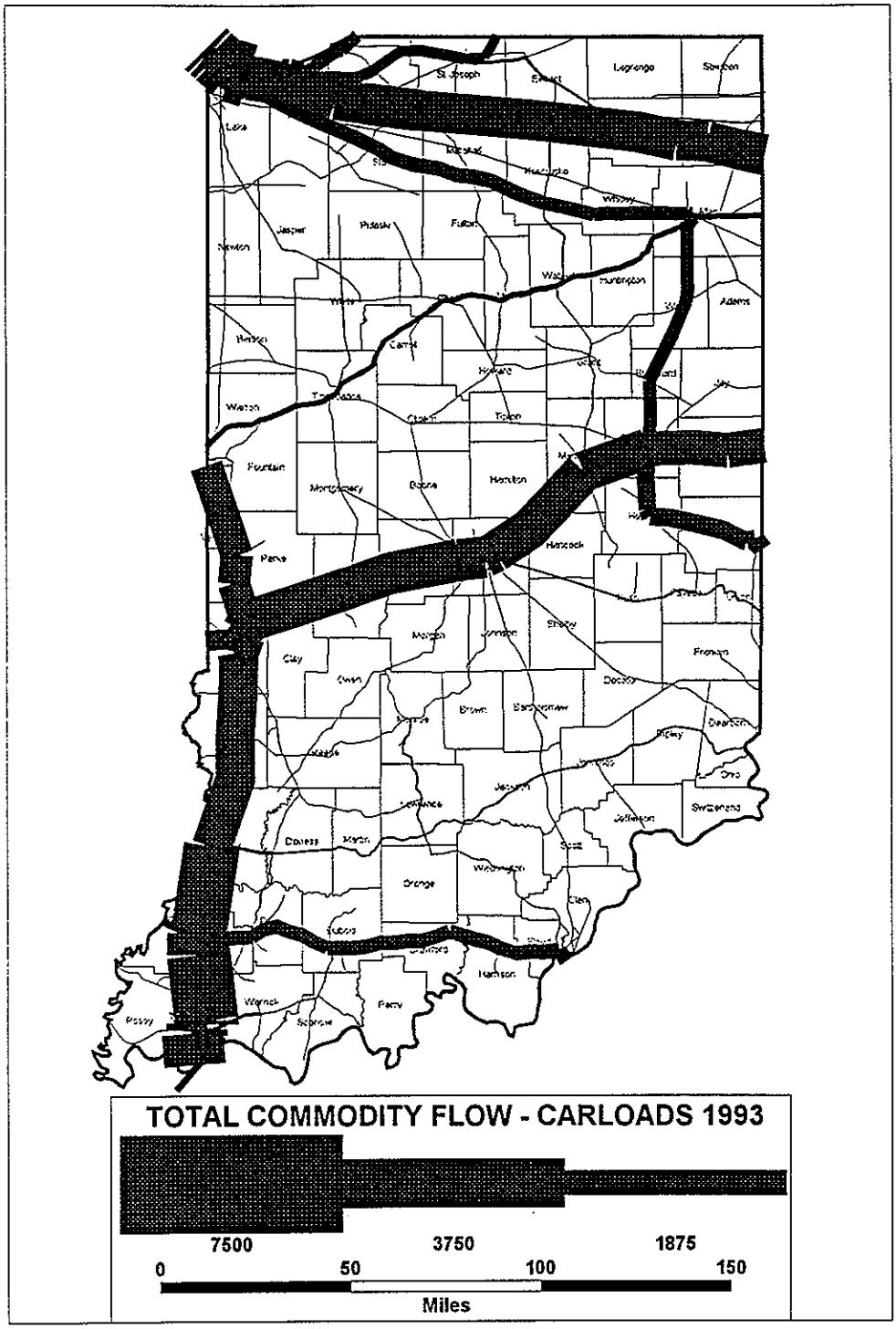

Figure 4.12 Total Daily Rail Traffic (Carloads) 1993

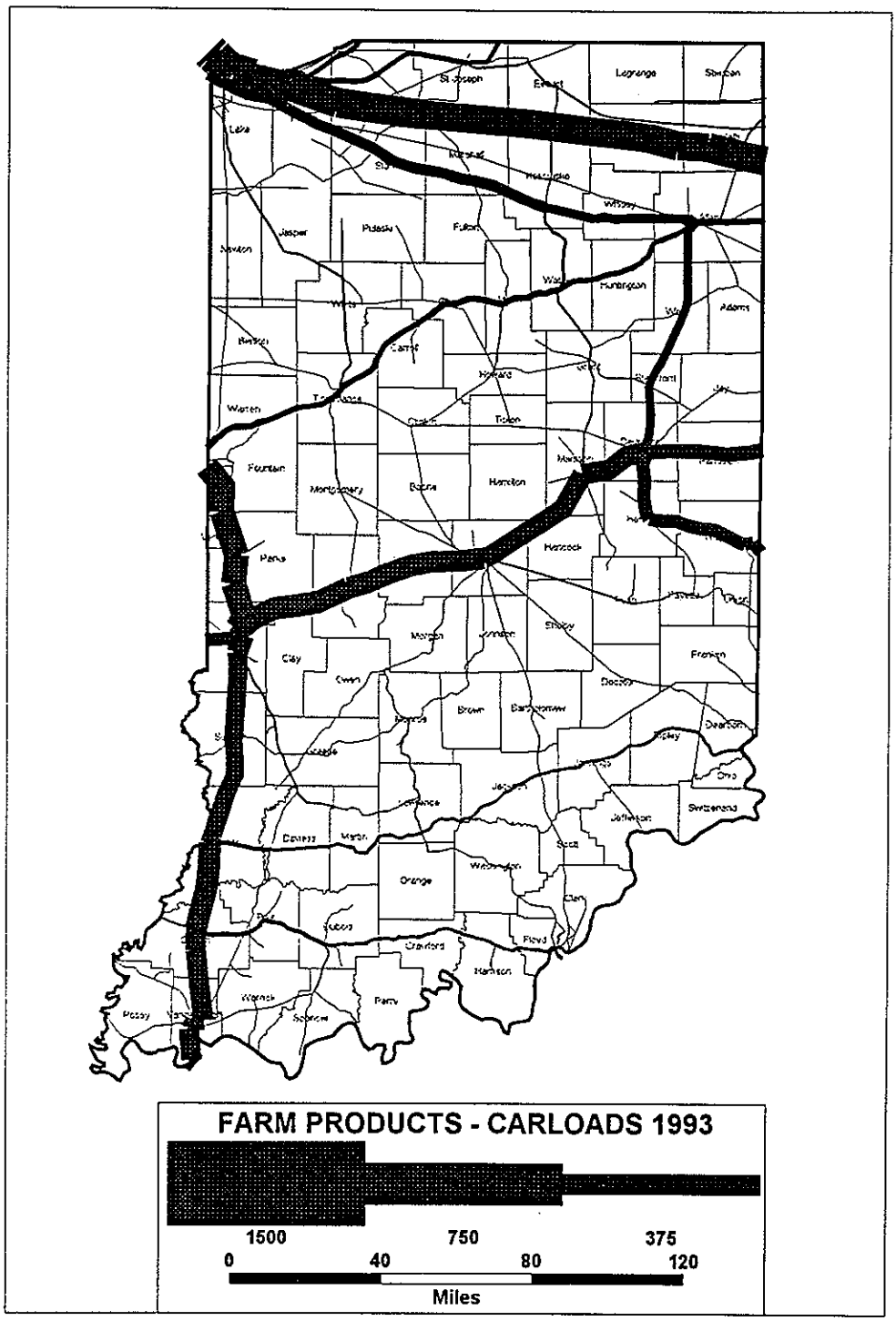

Figure 4.13 Daily Railroad Carloads - Farm Products 1993

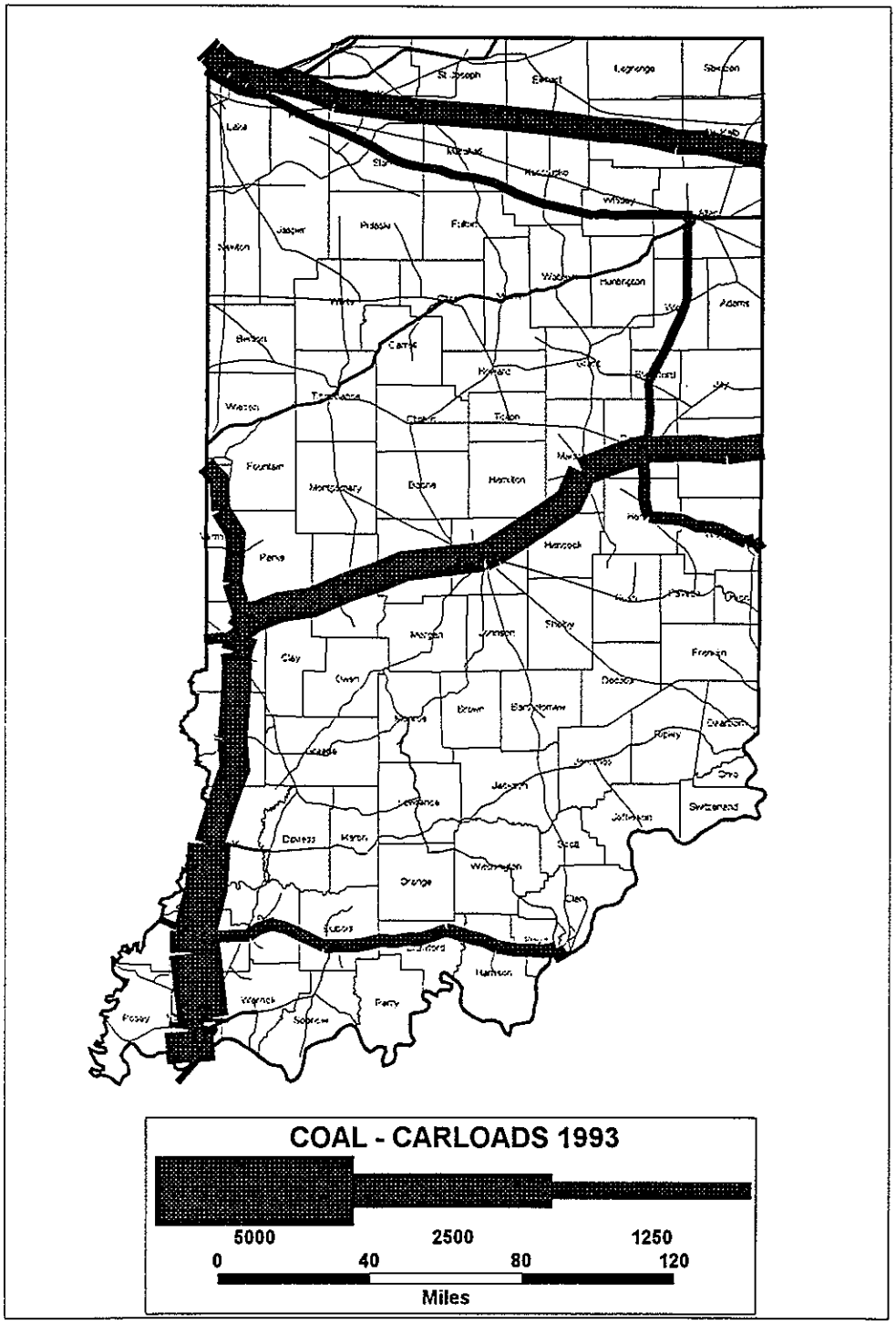

Figure 4.14 Daily Railroad Carloads - Coal 1993

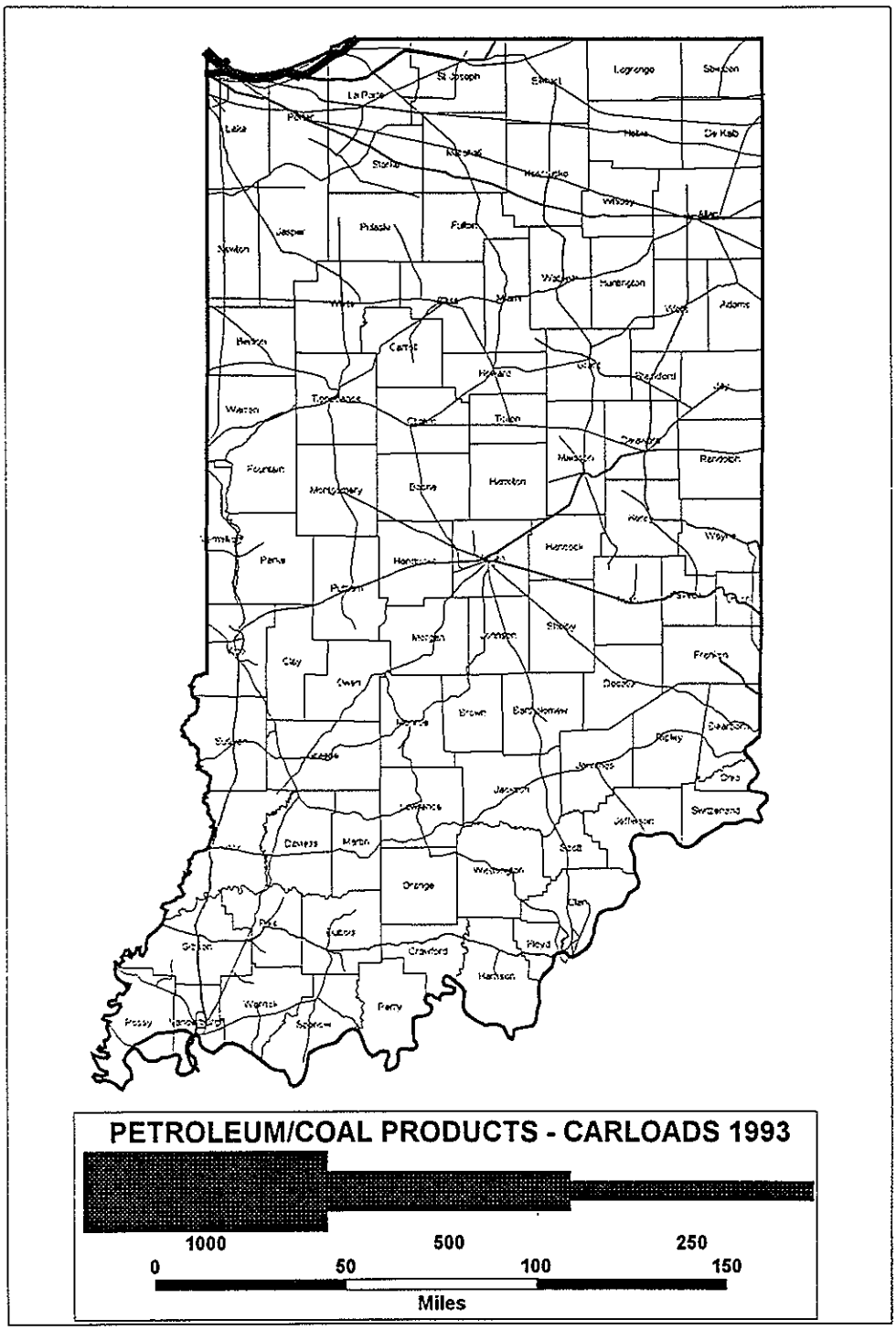

Figure 4.15 Daily Railroad Carloads - Petroleum and Coal Products 1993

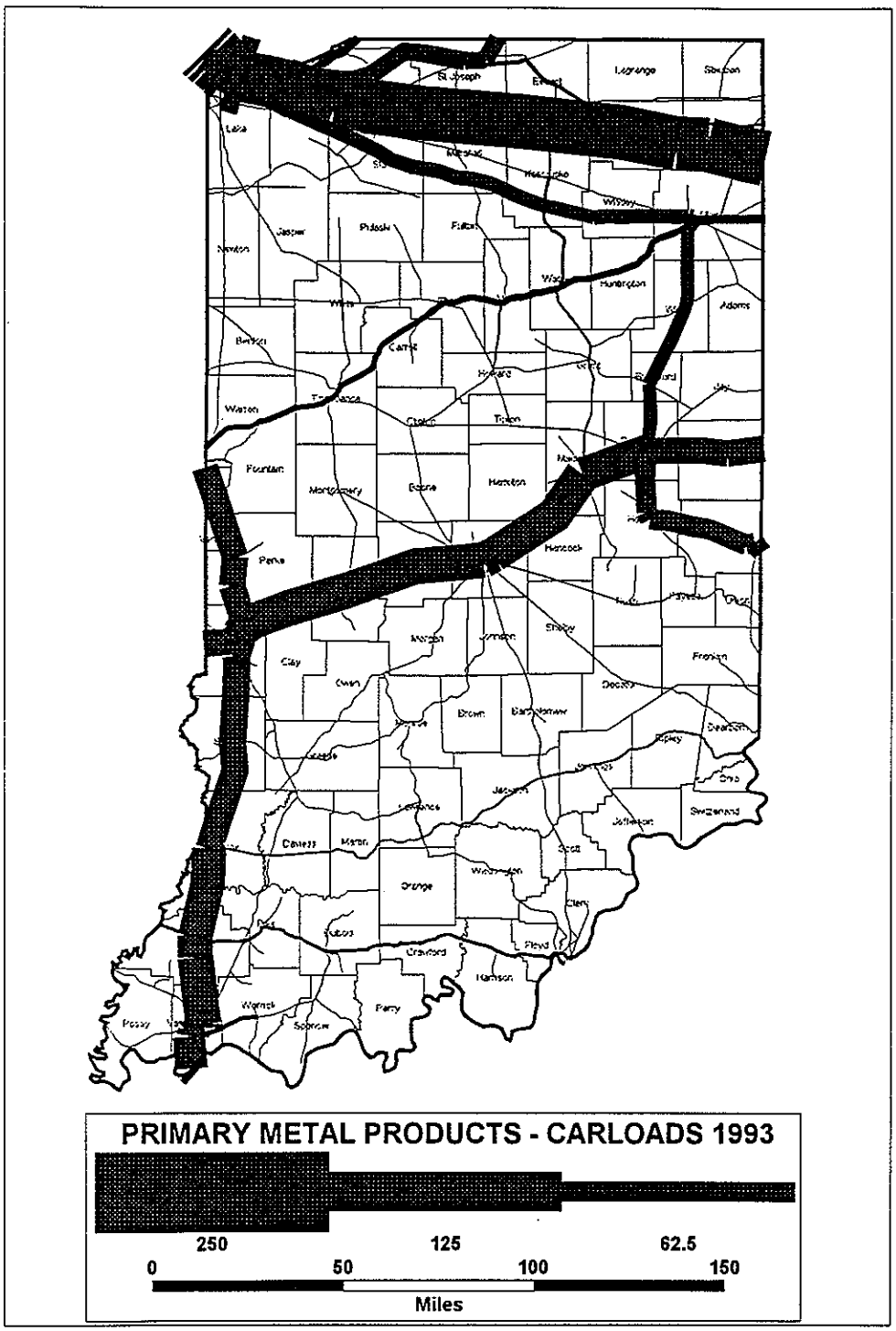

Figure 4.16 Daily Railroad Carloads - Primary Metal Products 1993

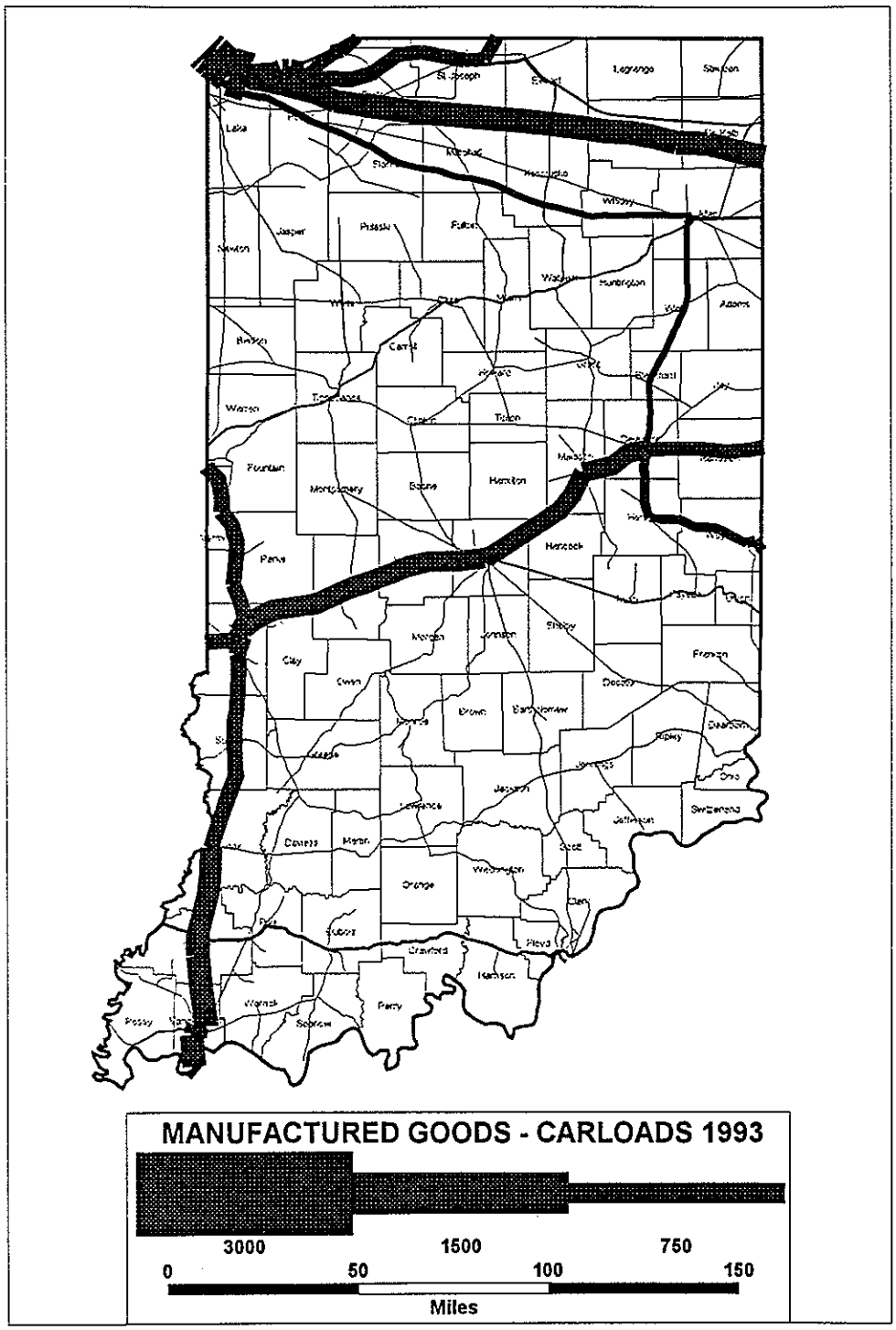

Figure 4.17 Daily Railroad Carloads - Manufactured Goods 1993

Conclusion

In the following chapter we will examine the traffic forecasts for 2005 and 2015. It is easy to lose sight of the fact that the primary objective of this entire chapter has been to develop estimates of traffic that can be projected into the future. It would appear that the models developed and the methods used can replicate existing flows and presumably these will be equally accurate for future flows if the parameters derived remain constant. This is the fundamental premise underlying all future-oriented transport planning and analysis; it is assumed that such stability exists.

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Chapter 5

FORECASTS OF FUTURE ACTIVITY AND FLOWS

In this chapter we will examine the forecasts of highway and railway flows for the target years of 2005 and 2015. We will begin with the logic behind this portion of the study and the basis for the traffic forecasts.

Background

In the previous chapter the highway and rail flows were distributed using a fully constrained gravity model. The program used in that portion of the study also yields values for all of the parameters necessary to calculate the model's outputs. These include the normalizing factors of the model, i.e., the *A* and *B* parameters of the model. In addition the model generated also has a beta value, which is the weight put on the measure of spatial separation used. It should be apparent that if we assume these parameters are constant into the future, then it would be possible to distribute "future" traffic flows. In order to do this we would only need estimates of future commodity traffic productions and attractions. These would then be placed in the calibrated 1993 gravity model and estimates of future traffic (estimates of flow between origins and destinations) would result.

Forecasts of future transportation flows begin with a calibrated gravity model for the flows of interest, as noted above. We next need forecasts of the traffic generation elements. This can be accomplished by forecasting values for the independent variables that went into the production and attraction equations of the last chapter; this was the approach taken during the phase 1 study when no current data were available [1]. In that earlier case these equations were derived using data for 1977. The calibrated models were run with input variable data from the 1989 *County Business Patterns* [2].

An alternative would be to use data from a long term series for employment and population and project these into the future. Such data would also be available from the *County Business Patterns* and the *Census of Population* [3].

Alternatively, one could use forecasts of variables related to the traffic generation variables

and use these as the basis for estimating growth factors for traffic production and attraction. For example, we could use forecasts of future population and manufacturing for Indiana counties and other states and assume that the growth in the sectors of interest here would be reflected by the expected growth in these variables. This is the exact approach used here for most of the manufacturing sectors examined. A variation on this approach was used for farm products, coal, non-metallic minerals, and waste. The mail and express mail sectors were derived as a function of population and this was used in their forecasts.

Forecasts Used for Traffic Generation

At the beginning of this project it was agreed that the flows analyzed would be forecasted for two points in the future: 2005 and 2015. It was also agreed that the basis for these forecasts would be projections developed by *Woods and Poole* [4]. Below we will examine the methods used to forecast future flows of the manufactured goods. These methods are very uniform since employment is a fairly good indicator of productivity and population is a reasonable indicator of demand for products. Resource based goods are a little more difficult to handle since the resources are not ubiquitous or uniformly distributed, e.g., coal is mined where coal deposits exist. As a result it is a little more difficult to forecast these flows. The final flow discussed below is waste; it shares some of the characteristics of manufactured goods as we will see.

Manufactured Goods

As noted above, the source of the forecasts of population and manufacturing activity is *Woods and Poole*. The forecasts available were for the counties of Indiana and the nation as a whole. Ordinarily, one would shy away from external forecasts of this nature. However, the population forecasts include the traditional attributes of cohort survival methods as well as expected economic activity, realizing that economic conditions influence the growth or loss of population. The county level manufacturing employment forecasts appear weak until one recognizes that the forecasts are essentially forecasts of what is there currently. In other words the forecasts of manufacturing employment take into consideration whether the local manufacturing industries are growing slowly or rapidly when the forecasts are made. High manufacturing forecasts would result from high growth industries, while little or no growth in this employment would be expected for counties with sluggish or no-growth industries. This attribute strengthens the forecasts considerably.

As noted the *Woods and Poole* data include county and national level forecasts for population and manufacturing employment. In general the population growth forecasts are the high set of forecasts, while the forecasts of employment in manufacturing tend to be lower. For Indiana the predicted growth in population will have this sector growing 7.64% between 1993 and 2005, and 7.41% between 2005 and 2015. Manufacturing employment is expected to grow 6.39% during the 1993-2005 period and 4.09% during the 2005-2015 period. It is also possible

to assume that the growth rate of each sector will be influential; an average of the two growth rates may be considered important. This would yield growth rates of 7.02% for the first time period and 5.75% for the second time period. In effect, three ranges of flow production and attraction forecasts were derived: using population yields the highest growth rate, using manufacturing employment yields the lowest growth rate, and an average of the two yields a "middle" or most likely rate. Of course this is only an example using state level statistics and forecasts. The actual "multipliers" are derived from forecasts for each county's population and employment growth in Indiana and incorporate attributes of each county's economy.

The forecasts available to the project did not include forecasts for the other states. They do include national forecasts and the assumption was made that each of the other states had the same expected growth as the nation as a whole. This is a weak assumption, without argument, however the primary concerns here are the transport of farm products, minerals, and manufactured goods whose traffic is produced and/or attracted by Indiana counties. The use of national growth forecasts provides a foundation for the state forecasts and should not necessarily undermine the Indiana county forecasts. In addition, the sum of the expected growth throughout the states will be equal to the national total used here. The only possible source of error might be one region of the country growing at a different rate than the nation as a whole, and there are numerous reasons for believing that these regional variations in growth rates will cancel each other out over the forecasting period used here (1993-2015).

The county-level traffic production of manufactured goods for each of the fifteen commodity groups examined here was allocated using the expected average growth in population and manufacturing employment in the county as discussed above. This average value was used simply as the growth factor for 2005 and 2015. For example, assume a county produced traffic of 100 units of a commodity in 1993. The expected average growth in population and manufacturing for that county might be 7% between 1993 and 2005 and 4% between 2005 and 2015. Using these two growth factors would yield productions of 107 units for 2005 and a little more than 111 units for 2015. It has long been recognized that manufacturing employment is a good indicator of commodity production and this latter variable is a key determinant of the amount of a manufactured good available for shipment [5]. The use of population as well reinforces and stabilizes the forecasts. Therefore, this seems like a reasonable approach.

Manufacturing traffic attraction is similar to traffic production. This traffic is attracted to both the personal consumer market as well as industrial markets. In effect, as the population and manufacturing employment grow there is an increase in traffic attracted. There is not sufficient information to weight these factors differentially on the basis of their importance in each county. Therefore, manufacturing traffic attraction is assumed to be equal to the expected average growth of population and manufacturing employment here also. If an area has no growth industries it may still attract traffic based on growth in its personal consumer market. Similarly, areas of stable population levels may still attract traffic if it has dynamic industries that use other products

in their own manufacturing processes.

Resource Based Commodities

Farm products include a broad array of goods that are tied to soil quality. They include apples from the orchards of Washington state, cattle from Texas, corn from Indiana, and so forth. In some cases production is tied to economic conditions, in other cases to weather conditions. We don't forecast either of these very well. Increasing agricultural mechanization has resulted in employment being a poor indicator of production potential in this sector. After analyzing the different variables available a decision was made to use farm earnings (from *Woods and Poole)* as an indicator of future flow production for farm products. For consumption or traffic attraction in this personal consumption sector, population growth has been used.

Forecasting the flow or production of coal is difficult at best. What is it related to? We might think that demand for coal is a function of economic conditions, and that is true. But there are numerous other factors that influence this variable. If the U.S. had not moved toward improving air quality, we would not see low sulfur Rocky Mountain coal transported to the Midwest. The Clean Air Act changed the overall distribution of coal in this country. If the federal government moves to significantly curtail carbon emissions in response to the recognition that global warming had begun, it might remove high sulfur coal regions from production. That possibility has not been factored in to the projections, and this may indicate the tenuous nature of the forecasting coal flows.

The variable selected as a growth factor for coal production is total earnings from mining as forecasted by *Woods and Poole*. Attractions would seem to be more closely related to consumers of coal, but our analysis did not support this belief. In effect, coal tends to be attracted to areas of coal production. This seems nonsensical until we remember that low sulfur coal is shipped to high sulfur coal states for mixing and reducing the overall sulfur content per unit of weight. As a result attraction of coal was also forecasted based on the forecast for total earnings from mining.

Non-metallic minerals flow production was also be related to total earnings from mining so this variable was used here as well. Recall that these minerals tend to be shipped very short distances since they are often rather ubiquitous and low in value. It stands to reason that a variable that correlated with production should also correlate with attraction. So total earnings from mining was used to forecast attractions as well.

Waste and Scrap

We might think of waste and scrap as being very much related to population and economic levels. This image is probably correct in the case of garbage, but this category is more like

industrial waste and scrap that can better be treated by other firms in the case of waste, or better used as inputs to manufacturing, e.g., scrap aluminum or steel are attractive inputs for manufacturing these metal products. As a result we have taken the growth of employment in manufacturing as an indicator of the expected growth in the production and attraction of waste and scrap.

Flow Forecasts

Each of the 145 geographic units in this study had their traffic productions and attractions estimated as described above for each of the 15 manufactured commodity groups, for the four resource oriented products, and waste and scrap for each of the target years (2005 and 2015). Mail and express mail were not discussed above since they were developed as a function of population. Therefore growth in population was used to forecast growth in these flow productions and attractions. The resulting values from all of these efforts were inserted in the gravity model in place of the production and attraction values of 1993. As noted above, it is assumed that the parameters of the model and the beta value would remain constant into the future. In effect, the forecasts of future flows are accomplished using models of current flows with forecasted inputs.

For the 2005 and 2015 forecasted flows, the average shipping distance nationally or for Indiana may be more or less than it was at the time of the base study (1993), i.e., there are no constraints placed on these "commodity specific" values. This is as it should be.

Given the distributed flow forecasts the next question is how should these flows be split between specific modes of transport and then how would these flows be assigned to the transport networks of interest. For the modal split analysis use is made of NEWMODE, the computer program that examines the length of shipment and the commodity to determine the modes to which the forecasted flow should be assigned. Following this assignment, one must assign the traffic to specific links of the networks identified. At this point one would make use of the same traffic assignment technique used during the allocation of the 1993 traffic to the network. This is exactly what has been done here and the cartographic results for road and rail for both target years appear in this chapter. Included are maps for six types of flows: manufactured goods, farm products, coal, primary metal products, petroleum and coal products, and total flows. Maps have been prepared for both rail and highway flows, for both target dates of 2005 and 2015, resulting in 24 maps that appear in this chapter (Figures 5.1 through 5.24).

Examination of the forecasted assigned flows indicates that by and large there is exceptional stability in the maps. This is in part misleading because the assigned flows tend to follow the same routes in the future and the traffic increases observed are often not that large. When the increases are significant the band-width adjusts to this as well.

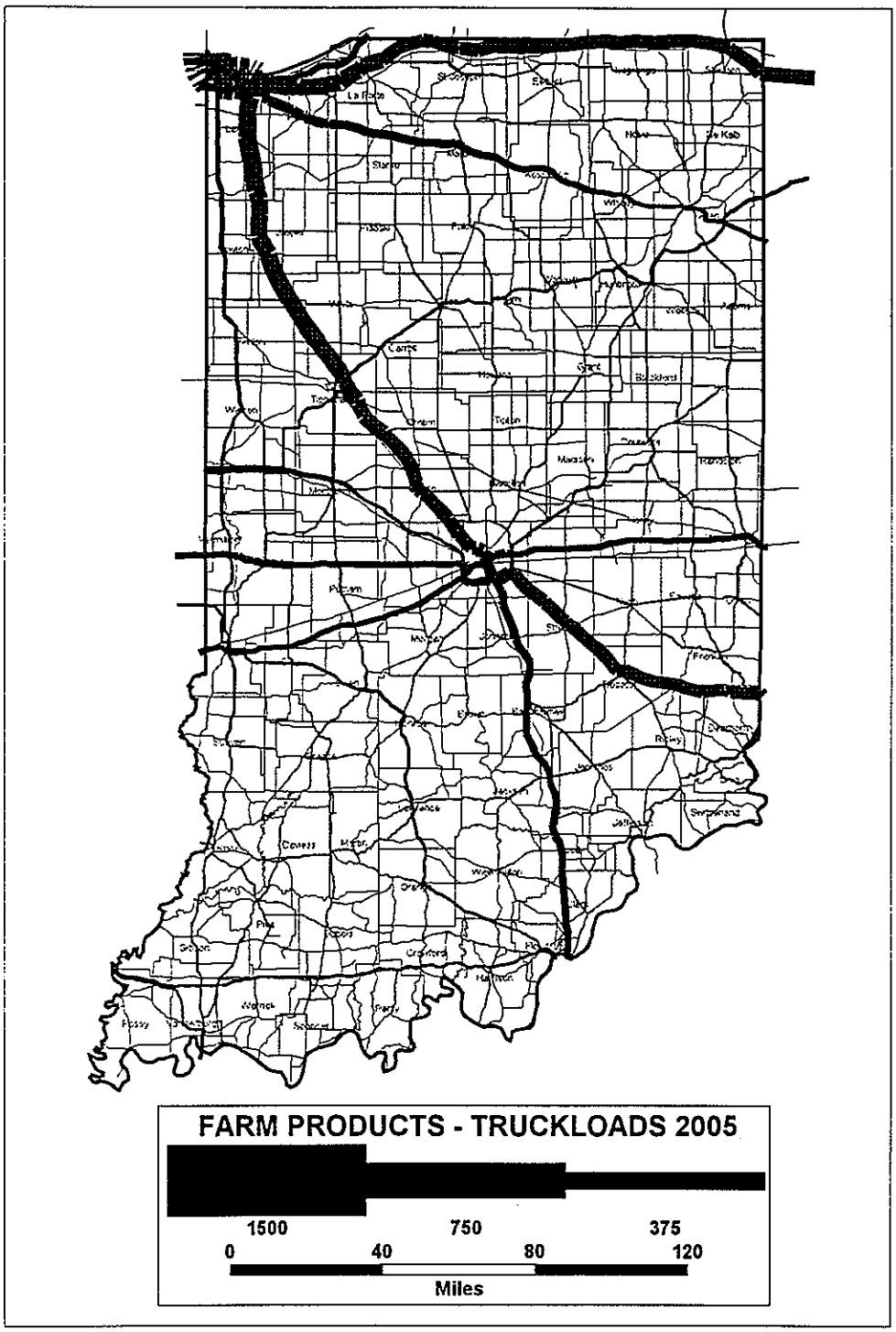

Figure 5.1 Daily Motor Carrier Volumes - Farm Products 2005 Forecast

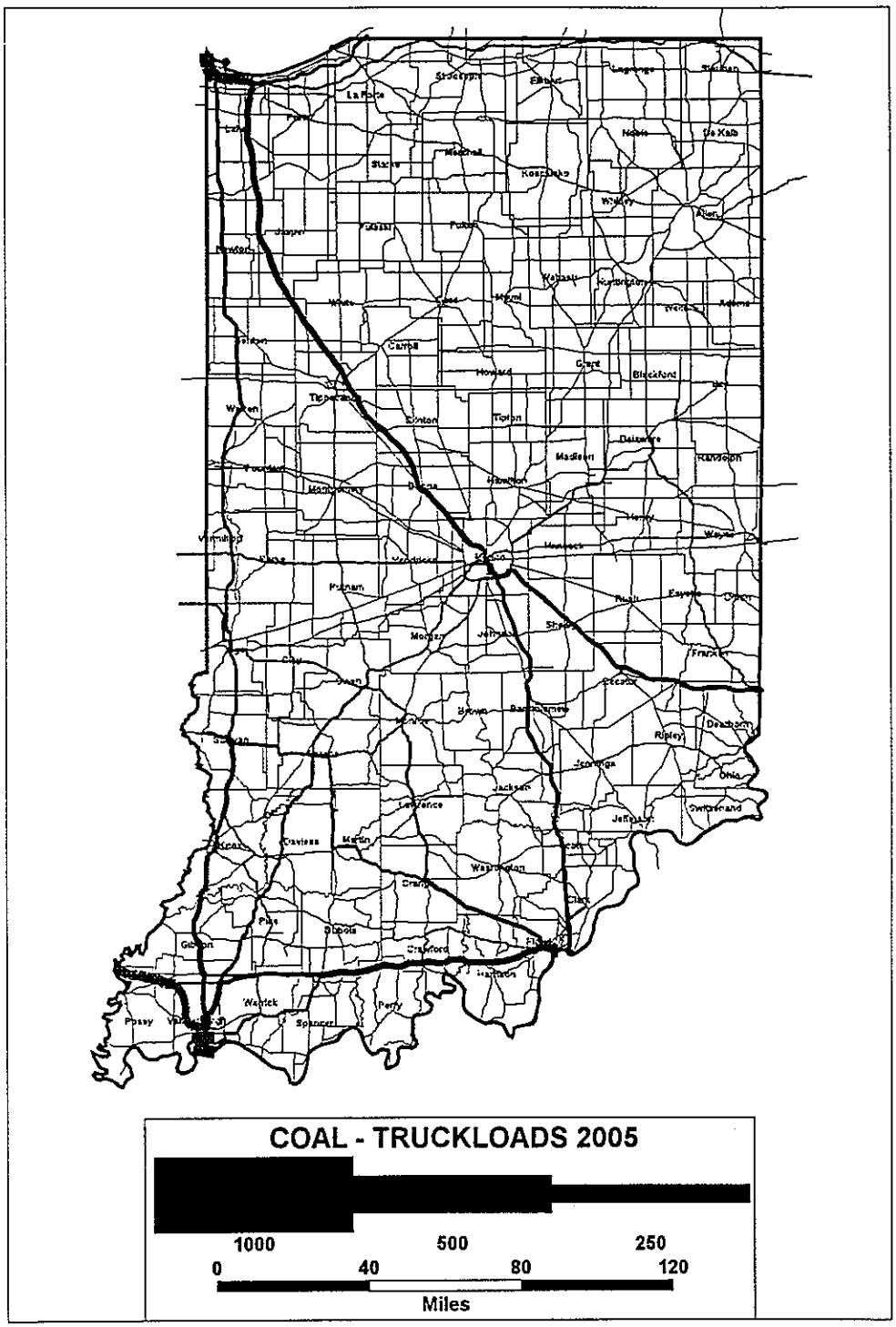

Figure 5.2 Daily Motor Carrier Volumes - Coal 2005 Forecast

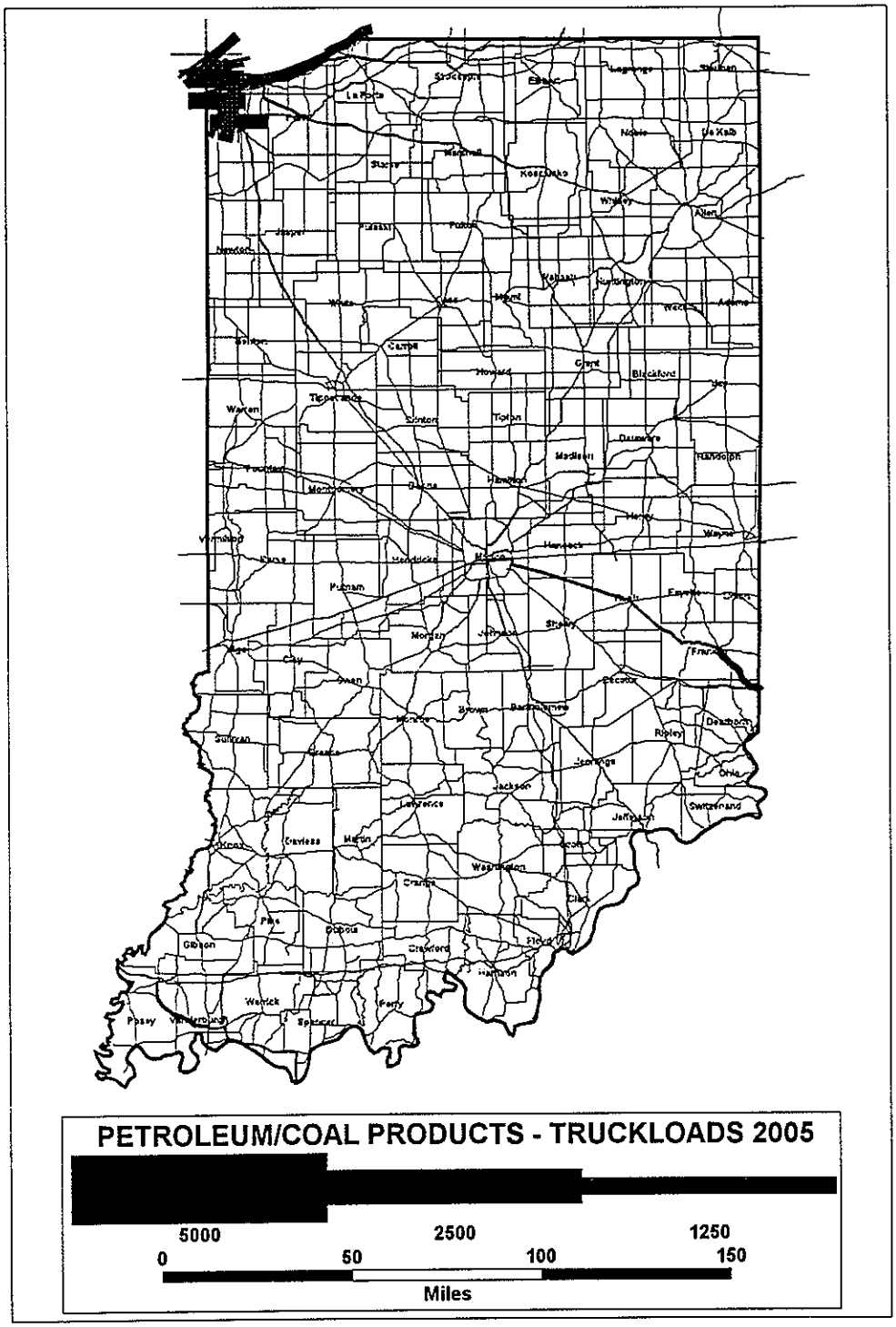

Figure 5.3 Daily Motor Carrier Volumes - Petroleum and Coal Products 2005 Forecast

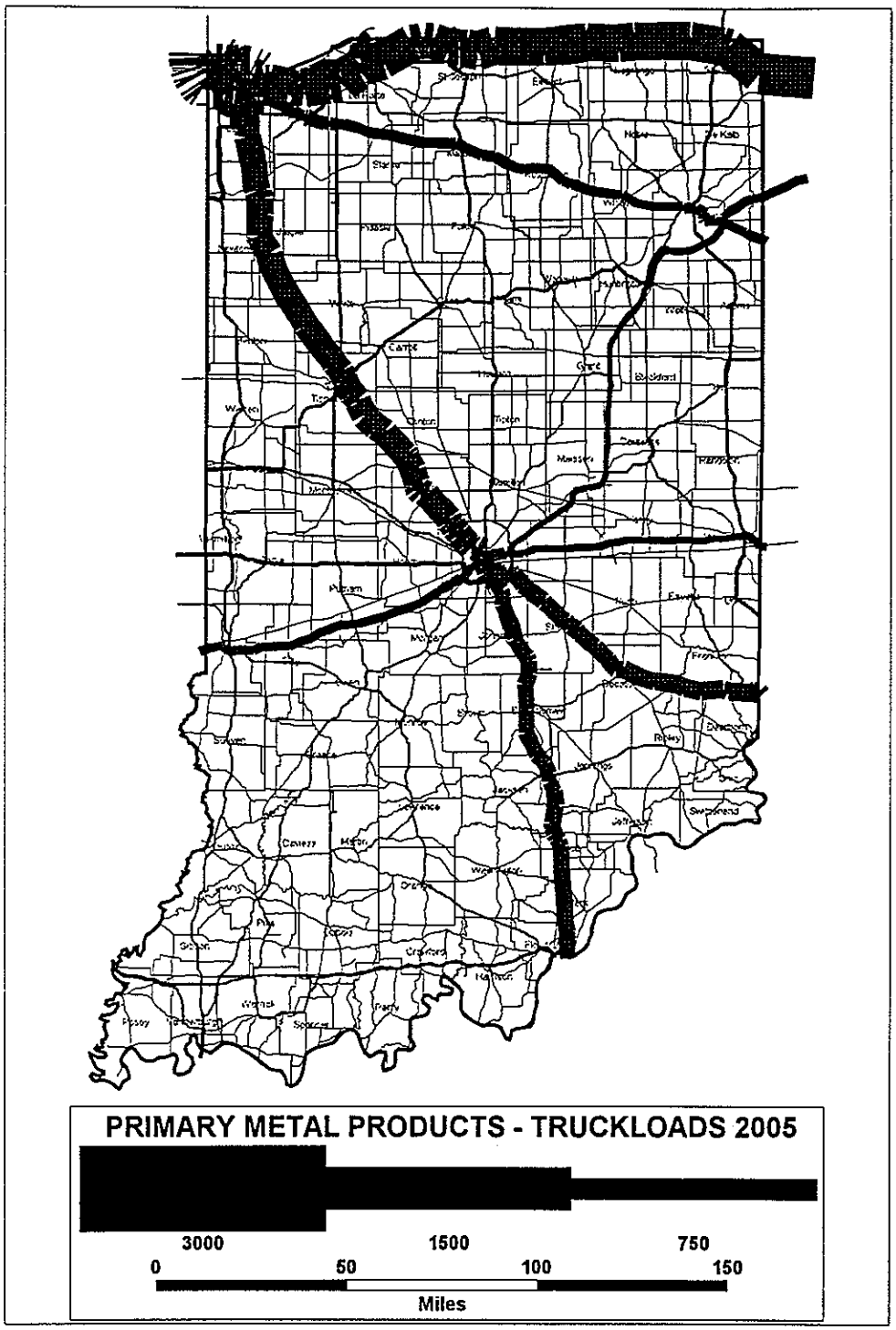

Figure 5.4 Daily Motor Carrier Volumes - Primary Metal Products 2005 Forecast

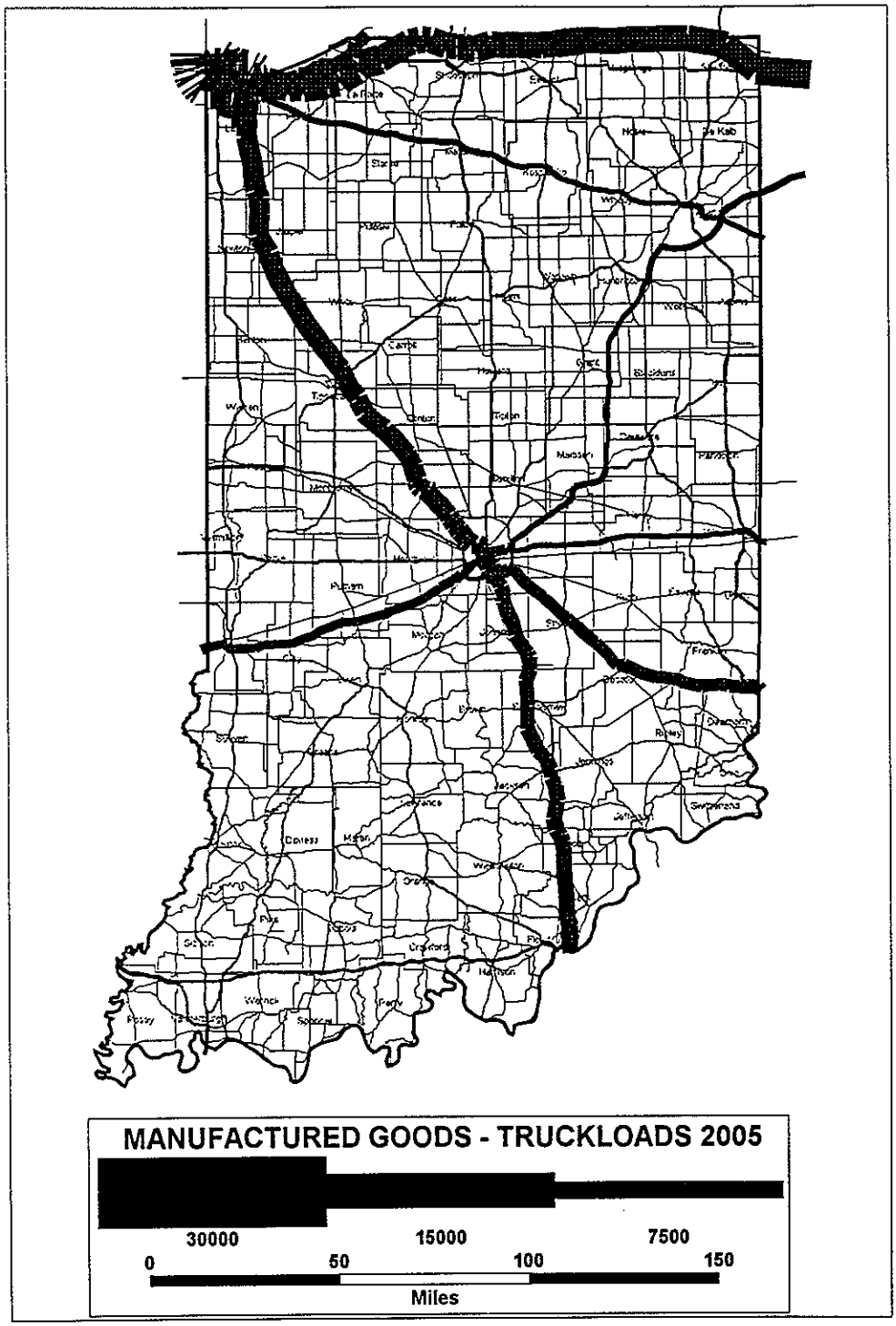

Figure 5.5 Daily Motor Carrier Volumes - Manufactured Goods 2005 Forecast

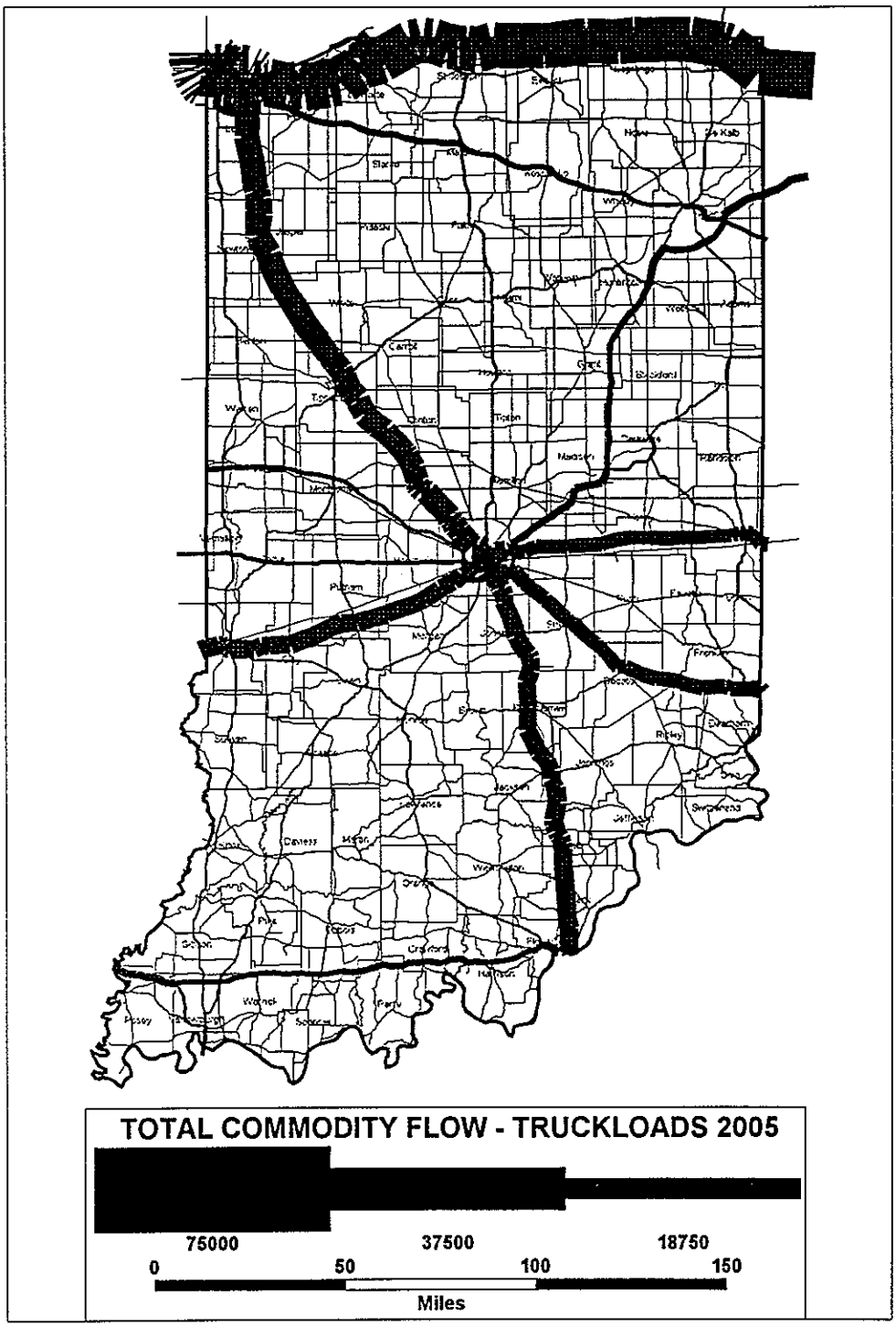

Figure 5.6 Daily Motor Carrier Volumes - Total Traffic 2005 Forecast

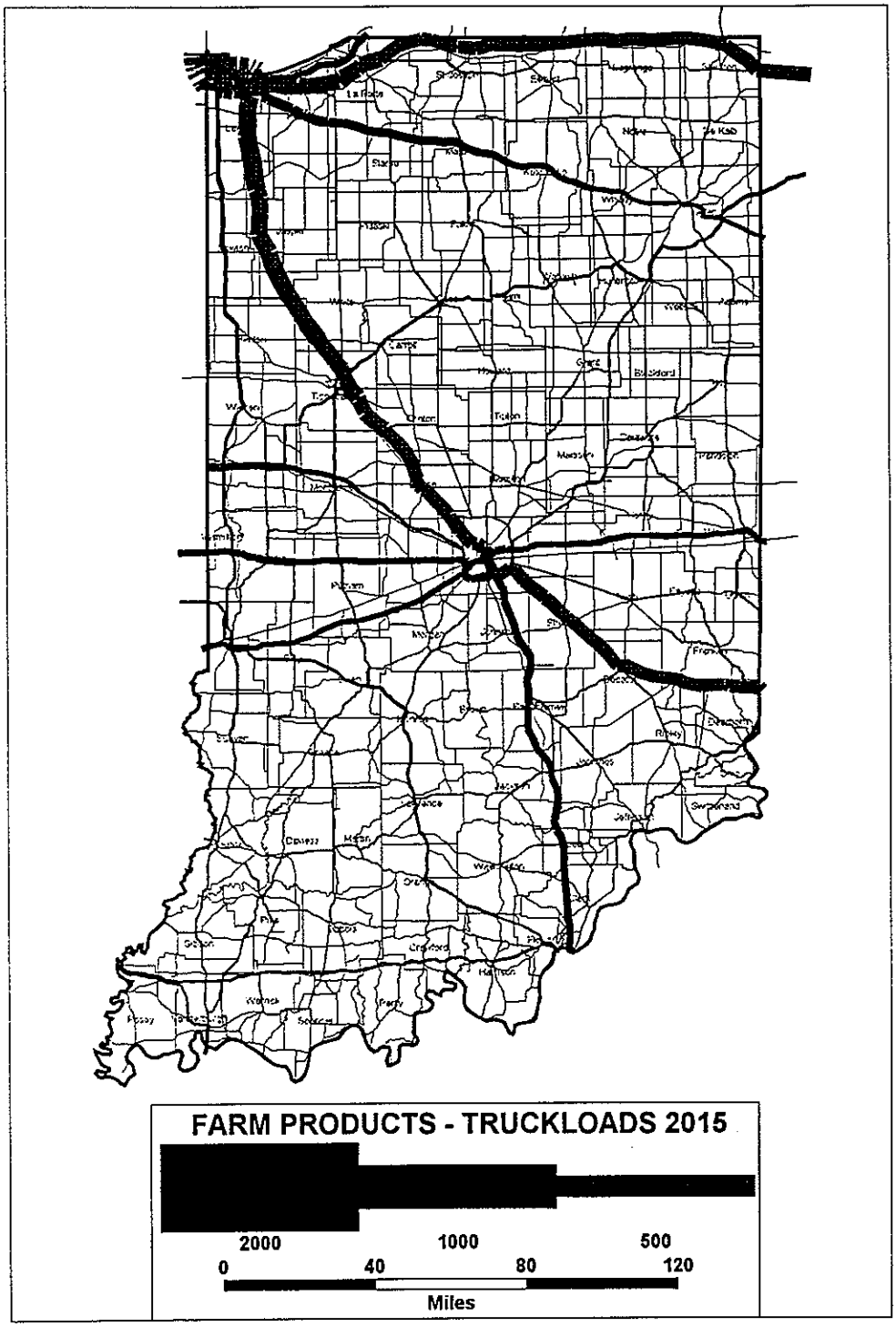

Figure 5.7 Daily Motor Carrier Volumes - Farm Products 2015 Forecast

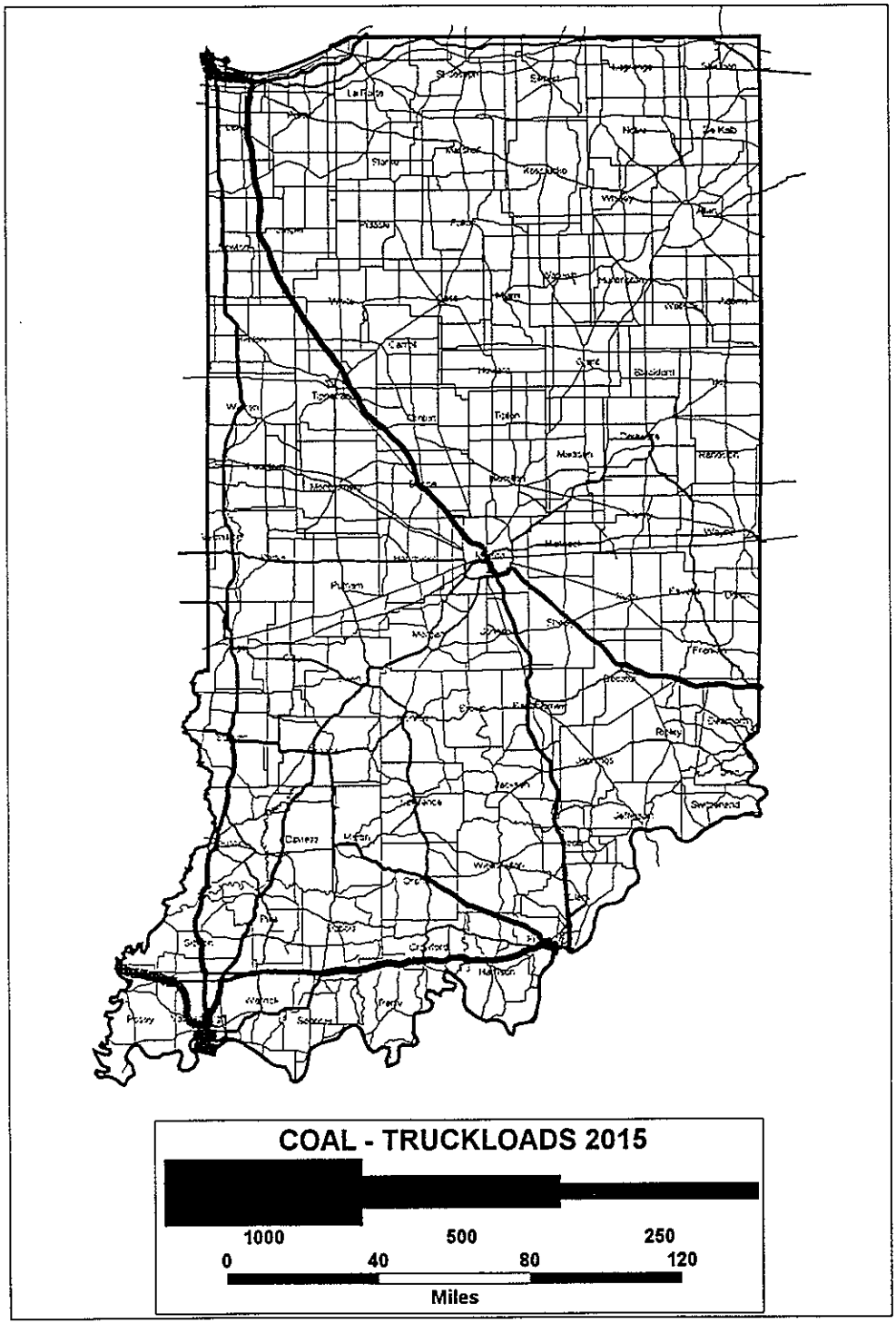

Figure 5.8 Daily Motor Carrier Volumes - Coal 2015 Forecast

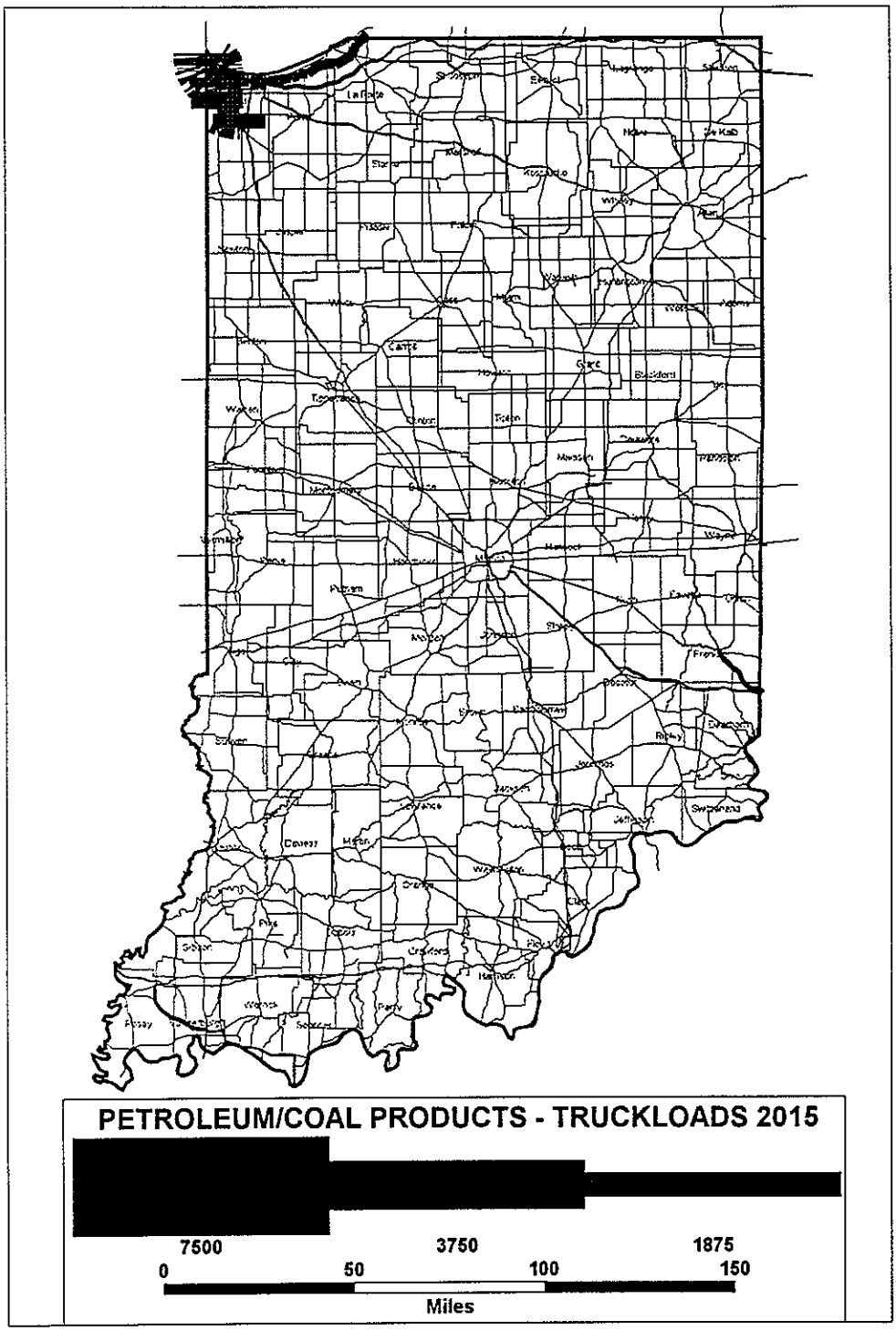

Figure 5.9 Daily Motor Carrier Volumes - Petroleum and Coal Products 2015 Forecast

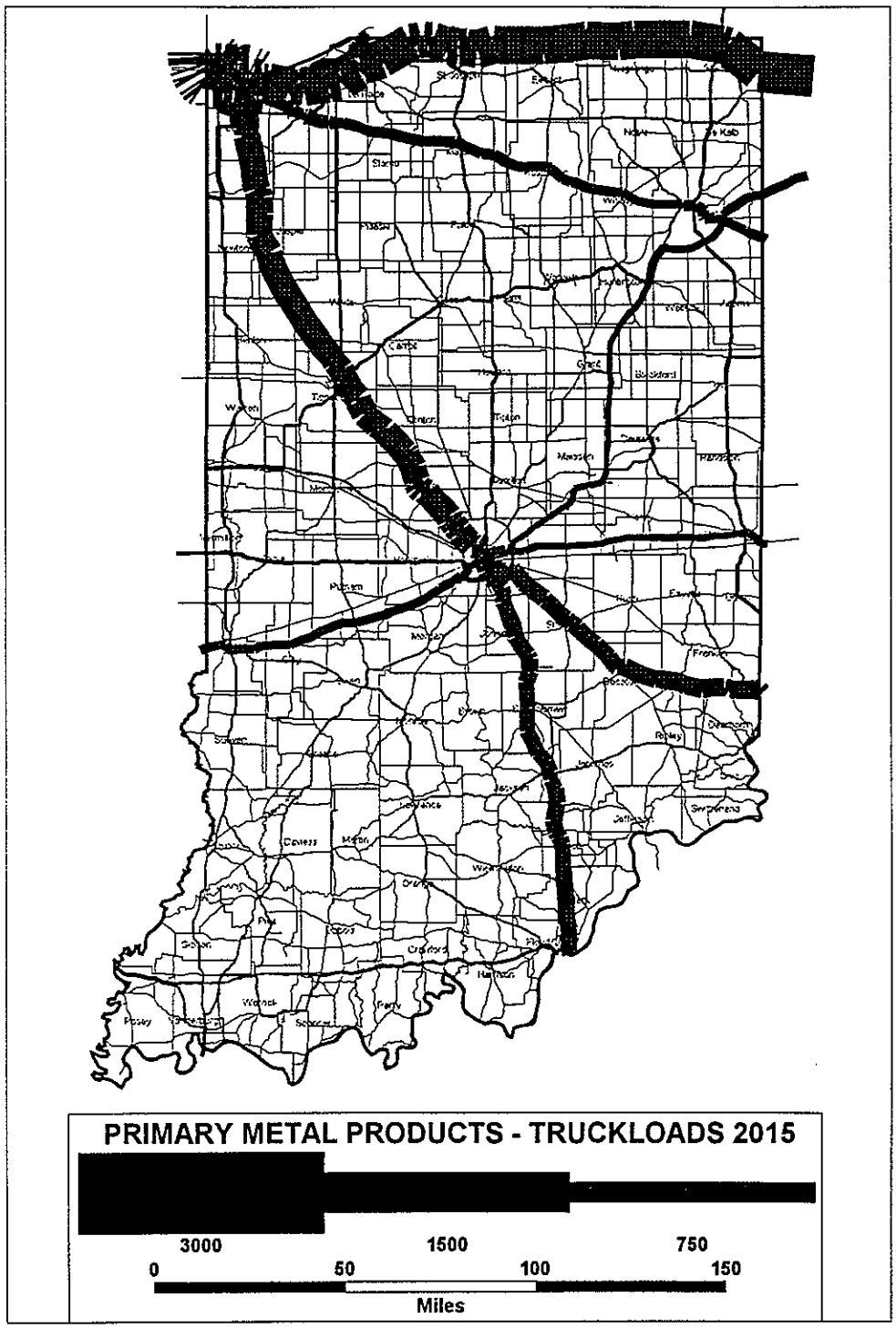

Figure 5.10 Daily Motor Carrier Volumes - Primary Metal Products 2015 Forecast

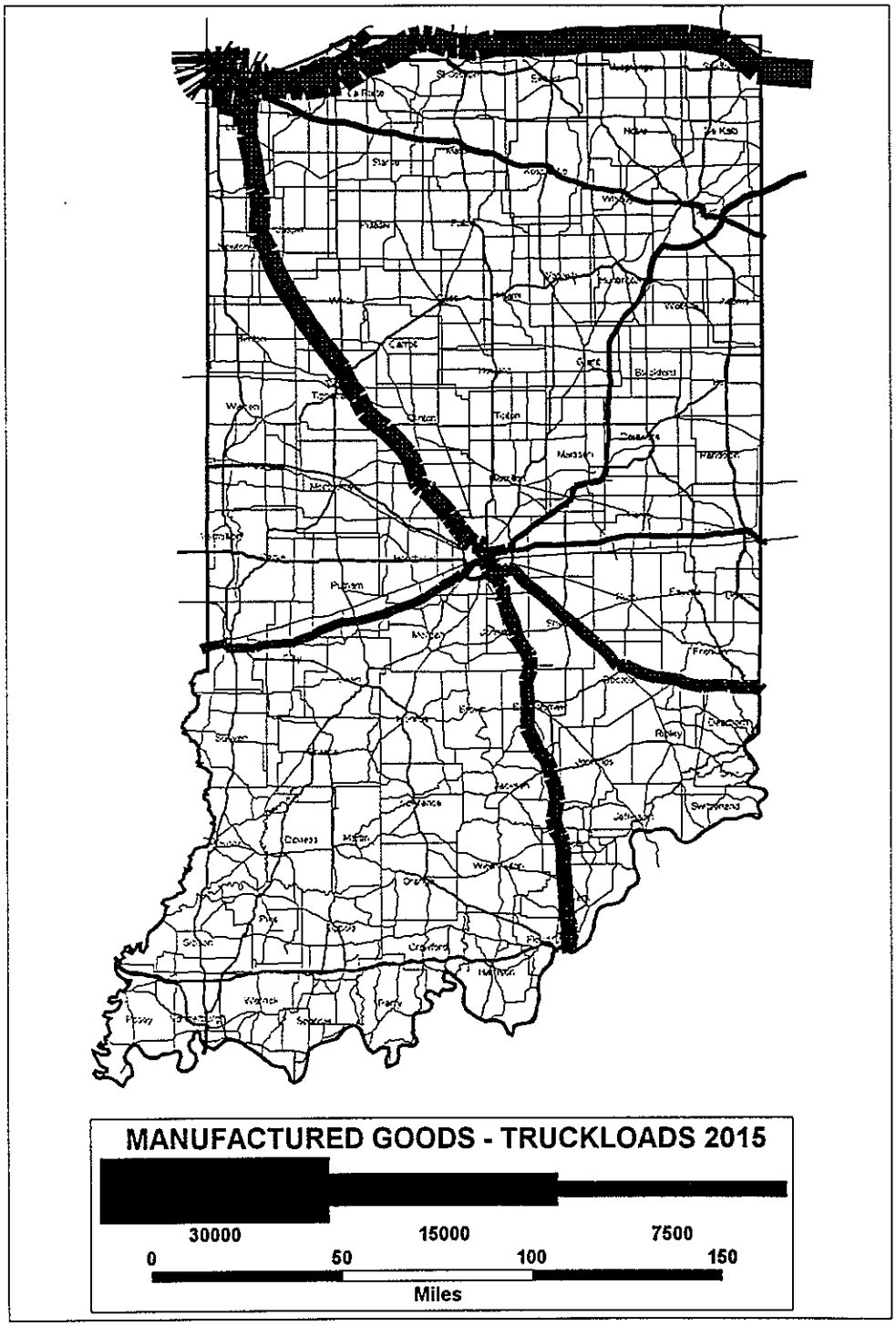

Figure 5.11 Daily Motor Carrier Volumes - Manufactured Goods 2015 Forecast

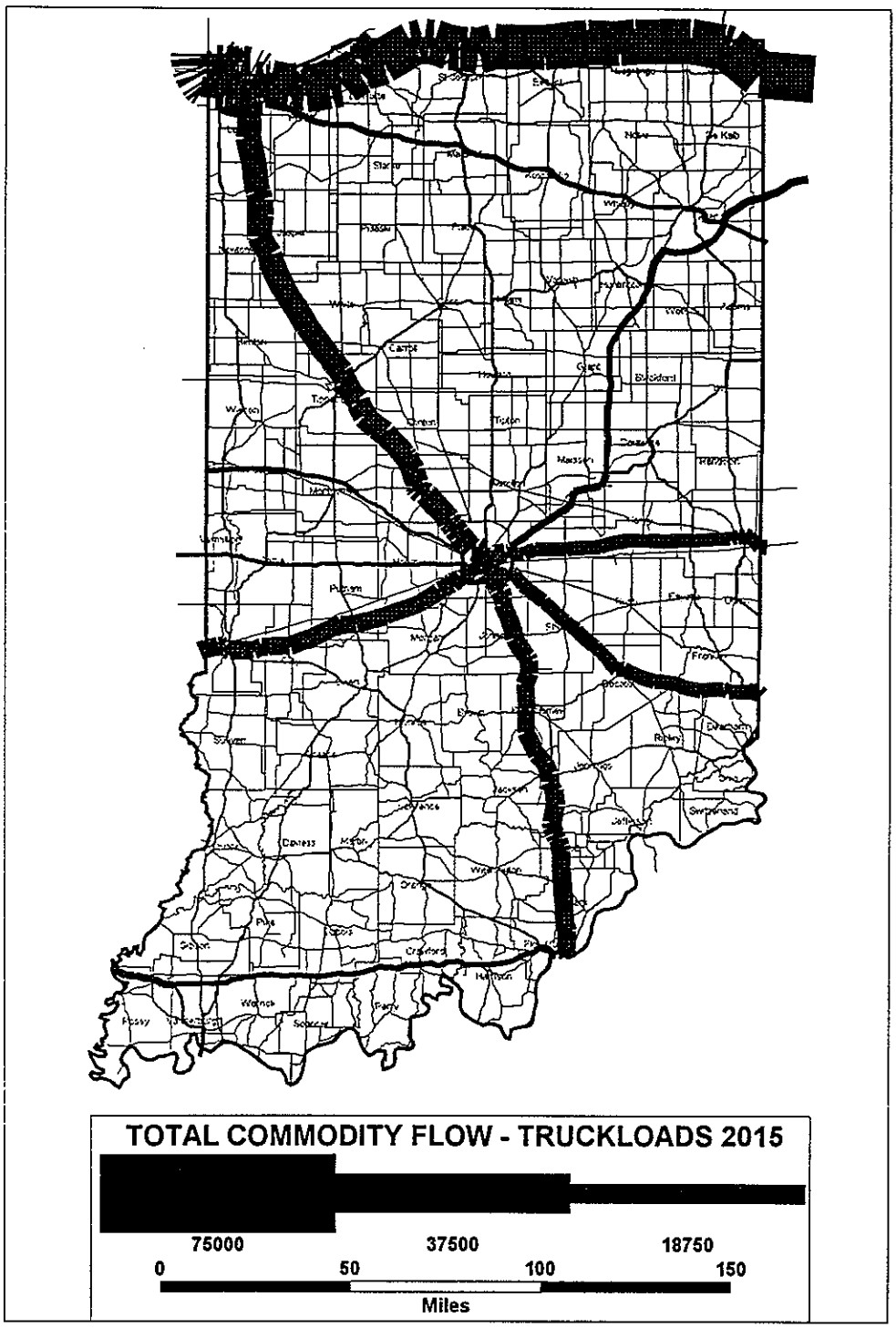

Figure 5.12 Daily Motor Carrier Volumes - Total Traffic 2015 Forecast

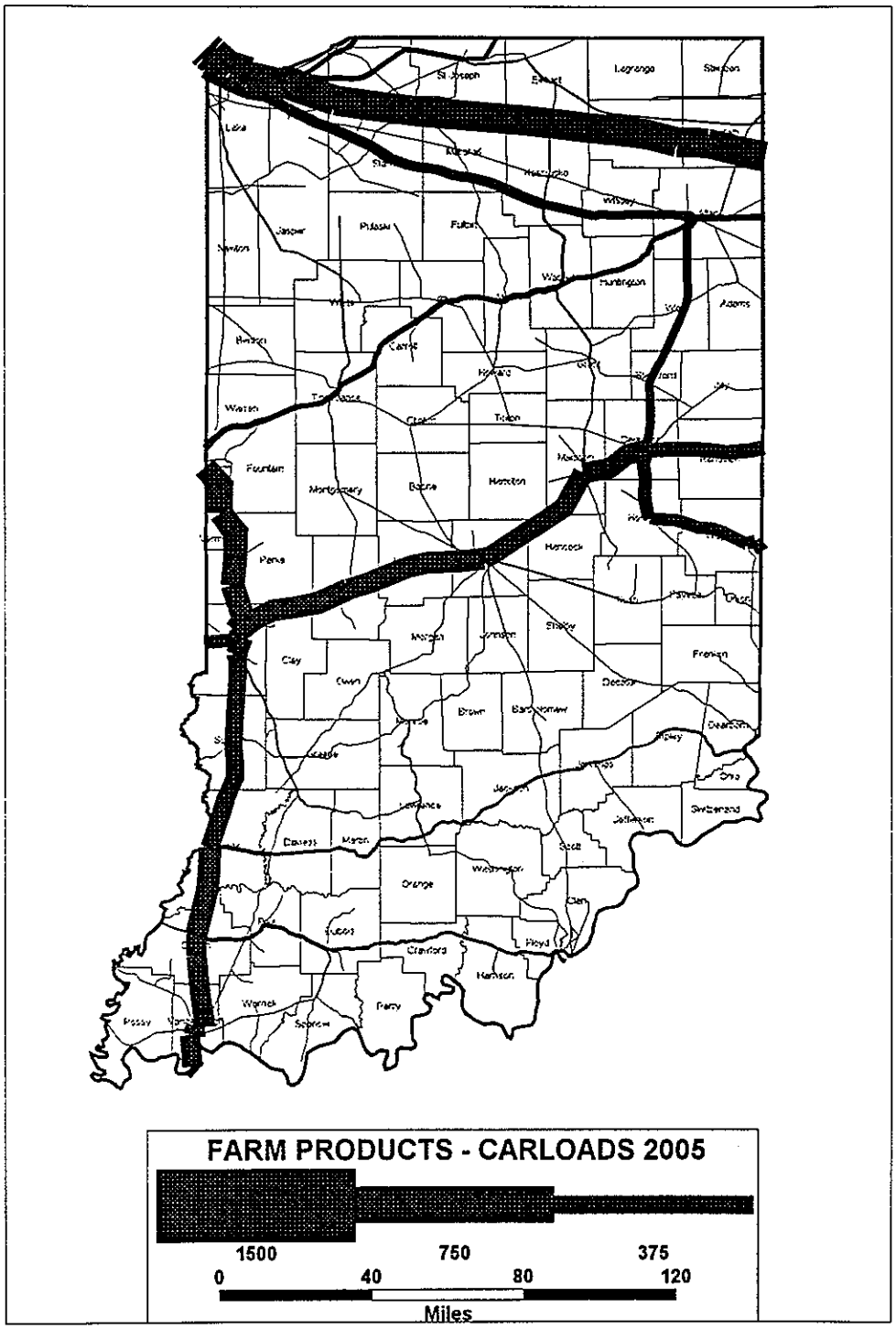

Figure 5.13 Daily Railroad Carloads - Farm Products 2005 Forecast

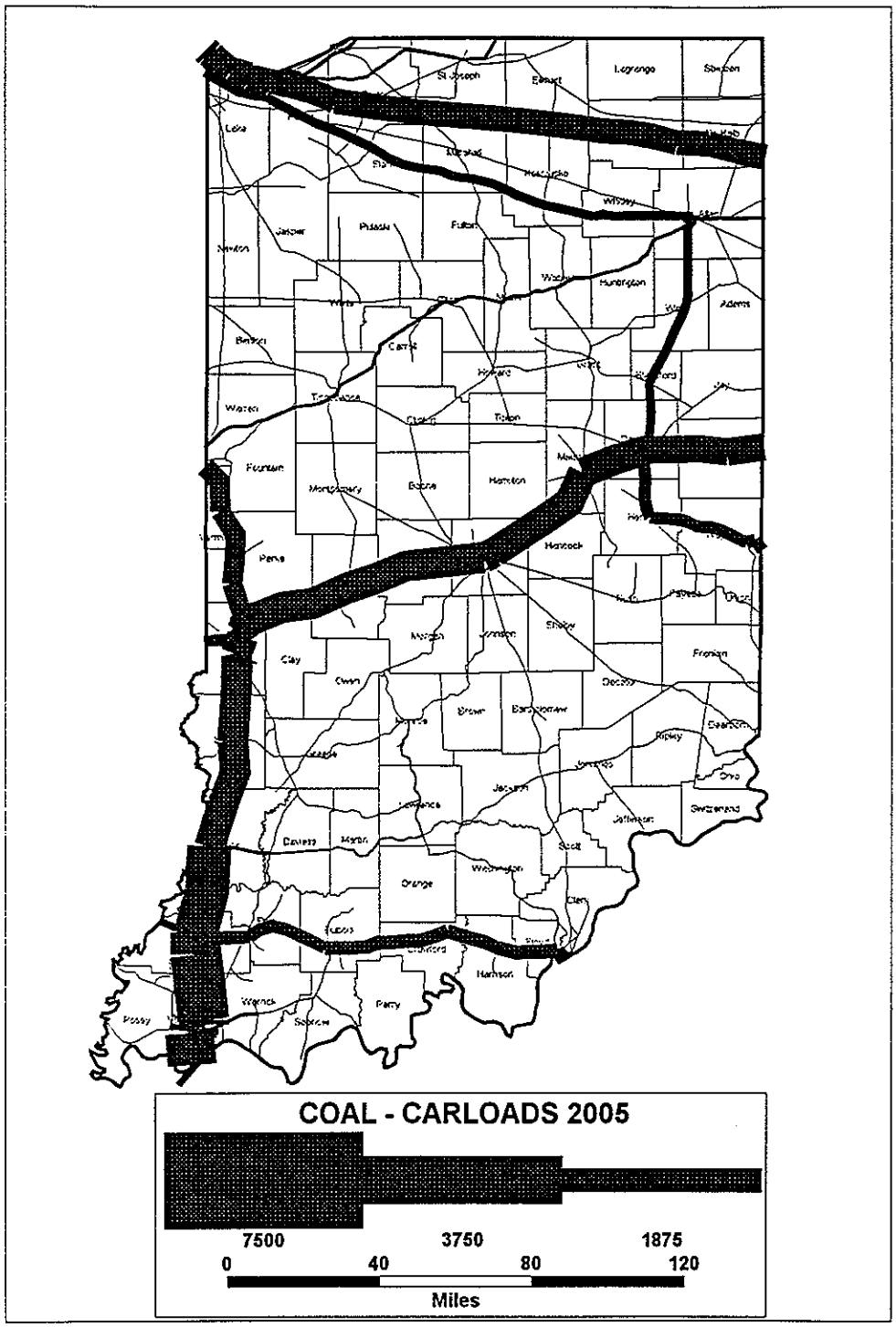

Figure 5.14 Daily Railroad Carloads - Coal 2005 Forecast

Figure 5.15 Daily Railroad Carloads - Petroleum and Coal Products 2005 Forecast

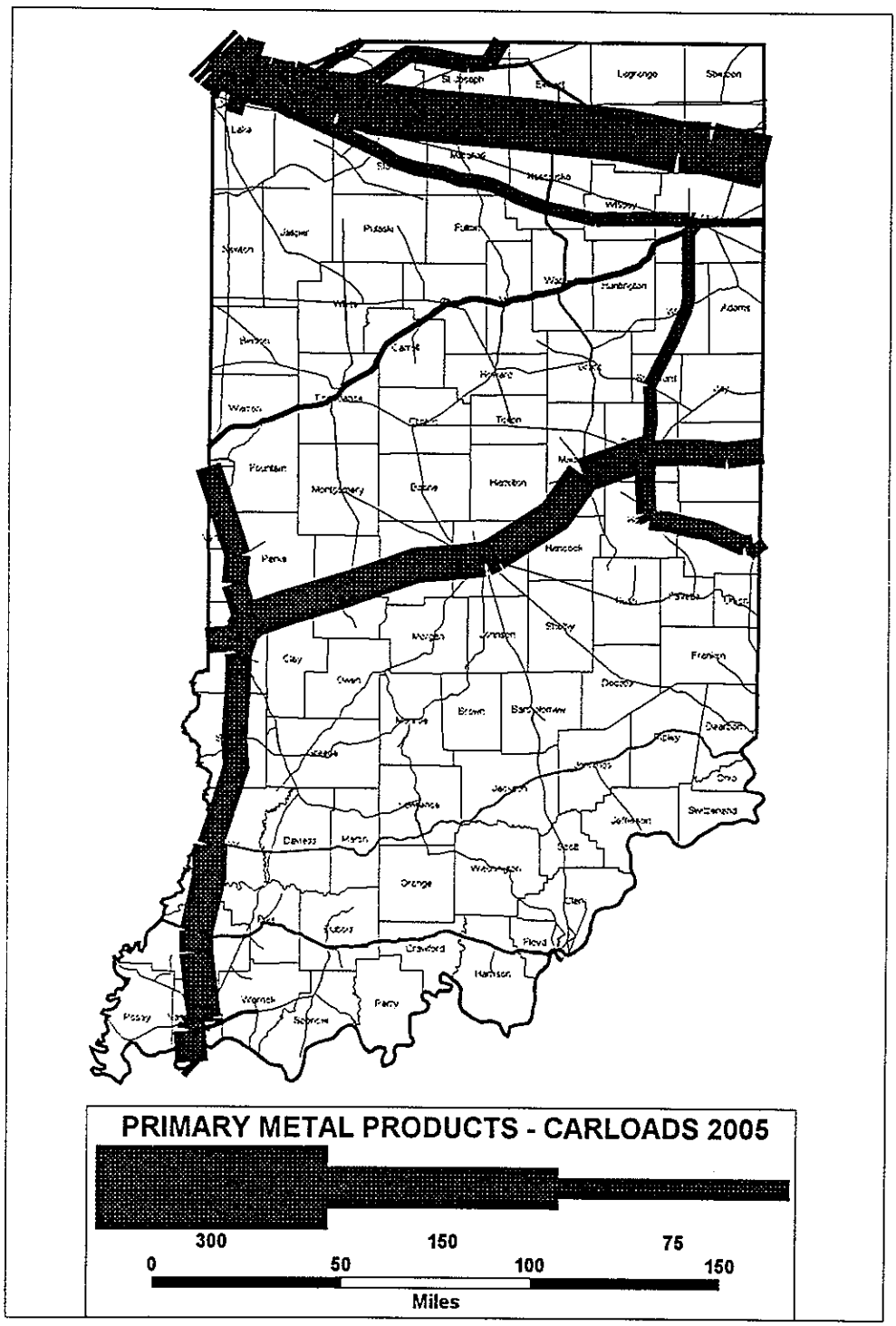

Figure 5.16 Daily Railroad Carloads - Primary Metal Products 2005 Forecast

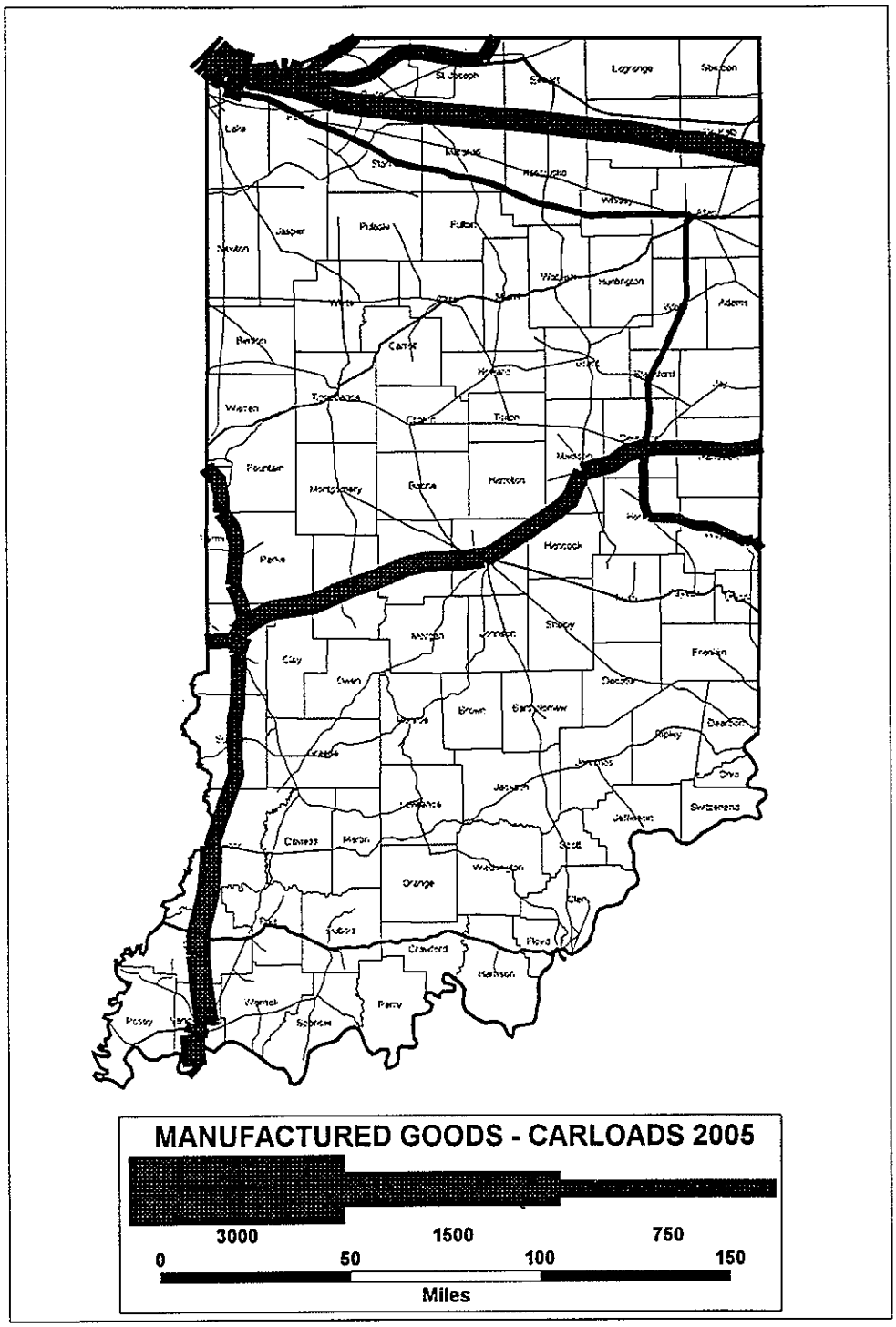

Figure 5.17 Daily Railroad Carloads - Manufactured Goods 2005 Forecast

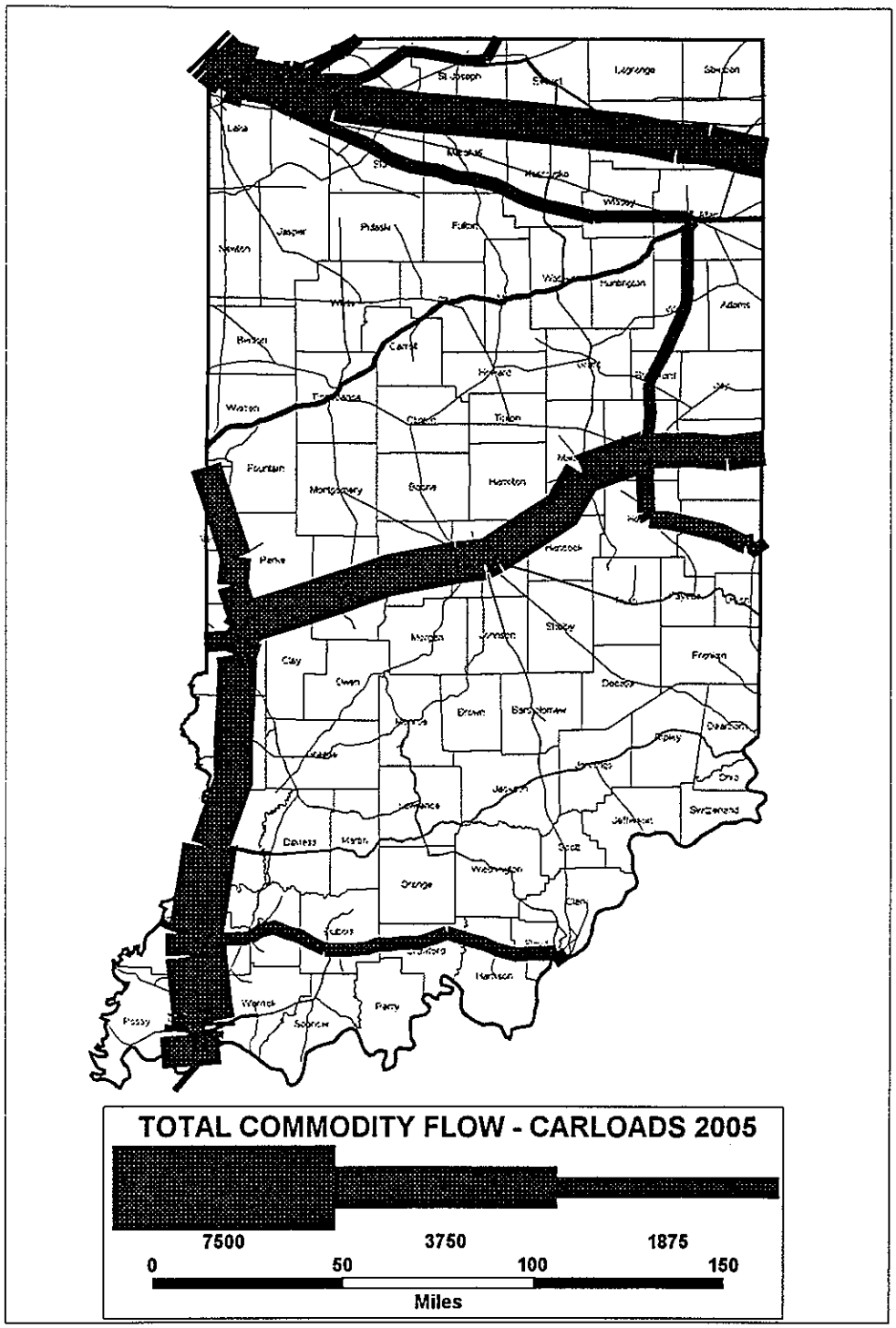

Figure 5.18 Total Daily Rail Traffic (Carloads) 2005 Forecast

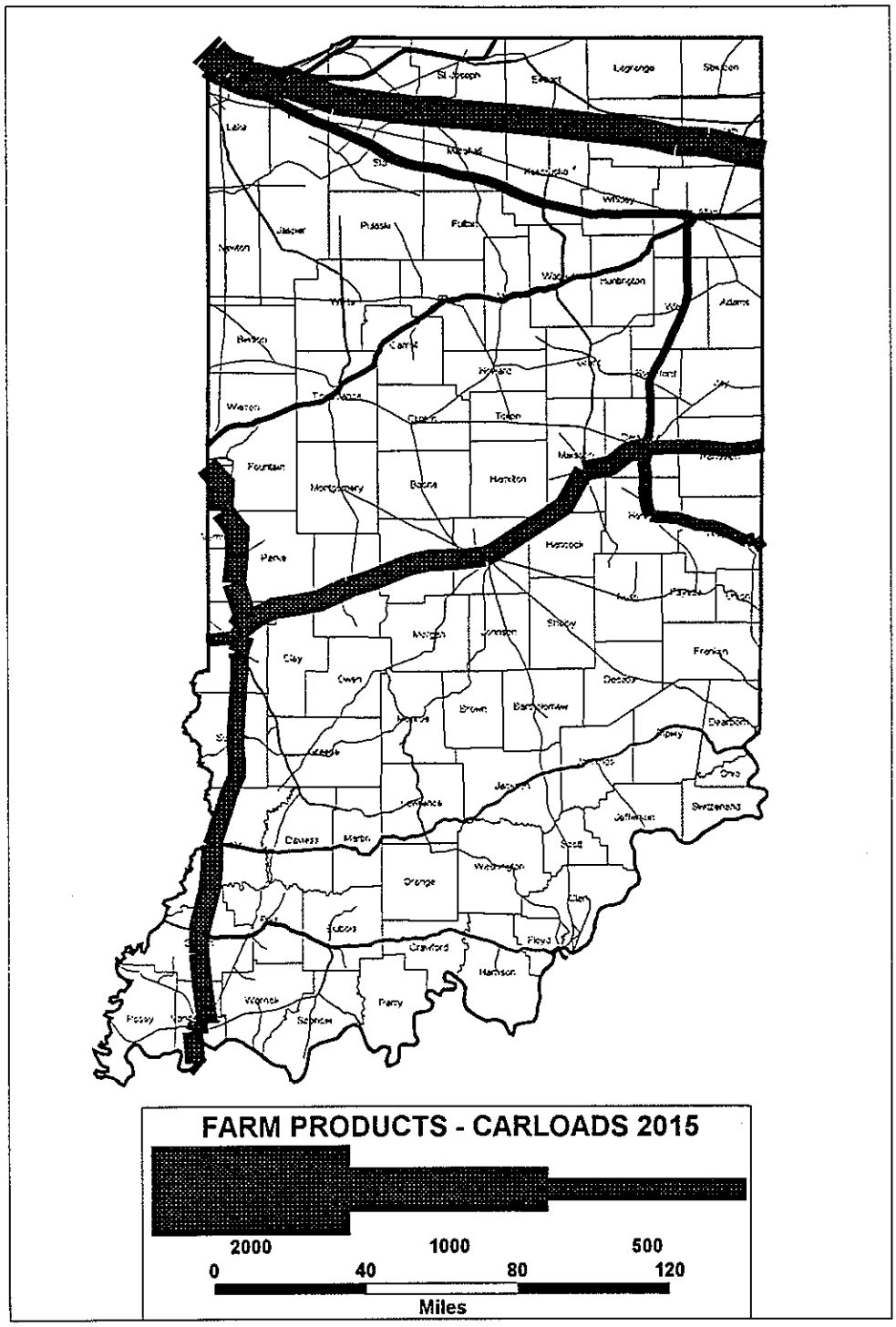

Figure 5.19 Daily Railroad Carloads - Farm Products 2015 Forecast

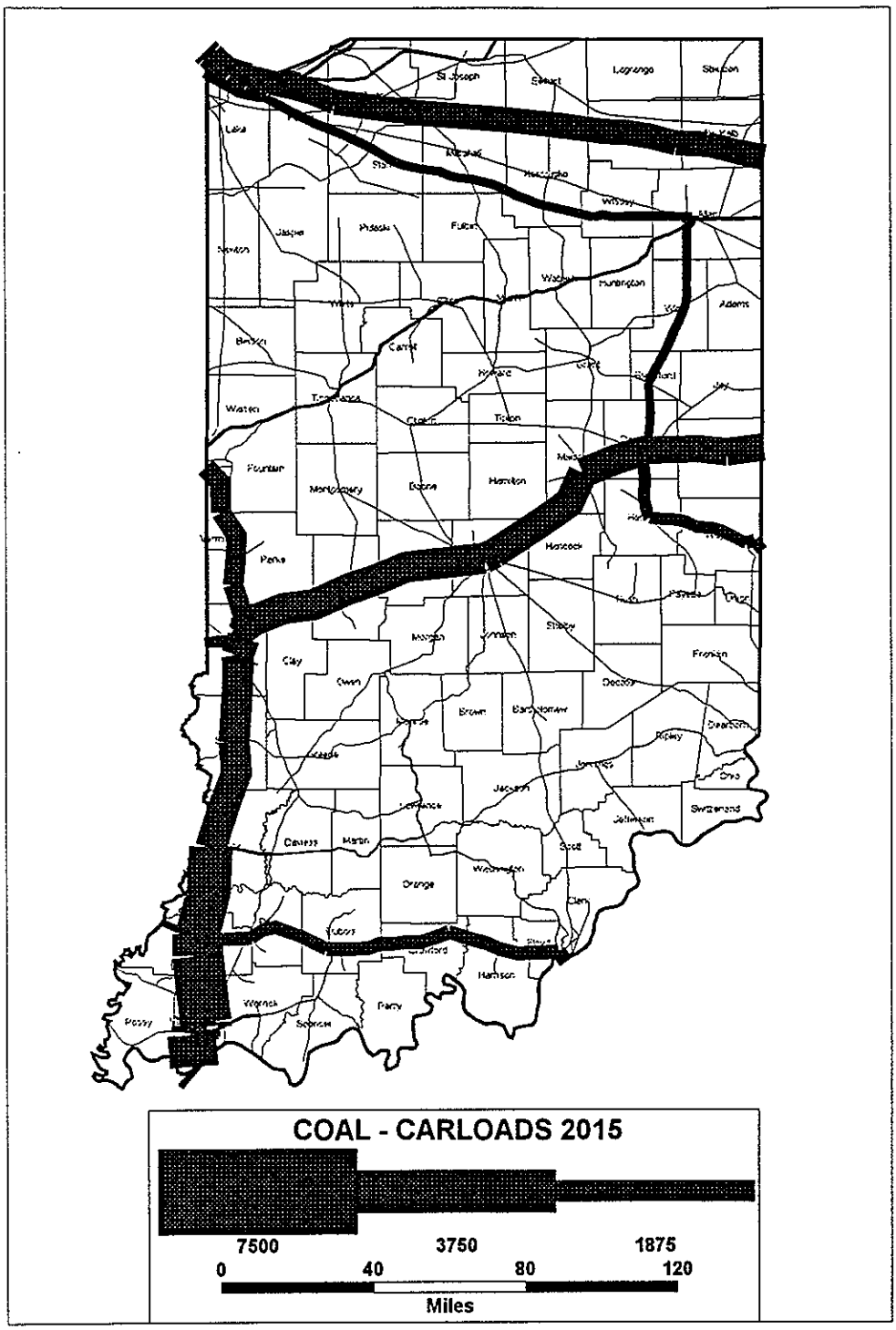

Figure 5.20 Daily Railroad Carloads - Coal 2015 Forecast

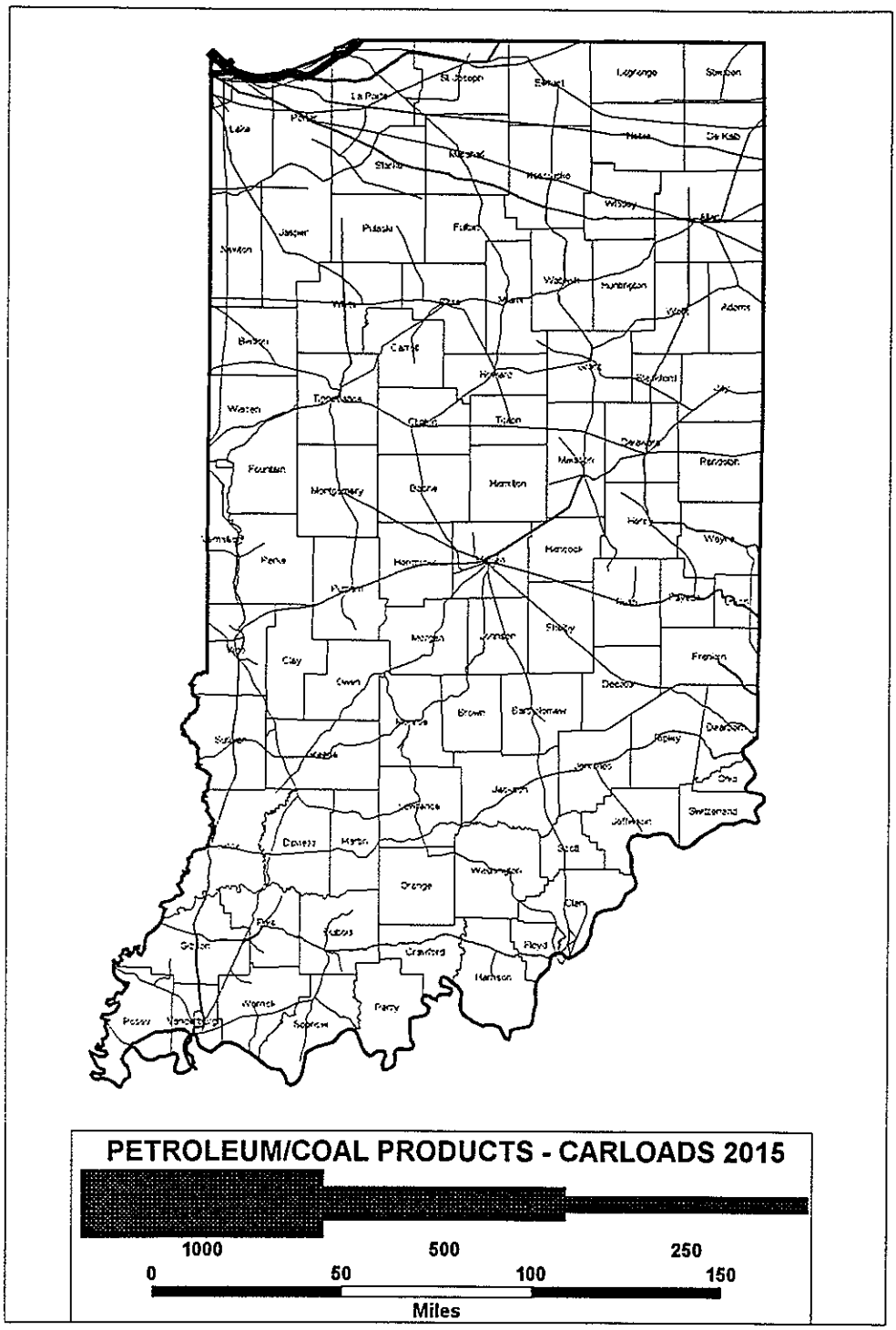

Figure 5.21 Daily Railroad Carloads - Petroleum and Coal Products 2015 Forecast

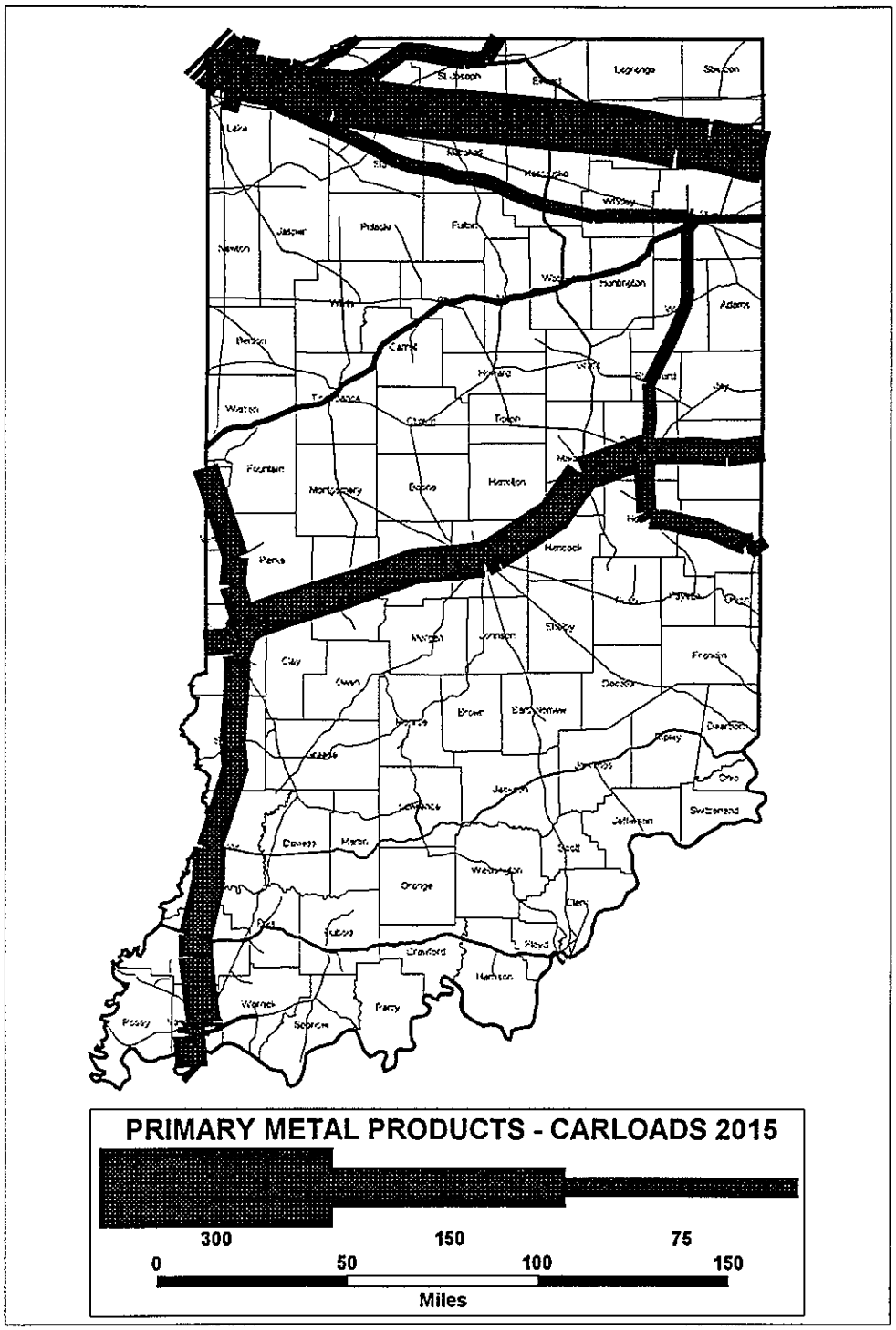

Figure 5.22 Daily Railroad Carloads - Primary Metal Products 2015 Forecast

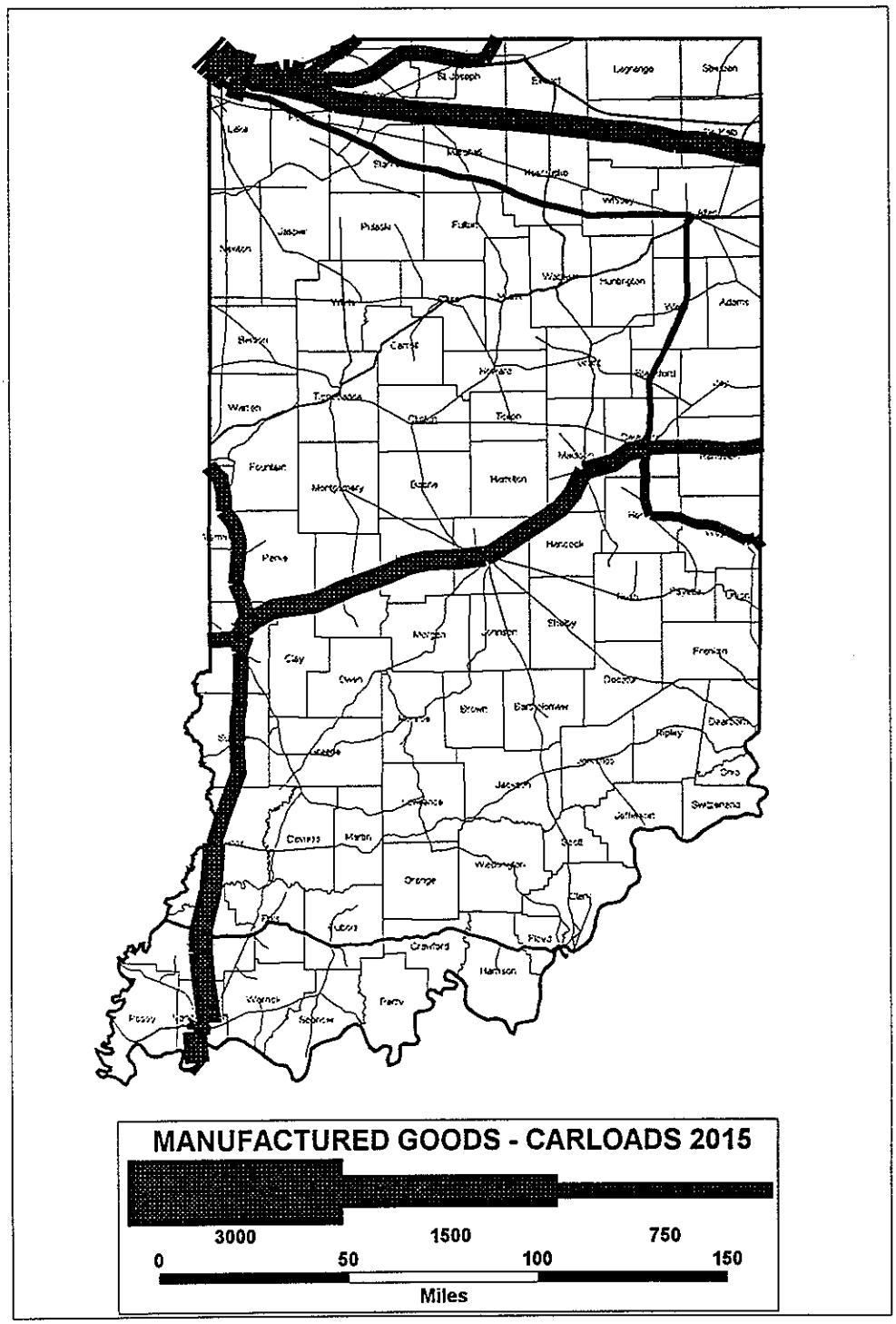

Figure 5.23 Daily Railroad Carloads - Manufactured Goods 2015 Forecast

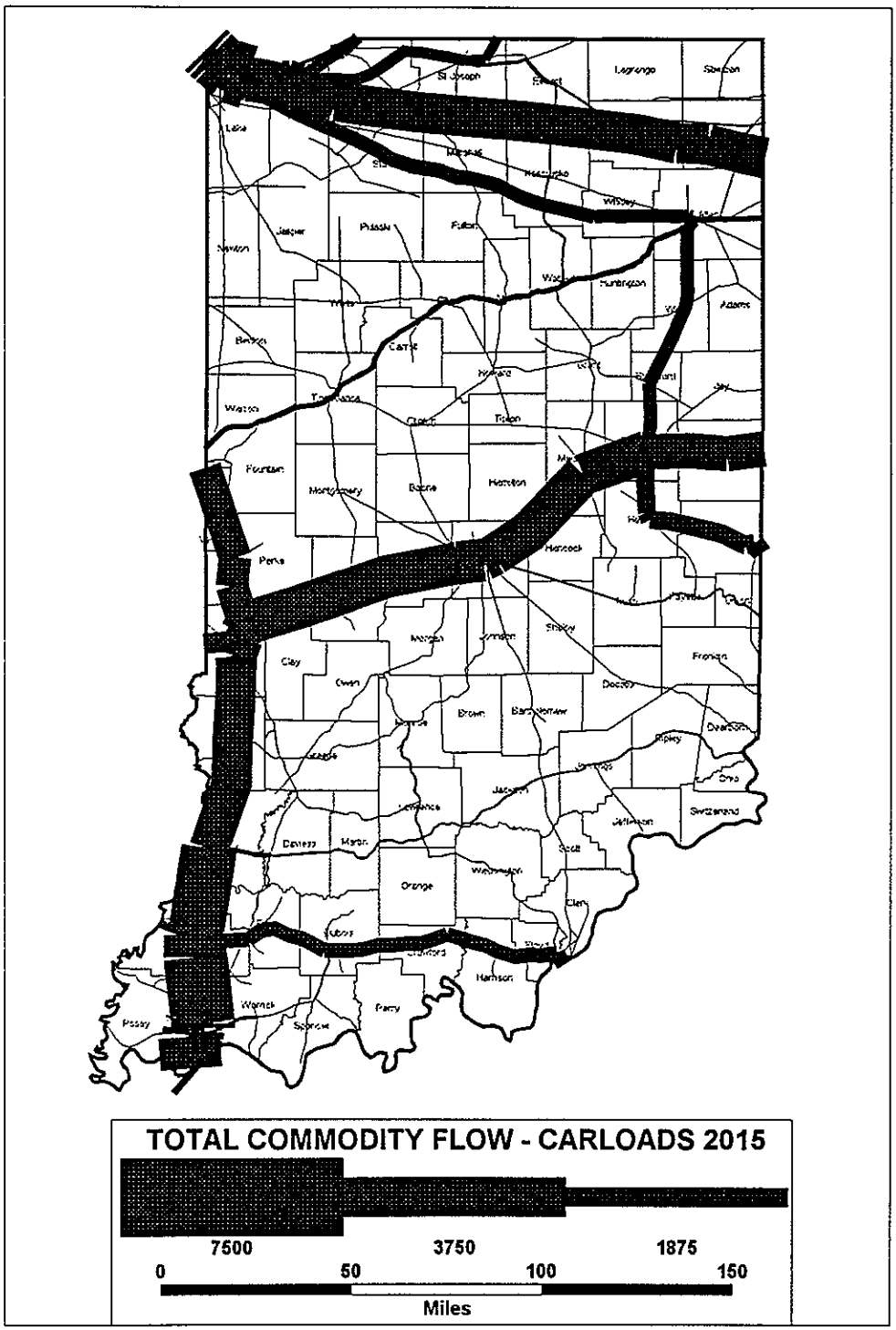

Figure 5.24 Total Daily Rail Traffic (Carloads) 2015 Forecast

Concluding Thoughts

Tables of the forecasted productions and attractions (in tons) for Indiana counties appear in an appendix of this report. Appendix D lists the existing and forecasted link and network specific flow files supplied to the State in digital form. These flows are in terms of motor carriers or rail cars. These are actually unnecessary since the State's planners can use the inputs used here, their digital network, the costing methods, and the same traffic assignment procedure used here and get the same results. In addition to vehicular forecasts of traffic to be produced and attracted, one can derive tonnage forecasts using the traffic density factors included here as multipliers on the vehicles (motor carriers or rail cars) to get tonnages. The tonnages in turn can be expanded by the value per ton figures here to obtain dollars of traffic produced or attracted by mode and commodity.

There is a temptation to evaluate the flow forecasts. It should be obvious that this is not possible until the forecast target dates have been reached (2005 or 2015) and data have been collected for those future points in time. One's acceptance of the forecasts should be influenced by the quality of the methods used in the analysis of the 1993 flows and the accuracy of the methods in replicating existing conditions. It has been demonstrated that the methods used here appear to be quite accurate.

One may question the assumptions of the modeling process undertaken here. Are the fully constrained gravity model's parameters stable into the future? Will commodity density values remain constant into the future and will the transport modes and factors that determine their use be the same in 2005 or 2015? We don't know the answers to these questions. It is believed that the analytical process followed here is about as rigorous as could have been undertaken given the resources available. It should provide answers to many of the transport policy questions the State has with regard to the flow of farm products, minerals, and manufactured commodities.

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Chapter 6

IMPLEMENTATION

This document has been prepared as a planning and analysis study. It was developed with the idea that it would be used in the analysis of actual transportation planning and policy questions. It is for this reason that the project has generated more than 130 data files. These files are intended for use in the analysis of the economic and planning questions. It may not be immediately apparent how the implementation of the research findings here should occur. It is the purpose of the present chapter to make this explicit.

Use of Results for Economic Analysis

The appendices of this report include several project-generated databases that should be useful to organizations interested in the flow of goods into, through, and out of the counties and urban areas governed by metropolitan planning organizations (MPOs) of Indiana. Naturally, these appendices contain data of interest to Indiana state government in its analysis of economic problems as well. The data presented here will enable an Indiana county, or MPO, or the State, to evaluate its exports (productions) and imports (attractions) for any one or all of 19 different commodity groupings. These 19 groups include more than 93% of the value or tonnage of these goods for the state. This should be useful in answering questions about potential economic development initiatives or in examining attributes of the economic base for the areas of interest. These production and attraction tables are in tons, but they can easily be converted to dollars by multiplying the tons by the national values of Table 4.5, or by using comparable Indiana values on the following page. Indiana values were not used in this study since shipments that terminate in Indiana are often valued at the origin. For economic analysis it might be desirable to use the dollar valuation nationally for imports and the Indiana dollar valuation for exports (see Table 6.1).

The above analyses would indicate whether the area under examination was a net importer or exporter of the 19 groups of commodities examined here simply by subtracting the imports from the exports.

Table 6.1 Indiana Commodity Value per Ton

Commodity STCC	Value per Ton
01	$145.21
11	26.11
14	8.07
20	806.03
22	2,957.99
23	14,095.84
24	783.10
25	4,250.68
26	1,135.04
28	959.61
29	144.13
32	125.07
33	627.13
34	2,266.62
35	9,290.32
36	8,336.30
37	5,110.83
40	157.13
50	6,004.13

Comparative analyses with other areas would enable a county or MPO to make some inferences with regard to the types of industries that the local area can support. If a neighboring county has a substantial proportion of its exports in the transportation equipment area and the county of interest has better transport facilities and cheaper labor, this may suggest the direction that economic development should take. Of course there are many other problems that might be of interest that could be addressed by the use of the production and attraction tables.

Other economic questions might make use of the total flows generated by this study. The productions and attractions noted above are distributed to origins and destinations and a file is created that gives the identification number of one of the 145 origins followed by the identification number of one of the 145 destinations. These numbers are followed by the tonnage of the good being transported and (in some cases) the length of shipment. These files can be used to generate data on modes used in the shipment and as a result help to identify the economic importance of one of the modes, e.g., given the nature of the traffic, does it matter whether a county continues to have rail service?

The above discussion has obviously been couched in terms of counties or MPOs, but the same types of questions and analyses can be undertaken by agencies of state government where appropriate.

Use of Results for Transport Analysis

The transport questions that can be addressed by the findings of this study fall into two broad classes: questions related to transport planning and questions related to transport policy. There may be some planning questions at the county level that can be answered using the data of this study. There probably aren't very many of these since this study was undertaken at the county level, i.e., a county is simply a node here. There would be more problems at the multi-county or MPO level, and even more at the state level. The planning questions would require the use of the geographic information system (GIS) that has been used throughout this research, TransCAD, in part because the data are compatible with that GIS and in part because TransCAD contains numerous applications that are useful for transport planning.

Typical of the questions that could be analyzed are the corridor improvement questions of interest to MPOs. For example, the data here could be used by an MPO to evaluate the traffic impacts of constructing a bypass around an urban area. Such projects are usually undertaken to divert through traffic away from the downtown in order to lessen congestion. The flows generated here went to considerable difficulty to estimate these through flows as an element of the total flows generated.

Analysis of such a problem would involve assigning the traffic to a transport network similar to the state network used here. The flows external to the MPO could be consolidated at

stations surrounding the region of interest. One would have to digitize the "bypass link" as part of the network, and give it attribute data such as travel time, speed limits, and length (if this is not automatically calculated by the GIS). This would be followed by possible modifications of the former central route and a reassignment of the traffic to the new network. This would give a fairly good idea of the traffic that would be diverted by the construction of the bypass route. It would not completely answer the question of traffic volume changes between the two routes because we have not included local (intracounty) traffic in this analysis. That is, an individual supplier might go from a plant in one part of the county to a plant in another part of the county, never leaving the county. These are simply intracounty flows and their origins and destinations within the county are unknown. In addition, we have also not included any flows of a personal nature. These are being developed by a different study.

Utilizing exactly the same general approach state transportation planners could undertake an analysis of the traffic reduction or speed improvements resulting from the construction of a new highway or improving an existing highway between two cities in the state. Local traffic is not of much interest in such situations and there is interest in whether the new facility would move the traffic better. One would have to follow the aforementioned steps of digitizing in the new route, coding its attributes, and assigning and reassigning traffic.

This study includes commodity traffic estimates for 1993, 2005 and 2015. In the event that one wants to initiate a study using 1997 data these values could be interpolated by calculating the average annual increase (or decrease) in traffic and adding four times this value to the 1993 flow estimate. For a 1999 study six times the value would be added, and so forth. There are plans at the federal level to redo the 1993 survey in 1998. If that occurs this study could be updated by the state. However, even if the 1998 survey is undertaken, it may be 2002 before the results of the survey are available. Some of the results from 1993 are still unavailable in the middle of 1997.

Use of the Results for Transport Policy Formulation

State transport policy is the position that the State takes with regard to certain issues. Some of the state's policies are reflected in its statutes, e.g., it is the policy of the State of Indiana to provide financial support for public transit, or to provide loans to short line railroads, while other policies are given by its rules or regulations, e.g., speed limits on the state's highways. In many cases the state does not have a transport policy and it may initiate different studies to assist it in these cases.

If the state has an interest in knowing whether it should encourage further rail abandonment in the interest of economic efficiency for the rail carriers or whether it should discourage such activities, the databases developed as part of this project could provide some insight in the development of a policy covering such situations. The design of the study would involve

examining current branch line operations and assuming that they would be abandoned. Of course the traffic would still reach its destination, but it would most likely have to be trucked the distance from a retained rail station to its destination. Similarly, outbound traffic would have to be trucked to the nearest retained rail station for transport. One could add attributes to the highway link file of the GIS to reflect damage per motor carrier axle, actual transport cost, and so forth. This design is being discussed within the context of a single line, but all potential abandonment candidates could be analyzed to give the basis for a comprehensive state policy toward abandonment.

Policy studies often have to be repeated because the state must function in a very dynamic context. For example, the state's rail abandonment policy of the 1970s may no longer be an acceptable policy, since much of the over-capitalization that existed in that physical plant has been abandoned. Therefore, there is always a need to update policy as situations change.

Completeness of the Database

The completeness of the database developed needs further clarification even though this has been discussed at several points in this study. The objective here was to model commodity flows between Indiana's counties and the rest of the United States. There are no trips to work, school, or shop included here. These are personal traffic flows, and they are being developed by a parallel project being undertaken by Cambridge Systematics. Also missing here are flows by service vehicles, e.g., tow trucks. While the movement of lumber to a given county is included here, its intracounty movement to a job site or a home is excluded. The movement of mail into a county is included, its delivery to your home is not. The movement of garbage from your county to the landfill is included here, its pickup in front of your house is not. The point is that counties and urban centers within counties generate a significant amount of what is called commercial traffic and this traffic is not examined here as traffic assigned to the county highway network because that was beyond the scope of the study. It is ironic that the transportation planning process has been in existence for half a century, but we have never developed a methodology for assigning the intrazonal (here the intracounty) traffic to the zonal (county) network.

These statements regarding what is included and what is not included in the database are important because all too often there is a tendency to go beyond the data. This is a relatively complete data set of intercounty - interstate commodity flows for Indiana's counties and states of the United States, no more and no less.

Deliverables

Aside from this report the major deliverables from this project are flow vectors and/or matrices of different types. There is a basic interest in the production and attraction vectors

developed for the 19 commodities and two types of mail service examined here. There is also an interest in the total flow, but it would be of little value as a tonnage since it would contain some very heterogeneous commodities. As a result, Appendix A contains productions and attractions of the commodities and mail expressed in annual tons. These 21 sets of productions and attractions are given for 1993 (Appendix A), 2005 (Appendix E), and 2015 (Appendix F).

The second set of databases developed and presented here are the various proportions used in modal assignments of different types of commodity shipments. These are presented in Appendix B as proportions of traffic assigned to the various modes for specific commodities and several classes of shipping distances. Given the commodity and length of shipment these tables can be used to identify the modes that will be used in distributing the good. The source of these data is the tons of goods shipped by mode as presented in the United States summary volume of the 1993 Commodity Flow Survey. The tons have been converted in every case to proportions from the original data. National data were used (as opposed to Indiana data) because this study examined all flows in the country in arriving at the flows for Indiana. There are 19 tables reflecting these modal choices for 1993. The assumption is that these remain constant into the future and therefore the patterns observed in 1993 are assumed to hold for 2005 and 2015. Mail and express mail are not included in these data. It is assumed that these are flown into the state and distributed to counties by motor carriers.

Appendix C contains the major computer programs used in this study. There were probably more than thirty programs written for this project, but the appendix contains only the most useful of these. The programs included are:

> GUNNAR5. This program takes the productions and attractions and an average length of shipment and distributes flows between origins and destinations using a gravity model that constrains the length of shipments, flows from origins and flows to destinations in such a way that the generated values are equal to the initial values. This is often called a fully-constrained gravity model.
>
> GUNIN. This program is essentially the GUNNAR5 program with the exception that it calculates the length of commodity specific shipments originating in Indiana for comparison with published data on this average length from the commodity flow survey.
>
> NEWMODE. This program takes a commodity as distributed by GUNNAR5, i.e., where the origin, destination, flow, and distance are generated as output, and assigns these to specific modes. It uses the data of Appendix B (although in a slightly different format) for this assignment.

ALLOHWY. This program takes the tonnage flows assigned to the Highway mode by NEWMODE and using commodity density and commodity value, it generates flow matrices in truck loads and the dollar value of these.

ALLORWY. This program works the same as ALLOHWY except that it generates flow matrices of rail cars and the dollar value of these.

GROWTH. This program takes the production and attraction vectors for total tonnage by commodity and expands these based on expected growth in population, manufacturing, mining, or agriculture, as appropriate, for 2005 and 2015.

NEWFLOWS. This program takes the future flows and the parameters from the gravity model of 1993 and distributes flows for future time periods (2005 and 2015 here). This yields a set of flows which may be subjected to NEWMODE, ALLOHWY, and ALLORWY to forecast flows between the 145 areal units used here.

All of the above programs are written in FORTRAN and can easily be modified for analysis of the traffic of any state. Most of the inputs in this report, e.g., commodity density, commodity value, modal proportions, could be used for other states.

The flow (origin-destination) matrices derived here for 1993 by GUNNAR5 and for 2005 and 2015 by NEWFLOWS are listed in Appendix D. They are not reproduced here since they would generate thousands of pages of output. They are being presented to the state on 100 MB diskettes. These are the matrices that can be subjected to different traffic assignment routines under different assumptions.

APPENDICES

Appendix A - Productions and Attractions for Commodities, 1993

Appendix B - Modal Shares for Commodities

Appendix C - Computer Programs Developed for the Project

Appendix D - Matrices Supplied to Sponsor

Appendix E - Forecasted Productions and Attractions, 2005

Appendix F - Forecasted Productions and Attractions, 2015

Appendix G - Beta, A and B Gravity Model Parameters, 1993 Model

Appendix H - Production and Attraction of Solid Waste Indiana, 1991

Appendix A - Productions and Attractions of Commodities, 1993

The state-level productions and attractions presented in this appendix are drawn primarily from the *1993 Commodity Flow Survey*. County-level values here are allocated using employment or similar related data as a pattern for the allocation. The reader should consult the text of the report for more detail on this procedure. The sum of the flows into and out of the counties of Indiana have been adjusted to equal the sum of these values for the state of Indiana.

Table A-1 Productions and Attractions - Farm Products, STCC 01 (Annual Tons)

Alabama	2113000	6115000
Arizona	1998000	2783000
Arkansas	2754000	6597000
California	22933000	29020000
Colorado	9437000	10338000
Connecticut	386000	2038000
Delaware	381000	2010000
District of Columbia	0	0
Florida	6066000	7355000
Georgia	3644000	9294000
Idaho	6439000	2999000
Illinois - north	33864500	24637000
Illinois - south	33864500	24637000
Indiana - Adams	482987	255837
Indiana - Allen	367950	194902
Indiana - Bartholomew	430981	228289
Indiana - Benton	464670	246134
Indiana - Blackford	415025	219838
Indiana - Boone	451073	238933
Indiana - Brown	388002	205524
Indiana - Carroll	517903	274332
Indiana - Cass	463063	245283
Indiana - Clark	391497	207375
Indiana - Clay	420556	222767
Indiana - Clinton	496350	262915
Indiana - Crawford	393845	208619
Indiana - Daviess	515753	273193
Indiana - Dearborn	393039	208192
Indiana - Decatur	473948	251049
Indiana - DeKalb	429276	227387
Indiana - Delaware	309174	163769
Indiana - Dubois	563927	298711
Indiana - Elkhart	455459	241256
Indiana - Fayette	423769	224469
Indiana - Floyd	384136	203476
Indiana - Fountain	449403	238048
Indiana - Franklin	434523	230166
Indiana - Fulton	450303	238524
Indiana - Gibson	468121	247962
Indiana - Grant	445526	235994
Indiana - Greene	431540	228586
Indiana - Hamilton	356852	189024
Indiana - Hancock	436044	230972
Indiana - Harrison	460965	244172
Indiana - Hendricks	430921	228258
Indiana - Henry	439871	232999
Indiana - Howard	441073	233635
Indiana - Huntington	432857	229283
Indiana - Jackson	479281	253874
Indiana - Jasper	489767	259428
Indiana - Jay	467100	247422
Indiana - Jefferson	412199	218341
Indiana - Jennings	432786	229246
Indiana - Johnson	414073	219334
Indiana - Knox	480631	254589
Indiana - Kosciusko	534935	283354
Indiana - Lagrange	501454	265619
Indiana - Lake	328499	174005
Indiana - LaPorte	446787	236662
Indiana - Lawrence	404011	214004
Indiana - Madison	448494	237566
Indiana - Marion	176359	93416
Indiana - Marshall	446370	236441
Indiana - Martin	420511	222744
Indiana - Miami	461757	244592
Indiana - Monroe	364647	193152
Indiana - Montgomery	498108	263847
Indiana - Morgan	416616	220680
Indiana - Newton	458767	243008
Indiana - Noble	440584	233376
Indiana - Ohio	391201	207219
Indiana - Orange	410383	217379
Indiana - Owen	395302	209391
Indiana - Parke	425806	225548
Indiana - Perry	396697	210129
Indiana - Pike	412414	218455
Indiana - Porter	394568	209002
Indiana - Posey	455618	241340
Indiana - Pulaski	468925	248388
Indiana - Putnam	433188	229459
Indiana - Randolph	458935	243097
Indiana - Ripley	429890	227712
Indiana - Rush	481488	255043
Indiana - St Joseph	390720	206963
Indiana - Scott	401399	212620
Indiana - Shelby	455063	241046
Indiana - Spencer	442880	234593
Indiana - Starke	426806	226078
Indiana - Steuben	409482	216902
Indiana - Sullivan	437093	231527
Indiana - Switzerland	406576	215362
Indiana - Tippecanoe	438090	232055
Indiana - Tipton	458665	242954
Indiana - Union	417706	221258
Indiana - Vanderburgh	377781	200110
Indiana - Vermillion	415603	220144
Indiana - Vigo	403527	213747
Indiana - Wabash	509685	269979
Indiana - Warren	415603	220144
Indiana - Warrick	404493	214259
Indiana - Washington	441665	233949
Indiana - Wayne	469360	248619
Indiana - Wells	450667	238717
Indiana - White	502732	266296
Indiana - Whitley	437876	231942
Iowa	54394000	41503000
Kansas	33711000	21943000
Kentucky - west	2210500	2392000
Kentucky - east	2210500	2392000
Louisiana	37475000	77413000
Maine	374000	1973000
Maryland	4088000	11889000
Massachusetts	537000	2834000
Michigan - west	4570500	3267500
Michigan - east	4570500	3267500
Minnesota	39272000	32188000
Mississippi	4945000	4538000
Missouri	23450000	12184000
Montana	7002000	3295000
Nebraska	44887000	14489000
Nevada	360000	1541000
New Hampshire	236000	1244000
New Jersey	1633000	3596000
New Mexico	1207000	2876000
New York	5929000	9622000
North Carolina	5062000	12701000
North Dakota	19154000	6511000
Ohio - north	10893333	7018667
Ohio - central	10893333	7018667
Ohio - south	10893333	7018667
Oklahoma	11381000	8559000
Oregon	22525000	28502000
Pennsylvania	4637000	8515000
Rhode Island	271000	1431000
South Carolina	1489000	4096000
South Dakota	7322000	3505000
Tennessee	5667000	6114000
Texas	49157000	71326000
Utah	1476000	3677000
Vermont	273000	1443000
Virginia	4603000	7387000
Washington	21753000	32465000
West Virginia	208000	1845000
Wisconsin	10090000	11267000
Wyoming	184000	969000

Table A-2 Productions and Attractions - Coal, STCC 11 (Annual Tons)

Alabama	31130000	48050000	Indiana - Parke	0	0
Arizona	2170000	3756000	Indiana - Perry	0	0
Arkansas	146000	12423000	Indiana - Pike	786559	2397850
California	3616000	6260000	Indiana - Porter	0	0
Colorado	22875000	26015000	Indiana - Posey	202882	618494
Connecticut	0	2504000	Indiana - Pulaski	0	0
Delaware	0	2924000	Indiana - Putnam	0	0
District of Columbia	0	0	Indiana - Randolph	0	0
Florida	11071000	19173000	Indiana - Ripley	0	0
Georgia	0	18826000	Indiana - Rush	0	0
Idaho	0	1294000	Indiana - St Joseph	0	0
Illinois - north	36924000	24673000	Indiana - Scott	0	0
Illinois - south	36924000	24673000	Indiana - Shelby	0	0
Indiana - Adams	0	0	Indiana - Spencer	0	0
Indiana - Allen	0	0	Indiana - Starke	0	0
Indiana - Bartholomew	0	0	Indiana - Steuben	0	0
Indiana - Benton	0	0	Indiana - Sullivan	1170470	3568230
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	0	0
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	0	0	Indiana - Vanderburgh	561828	1712750
Indiana - Clark	0	2066050	Indiana - Vermillion	0	0
Indiana - Clay	546221	1665180	Indiana - Vigo	0	0
Indiana - Clinton	0	0	Indiana - Wabash	0	0
Indiana - Crawford	546221	1665180	Indiana - Warren	0	0
Indiana - Daviess	1170470	3568230	Indiana - Warrick	2340950	7136470
Indiana - Dearborn	0	0	Indiana - Washington	0	0
Indiana - Decatur	0	0	Indiana - Wayne	0	0
Indiana - DeKalb	0	0	Indiana - Wells	0	0
Indiana - Delaware	0	2846910	Indiana - White	0	0
Indiana - Dubois	546221	1665180	Indiana - Whitley	0	0
Indiana - Elkhart	0	0	Iowa	0	23136000
Indiana - Fayette	0	0	Kansas	753000	26411000
Indiana - Floyd	0	0	Kentucky - west	98530000	49769500
Indiana - Fountain	0	0	Kentucky - east	98530000	49769500
Indiana - Franklin	0	0	Louisiana	8704000	32060000
Indiana - Fulton	0	0	Maine	1446000	2504000
Indiana - Gibson	1170470	3568230	Maryland	8133000	14099000
Indiana - Grant	0	0	Massachusetts	2893000	5008000
Indiana - Greene	0	0	Michigan - west	0	15339000
Indiana - Hamilton	0	0	Michigan - east	0	15339000
Indiana - Hancock	0	0	Minnesota	8233000	14270000
Indiana - Harrison	0	0	Mississippi	0	5008000
Indiana - Hendricks	0	0	Missouri	22809000	39527000
Indiana - Henry	0	0	Montana	2893000	5008000
Indiana - Howard	0	0	Nebraska	0	17046000
Indiana - Huntington	0	0	Nevada	0	4145000
Indiana - Jackson	0	0	New Hampshire	0	4271000
Indiana - Jasper	0	0	New Jersey	0	6260000
Indiana - Jay	0	0	New Mexico	22400000	2504000
Indiana - Jefferson	0	0	New York	0	19976000
Indiana - Jennings	0	0	North Carolina	0	30251000
Indiana - Johnson	0	0	North Dakota	4339000	7512000
Indiana - Knox	546221	1665180	Ohio - north	9130333	23807666
Indiana - Kosciusko	0	0	Ohio - central	9130333	23807666
Indiana - Lagrange	0	0	Ohio - south	9130333	23807666
Indiana - Lake	0	0	Oklahoma	1428000	24474000
Indiana - LaPorte	0	0	Oregon	2893000	5008000
Indiana - Lawrence	0	0	Pennsylvania	80467000	63433000
Indiana - Madison	0	0	Rhode Island	0	2000
Indiana - Marion	1170470	6415150	South Carolina	10477000	18093000
Indiana - Marshall	0	0	South Dakota	0	3756000
Indiana - Martin	0	0	Tennessee	3107000	22007000
Indiana - Miami	0	0	Texas	33357000	72333000
Indiana - Monroe	0	2846910	Utah	2893000	5008000
Indiana - Montgomery	0	0	Vermont	0	1252000
Indiana - Morgan	0	0	Virginia	103524000	81512000
Indiana - Newton	0	0	Washington	6735000	14642000
Indiana - Noble	0	0	West Virginia	158325000	53891000
Indiana - Ohio	0	0	Wisconsin	20227000	35040000
Indiana - Orange	0	0	Wyoming	238458000	34867000
Indiana - Owen	0	0			

Table A-3 Productions and Attractions - Non-metallic Minerals, STCC 14 (Annual Tons)

Alabama	26979000	28041000	Indiana - Parke	47481	50060
Arizona	13096000	16448000	Indiana - Perry	149192	157294
Arkansas	20691000	18380000	Indiana - Pike	15308	16139
California	134721000	139089000	Indiana - Porter	1050140	1107170
Colorado	21660000	22733000	Indiana - Posey	239831	252856
Connecticut	14850000	16950000	Indiana - Pulaski	102402	107963
Delaware	2155000	6331000	Indiana - Putnam	187246	197415
District of Columbia	0	0	Indiana - Randolph	248048	261518
Florida	127502000	114648000	Indiana - Ripley	445327	469511
Georgia	63227000	61776000	Indiana - Rush	90207	95105
Idaho	6784000	7101000	Indiana - St Joseph	1867450	1968860
Illinois - north	52986000	49104000	Indiana - Scott	199528	210363
Illinois - south	52986000	49104000	Indiana - Shelby	518409	546562
Indiana - Adams	2790280	2941800	Indiana - Spencer	147894	155926
Indiana - Allen	3293890	3472770	Indiana - Starke	97385	102674
Indiana - Bartholomew	1469520	1549320	Indiana - Steuben	523512	551942
Indiana - Benton	38314	40394	Indiana - Sullivan	51287	54072
Indiana - Blackford	140543	148175	Indiana - Switzerland	53017	55896
Indiana - Boone	127310	134224	Indiana - Tippecanoe	1301730	1372420
Indiana - Brown	7697	8115	Indiana - Tipton	75590	79695
Indiana - Carroll	138035	145531	Indiana - Union	4324	4559
Indiana - Cass	498344	525407	Indiana - Vanderburgh	1716440	1809650
Indiana - Clark	572205	603279	Indiana - Vermillion	167787	176899
Indiana - Clay	151267	159482	Indiana - Vigo	747775	788384
Indiana - Clinton	349584	368569	Indiana - Wabash	488917	515468
Indiana - Crawford	15221	16048	Indiana - Warren	13924	14680
Indiana - Daviess	167181	176260	Indiana - Warrick	391964	413250
Indiana - Dearborn	184565	194588	Indiana - Washington	221063	233068
Indiana - Decatur	353303	372490	Indiana - Wayne	595297	627625
Indiana - DeKalb	742672	783004	Indiana - Wells	266383	280849
Indiana - Delaware	893075	941575	Indiana - White	335833	354071
Indiana - Dubois	985790	1039320	Indiana - Whitley	283681	299086
Indiana - Elkhart	4795670	5056110	Iowa	24846000	25931000
Indiana - Fayette	455359	480088	Kansas	25963000	25550000
Indiana - Floyd	506387	533887	Kentucky - west	22042000	17469000
Indiana - Fountain	152046	160303	Kentucky - east	22042000	17469000
Indiana - Franklin	47395	49969	Louisiana	29000000	28437000
Indiana - Fulton	234036	246746	Maine	1944000	3305000
Indiana - Gibson	222015	234071	Maryland	34618000	35680000
Indiana - Grant	843431	889235	Massachusetts	25688000	27264000
Indiana - Greene	152565	160850	Michigan - west	40425000	36243000
Indiana - Hamilton	561566	592063	Michigan - east	40425000	36243000
Indiana - Hancock	243810	257050	Minnesota	24123000	28242000
Indiana - Harrison	166662	175713	Mississippi	11241000	11759000
Indiana - Hendricks	118489	124923	Missouri	60682000	66794000
Indiana - Henry	270621	285317	Montana	1729000	3116000
Indiana - Howard	1577370	1663030	Nebraska	13678000	17572000
Indiana - Huntington	622108	655893	Nevada	11765000	12142000
Indiana - Jackson	449910	474344	New Hampshire	9366000	1688000
Indiana - Jasper	102661	108236	New Jersey	29479000	32059000
Indiana - Jay	291378	307202	New Mexico	8116000	6436000
Indiana - Jefferson	324503	342126	New York	49008000	51407000
Indiana - Jennings	163808	172704	North Carolina	34428000	33179000
Indiana - Johnson	483900	510179	North Dakota	2016000	3667000
Indiana - Knox	175830	185379	Ohio - north	42879666	43583666
Indiana - Kosciusko	1213600	1279510	Ohio - central	42879966	43583666
Indiana - Lagrange	333757	351882	Ohio - south	42879966	43583666
Indiana - Lake	3505360	3695720	Oklahoma	25605000	21405000
Indiana - LaPorte	1075390	1133790	Oregon	48659000	51751000
Indiana - Lawrence	432959	456471	Pennsylvania	94879000	98816000
Indiana - Madison	1201660	1266920	Rhode Island	25134000	4530000
Indiana - Marion	7334270	7732560	South Carolina	19876000	18911000
Indiana - Marshall	626432	660452	South Dakota	5650000	6301000
Indiana - Martin	51892	54710	Tennessee	49427000	50514000
Indiana - Miami	195636	206260	Texas	92873000	108438000
Indiana - Monroe	724423	763764	Utah	9607000	9751000
Indiana - Montgomery	705310	743612	Vermont	5477000	6571000
Indiana - Morgan	224696	236898	Virginia	49073000	45089000
Indiana - Newton	102921	108510	Washington	63510000	65565000
Indiana - Noble	764900	806439	West Virginia	7935000	12526000
Indiana - Ohio	864	911	Wisconsin	37212000	39424000
Indiana - Orange	229885	242369	Wyoming	7026000	4226000
Indiana - Owen	92369	97385			

Table A-4 Productions and Attractions - Food and Kindred Products, STCC 20 (Annual Tons)

Alabama	13707000	16736972
Arizona	8518000	8266927
Arkansas	18303000	16784982
California	78780000	95369720
Colorado	10244000	12489947
Connecticut	3969000	7314116
Delaware	2867000	3517644
District of Columbia	87000	1024825
Florida	40194000	33213584
Georgia	25354000	26124744
Idaho	5250000	6390849
Illinois - north	16446000	32031802
Illinois - south	4111000	9568733
Indiana - Adams	344939	206811
Indiana - Allen	873846	866023
Indiana - Bartholomew	1133701	620435
Indiana - Benton	0	14772
Indiana - Blackford	0	22158
Indiana - Boone	0	59089
Indiana - Brown	0	22158
Indiana - Carroll	64389	59089
Indiana - Cass	1133701	581657
Indiana - Clark	137976	197579
Indiana - Clay	0	38777
Indiana - Clinton	742769	389618
Indiana - Crawford	0	14772
Indiana - Daviess	749668	387771
Indiana - Dearborn	485215	284366
Indiana - Decatur	179368	118178
Indiana - DeKalb	112680	107098
Indiana - Delaware	298947	321296
Indiana - Dubois	528907	300984
Indiana - Elkhart	793360	605662
Indiana - Fayette	0	40623
Indiana - Floyd	485215	323143
Indiana - Fountain	0	27697
Indiana - Franklin	0	29544
Indiana - Fulton	144875	96019
Indiana - Gibson	179368	131103
Indiana - Grant	266753	236356
Indiana - Greene	485215	271440
Indiana - Hamilton	112680	219737
Indiana - Hancock	0	70168
Indiana - Harrison	112680	97866
Indiana - Hendricks	112680	168034
Indiana - Henry	112680	125564
Indiana - Howard	112680	177267
Indiana - Huntington	243757	166187
Indiana - Jackson	0	57242
Indiana - Jasper	48292	60935
Indiana - Jay	96583	77554
Indiana - Jefferson	0	46163
Indiana - Jennings	0	36930
Indiana - Johnson	0	134796
Indiana - Knox	64389	90480
Indiana - Kosciusko	439223	302831
Indiana - Lagrange	0	46163
Indiana - Lake	1080810	1229790
Indiana - LaPorte	266753	288059
Indiana - Lawrence	0	66475
Indiana - Madison	220761	302831
Indiana - Marion	3086057	2647928
Indiana - Marshall	356437	228970
Indiana - Martin	0	16618
Indiana - Miami	39093	73861
Indiana - Monroe	66688	197579
Indiana - Montgomery	0	53549
Indiana - Morgan	0	86787
Indiana - Newton	0	20311
Indiana - Noble	485215	282519
Indiana - Ohio	0	7386
Indiana - Orange	39093	46163
Indiana - Owen	0	25851
Indiana - Parke	0	24004
Indiana - Perry	0	29544
Indiana - Pike	0	18465
Indiana - Porter	243757	310217
Indiana - Posey	39093	57242
Indiana - Pulaski	0	20311
Indiana - Putnam	0	46163
Indiana - Randolph	52891	66475
Indiana - Ripley	112680	90480
Indiana - Rush	0	27697
Indiana - St Joseph	287449	511489
Indiana - Scott	243757	144029
Indiana - Shelby	112680	114485
Indiana - Spencer	0	29544
Indiana - Starke	0	35084
Indiana - Steuben	103482	90480
Indiana - Sullivan	39093	48009
Indiana - Switzerland	0	11079
Indiana - Tippecanoe	485215	424702
Indiana - Tipton	32194	40623
Indiana - Union	0	11079
Indiana - Vanderburgh	1890268	1124538
Indiana - Vermillion	0	25851
Indiana - Vigo	588696	433935
Indiana - Wabash	39093	72014
Indiana - Warren	0	12925
Indiana - Warrick	0	68321
Indiana - Washington	0	36930
Indiana - Wayne	250656	227123
Indiana - Wells	280551	169881
Indiana - White	0	35084
Indiana - Whitley	0	42470
Iowa	39780000	17913214
Kansas	19504000	11538983
Kentucky - west	2969000	3622897
Kentucky - east	6927000	7354740
Louisiana	17139000	11884285
Maine	1871000	3613664
Maryland	20163000	13439065
Massachusetts	9510000	15776775
Michigan - west	7282000	7103611
Michigan - east	18250000	18265902
Minnesota	31804000	18919574
Mississippi	7546000	11629463
Missouri	27374000	19787444
Montana	2142000	1868691
Nebraska	17090000	11023800
Nevada	1413000	2417111
New Hampshire	1905000	2391259
New Jersey	23530000	22394748
New Mexico	1457000	3284981
New York	40467000	43805296
North Carolina	24809000	25435988
North Dakota	3980000	2130898
Ohio - north	10929000	15715840
Ohio - central	10928000	8939065
Ohio - south	10928000	7615101
Oklahoma	8945000	9245589
Oregon	8891000	10663726
Pennsylvania	33553000	42677064
Rhode Island	1030000	2191834
South Carolina	6909000	9541035
South Dakota	3058000	3037546
Tennessee	20675000	18494872
Texas	51979000	52369516
Utah	3902000	5583915
Vermont	1324000	1829913
Virginia	19402000	19610178
Washington	15285000	17165368
West Virginia	2171000	3864793
Wisconsin	29187000	23236768
Wyoming	489000	919573

Table A-5 Productions and Attractions - Basic Textiles, STCC 22 (Annual Tons)

Alabama	1287000	1144461	Indiana - Parke	0	0
Arizona	37000	130381	Indiana - Perry	0	0
Arkansas	62000	275250	Indiana - Pike	0	0
California	1026000	3382679	Indiana - Porter	0	0
Colorado	44000	108651	Indiana - Posey	0	0
Connecticut	47000	173842	Indiana - Pulaski	0	0
Delaware	238000	36217	Indiana - Putnam	0	7243
District of Columbia	0	14486	Indiana - Randolph	0	0
Florida	282000	796776	Indiana - Ripley	0	0
Georgia	5392000	1470415	Indiana - Rush	0	0
Idaho	4000	14486	Indiana - St Joseph	0	7243
Illinois - north	155000	434605	Indiana - Scott	0	0
Illinois - south	39000	130381	Indiana - Shelby	0	0
Indiana - Adams	0	7243	Indiana - Spencer	0	0
Indiana - Allen	0	14486	Indiana - Starke	0	0
Indiana - Bartholomew	0	7243	Indiana - Steuben	0	0
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	0	0
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	0	0	Indiana - Vanderburgh	0	14486
Indiana - Clark	0	0	Indiana - Vermillion	0	0
Indiana - Clay	0	0	Indiana - Vigo	0	0
Indiana - Clinton	0	0	Indiana - Wabash	0	36217
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	7243	Indiana - Warrick	0	0
Indiana - Dearborn	0	0	Indiana - Washington	0	7243
Indiana - Decatur	0	0	Indiana - Wayne	0	7243
Indiana - DeKalb	0	0	Indiana - Wells	0	0
Indiana - Delaware	0	0	Indiana - White	11625	7243
Indiana - Dubois	0	0	Indiana - Whitley	0	0
Indiana - Elkhart	3875	21730	Iowa	22000	144868
Indiana - Fayette	0	0	Kansas	26000	108651
Indiana - Floyd	0	7243	Kentucky - west	33000	231789
Indiana - Fountain	0	0	Kentucky - east	78000	470822
Indiana - Franklin	0	0	Louisiana	51000	231789
Indiana - Fulton	0	7243	Maine	59000	65190
Indiana - Gibson	0	0	Maryland	56000	224546
Indiana - Grant	0	7243	Massachusetts	413000	550500
Indiana - Greene	0	0	Michigan - west	28000	130381
Indiana - Hamilton	0	14486	Michigan - east	65000	347684
Indiana - Hancock	0	7243	Minnesota	109000	181085
Indiana - Harrison	0	0	Mississippi	144000	709855
Indiana - Hendricks	0	0	Missouri	93000	507039
Indiana - Henry	0	7243	Montana	2000	21730
Indiana - Howard	0	0	Nebraska	16000	65190
Indiana - Huntington	0	0	Nevada	102000	14486
Indiana - Jackson	0	0	New Hampshire	38000	50703
Indiana - Jasper	0	0	New Jersey	571000	941645
Indiana - Jay	0	7243	New Mexico	2000	43460
Indiana - Jefferson	0	0	New York	327000	2622119
Indiana - Jennings	23250	0	North Carolina	5799000	1593553
Indiana - Johnson	0	7243	North Dakota	9000	21730
Indiana - Knox	0	0	Ohio - north	80000	246276
Indiana - Kosciusko	11625	7243	Ohio - central	79000	137625
Indiana - Lagrange	0	7243	Ohio - south	79000	115894
Indiana - Lake	23250	14486	Oklahoma	68000	181085
Indiana - LaPorte	15500	14486	Oregon	51000	86921
Indiana - Lawrence	0	7243	Pennsylvania	760000	1673231
Indiana - Madison	0	0	Rhode Island	163000	57947
Indiana - Marion	0	28973	South Carolina	3978000	738829
Indiana - Marshall	0	0	South Dakota	3000	21730
Indiana - Martin	0	7243	Tennessee	857000	1282086
Indiana - Miami	0	0	Texas	475000	1180678
Indiana - Monroe	3875	0	Utah	42000	130381
Indiana - Montgomery	0	0	Vermont	3000	28973
Indiana - Morgan	0	0	Virginia	964000	702612
Indiana - Newton	0	0	Washington	159000	188329
Indiana - Noble	0	0	West Virginia	119000	86921
Indiana - Ohio	0	0	Wisconsin	158000	231789
Indiana - Orange	0	0	Wyoming	0	7243
Indiana - Owen	0	0			

Table A-6 Productions and Attractions - Apparel, STCC 23 (Annual Tons)

Alabama	417000	498346
Arizona	368000	167253
Arkansas	159000	167253
California	1546000	2048000
Colorado	36000	143360
Connecticut	67000	153600
Delaware	37000	27306
District of Columbia	0	23893
Florida	361000	699733
Georgia	1007000	682666
Idaho	5000	40960
Illinois - north	230000	413013
Illinois - south	57000	122880
Indiana - Adams	12289	3413
Indiana - Allen	12289	13653
Indiana - Bartholomew	12289	3413
Indiana - Benton	0	0
Indiana - Blackford	0	0
Indiana - Boone	0	0
Indiana - Brown	0	0
Indiana - Carroll	0	0
Indiana - Cass	0	0
Indiana - Clark	0	3413
Indiana - Clay	0	0
Indiana - Clinton	0	0
Indiana - Crawford	0	0
Indiana - Daviess	12289	3413
Indiana - Dearborn	0	0
Indiana - Decatur	0	0
Indiana - DeKalb	0	0
Indiana - Delaware	0	3413
Indiana - Dubois	0	0
Indiana - Elkhart	36867	10240
Indiana - Fayette	0	0
Indiana - Floyd	24578	3413
Indiana - Fountain	0	0
Indiana - Franklin	0	0
Indiana - Fulton	24578	3413
Indiana - Gibson	0	0
Indiana - Grant	12289	3413
Indiana - Greene	0	0
Indiana - Hamilton	24578	6826
Indiana - Hancock	12289	3413
Indiana - Harrison	0	0
Indiana - Hendricks	0	3413
Indiana - Henry	12289	3413
Indiana - Howard	0	3413
Indiana - Huntington	0	0
Indiana - Jackson	0	0
Indiana - Jasper	0	0
Indiana - Jay	24578	3413
Indiana - Jefferson	0	0
Indiana - Jennings	0	0
Indiana - Johnson	12289	3413
Indiana - Knox	0	0
Indiana - Kosciusko	0	3413
Indiana - Lagrange	12289	3413
Indiana - Lake	24578	20480
Indiana - LaPorte	36867	10240
Indiana - Lawrence	12289	3413
Indiana - Madison	0	3413
Indiana - Marion	36867	34133
Indiana - Marshall	0	3413
Indiana - Martin	12289	0
Indiana - Miami	0	0
Indiana - Monroe	0	3413
Indiana - Montgomery	0	0
Indiana - Morgan	0	3413
Indiana - Newton	0	0
Indiana - Noble	0	0
Indiana - Ohio	0	0
Indiana - Orange	0	0
Indiana - Owen	0	0
Indiana - Parke	0	0
Indiana - Perry	0	0
Indiana - Pike	0	0
Indiana - Porter	0	6826
Indiana - Posey	0	0
Indiana - Pulaski	0	0
Indiana - Putnam	24578	3413
Indiana - Randolph	0	0
Indiana - Ripley	0	0
Indiana - Rush	0	0
Indiana - St Joseph	0	10240
Indiana - Scott	0	0
Indiana - Shelby	0	0
Indiana - Spencer	0	0
Indiana - Starke	0	0
Indiana - Steuben	0	0
Indiana - Sullivan	0	0
Indiana - Switzerland	0	0
Indiana - Tippecanoe	0	3413
Indiana - Tipton	0	0
Indiana - Union	0	0
Indiana - Vanderburgh	24578	10240
Indiana - Vermillion	12289	0
Indiana - Vigo	0	3413
Indiana - Wabash	86022	13653
Indiana - Warren	0	0
Indiana - Warrick	0	0
Indiana - Washington	12289	3413
Indiana - Wayne	12289	3413
Indiana - Wells	0	0
Indiana - White	12289	3413
Indiana - Whitley	0	0
Iowa	82000	136533
Kansas	44000	116053
Kentucky - west	82000	112640
Kentucky - east	193000	20480
Louisiana	104000	225280
Maine	66000	61440
Maryland	81000	232106
Massachusetts	148000	34133
Michigan - west	33000	126293
Michigan - east	78000	320853
Minnesota	70000	187733
Mississippi	198000	314026
Missouri	131000	320853
Montana	4000	34133
Nebraska	67000	71680
Nevada	100000	47786
New Hampshire	9000	51200
New Jersey	841000	529066
New Mexico	19000	68266
New York	383000	1399467
North Carolina	1520000	713386
North Dakota	5000	30720
Ohio - north	193000	23893
Ohio - central	193000	116053
Ohio - south	193000	136533
Oklahoma	66000	167253
Oregon	70000	122880
Pennsylvania	578000	911360
Rhode Island	7000	47786
South Carolina	455000	348160
South Dakota	8000	30720
Tennessee	2582000	559786
Texas	826000	952320
Utah	48000	98986
Vermont	5000	27306
Virginia	367000	430080
Washington	113000	225280
West Virginia	15000	92160
Wisconsin	284000	225280
Wyoming	0	17066

Table A-7 Productions and Attractions - Lumber and Wood Products, STCC 24 (Annual Tons)

Alabama	49525000	27693960
Arizona	2167000	6245483
Arkansas	21115000	19264514
California	31023000	58162968
Colorado	1860000	3281378
Connecticut	880000	2383888
Delaware	1145000	838815
District of Columbia	0	184713
Florida	22834000	20303254
Georgia	39170000	28078598
Idaho	20790000	11965077
Illinois - north	2627000	9242186
Illinois - south	657000	2759834
Indiana - Adams	86324	445485
Indiana - Allen	106834	551966
Indiana - Bartholomew	18673	97789
Indiana - Benton	12245	63019
Indiana - Blackford	11020	56500
Indiana - Boone	0	0
Indiana - Brown	11632	60846
Indiana - Carroll	0	0
Indiana - Cass	20203	104308
Indiana - Clark	172036	888797
Indiana - Clay	0	0
Indiana - Clinton	25714	132558
Indiana - Crawford	21122	110827
Indiana - Daviess	28162	145597
Indiana - Dearborn	35815	184713
Indiana - Decatur	0	0
Indiana - DeKalb	61529	317272
Indiana - Delaware	23265	119520
Indiana - Dubois	397641	2053577
Indiana - Elkhart	1155272	5969500
Indiana - Fayette	0	0
Indiana - Floyd	151220	780142
Indiana - Fountain	0	0
Indiana - Franklin	0	0
Indiana - Fulton	40713	210790
Indiana - Gibson	0	0
Indiana - Grant	0	0
Indiana - Greene	0	0
Indiana - Hamilton	18673	97789
Indiana - Hancock	11938	60846
Indiana - Harrison	51733	267291
Indiana - Hendricks	0	0
Indiana - Henry	14081	73885
Indiana - Howard	0	0
Indiana - Huntington	0	0
Indiana - Jackson	78059	402023
Indiana - Jasper	41631	215136
Indiana - Jay	12245	63019
Indiana - Jefferson	0	0
Indiana - Jennings	18673	95616
Indiana - Johnson	181831	938778
Indiana - Knox	12245	63019
Indiana - Kosciusko	74692	386811
Indiana - Lagrange	202341	1045260
Indiana - Lake	23571	121693
Indiana - LaPorte	19285	99962
Indiana - Lawrence	12245	63019
Indiana - Madison	12245	63019
Indiana - Marion	153363	793180
Indiana - Marshall	94589	488947
Indiana - Martin	35815	184713
Indiana - Miami	29999	154289
Indiana - Monroe	10102	52154
Indiana - Montgomery	0	0
Indiana - Morgan	44386	230348
Indiana - Newton	0	0
Indiana - Noble	16836	86923
Indiana - Ohio	0	0
Indiana - Orange	53876	278156
Indiana - Owen	13163	67366
Indiana - Parke	12245	63019
Indiana - Perry	17448	91270
Indiana - Pike	0	0
Indiana - Porter	0	0
Indiana - Posey	0	0
Indiana - Pulaski	0	0
Indiana - Putnam	16836	86923
Indiana - Randolph	50815	262944
Indiana - Ripley	15000	78231
Indiana - Rush	0	0
Indiana - St Joseph	55100	284675
Indiana - Scott	10714	56500
Indiana - Shelby	23265	119520
Indiana - Spencer	35815	184713
Indiana - Starke	0	0
Indiana - Steuben	0	0
Indiana - Sullivan	14387	76058
Indiana - Switzerland	0	0
Indiana - Tippecanoe	0	0
Indiana - Tipton	0	0
Indiana - Union	0	0
Indiana - Vanderburgh	46223	239040
Indiana - Vermillion	0	0
Indiana - Vigo	17755	91270
Indiana - Wabash	28775	147770
Indiana - Warren	12245	63019
Indiana - Warrick	35815	184713
Indiana - Washington	44693	232521
Indiana - Wayne	0	0
Indiana - Wells	0	0
Indiana - White	0	0
Indiana - Whitley	76834	395503
Iowa	1562000	7453726
Kansas	484000	2922816
Kentucky - west	1723000	3394379
Kentucky - east	4020000	6890893
Louisiana	30892000	12112848
Maine	21752000	11497861
Maryland	4546000	4283176
Massachusetts	1803000	3926788
Michigan - west	3594000	4046308
Michigan - east	8385000	10404793
Minnesota	6757000	15939673
Mississippi	33203000	22963126
Missouri	4413000	10754662
Montana	13344000	6947394
Nebraska	581000	2186136
Nevada	219000	1075683
New Hampshire	3329000	3948519
New Jersey	13820000	4213637
New Mexico	1990000	2653352
New York	4543000	14170772
North Carolina	39044000	37027416
North Dakota	305000	845335
Ohio - north	3674000	10094040
Ohio - central	3674000	5741325
Ohio - south	3674000	4891643
Oklahoma	1705000	3485649
Oregon	73928000	55670424
Pennsylvania	10778000	28730528
Rhode Island	0	1225627
South Carolina	25477000	14118617
South Dakota	1106000	1901460
Tennessee	7010000	17754210
Texas	17605000	26377062
Utah	960000	2866316
Vermont	2204000	3150992
Virginia	24060000	22445928
Washington	72463000	34719588
West Virginia	5611000	6614910
Wisconsin	13556000	25053646
Wyoming	1962000	1429898

Table A-8 Productions and Attractions - Furniture and Fixtures, STCC 25 (Annual Tons)

Alabama	495000	356876	Indiana - Parke	0	2332
Arizona	312000	296230	Indiana - Perry	16895	4665
Arkansas	285000	223922	Indiana - Pike	0	0
California	1648000	2533121	Indiana - Porter	0	9330
Colorado	200000	265907	Indiana - Posey	0	2332
Connecticut	48000	263575	Indiana - Pulaski	0	0
Delaware	44000	53648	Indiana - Putnam	0	2332
District of Columbia	0	46650	Indiana - Randolph	0	2332
Florida	355000	1054300	Indiana - Ripley	56317	9330
Georgia	703000	545810	Indiana - Rush	0	2332
Idaho	13000	79305	Indiana - St Joseph	1877	18660
Illinois - north	487000	734745	Indiana - Scott	0	2332
Illinois - south	122000	219257	Indiana - Shelby	3754	4665
Indiana - Adams	13141	4665	Indiana - Spencer	11263	2332
Indiana - Allen	15018	25657	Indiana - Starke	0	2332
Indiana - Bartholomew	24404	9330	Indiana - Steuben	1877	2332
Indiana - Benton	0	0	Indiana - Sullivan	0	2332
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	2332	Indiana - Tippecanoe	24404	13995
Indiana - Brown	0	0	Indiana - Tipton	0	2332
Indiana - Carroll	11263	2332	Indiana - Union	0	0
Indiana - Cass	0	2332	Indiana - Vanderburgh	16895	16327
Indiana - Clark	16895	9330	Indiana - Vermillion	0	2332
Indiana - Clay	0	2332	Indiana - Vigo	0	9330
Indiana - Clinton	0	2332	Indiana - Wabash	1877	2332
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	2332	Indiana - Warrick	0	2332
Indiana - Dearborn	0	2332	Indiana - Washington	35668	6997
Indiana - Decatur	0	2332	Indiana - Wayne	5632	6997
Indiana - DeKalb	0	2332	Indiana - Wells	5632	2332
Indiana - Delaware	5632	9330	Indiana - White	1877	2332
Indiana - Dubois	161442	25657	Indiana - Whitley	0	2332
Indiana - Elkhart	107003	27990	Iowa	203000	233252
Indiana - Fayette	0	2332	Kansas	45000	198264
Indiana - Floyd	9386	6997	Kentucky - west	35000	97966
Indiana - Fountain	0	2332	Kentucky - east	82000	200597
Indiana - Franklin	0	2332	Louisiana	25000	328885
Indiana - Fulton	0	2332	Maine	17000	97966
Indiana - Gibson	0	2332	Maryland	102000	380201
Indiana - Grant	5632	6997	Massachusetts	293000	485164
Indiana - Greene	5632	2332	Michigan - west	297000	240249
Indiana - Hamilton	0	9330	Michigan - east	692000	618118
Indiana - Hancock	0	4665	Minnesota	268000	361541
Indiana - Harrison	15018	4665	Mississippi	635000	314890
Indiana - Hendricks	0	4665	Missouri	632000	433849
Indiana - Henry	11263	4665	Montana	13000	62978
Indiana - Howard	1877	6997	Nebraska	117000	130621
Indiana - Huntington	0	2332	Nevada	102000	95633
Indiana - Jackson	0	2332	New Hampshire	24000	88635
Indiana - Jasper	0	2332	New Jersey	5265000	627448
Indiana - Jay	0	2332	New Mexico	13000	118958
Indiana - Jefferson	0	2332	New York	467000	1471822
Indiana - Jennings	0	2332	North Carolina	1355000	856036
Indiana - Johnson	0	6997	North Dakota	27000	53648
Indiana - Knox	1877	2332	Ohio - north	286000	443179
Indiana - Kosciusko	3754	4665	Ohio - central	286000	251912
Indiana - Lagrange	5632	2332	Ohio - south	286000	214592
Indiana - Lake	1877	37320	Oklahoma	58000	251912
Indiana - LaPorte	9386	9330	Oregon	104000	233252
Indiana - Lawrence	0	2332	Pennsylvania	757000	995987
Indiana - Madison	11263	11662	Rhode Island	0	83970
Indiana - Marion	80721	72308	South Carolina	161000	286900
Indiana - Marshall	1877	4665	South Dakota	7000	53648
Indiana - Martin	0	0	Tennessee	675000	485164
Indiana - Miami	5632	4665	Texas	900000	1371524
Indiana - Monroe	0	9330	Utah	89000	144616
Indiana - Montgomery	0	2332	Vermont	15000	51315
Indiana - Morgan	0	4665	Virginia	678000	569135
Indiana - Newton	0	0	Washington	228000	391864
Indiana - Noble	0	2332	West Virginia	32000	139951
Indiana - Ohio	0	0	Wisconsin	425000	433849
Indiana - Orange	24404	4665	Wyoming	0	34987
Indiana - Owen	0	2332			

Table A-9 Productions and Attractions - Pulp and Paper Products, STCC 26 (Annual Tons)

Alabama	11850000	5034552
Arizona	973000	2056889
Arkansas	5970000	3464039
California	14257000	20257020
Colorado	1331000	2008623
Connecticut	1704000	2671357
Delaware	223000	581052
District of Columbia	0	300736
Florida	6603000	8418767
Georgia	14492000	8077190
Idaho	840000	761123
Illinois - north	7157000	8324091
Illinois - south	1789000	2485717
Indiana - Adams	24967	14851
Indiana - Allen	111312	263608
Indiana - Bartholomew	59297	111383
Indiana - Benton	21846	31558
Indiana - Blackford	37451	57548
Indiana - Boone	0	18563
Indiana - Brown	3121	7425
Indiana - Carroll	0	9281
Indiana - Cass	6242	18563
Indiana - Clark	48894	42697
Indiana - Clay	0	11138
Indiana - Clinton	7282	14851
Indiana - Crawford	6242	5569
Indiana - Daviess	8322	12994
Indiana - Dearborn	10403	18563
Indiana - Decatur	80103	129947
Indiana - DeKalb	44733	55691
Indiana - Delaware	46813	116953
Indiana - Dubois	119634	27845
Indiana - Elkhart	354741	113240
Indiana - Fayette	0	12994
Indiana - Floyd	59297	53835
Indiana - Fountain	32249	55691
Indiana - Franklin	0	9281
Indiana - Fulton	11443	9281
Indiana - Gibson	0	14851
Indiana - Grant	81143	154081
Indiana - Greene	0	14851
Indiana - Hamilton	11443	61261
Indiana - Hancock	3121	22276
Indiana - Harrison	14564	14851
Indiana - Hendricks	0	37127
Indiana - Henry	22887	50122
Indiana - Howard	0	38984
Indiana - Huntington	0	16707
Indiana - Jackson	65539	81681
Indiana - Jasper	11443	11138
Indiana - Jay	10403	20420
Indiana - Jefferson	0	14851
Indiana - Jennings	23927	38984
Indiana - Johnson	70740	70543
Indiana - Knox	10403	27845
Indiana - Kosciusko	34330	50122
Indiana - Lagrange	57216	14851
Indiana - Lake	111312	384274
Indiana - LaPorte	34330	92819
Indiana - Lawrence	3121	20420
Indiana - Madison	21846	90963
Indiana - Marion	365144	855799
Indiana - Marshall	80103	98389
Indiana - Martin	10403	5569
Indiana - Miami	48894	76112
Indiana - Monroe	16645	72399
Indiana - Montgomery	18725	44553
Indiana - Morgan	12484	25989
Indiana - Newton	0	7425
Indiana - Noble	5201	18563
Indiana - Ohio	0	1856
Indiana - Orange	15604	9281
Indiana - Owen	4161	7425
Indiana - Parke	3121	7425
Indiana - Perry	5201	9281
Indiana - Pike	0	5569
Indiana - Porter	0	61261
Indiana - Posey	0	12994
Indiana - Pulaski	0	5569
Indiana - Putnam	11443	24133
Indiana - Randolph	14564	12994
Indiana - Ripley	4161	11138
Indiana - Rush	18725	37127
Indiana - St Joseph	66579	194921
Indiana - Scott	3121	9281
Indiana - Shelby	46813	77968
Indiana - Spencer	10403	9281
Indiana - Starke	0	11138
Indiana - Steuben	0	12994
Indiana - Sullivan	4161	9281
Indiana - Switzerland	0	3712
Indiana - Tippecanoe	6242	72399
Indiana - Tipton	0	7425
Indiana - Union	0	3712
Indiana - Vanderburgh	32249	107671
Indiana - Vermillion	14564	29702
Indiana - Vigo	192455	326726
Indiana - Wabash	47854	76112
Indiana - Warren	3121	3712
Indiana - Warrick	10403	22276
Indiana - Washington	12484	11138
Indiana - Wayne	18725	63117
Indiana - Wells	0	12994
Indiana - White	0	11138
Indiana - Whitley	28088	22276
Iowa	1418000	2285226
Kansas	994000	2014192
Kentucky - west	812000	1017306
Kentucky - east	1896000	2066171
Louisiana	10064000	3852027
Maine	5294000	3070483
Maryland	2578000	3696089
Massachusetts	3430000	6033295
Michigan - west	2217000	2155278
Michigan - east	5172000	5539493
Minnesota	5471000	4473920
Mississippi	7010000	2658362
Missouri	3711000	4512904
Montana	557000	503084
Nebraska	533000	982034
Nevada	194000	640457
New Hampshire	898000	1234505
New Jersey	5265000	7033894
New Mexico	140000	755554
New York	6004000	14312832
North Carolina	8622000	6709024
North Dakota	67000	317444
Ohio - north	2857000	4826636
Ohio - central	2857000	2745613
Ohio - south	2857000	2339062
Oklahoma	2423000	2069884
Oregon	5392000	2650937
Pennsylvania	9431000	11546799
Rhode Island	80000	766692
South Carolina	6723000	3926282
South Dakota	115000	430684
Tennessee	5570000	5444817
Texas	8407000	12031319
Utah	602000	1165818
Vermont	597000	553206
Virginia	6821000	5350140
Washington	7795000	5012276
West Virginia	364000	1043295
Wisconsin	11711000	9469489
Wyoming	22000	219055

Table A-10 Productions and Attractions - Chemical and Allied Prod., STCC 28 (Annual Tons)

Alabama	7787000	8110573
Arizona	3095000	5316099
Arkansas	4322000	4677667
California	26881000	56807892
Colorado	1224000	5037900
Connecticut	1334000	6705311
Delaware	3489000	2375392
District of Columbia	0	747214
Florida	33569000	19604118
Georgia	12880000	11752127
Idaho	2693000	1818993
Illinois - north	20078000	20968364
Illinois - south	5019000	6263045
Indiana - Adams	17524	48149
Indiana - Allen	156253	449398
Indiana - Bartholomew	0	76683
Indiana - Benton	0	10699
Indiana - Blackford	0	17833
Indiana - Boone	0	46366
Indiana - Brown	0	17833
Indiana - Carroll	0	23183
Indiana - Cass	0	46366
Indiana - Clark	219046	244315
Indiana - Clay	0	30316
Indiana - Clinton	45270	65983
Indiana - Crawford	0	12483
Indiana - Daviess	0	33883
Indiana - Dearborn	0	48149
Indiana - Decatur	13143	37449
Indiana - DeKalb	21905	57066
Indiana - Delaware	0	146232
Indiana - Dubois	0	44583
Indiana - Elkhart	822153	704414
Indiana - Fayette	0	32099
Indiana - Floyd	20444	90949
Indiana - Fountain	0	21399
Indiana - Franklin	297903	165849
Indiana - Fulton	0	23183
Indiana - Gibson	0	39233
Indiana - Grant	0	90949
Indiana - Greene	0	37449
Indiana - Hamilton	21905	146232
Indiana - Hancock	0	55283
Indiana - Harrison	0	35666
Indiana - Hendricks	0	92733
Indiana - Henry	0	58849
Indiana - Howard	0	98083
Indiana - Huntington	81777	94516
Indiana - Jackson	81777	98083
Indiana - Jasper	0	30316
Indiana - Jay	0	26749
Indiana - Jefferson	13143	44583
Indiana - Jennings	0	28533
Indiana - Johnson	0	106999
Indiana - Knox	13143	57066
Indiana - Kosciusko	32126	99866
Indiana - Lagrange	0	35666
Indiana - Lake	3408358	2270175
Indiana - LaPorte	56952	165849
Indiana - Lawrence	0	51716
Indiana - Madison	0	158716
Indiana - Marion	3643468	3140439
Indiana - Marshall	0	51716
Indiana - Martin	0	12483
Indiana - Miami	0	44583
Indiana - Monroe	0	131966
Indiana - Montgomery	13143	49933
Indiana - Morgan	81777	119482
Indiana - Newton	0	16049
Indiana - Noble	37968	69549
Indiana - Ohio	0	7133
Indiana - Orange	0	23183
Indiana - Owen	0	21399
Indiana - Parke	0	19616
Indiana - Perry	0	23183
Indiana - Pike	0	16049
Indiana - Porter	42349	183682
Indiana - Posey	1020755	576014
Indiana - Pulaski	0	16049
Indiana - Putnam	0	37449
Indiana - Randolph	0	33883
Indiana - Ripley	0	30316
Indiana - Rush	0	21399
Indiana - St Joseph	109523	369148
Indiana - Scott	0	24966
Indiana - Shelby	0	49933
Indiana - Spencer	0	23183
Indiana - Starke	0	28533
Indiana - Steuben	0	33883
Indiana - Sullivan	0	23183
Indiana - Switzerland	0	8916
Indiana - Tippecanoe	384061	399465
Indiana - Tipton	0	19616
Indiana - Union	0	8916
Indiana - Vanderburgh	576822	561748
Indiana - Vermillion	0	19616
Indiana - Vigo	604567	492198
Indiana - Wabash	102222	90949
Indiana - Warren	0	10699
Indiana - Warrick	0	55283
Indiana - Washington	0	28533
Indiana - Wayne	17524	99866
Indiana - Wells	0	32099
Indiana - White	0	28533
Indiana - Whitley	0	33883
Iowa	7265000	4372718
Kansas	7224000	6683911
Kentucky - west	2264000	2534108
Kentucky - east	5284000	5144899
Louisiana	62779000	17246558
Maine	932000	1776194
Maryland	6163000	8313872
Massachusetts	3173000	10489532
Michigan - west	3289000	4786450
Michigan - east	7674000	12306742
Minnesota	5209000	7859123
Mississippi	7145000	5465898
Missouri	6979000	9936700
Montana	712000	1667411
Nebraska	4082000	2361125
Nevada	1315000	1708427
New Hampshire	595000	1580028
New Jersey	13688000	22421774
New Mexico	627000	2632191
New York	12384000	29358918
North Carolina	14659000	13644238
North Dakota	684000	1130629
Ohio - north	8335000	11160063
Ohio - central	8335000	6346862
Ohio - south	8335000	5407048
Oklahoma	8023000	6821227
Oregon	3432000	4351319
Pennsylvania	16143000	25694180
Rhode Island	644000	1588944
South Carolina	12464000	9842184
South Dakota	1292000	948730
Tennessee	11001000	12572458
Texas	96505000	51518544
Utah	4781000	3263489
Vermont	121000	745430
Virginia	6743000	11939377
Washington	4636000	9590735
West Virginia	8090000	4469018
Wisconsin	5246000	7629074
Wyoming	0	1578244

Table A-11 Productions and Attractions - Petroleum and Coal Prod., STCC 29 (Annual Tons)

Alabama	30039000	28538672
Arizona	10914000	15311243
Arkansas	7676000	17525904
California	205748992	229000736
Colorado	6665000	17969228
Connecticut	8207000	16192030
Delaware	0	8315723
District of Columbia	0	2230285
Florida	42204000	56614492
Georgia	0	33758948
Idaho	1719000	4169579
Illinois - north	70943000	76622616
Illinois - south	17736000	22886794
Indiana - Adams	0	113271
Indiana - Allen	1279513	1574089
Indiana - Bartholomew	0	234355
Indiana - Benton	0	35153
Indiana - Blackford	0	50777
Indiana - Boone	0	140613
Indiana - Brown	0	50777
Indiana - Carroll	0	68353
Indiana - Cass	0	140613
Indiana - Clark	0	322239
Indiana - Clay	0	89836
Indiana - Clinton	0	113271
Indiana - Crawford	0	37106
Indiana - Daviess	0	101554
Indiana - Dearborn	0	142566
Indiana - Decatur	0	85930
Indiana - DeKalb	0	128895
Indiana - Delaware	0	439417
Indiana - Dubois	0	134754
Indiana - Elkhart	0	574171
Indiana - Fayette	0	95695
Indiana - Floyd	0	236308
Indiana - Fountain	0	64447
Indiana - Franklin	3735804	1441287
Indiana - Fulton	0	68353
Indiana - Gibson	0	117177
Indiana - Grant	0	273415
Indiana - Greene	0	111318
Indiana - Hamilton	0	400357
Indiana - Hancock	0	167954
Indiana - Harrison	0	109366
Indiana - Hendricks	0	277320
Indiana - Henry	0	177719
Indiana - Howard	0	296850
Indiana - Huntington	0	130848
Indiana - Jackson	0	138660
Indiana - Jasper	0	91789
Indiana - Jay	0	78118
Indiana - Jefferson	0	109366
Indiana - Jennings	0	87883
Indiana - Johnson	0	324192
Indiana - Knox	0	146472
Indiana - Kosciusko	0	240214
Indiana - Lagrange	0	107413
Indiana - Lake	37358040	15442092
Indiana - LaPorte	0	392545
Indiana - Lawrence	0	158190
Indiana - Madison	0	480429
Indiana - Marion	9563658	6435018
Indiana - Marshall	0	154284
Indiana - Martin	0	39059
Indiana - Miami	0	134754
Indiana - Monroe	0	400357
Indiana - Montgomery	0	126942
Indiana - Morgan	0	205061
Indiana - Newton	0	48824
Indiana - Noble	0	138660
Indiana - Ohio	0	19529
Indiana - Orange	0	68353
Indiana - Owen	0	64447

Indiana - Parke	0	56635
Indiana - Perry	0	70306
Indiana - Pike	0	46871
Indiana - Porter	0	474570
Indiana - Posey	8003960	3029048
Indiana - Pulaski	0	46871
Indiana - Putnam	0	111318
Indiana - Randolph	0	99601
Indiana - Ripley	0	89836
Indiana - Rush	0	66400
Indiana - St Joseph	0	908128
Indiana - Scott	0	76165
Indiana - Shelby	0	148425
Indiana - Spencer	0	72259
Indiana - Starke	0	83977
Indiana - Steuben	0	101554
Indiana - Sullivan	0	70306
Indiana - Switzerland	0	29294
Indiana - Tippecanoe	0	480429
Indiana - Tipton	0	58588
Indiana - Union	0	25388
Indiana - Vanderburgh	0	605419
Indiana - Vermillion	0	62494
Indiana - Vigo	1279513	859304
Indiana - Wabash	1279513	597607
Indiana - Warren	0	29294
Indiana - Warrick	0	164049
Indiana - Washington	0	87883
Indiana - Wayne	0	263650
Indiana - Wells	0	95695
Indiana - White	0	85930
Indiana - Whitley	0	101554
Iowa	9632000	11571316
Kansas	29727000	34333120
Kentucky - west	11430000	8716081
Kentucky - east	26670000	17693860
Louisiana	135136000	94304760
Maine	4322000	5880376
Maryland	19973000	24974512
Massachusetts	14588000	35793936
Michigan - west	17473000	13186417
Michigan - east	40771000	33909324
Minnesota	14198000	29954572
Mississippi	28438000	23726568
Missouri	12226000	28116832
Montana	10579000	8968014
Nebraska	3477000	6267063
Nevada	3422000	5784681
New Hampshire	0	4966389
New Jersey	64080000	59174828
New Mexico	15514000	11028392
New York	39502000	79780560
North Carolina	31542000	28624604
North Dakota	8352000	5282769
Ohio - north	26806000	38383568
Ohio - central	26806000	21832192
Ohio - south	26806000	18601988
Oklahoma	39469000	36122036
Oregon	22638000	15018298
Pennsylvania	75164000	101063968
Rhode Island	0	4153955
South Carolina	14918000	15744801
South Dakota	1797000	3027095
Tennessee	19936000	25718592
Texas	385848000	258564704
Utah	11627000	13850425
Vermont	433000	2146308
Virginia	30392000	28597262
Washington	40558000	36331000
West Virginia	39215000	9512891
Wisconsin	22542000	20693614
Wyoming	13780000	10323371

Table A-12 Productions and Attractions - Stone, Clay and Glass, STCC 32 (Annual Tons)

Alabama	16974000	12993773
Arizona	13480000	11785435
Arkansas	5853000	7560114
California	77884000	95697072
Colorado	11569000	10592546
Connecticut	6412000	10569372
Delaware	2435000	2141903
District of Columbia	0	1952100
Florida	37866000	41603248
Georgia	32015000	20830866
Idaho	2798000	3237684
Illinois - north	28127000	28303804
Illinois - south	7032000	8453953
Indiana - Adams	123778	100418
Indiana - Allen	1192396	967774
Indiana - Bartholomew	251682	204148
Indiana - Benton	37133	30898
Indiana - Blackford	56388	45243
Indiana - Boone	151284	122489
Indiana - Brown	56388	45243
Indiana - Carroll	74267	60692
Indiana - Cass	152660	123592
Indiana - Clark	347954	282497
Indiana - Clay	97647	79452
Indiana - Clinton	122403	99315
Indiana - Crawford	39884	32001
Indiana - Daviess	108650	88280
Indiana - Dearborn	154035	124696
Indiana - Decatur	93521	76141
Indiana - DeKalb	140282	113661
Indiana - Delaware	474483	385123
Indiana - Dubois	145783	118075
Indiana - Elkhart	618891	502094
Indiana - Fayette	103148	83866
Indiana - Floyd	255808	207458
Indiana - Fountain	70141	57382
Indiana - Franklin	77018	62899
Indiana - Fulton	74267	60692
Indiana - Gibson	126529	102625
Indiana - Grant	294317	238357
Indiana - Greene	121028	98211
Indiana - Hamilton	431848	349811
Indiana - Hancock	180166	146766
Indiana - Harrison	118277	96004
Indiana - Hendricks	299818	243874
Indiana - Henry	191169	154490
Indiana - Howard	320448	260427
Indiana - Huntington	140282	113661
Indiana - Jackson	149909	121385
Indiana - Jasper	99023	80555
Indiana - Jay	85269	69520
Indiana - Jefferson	118277	96004
Indiana - Jennings	93521	76141
Indiana - Johnson	349329	283600
Indiana - Knox	158161	128006
Indiana - Kosciusko	258558	209665
Indiana - Lagrange	116902	94901
Indiana - Lake	1885554	1529458
Indiana - LaPorte	424972	344293
Indiana - Lawrence	169163	137938
Indiana - Madison	518492	420435
Indiana - Marion	3159094	2563442
Indiana - Marshall	167788	135731
Indiana - Martin	41259	33105
Indiana - Miami	145783	119178
Indiana - Monroe	431848	350914
Indiana - Montgomery	136156	110350
Indiana - Morgan	221425	179871
Indiana - Newton	53637	43036
Indiana - Noble	149909	121385
Indiana - Ohio	20630	16552
Indiana - Orange	72892	59589
Indiana - Owen	68766	55175
Indiana - Parke	60514	49657
Indiana - Perry	75642	61796
Indiana - Pike	49511	39726
Indiana - Porter	511616	414917
Indiana - Posey	103148	83866
Indiana - Pulaski	49511	40829
Indiana - Putnam	119652	97108
Indiana - Randolph	107274	87176
Indiana - Ripley	97647	79452
Indiana - Rush	71516	58485
Indiana - St Joseph	979223	794523
Indiana - Scott	82519	67313
Indiana - Shelby	159536	129110
Indiana - Spencer	77018	62899
Indiana - Starke	90771	72831
Indiana - Steuben	108650	88280
Indiana - Sullivan	75642	60692
Indiana - Switzerland	30257	25380
Indiana - Tippecanoe	517117	420435
Indiana - Tipton	63264	51864
Indiana - Union	27506	22070
Indiana - Vanderburgh	654649	530786
Indiana - Vermillion	66015	54071
Indiana - Vigo	420846	340983
Indiana - Wabash	138907	112557
Indiana - Warren	33008	26484
Indiana - Warrick	177415	144559
Indiana - Washington	93521	76141
Indiana - Wayne	284690	231736
Indiana - Wells	103148	83866
Indiana - White	92146	75038
Indiana - Whitley	110025	89383
Iowa	15240000	8929564
Kansas	8842000	7968410
Kentucky - west	6762000	3910822
Kentucky - east	15778000	7939719
Louisiana	13054000	13569803
Maine	2009000	3948341
Maryland	9695000	15374034
Massachusetts	4766000	19345548
Michigan - west	8609000	8336981
Michigan - east	20087000	21436692
Minnesota	13368000	14068587
Mississippi	5903000	8274081
Missouri	36574000	16454365
Montana	2912000	2568960
Nebraska	9261000	5073916
Nevada	10132000	3865578
New Hampshire	3588000	3566528
New Jersey	9416000	24856454
New Mexico	4653000	4871975
New York	28752000	57849052
North Carolina	21281000	21316408
North Dakota	1362000	2054726
Ohio - north	11822000	16986254
Ohio - central	11822000	9661188
Ohio - south	11822000	8232148
Oklahoma	12692000	10115832
Oregon	7752000	9139230
Pennsylvania	38411000	38207764
Rhode Island	1776000	3225545
South Carolina	12917000	11212716
South Dakota	3720000	2237908
Tennessee	21595000	15683015
Texas	64398000	54623504
Utah	10995000	5540699
Vermont	1576000	1810852
Virginia	30323000	19895094
Washington	13141000	15649910
West Virginia	5319000	5765814
Wisconsin	14485000	15730466
Wyoming	3286000	1459937

Table A-13 Productions and Attractions - Primary Metal Products, STCC 33 (Annual Tons)

Alabama	10597000	6540902	Indiana - Parke	0	0
Arizona	3148000	2112166	Indiana - Perry	0	0
Arkansas	4824000	3085771	Indiana - Pike	0	7172
California	11743000	19983102	Indiana - Porter	3151121	1305311
Colorado	882000	2339878	Indiana - Posey	0	7172
Connecticut	2022000	5637225	Indiana - Pulaski	74086	111166
Delaware	819000	390876	Indiana - Putnam	0	82478
District of Columbia	0	12551	Indiana - Randolph	93842	71720
Florida	3269000	4190265	Indiana - Ripley	0	43032
Georgia	4068000	4305018	Indiana - Rush	74086	28688
Idaho	197000	245642	Indiana - St Joseph	785311	566591
Illinois - north	18221000	14837162	Indiana - Scott	0	0
Illinois - south	4555000	4432322	Indiana - Shelby	158050	103994
Indiana - Adams	74086	69927	Indiana - Spencer	74086	28688
Indiana - Allen	1101411	613209	Indiana - Starke	0	0
Indiana - Bartholomew	345734	274330	Indiana - Steuben	167928	202610
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	0	37653	Indiana - Switzerland	0	7172
Indiana - Boone	0	19723	Indiana - Tippecanoe	735920	333499
Indiana - Brown	0	0	Indiana - Tipton	0	41239
Indiana - Carroll	0	51997	Indiana - Union	0	0
Indiana - Cass	39512	130889	Indiana - Vanderburgh	79025	190059
Indiana - Clark	64208	177508	Indiana - Vermillion	0	34067
Indiana - Clay	0	7172	Indiana - Vigo	256831	136268
Indiana - Clinton	0	19723	Indiana - Wabash	246953	184680
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	1259461	514594
Indiana - Dearborn	0	0	Indiana - Washington	0	41239
Indiana - Decatur	0	136268	Indiana - Wayne	488967	258193
Indiana - DeKalb	409942	353223	Indiana - Wells	74086	93236
Indiana - Delaware	242014	313776	Indiana - White	0	59169
Indiana - Dubois	0	26895	Indiana - Whitley	158050	91443
Indiana - Elkhart	350673	609623	Iowa	2077000	3306311
Indiana - Fayette	0	59169	Kansas	696000	1396755
Indiana - Floyd	0	48411	Kentucky - west	1961000	1669292
Indiana - Fountain	405003	166749	Kentucky - east	4576000	3388790
Indiana - Franklin	0	0	Louisiana	2515000	2038653
Indiana - Fulton	74086	109373	Maine	132000	435701
Indiana - Gibson	0	0	Maryland	4594000	2863438
Indiana - Grant	296344	527145	Massachusetts	1079000	6054996
Indiana - Greene	74086	35860	Michigan - west	6211000	5181800
Indiana - Hamilton	153111	134475	Michigan - east	14491000	13323862
Indiana - Hancock	24695	43032	Minnesota	2380000	5027601
Indiana - Harrison	0	19723	Mississippi	1157000	2108580
Indiana - Hendricks	0	14344	Missouri	4826000	6078306
Indiana - Henry	103720	48411	Montana	299000	374739
Indiana - Howard	735920	313776	Nebraska	1063000	1120631
Indiana - Huntington	64208	93236	Nevada	171000	412392
Indiana - Jackson	108659	107580	New Hampshire	166000	1278416
Indiana - Jasper	24695	43032	New Jersey	4084000	6417185
Indiana - Jay	0	69927	New Mexico	607000	329913
Indiana - Jefferson	0	26895	New York	4310000	10325948
Indiana - Jennings	0	23309	North Carolina	2531000	4993534
Indiana - Johnson	24695	53790	North Dakota	51000	89650
Indiana - Knox	158050	103994	Ohio - north	13606000	13556953
Indiana - Kosciusko	321039	258193	Ohio - central	13606000	7711738
Indiana - Lagrange	0	25102	Ohio - south	13606000	6569590
Indiana - Lake	10673312	4443080	Oklahoma	2164000	2936951
Indiana - LaPorte	829762	591693	Oregon	3059000	3261486
Indiana - Lawrence	602565	292260	Pennsylvania	25256000	21639844
Indiana - Madison	74086	123717	Rhode Island	841000	1859352
Indiana - Marion	1437267	1717704	South Carolina	2552000	2990741
Indiana - Marshall	197562	116545	South Dakota	75000	216954
Indiana - Martin	0	0	Tennessee	6180000	6228918
Indiana - Miami	74086	59169	Texas	15945000	13544402
Indiana - Monroe	0	21516	Utah	4212000	1968725
Indiana - Montgomery	316100	186473	Vermont	31000	537903
Indiana - Morgan	0	19723	Virginia	1851000	3064255
Indiana - Newton	74086	28688	Washington	3398000	3749185
Indiana - Noble	380308	263572	West Virginia	3795000	2827577
Indiana - Ohio	0	0	Wisconsin	3879000	9580055
Indiana - Orange	74086	28688	Wyoming	21000	73513
Indiana - Owen	74086	28688			

Table A-14 Productions and Attractions - Fabricated Metal Products, STCC 34 (Annual Tons)

Alabama	1388000	1463537	Indiana - Parke	0	0
Arizona	432000	583007	Indiana - Perry	0	0
Arkansas	913000	1031871	Indiana - Pike	3149	3439
California	5882000	8330643	Indiana - Porter	181054	30956
Colorado	532000	1019833	Indiana - Posey	3149	3439
Connecticut	582000	2172089	Indiana - Pulaski	44083	46434
Delaware	33000	127264	Indiana - Putnam	40934	46434
District of Columbia	0	6879	Indiana - Randolph	22041	18917
Florida	2126000	1953676	Indiana - Ripley	20467	24077
Georgia	2311000	1262322	Indiana - Rush	3149	0
Idaho	82000	122104	Indiana - St Joseph	163736	144462
Illinois - north	4646000	4946104	Indiana - Scott	0	0
Illinois - south	1161000	1477296	Indiana - Shelby	28339	22357
Indiana - Adams	23616	22357	Indiana - Spencer	3149	0
Indiana - Allen	140120	99747	Indiana - Starke	0	0
Indiana - Bartholomew	85017	77390	Indiana - Steuben	73996	75670
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	17318	20637	Indiana - Switzerland	3149	3439
Indiana - Boone	9446	10318	Indiana - Tippecanoe	56678	24077
Indiana - Brown	0	0	Indiana - Tipton	20467	22357
Indiana - Carroll	25190	29236	Indiana - Union	0	0
Indiana - Cass	58252	65351	Indiana - Vanderburgh	81868	89428
Indiana - Clark	77145	85989	Indiana - Vermillion	17318	18917
Indiana - Clay	3149	3439	Indiana - Vigo	29913	18917
Indiana - Clinton	9446	10318	Indiana - Wabash	55103	49873
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	69273	8598
Indiana - Dearborn	0	0	Indiana - Washington	20467	22357
Indiana - Decatur	66124	77390	Indiana - Wayne	55103	36115
Indiana - DeKalb	113355	108346	Indiana - Wells	34636	36115
Indiana - Delaware	118079	123824	Indiana - White	29913	34395
Indiana - Dubois	12595	15478	Indiana - Whitley	22041	15478
Indiana - Elkhart	247178	266566	Iowa	1437000	1095503
Indiana - Fayette	28339	32675	Kansas	529000	605364
Indiana - Floyd	23616	27516	Kentucky - west	411000	435105
Indiana - Fountain	23616	3439	Kentucky - east	960000	882250
Indiana - Franklin	0	0	Louisiana	1095000	861612
Indiana - Fulton	42508	44714	Maine	187000	177137
Indiana - Gibson	0	0	Maryland	1391000	610524
Indiana - Grant	215690	232171	Massachusetts	826000	2144573
Indiana - Greene	6298	3439	Michigan - west	3476000	1809214
Indiana - Hamilton	44083	42994	Michigan - east	8112000	4653740
Indiana - Hancock	17318	18917	Minnesota	1262000	2199606
Indiana - Harrison	9446	10318	Mississippi	877000	754986
Indiana - Hendricks	6298	8598	Missouri	1757000	2311392
Indiana - Henry	7872	3439	Montana	76000	46434
Indiana - Howard	45657	12038	Nebraska	842000	433386
Indiana - Huntington	36211	37835	Nevada	183000	118665
Indiana - Jackson	37785	37835	New Hampshire	292000	371473
Indiana - Jasper	17318	18917	New Jersey	2561000	2345788
Indiana - Jay	34636	39555	New Mexico	81000	60192
Indiana - Jefferson	12595	15478	New York	2152000	3706138
Indiana - Jennings	11021	13758	North Carolina	1974000	1809214
Indiana - Johnson	22041	24077	North Dakota	78000	49873
Indiana - Knox	28339	22357	Ohio - north	2858000	3909073
Indiana - Kosciusko	80293	73950	Ohio - central	2858000	2223683
Indiana - Lagrange	12595	13758	Ohio - south	2858000	1895204
Indiana - Lake	620306	115225	Oklahoma	783000	1126459
Indiana - LaPorte	168459	147901	Oregon	588000	703392
Indiana - Lawrence	55103	30956	Pennsylvania	4547000	5321017
Indiana - Madison	50380	53313	Rhode Island	128000	505617
Indiana - Marion	631326	650079	South Carolina	1401000	99747
Indiana - Marshall	28339	20637	South Dakota	123000	87709
Indiana - Martin	0	0	Tennessee	2351000	2139413
Indiana - Miami	17318	17197	Texas	4981000	4872153
Indiana - Monroe	9446	12038	Utah	856000	510776
Indiana - Montgomery	45657	34395	Vermont	80000	232171
Indiana - Morgan	9446	10318	Virginia	1019000	1000915
Indiana - Newton	3149	0	Washington	998000	851294
Indiana - Noble	73996	63632	West Virginia	905000	357715
Indiana - Ohio	0	0	Wisconsin	2227000	3277912
Indiana - Orange	3149	0	Wyoming	45000	25796
Indiana - Owen	3149	0			

Table A-15 Productions and Attractions - Machinery, non-electrical, STCC 35 (Annual Tons)

Alabama	455000	467635	Indiana - Parke	1290	1833
Arizona	283000	271411	Indiana - Perry	2580	3667
Arkansas	359000	302587	Indiana - Pike	0	0
California	2056000	3719075	Indiana - Porter	16770	18338
Colorado	413000	485973	Indiana - Posey	0	0
Connecticut	328000	812401	Indiana - Pulaski	0	0
Delaware	21000	33009	Indiana - Putnam	0	0
District of Columbia	0	1833	Indiana - Randolph	11610	12837
Florida	770000	520817	Indiana - Ripley	0	0
Georgia	978000	557494	Indiana - Rush	7740	9169
Idaho	59000	115533	Indiana - St Joseph	47731	51348
Illinois - north	2677000	1971403	Indiana - Scott	0	0
Illinois - south	669000	588670	Indiana - Shelby	7740	9169
Indiana - Adams	7740	9169	Indiana - Spencer	2580	3667
Indiana - Allen	94173	102696	Indiana - Starke	2580	3667
Indiana - Bartholomew	108363	119201	Indiana - Steuben	3870	5501
Indiana - Benton	1290	1833	Indiana - Sullivan	0	0
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	10320	11003	Indiana - Tippecanoe	41281	45846
Indiana - Brown	0	0	Indiana - Tipton	2580	1833
Indiana - Carroll	3870	3667	Indiana - Union	0	0
Indiana - Cass	3870	3667	Indiana - Vanderburgh	20641	22006
Indiana - Clark	10320	11003	Indiana - Vermillion	0	0
Indiana - Clay	1290	1833	Indiana - Vigo	7740	9169
Indiana - Clinton	3870	3667	Indiana - Wabash	9030	9169
Indiana - Crawford	0	0	Indiana - Warren	1290	1833
Indiana - Daviess	5160	5501	Indiana - Warrick	1290	1833
Indiana - Dearborn	3870	3667	Indiana - Washington	6450	7335
Indiana - Decatur	14190	16504	Indiana - Wayne	18061	20172
Indiana - DeKalb	9030	9169	Indiana - Wells	5160	5501
Indiana - Delaware	18061	20172	Indiana - White	9030	9169
Indiana - Dubois	1290	1833	Indiana - Whitley	2580	3667
Indiana - Elkhart	33541	36677	Iowa	1062000	720708
Indiana - Fayette	63212	69686	Kansas	471000	383277
Indiana - Floyd	5160	5501	Kentucky - west	320000	166881
Indiana - Fountain	0	0	Kentucky - east	746000	339264
Indiana - Franklin	0	0	Louisiana	300000	190721
Indiana - Fulton	7740	9169	Maine	77000	67852
Indiana - Gibson	2580	1833	Maryland	351000	240236
Indiana - Grant	2580	3667	Massachusetts	295000	1061806
Indiana - Greene	0	0	Michigan - west	540000	608842
Indiana - Hamilton	6450	7335	Michigan - east	1261000	1564285
Indiana - Hancock	16770	18338	Minnesota	1076000	1122324
Indiana - Harrison	0	0	Mississippi	512000	254907
Indiana - Hendricks	2580	1833	Missouri	805000	561162
Indiana - Henry	2580	3667	Montana	25000	14670
Indiana - Howard	3870	5501	Nebraska	519000	209060
Indiana - Huntington	3870	3667	Nevada	83000	44012
Indiana - Jackson	3870	3667	New Hampshire	71000	271411
Indiana - Jasper	0	0	New Jersey	393000	755551
Indiana - Jay	5160	5501	New Mexico	104000	49514
Indiana - Jefferson	16770	18338	New York	832000	1791684
Indiana - Jennings	5160	5501	North Carolina	1258000	1083813
Indiana - Johnson	9030	9169	North Dakota	197000	64185
Indiana - Knox	0	0	Ohio - north	816000	1272701
Indiana - Kosciusko	9030	11003	Ohio - central	816000	724376
Indiana - Lagrange	6450	7335	Ohio - south	816000	616178
Indiana - Lake	33541	36677	Oklahoma	439000	484139
Indiana - LaPorte	19351	20172	Oregon	278000	293418
Indiana - Lawrence	7740	7335	Pennsylvania	1542000	1705492
Indiana - Madison	7740	9169	Rhode Island	0	100862
Indiana - Marion	149644	163213	South Carolina	483000	597839
Indiana - Marshall	9030	9169	South Dakota	191000	97194
Indiana - Martin	0	0	Tennessee	1274000	740880
Indiana - Miami	0	0	Texas	2763000	1943895
Indiana - Monroe	29671	33009	Utah	175000	154044
Indiana - Montgomery	12900	14670	Vermont	44000	78856
Indiana - Morgan	5160	5501	Virginia	459000	421788
Indiana - Newton	1290	1833	Washington	565000	370440
Indiana - Noble	14190	16504	West Virginia	169000	88025
Indiana - Ohio	0	0	Wisconsin	1746000	1755007
Indiana - Orange	0	0	Wyoming	44000	23840
Indiana - Owen	0	0			

Table A-16 Productions and Attractions - Electrical Machinery, STCC 36 (Annual Tons)

Alabama	569000	519476
Arizona	327000	349023
Arkansas	782000	330760
California	2547000	3419210
Colorado	143000	393665
Connecticut	160000	582381
Delaware	49000	66963
District of Columbia	0	42613
Florida	827000	1213464
Georgia	1112000	653403
Idaho	20000	89285
Illinois - north	1470000	1418414
Illinois - south	367000	424103
Indiana - Adams	10816	6087
Indiana - Allen	81119	36525
Indiana - Bartholomew	27040	16233
Indiana - Benton	0	0
Indiana - Blackford	2704	4058
Indiana - Boone	2704	4058
Indiana - Brown	0	0
Indiana - Carroll	5408	6087
Indiana - Cass	27040	14204
Indiana - Clark	16224	20292
Indiana - Clay	0	2029
Indiana - Clinton	2704	4058
Indiana - Crawford	0	0
Indiana - Daviess	0	2029
Indiana - Dearborn	0	2029
Indiana - Decatur	13520	14204
Indiana - DeKalb	32448	20292
Indiana - Delaware	37856	28408
Indiana - Dubois	8112	4058
Indiana - Elkhart	70303	54788
Indiana - Fayette	10816	8116
Indiana - Floyd	8112	8116
Indiana - Fountain	13520	2029
Indiana - Franklin	0	2029
Indiana - Fulton	13520	8116
Indiana - Gibson	10816	2029
Indiana - Grant	62191	42613
Indiana - Greene	5408	2029
Indiana - Hamilton	13520	14204
Indiana - Hancock	2704	6087
Indiana - Harrison	2704	4058
Indiana - Hendricks	2704	6087
Indiana - Henry	2704	4058
Indiana - Howard	116271	8116
Indiana - Huntington	32448	8116
Indiana - Jackson	16224	8116
Indiana - Jasper	5408	4058
Indiana - Jay	8112	8116
Indiana - Jefferson	13520	4058
Indiana - Jennings	2704	4058
Indiana - Johnson	10816	10146
Indiana - Knox	8112	6087
Indiana - Kosciusko	21632	16233
Indiana - Lagrange	5408	4058
Indiana - Lake	297436	52759
Indiana - LaPorte	48671	32467
Indiana - Lawrence	21632	8116
Indiana - Madison	91935	18262
Indiana - Marion	167646	162336
Indiana - Marshall	13520	6087
Indiana - Martin	0	0
Indiana - Miami	8112	6087
Indiana - Monroe	35152	10146
Indiana - Montgomery	18928	8116
Indiana - Morgan	8112	6087
Indiana - Newton	5408	0
Indiana - Noble	27040	12175
Indiana - Ohio	0	0
Indiana - Orange	5408	2029
Indiana - Owen	2704	2029
Indiana - Parke	2704	2029
Indiana - Perry	2704	2029
Indiana - Pike	0	2029
Indiana - Porter	89231	14204
Indiana - Posey	0	2029
Indiana - Pulaski	10816	8116
Indiana - Putnam	10816	10146
Indiana - Randolph	5408	6087
Indiana - Ripley	5408	6087
Indiana - Rush	2704	2029
Indiana - St Joseph	54079	40584
Indiana - Scott	0	2029
Indiana - Shelby	10816	6087
Indiana - Spencer	2704	2029
Indiana - Starke	0	2029
Indiana - Steuben	21632	14204
Indiana - Sullivan	0	2029
Indiana - Switzerland	0	2029
Indiana - Tippecanoe	27040	12175
Indiana - Tipton	5408	4058
Indiana - Union	0	0
Indiana - Vanderburgh	48671	26379
Indiana - Vermillion	2704	4058
Indiana - Vigo	16224	10146
Indiana - Wabash	18928	10146
Indiana - Warren	0	0
Indiana - Warrick	35152	4058
Indiana - Washington	5408	6087
Indiana - Wayne	21632	10146
Indiana - Wells	13520	8116
Indiana - White	8112	8116
Indiana - Whitley	8112	4058
Iowa	568000	371344
Kansas	804000	269884
Kentucky - west	316000	154219
Kentucky - east	737000	314526
Louisiana	216000	432220
Maine	77000	113635
Maryland	279000	430191
Massachusetts	409000	767039
Michigan - west	144000	474833
Michigan - east	337000	1221581
Minnesota	521000	661520
Mississippi	563000	300322
Missouri	1225000	73051
Montana	13000	62905
Nebraska	180000	180599
Nevada	71000	101460
New Hampshire	53000	137985
New Jersey	1307000	917200
New Mexico	25000	113635
New York	726000	1848605
North Carolina	979000	754864
North Dakota	18000	52759
Ohio - north	988000	1004456
Ohio - central	988000	572235
Ohio - south	988000	487009
Oklahoma	439000	401782
Oregon	161000	310468
Pennsylvania	1244000	1692356
Rhode Island	55000	152190
South Carolina	886000	405840
South Dakota	30000	62905
Tennessee	1613000	687900
Texas	1344000	1970357
Utah	64000	202920
Vermont	12000	77109
Virginia	365000	590498
Washington	233000	474833
West Virginia	155000	182628
Wisconsin	1019000	874587
Wyoming	0	36525

Table A-17 Productions and Attractions - Transportation Equipment, STCC 37 (Annual Tons)

Alabama	1236000	1242452	Indiana - Parke	0	0
Arizona	262000	1681560	Indiana - Perry	16191	10117
Arkansas	560000	584802	Indiana - Pike	0	0
California	7065000	14711120	Indiana - Porter	0	0
Colorado	0	957133	Indiana - Posey	0	0
Connecticut	160000	4026840	Indiana - Pulaski	0	0
Delaware	306000	410778	Indiana - Putnam	0	0
District of Columbia	0	4047	Indiana - Randolph	69392	40470
Florida	1744000	2207679	Indiana - Ripley	0	0
Georgia	2530000	2086267	Indiana - Rush	0	0
Idaho	101000	84988	Indiana - St Joseph	300698	178071
Illinois - north	3469000	1649183	Indiana - Scott	0	0
Illinois - south	867000	493743	Indiana - Shelby	34696	20235
Indiana - Adams	127218	74870	Indiana - Spencer	0	0
Indiana - Allen	464925	275201	Indiana - Starke	0	0
Indiana - Bartholomew	48574	28329	Indiana - Steuben	138784	82965
Indiana - Benton	0	0	Indiana - Sullivan	16191	10117
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	346959	204377
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	16191	10117	Indiana - Vanderburgh	16191	10117
Indiana - Clark	46261	28329	Indiana - Vermillion	0	0
Indiana - Clay	76331	44517	Indiana - Vigo	34696	20235
Indiana - Clinton	16191	10117	Indiana - Wabash	4626	4047
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	0	0
Indiana - Dearborn	0	0	Indiana - Washington	0	0
Indiana - Decatur	16191	10117	Indiana - Wayne	69392	40470
Indiana - DeKalb	34696	20235	Indiana - Wells	4626	4047
Indiana - Delaware	346959	204377	Indiana - White	69392	40470
Indiana - Dubois	53200	30353	Indiana - Whitley	34696	20235
Indiana - Elkhart	1094077	645508	Iowa	795000	493743
Indiana - Fayette	0	0	Kansas	398000	2565846
Indiana - Floyd	27757	16188	Kentucky - west	1038000	380425
Indiana - Fountain	0	0	Kentucky - east	2421000	772991
Indiana - Franklin	0	0	Louisiana	768000	1398264
Indiana - Fulton	0	0	Maine	51000	797273
Indiana - Gibson	0	0	Maryland	2278000	560520
Indiana - Grant	60140	34400	Massachusetts	319000	902497
Indiana - Greene	0	0	Michigan - west	4683000	2727729
Indiana - Hamilton	23131	14164	Michigan - east	10927000	700144
Indiana - Hancock	23131	14164	Minnesota	830000	410778
Indiana - Harrison	16191	10117	Mississippi	679000	1236381
Indiana - Hendricks	4626	4047	Missouri	2509000	3154695
Indiana - Henry	136470	80941	Montana	36000	14164
Indiana - Howard	231306	137600	Nebraska	322000	313648
Indiana - Huntington	78644	46541	Nevada	46000	44517
Indiana - Jackson	69392	40470	New Hampshire	53000	141647
Indiana - Jasper	16191	10117	New Jersey	1549000	505884
Indiana - Jay	0	0	New Mexico	0	222589
Indiana - Jefferson	16191	10117	New York	2350000	2353374
Indiana - Jennings	16191	10117	North Carolina	1246000	1096757
Indiana - Johnson	138784	80941	North Dakota	62000	66776
Indiana - Knox	0	0	Ohio - north	3472000	3383355
Indiana - Kosciusko	87896	52611	Ohio - central	3472000	1924384
Indiana - Lagrange	62453	36423	Ohio - south	3472000	1639065
Indiana - Lake	104088	60706	Oklahoma	1025000	880238
Indiana - LaPorte	161914	95106	Oregon	0	613131
Indiana - Lawrence	120279	70823	Pennsylvania	2492000	2468716
Indiana - Madison	34696	20235	Rhode Island	0	107247
Indiana - Marion	1619141	957133	South Carolina	631000	643485
Indiana - Marshall	34696	20235	South Dakota	55000	62729
Indiana - Martin	0	0	Tennessee	3018000	1970925
Indiana - Miami	0	0	Texas	1934000	4397147
Indiana - Monroe	16191	10117	Utah	182000	791203
Indiana - Montgomery	16191	10117	Vermont	31000	163906
Indiana - Morgan	16191	10117	Virginia	1079000	2462645
Indiana - Newton	0	0	Washington	1915000	6076684
Indiana - Noble	101775	58682	West Virginia	253000	76894
Indiana - Ohio	0	0	Wisconsin	2399000	1167581
Indiana - Orange	0	0	Wyoming	0	10117
Indiana - Owen	0	0			

Table A-18 Productions and Attractions - Waste and Scrap, STCC 40 (Annual Tons)

Alabama	2678000	3669000
Arizona	540000	231000
Arkansas	1068000	2843000
California	12313000	11760000
Colorado	1841000	1634000
Connecticut	451000	979000
Delaware	1055000	377000
District of Columbia	0	0
Florida	10351000	3657000
Georgia	3666000	4652000
Idaho	138000	437000
Illinois - north	3852000	3943500
Illinois - south	3852000	3943500
Indiana - Adams	25092	284570
Indiana - Allen	242767	335932
Indiana - Bartholomew	51369	149871
Indiana - Benton	7618	3907
Indiana - Blackford	11351	14333
Indiana - Boone	30783	12983
Indiana - Brown	11362	785
Indiana - Carroll	15178	14077
Indiana - Cass	30998	50824
Indiana - Clark	70833	58357
Indiana - Clay	19936	15427
Indiana - Clinton	24995	35652
Indiana - Crawford	8000	1552
Indiana - Daviess	22218	17050
Indiana - Dearborn	31338	18823
Indiana - Decatur	19080	36032
Indiana - DeKalb	28505	75742
Indiana - Delaware	96561	91081
Indiana - Dubois	29548	100537
Indiana - Elkhart	126048	489093
Indiana - Fayette	20993	46440
Indiana - Floyd	51972	51644
Indiana - Fountain	14370	15506
Indiana - Franklin	15800	4833
Indiana - Fulton	15203	23868
Indiana - Gibson	25753	22642
Indiana - Grant	59852	86018
Indiana - Greene	24540	15559
Indiana - Hamilton	87908	57272
Indiana - Hancock	36739	24865
Indiana - Harrison	24120	16997
Indiana - Hendricks	61101	12084
Indiana - Henry	38846	27599
Indiana - Howard	65225	160870
Indiana - Huntington	28588	63446
Indiana - Jackson	30447	45884
Indiana - Jasper	20142	10470
Indiana - Jay	17359	29716
Indiana - Jefferson	24045	33094
Indiana - Jennings	19093	16706
Indiana - Johnson	71101	49351
Indiana - Knox	32185	17932
Indiana - Kosciusko	52690	123771
Indiana - Lagrange	23787	34038
Indiana - Lake	383792	357499
Indiana - LaPorte	86399	109675
Indiana - Lawrence	34567	44155
Indiana - Madison	105447	122553
Indiana - Marion	643287	747995
Indiana - Marshall	34039	63887
Indiana - Martin	8367	5292
Indiana - Miami	29774	19952
Indiana - Monroe	87942	73881
Indiana - Montgomery	27789	71931
Indiana - Morgan	45126	22915
Indiana - Newton	10935	10496
Indiana - Noble	30565	78009
Indiana - Ohio	4289	88
Indiana - Orange	14855	23445
Indiana - Owen	13945	9420
Indiana - Parke	12435	4842
Indiana - Perry	15418	15215
Indiana - Pike	10094	1561
Indiana - Porter	104045	107100
Indiana - Posey	20955	24459
Indiana - Pulaski	10202	10443
Indiana - Putnam	24463	19096
Indiana - Randolph	21907	25297
Indiana - Ripley	19864	45417
Indiana - Rush	14629	9199
Indiana - St Joseph	199365	190454
Indiana - Scott	16939	20349
Indiana - Shelby	32526	52870
Indiana - Spencer	15734	15083
Indiana - Starke	18356	9931
Indiana - Steuben	22148	53391
Indiana - Sullivan	15326	5230
Indiana - Switzerland	6244	5407
Indiana - Tippecanoe	105389	132759
Indiana - Tipton	13007	7709
Indiana - Union	5629	441
Indiana - Vanderburgh	133198	175053
Indiana - Vermillion	13535	17111
Indiana - Vigo	85625	76262
Indiana - Wabash	28299	49862
Indiana - Warren	6597	1420
Indiana - Warrick	36249	39974
Indiana - Washington	19139	22545
Indiana - Wayne	58062	60712
Indiana - Wells	20939	27167
Indiana - White	18774	34250
Indiana - Whitley	22313	28931
Iowa	6165000	2174000
Kansas	1027000	857000
Kentucky - west	753500	1400000
Kentucky - east	753500	1400000
Louisiana	1065000	1388000
Maine	282000	513000
Maryland	3132000	1108000
Massachusetts	1301000	1724000
Michigan - west	3758000	1329000
Michigan - east	1492500	970000
Minnesota	1492500	970000
Mississippi	605000	1167000
Missouri	2079000	2433000
Montana	77000	576000
Nebraska	343000	1101000
Nevada	257000	187000
New Hampshire	132000	374000
New Jersey	4202000	4379000
New Mexico	692000	250000
New York	5179000	5715000
North Carolina	1958000	1665000
North Dakota	173000	398000
Ohio - north	3815000	3298000
Ohio - central	3815000	3298000
Ohio - south	3815000	3298000
Oklahoma	563000	1368000
Oregon	1227000	2805000
Pennsylvania	6512000	8395000
Rhode Island	1582000	561000
South Carolina	1074000	2188000
South Dakota	158000	881000
Tennessee	1784000	2876000
Texas	7985000	9458000
Utah	718000	1258000
Vermont	1945000	684000
Virginia	1575000	1874000
Washington	2337000	3684000
West Virginia	557000	972000
Wisconsin	3381000	5760000
Wyoming	527000	187000

Table A-19 Productions and Attractions - Other Manufactured Goods (Annual Tons)

Alabama	1162000	1820737	Indiana - Parke	2706	2534
Arizona	387000	533046	Indiana - Perry	5144	4819
Arkansas	1226000	1206293	Indiana - Pike	0	0
California	7485000	9008208	Indiana - Porter	0	0
Colorado	938000	487950	Indiana - Posey	126598	119139
Connecticut	593000	759652	Indiana - Pulaski	0	0
Delaware	165000	322525	Indiana - Putnam	3746	3505
District of Columbia	0	7823	Indiana - Randolph	16590	15616
Florida	1978000	1456152	Indiana - Ripley	3300	3098
Georgia	3103000	1788817	Indiana - Rush	0	0
Idaho	54000	509731	Indiana - St Joseph	35381	33297
Illinois - north	3434000	2372498	Indiana - Scott	2379	2253
Illinois - south	858000	708673	Indiana - Shelby	7819	7354
Indiana - Adams	28810	27101	Indiana - Spencer	7879	7416
Indiana - Allen	79860	75139	Indiana - Starke	0	0
Indiana - Bartholomew	7938	7448	Indiana - Steuben	10822	10202
Indiana - Benton	2706	2534	Indiana - Sullivan	4460	4193
Indiana - Blackford	2438	2284	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	26878	25286
Indiana - Brown	2557	2409	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	5709	5382	Indiana - Vanderburgh	11447	10765
Indiana - Clark	41476	39056	Indiana - Vermillion	0	0
Indiana - Clay	5857	5507	Indiana - Vigo	26878	25286
Indiana - Clinton	6928	6509	Indiana - Wabash	26996	25411
Indiana - Crawford	4698	4412	Indiana - Warren	2706	2534
Indiana - Daviess	6214	5852	Indiana - Warrick	7879	7416
Indiana - Dearborn	7879	7416	Indiana - Washington	9871	9294
Indiana - Decatur	1249	1189	Indiana - Wayne	5381	5069
Indiana - DeKalb	16263	15303	Indiana - Wells	416	406
Indiana - Delaware	32021	30105	Indiana - White	5381	5069
Indiana - Dubois	91663	86248	Indiana - Whitley	19593	18432
Indiana - Elkhart	339388	319364	Iowa	833000	415752
Indiana - Fayette	0	0	Kansas	1267000	1458092
Indiana - Floyd	35470	33391	Kentucky - west	200000	355729
Indiana - Fountain	0	0	Kentucky - east	468000	722223
Indiana - Franklin	59077	55579	Louisiana	637000	3857754
Indiana - Fulton	8979	8449	Maine	269000	615351
Indiana - Gibson	0	0	Maryland	304000	542090
Indiana - Grant	4638	4381	Massachusetts	1810000	824933
Indiana - Greene	0	0	Michigan - west	849000	647710
Indiana - Hamilton	6006	5633	Michigan - east	1981000	1665515
Indiana - Hancock	4400	4130	Minnesota	1918000	1254080
Indiana - Harrison	12666	11923	Mississippi	1145000	1653685
Indiana - Hendricks	416	406	Missouri	1881000	1199283
Indiana - Henry	13706	12893	Montana	38000	525629
Indiana - Howard	17928	16867	Nebraska	469000	145364
Indiana - Huntington	6154	5789	Nevada	237000	104305
Indiana - Jackson	22537	21217	New Hampshire	181000	212179
Indiana - Jasper	10436	9826	New Jersey	4709000	1480969
Indiana - Jay	2706	2534	New Mexico	77000	355760
Indiana - Jefferson	1249	1189	New York	4902000	1415093
Indiana - Jennings	5352	5038	North Carolina	3084000	1794856
Indiana - Johnson	50812	47787	North Dakota	76000	161387
Indiana - Knox	2706	2534	Ohio - north	1603000	1593223
Indiana - Kosciusko	23369	21969	Ohio - central	1603000	906206
Indiana - Lagrange	49503	46566	Ohio - south	1603000	772076
Indiana - Lake	604061	568440	Oklahoma	1093000	1245725
Indiana - LaPorte	16828	15835	Oregon	192000	2495706
Indiana - Lawrence	12041	11328	Pennsylvania	4909000	3788655
Indiana - Madison	5381	5069	Rhode Island	185000	81491
Indiana - Marion	310459	292137	South Carolina	992000	765191
Indiana - Marshall	23637	22250	South Dakota	90000	103148
Indiana - Martin	7879	7416	Tennessee	2519000	1272576
Indiana - Miami	6630	6227	Texas	3593000	9564632
Indiana - Monroe	3508	3285	Utah	339000	517899
Indiana - Montgomery	1249	1189	Vermont	64000	149902
Indiana - Morgan	11030	10389	Virginia	1267000	1443039
Indiana - Newton	0	0	Washington	1002000	2892432
Indiana - Noble	11506	10828	West Virginia	176000	393877
Indiana - Ohio	0	0	Wisconsin	1955000	1260277
Indiana - Orange	11893	11203	Wyoming	0	409963
Indiana - Owen	2884	2722			

Table A-20 Productions and Attractions - U.S. Mail (Daily Tons)

Alabama	192	192
Arizona	174	174
Arkansas	112	112
California	1418	1418
Colorado	156	156
Connecticut	156	156
Delaware	31	31
District of Columbia	28	28
Florida	616	616
Georgia	308	308
Idaho	47	47
Illinois - north	419	419
Illinois - south	125	125
Indiana - Adams	1	1
Indiana - Allen	14	14
Indiana - Bartholomew	3	3
Indiana - Benton	1	1
Indiana - Blackford	1	1
Indiana - Boone	1	1
Indiana - Brown	1	1
Indiana - Carroll	1	1
Indiana - Cass	1	1
Indiana - Clark	4	4
Indiana - Clay	1	1
Indiana - Clinton	1	1
Indiana - Crawford	1	1
Indiana - Daviess	1	1
Indiana - Dearborn	1	1
Indiana - Decatur	1	1
Indiana - DeKalb	1	1
Indiana - Delaware	5	5
Indiana - Dubois	1	1
Indiana - Elkhart	7	7
Indiana - Fayette	1	1
Indiana - Floyd	3	3
Indiana - Fountain	1	1
Indiana - Franklin	1	1
Indiana - Fulton	1	1
Indiana - Gibson	1	1
Indiana - Grant	3	3
Indiana - Greene	1	1
Indiana - Hamilton	5	5
Indiana - Hancock	2	2
Indiana - Harrison	1	1
Indiana - Hendricks	3	3
Indiana - Henry	2	2
Indiana - Howard	3	3
Indiana - Huntington	1	1
Indiana - Jackson	1	1
Indiana - Jasper	1	1
Indiana - Jay	1	1
Indiana - Jefferson	1	1
Indiana - Jennings	1	1
Indiana - Johnson	4	4
Indiana - Knox	1	1
Indiana - Kosciusko	3	3
Indiana - Lagrange	1	1
Indiana - Lake	22	22
Indiana - LaPorte	5	5
Indiana - Lawrence	2	2
Indiana - Madison	6	6
Indiana - Marion	37	37
Indiana - Marshall	2	2
Indiana - Martin	1	1
Indiana - Miami	1	1
Indiana - Monroe	5	5
Indiana - Montgomery	1	1
Indiana - Morgan	2	2
Indiana - Newton	1	1
Indiana - Noble	1	1
Indiana - Ohio	1	1
Indiana - Orange	1	1
Indiana - Owen	1	1
Indiana - Parke	1	1
Indiana - Perry	1	1
Indiana - Pike	1	1
Indiana - Porter	6	6
Indiana - Posey	1	1
Indiana - Pulaski	1	1
Indiana - Putnam	1	1
Indiana - Randolph	1	1
Indiana - Ripley	1	1
Indiana - Rush	1	1
Indiana - St Joseph	11	11
Indiana - Scott	1	1
Indiana - Shelby	1	1
Indiana - Spencer	1	1
Indiana - Starke	1	1
Indiana - Steuben	1	1
Indiana - Sullivan	1	1
Indiana - Switzerland	1	1
Indiana - Tippecanoe	6	6
Indiana - Tipton	1	1
Indiana - Union	1	1
Indiana - Vanderburgh	7	7
Indiana - Vermillion	1	1
Indiana - Vigo	5	5
Indiana - Wabash	1	1
Indiana - Warren	1	1
Indiana - Warrick	2	2
Indiana - Washington	1	1
Indiana - Wayne	3	3
Indiana - Wells	1	1
Indiana - White	1	1
Indiana - Whitley	1	1
Iowa	132	132
Kansas	118	118
Kentucky - west	57	57
Kentucky - east	117	117
Louisiana	201	201
Maine	58	58
Maryland	227	227
Massachusetts	286	286
Michigan - west	123	123
Michigan - east	317	317
Minnesota	208	208
Mississippi	122	122
Missouri	243	243
Montana	38	38
Nebraska	75	75
Nevada	57	57
New Hampshire	52	52
New Jersey	368	368
New Mexico	72	72
New York	857	857
North Carolina	315	315
North Dakota	30	30
Ohio - north	251	251
Ohio - central	121	121
Ohio - south	143	143
Oklahoma	149	149
Oregon	135	135
Pennsylvania	566	566
Rhode Island	47	47
South Carolina	166	166
South Dakota	33	33
Tennessee	232	232
Texas	809	809
Utah	82	82
Vermont	26	26
Virginia	294	294
Washington	231	231
West Virginia	85	85
Wisconsin	233	233
Wyoming	21	21

Table A-21 Productions and Attractions - Express Mail, non- U.S. (Daily Tons)

Alabama	46	46
Arizona	41	41
Arkansas	26	26
California	339	339
Colorado	37	37
Connecticut	37	37
Delaware	7	7
District of Columbia	6	6
Florida	147	147
Georgia	73	73
Idaho	11	11
Illinois - north	100	100
Illinois - south	29	29
Indiana - Adams	1	1
Indiana - Allen	3	3
Indiana - Bartholomew	1	1
Indiana - Benton	1	1
Indiana - Blackford	1	1
Indiana - Boone	1	1
Indiana - Brown	1	1
Indiana - Carroll	1	1
Indiana - Cass	1	1
Indiana - Clark	1	1
Indiana - Clay	1	1
Indiana - Clinton	1	1
Indiana - Crawford	1	1
Indiana - Daviess	1	1
Indiana - Dearborn	1	1
Indiana - Decatur	1	1
Indiana - DeKalb	1	1
Indiana - Delaware	1	1
Indiana - Dubois	1	1
Indiana - Elkhart	1	1
Indiana - Fayette	1	1
Indiana - Floyd	1	1
Indiana - Fountain	1	1
Indiana - Franklin	1	1
Indiana - Fulton	1	1
Indiana - Gibson	1	1
Indiana - Grant	1	1
Indiana - Greene	1	1
Indiana - Hamilton	1	1
Indiana - Hancock	1	1
Indiana - Harrison	1	1
Indiana - Hendricks	1	1
Indiana - Henry	1	1
Indiana - Howard	1	1
Indiana - Huntington	1	1
Indiana - Jackson	1	1
Indiana - Jasper	1	1
Indiana - Jay	1	1
Indiana - Jefferson	1	1
Indiana - Jennings	1	1
Indiana - Johnson	1	1
Indiana - Knox	1	1
Indiana - Kosciusko	1	1
Indiana - Lagrange	5	5
Indiana - Lake	1	1
Indiana - LaPorte	1	1
Indiana - Lawrence	1	1
Indiana - Madison	9	9
Indiana - Marion	1	1
Indiana - Marshall	1	1
Indiana - Martin	1	1
Indiana - Miami	1	1
Indiana - Monroe	1	1
Indiana - Montgomery	1	1
Indiana - Morgan	1	1
Indiana - Newton	1	1
Indiana - Noble	1	1
Indiana - Ohio	1	1
Indiana - Orange	1	1
Indiana - Owen	1	1
Indiana - Parke	1	1
Indiana - Perry	1	1
Indiana - Pike	1	1
Indiana - Porter	1	1
Indiana - Posey	1	1
Indiana - Pulaski	1	1
Indiana - Putnam	1	1
Indiana - Randolph	1	1
Indiana - Ripley	1	1
Indiana - Rush	1	1
Indiana - St Joseph	2	2
Indiana - Scott	1	1
Indiana - Shelby	1	1
Indiana - Spencer	1	1
Indiana - Starke	1	1
Indiana - Steuben	1	1
Indiana - Sullivan	1	1
Indiana - Switzerland	1	1
Indiana - Tippecanoe	1	1
Indiana - Tipton	1	1
Indiana - Union	1	1
Indiana - Vanderburgh	1	1
Indiana - Vermillion	1	1
Indiana - Vigo	1	1
Indiana - Wabash	1	1
Indiana - Warren	1	1
Indiana - Warrick	1	1
Indiana - Washington	1	1
Indiana - Wayne	1	1
Indiana - Wells	1	1
Indiana - White	1	1
Indiana - Whitley	1	1
Iowa	31	31
Kansas	28	28
Kentucky - west	13	13
Kentucky - east	28	28
Louisiana	48	48
Maine	14	14
Maryland	54	54
Massachusetts	68	68
Michigan - west	29	29
Michigan - east	76	76
Minnesota	49	49
Mississippi	29	29
Missouri	58	58
Montana	9	9
Nebraska	18	18
Nevada	13	13
New Hampshire	12	12
New Jersey	88	88
New Mexico	17	17
New York	205	205
North Carolina	75	75
North Dakota	7	7
Ohio - north	60	60
Ohio - central	29	29
Ohio - south	34	34
Oklahoma	35	35
Oregon	32	32
Pennsylvania	135	135
Rhode Island	11	11
South Carolina	39	39
South Dakota	7	7
Tennessee	55	55
Texas	193	193
Utah	19	19
Vermont	6	6
Virginia	70	70
Washington	55	55
West Virginia	20	20
Wisconsin	55	55
Wyoming	5	5

Appendix B - Modal Shares of Commodities

Computer programs developed for the project generated a length of shipment variable that was recorded along with the estimated or forecasted flows for each commodity. This length of shipment distance was used by a subsequent program to allocate the traffic to different transport modes or combinations of transport modes based on current practices. The 19 tables that follow represent the current patterns of mode use for the commodities examined here based on the *1993 Commodity Flow Survey*. U.S. mail and express mail are not included in the tables.

Commodity: Farm Products (STCC 01)

	<50 m	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000019	.000102	.000222	.000221	.000170	.000428	.000515	.001286	.003937
Private Truck	.332435	.357910	.170381	.045621	.027220	.000000	.010304	.037299	.027952
For Hire Truck	.337333	.474608	.388586	.198523	.071356	.088559	.121239	.581672	.631889
Private and For Hire Truck	.000000	.000000	.000000	.001028	.000923	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000039	.000026	.000071	.000085	.000158	.002250	.014173
Truck/Rail	.000000	.000000	.001348	.000000	.001933	.000000	.002100	.040836	.051181
Truck/Water	.000000	.000000	.000000	.000000	.000241	.000000	.000000	.000000	.000000
Highway (Total)	.669788	.832622	.560578	.245421	.101917	.089073	.134318	.663344	.729133
Rail	.092951	.145525	.366612	.623023	.434293	.380511	.865681	.290032	.061811
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.092951	.145525	.366612	.623023	.434293	.380511	.865681	.290032	.061811
Inland Water	.053537	.000000	.062608	.131555	.463788	.530414	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.053537	.000000	.062608	.131555	.463788	.530414	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.183722	.021852	.010201	.000000	.000000	.000000	.000000	.046623	.209055
Other (Total)	.183722	.021852	.010201	.000000	.000000	.000000	.000000	.046623	.209055

Commodity: Coal (STCC 11)

	<50 m	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Private Truck	.000000	.000000	.009176	.000000	.000000	.000000	.000000	.000000	.000000
For Hire Truck	.413433	.257557	.071031	.003860	.000000	.000000	.000000	.000000	.000000
Private and For Hire Truck	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Rail	.000000	.000000	.000000	.016012	.000000	.000000	.000000	.000000	.000000
Truck/Water	.000000	.006459	.088978	.005005	.005388	.000000	.000000	.000000	.000000
Highway (Total)	.413433	.264017	.169185	.024878	.005388	.000000	.000000	.000000	.000000
Rail	.195017	.594133	.668611	.810274	.919782	.999999	.999999	.999999	.999999
Rail/Water	.015848	.035278	.047667	.072528	.023580	.000000	.000000	.000000	.000000
Rail (Total)	.210866	.629412	.716279	.882802	.943580	.999999	.999999	.999999	.999999
Inland Water	.050709	.106569	.084783	.021399	.046495	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.004753	.000000	.000000	.000000	.000000
Water (Total)	.050709	.106569	.084783	.021399	.051248	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.324991	.000000	.029751	.070918	.000000	.000000	.000000	.000000	.000000
Other (Total)	.324991	.000000	.029751	.070918	.000000	.000000	.000000	.000000	.000000

Commodity: Non-metallic Minerals (STCC 14)

	<50 m	50-99	100-249	250-499	500-749	750-999	100-1499	1500-1999	2000 +
Parcel	.000000	.000000	.000009	.000031	.000000	.000000	.000000	.000000	.000000
Private Truck	.568413	.460115	.235514	.106647	.000000	.000000	.000000	.000000	.000000
For Hire Truck	.344818	.381947	.274769	.272047	.249864	.213828	.162981	.111806	.507082
Private and For Hire Truck	.002397	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Rail	.000000	.000000	.000000	.000000	.004954	.000000	.005223	.000000	.113314
Truck/Water	.000000	.000000	.063476	.046519	.000000	.000000	.000000	.000000	.000000
Highway (Total)	.915631	.842062	.573770	.425246	.254818	.213828	.168204	.111806	.620396
Rail	.043803	.141495	.282167	.459877	.704107	.459553	.759533	.888193	.379603
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.043803	.141495	.282167	.459877	.704107	.459553	.759533	.888193	.379603
Inland Water	.010405	.000000	.032891	.097074	.000000	.161053	.000000	.000000	.000000
Great Lakes	.000000	.000000	.094144	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.010405	.000000	.127036	.097074	.000000	.161053	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.030159	.016442	.017026	.017800	,041073	.165564	.072261	.000000	.000000
Other (Total)	.030159	.016442	.017026	.017800	.041073	.165564	.072261	.000000	.000000

Commodity: Food and Kindred Products (STCC 20)

	<50 m	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000358	.000184	.000304	.000488	.000714	.000860	.000927	.000843	.000960
Private Truck	.799433	.662572	.497360	.226618	.117325	.091195	.092631	.055624	.042857
For Hire Truck	.147315	.296051	.417411	.563293	.541261	.572053	.521340	.472382	.491476
Private and For Hire Truck	.001096	.003337	.003009	.001265	.001081	.001003	.001546	.000129	.002040
Truck/Air	.000000	.000000	.000012	.000022	.000077	.000107	.000193	.000454	.002040
Truck/Rail	.000421	.000000	.000000	.001199	.007203	.006811	.014149	.030830	.030252
Truck/Water	.000000	.000000	.001368	.000000	.000000	.000000	.005489	.001557	.084273
Highway (Total)	.948625	.962146	.919467	.792887	.667645	.672031	.635119	.561822	.652100
Rail	.009519	.029550	.067452	.194255	.281562	.310653	.364880	.406568	.266266
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.009519	.029550	.067452	.194255	.281562	.310653	.364880	.406568	.226266
Inland Water	.009636	.000000	.000000	.000000	.038451	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.003699	.000000
Water (Total)	.009636	.000000	.000000	.000000	.038451	.000000	.000000	.003699	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000120
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000120
Other	.032218	.008303	.013080	.012856	.012340	.017314	.000000	.027909	.081512
Other (Total)	.032218	.008303	.013080	.012856	.012340	.017314	.000000	.027909	.081512

Commodity: Basic Textiles (STCC 22)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000+
Parcel	.006605	.009962	.012409	.017527	.021697	.036463	.051502	.066790	.052419
Private Truck	.724913	.488584	.329896	.199953	.101148	.119416	.127324	.141001	.068548
For Hire Truck	.210443	.480697	.639938	.758302	.849712	.810391	.782546	.736549	.807795
Private and For Hire Truck	.007706	.002905	.004009	.011531	.006381	.005469	.005722	.000000	.000000
Truck/Air	.000000	.000830	.000381	.000461	.001276	.000911	.001430	.003710	.008064
Truck/Rail	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.014784
Truck/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Highway (Total)	.949669	.922980	.986636	.987776	.980216	.972652	.968526	.948051	.951612
Rail	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.024118	.000000
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.024118	.000000
Inland Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.050330	.017019	.013363	.012223	.019783	.027349	.031473	.027829	.048387
Other (Total)	.050330	.017019	.013363	.012223	.019783	.027347	.031473	.027829	.048387

Commodity: Apparel (STCC 23)

	< 50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.057981	.079411	.073692	.076299	.090097	.147880	.188976	.135908	.192307
Private Truck	.471009	.351960	.271477	.085415	.091372	.043433	.056430	.000000	.000000
For Hire Truck	.391195	.526470	.639557	.809588	.768805	.770423	.711286	.789699	.712307
Private and For Hire Truck	.035075	.023529	.000000	.000000	.003824	.005170	.006561	.000000	.000000
Truck/Air	.000000	.000980	.001527	.003713	.003824	.005170	.010498	.015736	.052307
Truck/Rail	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.040057	.000000
Truck/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Highway (Total)	.955261	.982352	.986254	.975016	.957926	.972078	.973753	.981402	.956923
Rail	.000000	.000000	.000000	.000000	.005524	.000000	.000000	.000000	.000000
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.000000	.000000	.000000	.000000	.005524	.000000	.000000	.000000	.000000
Inland Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.001430	.000000
Water (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.001430	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.044738	.017647	.013745	.024983	.036549	.027921	.026246	.017167	.043076
Other (Total)	.044738	.017647	.013745	.024983	.036549	.027921	.026246	.017167	.043076

Commodity: Lumber and Wood Products (STCC 24)

	< 50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000054	.000095	.000533	.001024	.001721	.001529	.001810	.001180	.002743
Private Truck	.619286	.445262	.302878	.195843	.150950	.086391	.079500	.051247	.113511
For Hire Truck	.376638	.466427	.508880	.602763	.497926	.432976	.352951	.464598	.000000
Private and For Hire Truck	.000000	.000000	.001736	.000777	.000234	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000000	.000000	.000078	.000127	.000181	.000000	.000000
Truck/Rail	.000000	.000428	.003349	.011133	.013146	.016182	.000000	.042481	.080589
Truck/Water	.000000	.000000	.000287	.000600	.002034	.000000	.000000	.000000	.013717
Highway (Total)	.995979	.912221	.817665	.812144	.666092	.537206	.434444	.559507	.210562
Rail	.004020	.075271	.088015	.168239	.304327	.435270	.547989	.416385	.673182
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.004020	.075271	.088015	.168239	.304327	.435270	.547989	.416385	.673182
Inland Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.012345
Water (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.012345
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.000000	.012506	.094318	.019619	.029579	.027522	.017566	.024106	.103909
Other (Total)	.000000	.012506	.094318	.019619	.029579	.027522	.017566	.024106	.103909

Commodity: Furniture and Fixtures (STCC 25)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.006627	.012950	.012440	.019581	.024070	.031157	.040609	.028391	.076388
Private Truck	.641569	.563367	.428832	.233654	.194679	.169881	.140101	.074132	.000000
For Hire Truck	.327677	.402405	.548847	.715233	.755912	.764836	.756345	.793375	.763888
Private and For Hire Truck	.000000	.000000	.000000	.001659	.000000	.005934	.000000	.001577	.004629
Truck/Air	.000000	.000000	.000000	.000000	.000000	.001483	.001015	.001577	.000000
Truck/Rail	.000000	.000000	.000000	.000000	.000000	.002225	.003045	.000000	.000000
Truck/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Highway (Total)	.975874	.978723	.990120	.970129	.974662	.975519	.941116	.899053	.844907
Rail	.000000	.000000	.000000	.006306	.008445	.008902	.058883	.083596	.062500
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.000000	.000000	.000000	.006306	.008445	.008902	.058883	.083596	.055555
Inland Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.024125	.021276	.009879	.023564	.016891	.015578	.000000	.017350	.099537
Other (Total)	.024125	.021276	.009879	.023564	.016891	.015578	.000000	.017350	.099537

Commodity: Pulp and Paper Products (STCC 26)

	< 50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.005835	.005092	.004810	.003880	.003551	.003086	.005440	.004962	.009184
Private Truck	.622403	.391942	.197906	.091276	.039070	.033184	.024047	.032136	.000000
For Hire Truck	.307482	.451643	.612082	.605421	.559484	.461027	.470946	.452032	.386528
Private and For Hire Truck	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000084	.000137	.000000	.000296	.000000	.000000	.000000
Truck/Rail	.001291	.002455	.005772	.004402	.005028	.010329	.047334	.061436	.028702
Truck/Water	.000000	.000000	.000735	.000825	.002434	.003443	.003373	.010396	.031381
Highway (Total)	.937012	.851134	.821392	.705943	.609570	.511368	.551142	.560964	.455797
Rail	.027805	.126949	.164714	.280737	.375264	.469931	.428073	.400047	.228855
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.027805	.126949	.164714	.280737	.375264	.469931	.428073	.400047	.285555
Inland Water	.004247	.005638	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.004247	.005638	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.030933	.016277	.013893	.013318	.015165	.018699	.020783	.038988	.315346
Other (Total)	.030933	.016277	.013893	.013318	.015165	.018699	.020783	.038988	.315346

Commodity: Chemicals and Allied Products (STCC 28)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.001501	.002395	.003040	.003219	.001701	.002179	.002572	.003194	.008880
Private Truck	.521451	.529384	.315851	.114794	.043566	.027761	.030067	.013870	.022868
For Hire Truck	.253993	.344691	.396066	.446026	.251786	.250689	.210756	.237222	.346802
Private and For Hire Truck	.000000	.000000	.000000	.000000	.000000	.001250	.000000	.000000	.000000
Truck/Air	.000000	.000036	.000000	.000000	.000850	.000544	.000482	.002521	.004440
Truck/Rail	.000447	.000000	.000630	.000847	.005545	.008270	.008240	.053883	.044626
Truck/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.015763
Highway (Total)	.777393	.876508	.715588	.564887	.303449	.290696	.252120	.310692	.443383
Rail	.062905	.105209	.221215	.330249	.604892	.557062	.681915	.478312	.186056
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.062905	.105209	.221215	.330249	.604892	.557962	.681915	.478312	.186056
Inland Water	.049938	.018281	.037382	.070191	.091657	.104186	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000416	.000559	.000000	.000000	.024882	.179556	.000000
Water (Total)	.049938	.018281	.037798	.070750	.091657	.104186	.024882	.179556	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000222
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000222
Other	.109762	.000000	.025396	.034112	.000000	.048054	.041082	.031439	.370337
Other (Total)	.109762	.000000	.025396	.034112	.000000	.048054	.041082	.031439	.370337

Commodity: Petroleum and Coal Products (STCC 29)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000021	.000035	.000135	.000099	.000166	.000232	.000099	.000000	.000000
Private Truck	.521203	.418587	.221312	.050180	.029784	.015563	.014647	.061394	.000000
For Hire Truck	.305716	.355604	.251760	.120957	.100776	.136972	.128774	.236212	.295774
Private and For Hire Truck	.000000	.000000	.011478	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Rail	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.010405	.000000
Truck/Water	.000000	.000000	.004203	.000000	.000000	.000000	.000000	.000000	.000000
Highway (Total)	.826941	.774228	.488889	.171237	.130727	.152768	.143521	.308012	.295774
Rail	.045491	.135618	.186937	.350263	.297553	.340689	.253849	.691987	.704225
Rail/Water	.000000	.000000	.000000	.025009	.121380	.000000	.000000	.000000	.000000
Rail (Total)	.045491	.135618	.186937	.375272	.418934	.340689	.253849	.691987	.704225
Inland Water	.068161	.055124	.221755	.088410	.138703	.087727	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.102417	.232632	.311635	.418815	.602629	.000000	.000000
Water (Total)	.068161	.055124	.324172	.321042	.450338	.506542	.602629	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.059405	.035027	.000000	.132446	.000000	.000000	.000000	.000000	.000000
Other (Total)	.059405	.035027	.000000	.132446	.000000	.000000	.000000	.000000	.000000

Commodity: Stone, Clay, and Glass Products (STCC 32)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000096	.000504	.000609	.001952	.002777	.005363	.013071	.013504	.019905
Private Truck	.856008	.453638	.270243	.095719	.064773	.050481	.000000	.053342	.000000
For Hire Truck	.131350	.545466	.552817	.572836	.445709	.483830	.470996	.559756	.693838
Private and For Hire Truck	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000000	.000125	.000138	.000315	.000000	.000000	.000000
Truck/Rail	.000000	.000000	.011182	.011086	.003193	.000000	.016135	.000000	.000000
Truck/Water	.000000	.000390	.000000	.000000	.000000	.000000	.000000	.005401	.000000
Highway (Total)	.987456	1.00000	.834853	.681722	.516592	.539990	.500204	.632005	.713744
Rail	.002699	.000000	.151132	.221676	.241530	.360940	.433823	.243754	.123222
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.002699	.000000	.151132	.221676	.241530	.360940	.433823	.243754	.123222
Inland Water	.000000	.000000	.000000	.074616	.213690	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.000000	.000000	.000000	.074616	.213690	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.009844	.000000	.014013	.021984	.028186	.099069	.065972	.124240	.163033
Other (Total)	.009844	.000000	.014013	.021984	.028186	.099069	.065972	.124240	.163033

Commodity: Primary Metal Products (STCC 33)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.001055	.001899	.001437	.001203	.001646	.002090	.002314	.002072	.007799
Private Truck	.451772	.402010	.215624	.107176	.087287	.064221	.032656	.020936	.050696
For Hire Truck	.425644	.540853	.681062	.642196	.630625	.532680	.411673	.319651	.471309
Private and For Hire Truck	.002303	.001345	.001568	.000721	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000000	.000160	.000329	.000475	.001285	.001451	.000000
Truck/Rail	.000000	.000000	.001437	.000000	.000000	.007030	.013756	.033996	.009470
Truck/Water	.000000	.000000	.000000	.005975	.000000	.020425	.000000	.000621	.000000
Highway (Total)	.880774	.946108	.901131	.757434	.719889	.626923	.461686	.378731	.539275
Rail	.098407	.040675	.082922	.204928	.254291	.366425	.514013	.614220	.371030
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.098407	.040675	.082922	.204928	.254291	.366425	.514013	.614220	.371030
Inland Water	.000000	.000000	.000000	.027290	.025819	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.000000	.000000	.000000	.027290	.025819	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000207	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000207	.000000
Other	.020818	.013215	.015945	.010346	.000000	.006650	.024299	.006840	.089693
Other (Total)	.020818	.013215	.015945	.010346	.000000	.006650	.024299	.006840	.089693

Commodity: Fabricated Metal Products (STCC 34)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.008807	.014151	.014884	.016774	.020146	.033102	.040250	.041085	.058072
Private Truck	.629689	.435670	.303159	.170848	.121009	.115859	.066822	.056493	.036004
For Hire Truck	.323705	.533758	.619137	.735128	.755886	.818838	.770613	.782098	.700348
Private and For Hire Truck	.001248	.000648	.000000	.000775	.000784	.000902	.000000	.000000	.000000
Truck/Air	.000000	.000216	.000364	.000704	.001569	.003009	.007033	.008070	.010452
Truck/Rail	.000000	.000000	.000000	.000000	.007718	.007523	.006252	.031548	.000000
Truck/Water	.000000	.000108	.000243	.000000	.000000	.000000	.000000	.002934	.027874
Highway (Total)	.963450	.984552	.937788	.924231	.907116	.979235	.890973	.922230	.832752
Rail	.010055	.000000	.037727	.051029	.063317	.000000	.073075	.044020	.032520
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.010055	.000000	.037727	.051029	.063317	.000000	.073075	.044020	.032520
Inland Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000060	.000000	.000000	.000000	.001953	.000000	.000000
Water (Total)	.000000	.000000	.000060	.000000	.000000	.000000	.001953	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.026494	.015447	.024422	.024739	.029565	.020764	.033997	.033749	.134727
Other (Total)	.026494	.015447	.024422	.024739	.029565	.020764	.033997	.033749	.134727

Commodity: Machinery, except Electrical (STCC 35)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.037274	.068119	.067667	.051539	.042289	.046844	.057638	.069594	.095757
Private Truck	.629797	.401712	.256240	.127352	.097448	.094076	.057169	.090540	.037575
For Hire Truck	.273199	.486570	.648400	.769041	.806021	.753387	.787722	.672297	.684848
Private and For Hire Truck	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.001946	.000000	.015831	.010572	.015098	.022492	.029054	.082424
Truck/Rail	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.020945	.000000
Truck/Water	.000000	.000000	.000975	.000000	.000000	.000000	.000000	.000000	.003636
Highway (Total)	.940272	.958349	.973283	.963764	.956331	.909407	.925023	.882432	.904242
Rail	.000995	.000000	.000000	.005804	.025511	.053813	.044985	.058108	.008484
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.000995	.000000	.000000	.005804	.025511	.053813	.044985	.058108	.008484
Inland Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000195	.000175	.000459	.000387	.000000	.000675	.001212
Air (Total)	.000000	.000000	.000195	.000175	.000459	.000387	.000000	.000675	.001212
Other	.058732	.041650	.026521	.030255	.017697	.036391	.029990	.058783	.086060
Other (Total)	.058732	.041560	.026521	.030255	.017697	.036391	.029990	.058783	.086060

Commodity: Electrical Machinery (STCC 36)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.038595	.047619	.054101	.038585	.039674	.049215	.051839	.065734	.107538
Private Truck	.596791	.375166	.270755	.115219	.111138	.054730	.044732	.047552	.092017
For Hire Truck	.315423	.532710	.659436	.794033	.755544	.800593	.735367	.641958	.717294
Private and For Hire Truck	.000000	.000445	.000498	.000000	.001478	.001272	.000000	.000000	.000000
Truck/Air	.000000	.004895	.005235	.011611	.007885	.011030	.022157	.020979	.047671
Truck/Rail	.000000	.000000	.000000	.000000	.009857	.009333	.027591	.000000	.000000
Truck/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.008869
Highway (Total)	.950809	.960836	.990027	.959449	.925579	.926177	.881688	.776223	.973392
Rail	.000000	.000000	.000000	.023401	.053721	.037759	.067725	.154545	.024390
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.000000	.000000	.000000	.023401	.053721	.037759	.067725	.154545	.024390
Inland Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000424	.000418	.000699	.002217
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000424	.000418	.000699	.002217
Other	.049190	.039163	.009972	.017148	.020699	.035638	.050167	.068531	.000000
Other (Total)	.049190	.039163	.009972	.017148	.020699	.035638	.050167	.068531	.000000

Commodity: Transportation Equipment (STCC 37)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.009971	.016531	.016360	.012352	.012555	.017310	.019834	.014497	.035377
Private Truck	.358322	.251833	.180698	.107405	.095897	.053928	.050325	.073668	.052672
For Hire Truck	.346569	.641381	.649466	.602001	.531118	.398302	.581705	.384911	.528301
Private and For Hire Truck	.000890	.000000	.000000	.003767	.004329	.000000	.000000	.000000	.002358
Truck/Air	.000000	.001466	.002914	.002964	.004762	.004327	.007696	.008579	.029088
Truck/Rail	.000000	.000000	.009207	.080662	.152938	.230026	.288632	.284319	.000000
Truck/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.005503
Highway (Total)	.715754	.911211	.858647	.809153	.801601	.703894	.948194	.765976	.653301
Rail	.036905	.053726	.078624	.133469	.148284	.260652	.000000	.128106	.226415
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.036905	.053726	.078624	.133469	.148284	.260652	.000000	.128106	.226415
Inland Water	.038908	.000000	.000000	.000000	.019590	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Water (Total)	.038908	.000000	.000000	.000000	.019590	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000216	.000166	.000296	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000216	.000166	.000296	.000000	.000000
Other	.208431	.035061	.062727	.057377	.030306	.035286	.051509	.105917	.120283
Other (Total)	.208431	.035061	.062727	.057377	.030306	.035286	.051509	.105917	.120283

Commodity: Waste and Scrap (STCC 40)

	<50 m	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000017	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Private Truck	.396748	.242517	.159459	.085368	.055152	.013846	.000000	.023668	.000000
For Hire Truck	.434597	.657377	.500450	.445849	.398645	.477307	.387181	.392504	.999999
Private and For Hire Truck	.002433	.000000	.000900	.000785	.000000	.000000	.000000	.000000	.000000
Truck/Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Truck/Rail	.000000	.000000	.000000	.000000	.007498	.020769	.000000	.000000	.000000
Truck/Water	.000000	.000000	.000000	.000000	.000000	.000000	.008779	.000000	.000000
Highway (Total)	.833796	.899894	.660810	.532003	.461296	.511923	.395961	.416173	.999999
Rail	.146390	.095979	.309880	.467996	.518626	.488076	.604038	.345167	.000000
Rail/Water	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Rail (Total)	.146390	.095979	.309880	.467996	.518626	.488076	.604038	.345167	.000000
Inland Water	.000000	.000000	.020896	.000000	.000000	.000000	.000000	.000000	.000000
Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.000000	.000000	.020077	.000000	.000000	.000000	.000000
Water (Total)	.000000	.000000	.020896	.000000	.020077	.000000	.000000	.000000	.000000
Air	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Air (Total)	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000	.000000
Other	.019813	.004125	.008413	.000000	.000000	.000000	.000000	.238658	.000000
Other (Total)	.019813	.004125	.008413	.000000	.000000	.000000	.000000	.238658	.000000

Commodity: Other Manufactured Products (STCC 50; see text)

	<50	50-99	100-249	250-499	500-749	750-999	1000-1499	1500-1999	2000 +
Parcel	.000738	.001540	.002746	.003744	.004231	.005632	.008110	.014731	.023729
Private Truck	.542898	.401049	.238399	.088078	.057974	.058342	.033960	.043637	.055475
For Hire Truck	.290841	.374246	.358899	.329569	.258155	.246845	.245018	.405924	.473626
Private and For Hire Truck	.004113	.007525	.003159	.001488	.001253	.000767	.000461	.000000	.000319
Truck/Air	.000000	.000074	.000644	.000461	.000838	.000795	.001397	.004548	.012195
Truck/Rail	.001155	.007251	.003085	.009341	.007596	.010266	.018766	.048700	.055453
Truck/Water	.001442	.004701	.022908	.000000	.012949	.007872	.003012	.000000	.025925
Highway (Total)	.841189	.796389	.629842	.432684	.342999	.330523	.310727	.517542	.646725
Rail	.054062	.142460	.233179	.400087	.495379	.520838	.564185	.382682	.166339
Rail/Water	.002698	.000000	.007841	.032926	.016992	.000000	.000000	.000000	.000000
Rail (Total)	.056760	.142460	.241020	.433013	.512372	.520838	.564185	.382682	.166339
Inland Water	.025206	.042065	.056284	.044448	.129049	.093397	.000000	.000000	.000000
Great Lakes	.000000	.000000	.013707	.000000	.000000	.000000	.000000	.000000	.000000
Inland Water/ Great Lakes	.000000	.000000	.000000	.001246	.000000	.003988	.000000	.000000	.000000
Inland Water/ Deep Sea	.000000	.000000	.013013	.029600	.000000	.023631	.067313	.060600	.034304
Water (Total)	.025206	.042065	.083005	.075296	.129049	.121018	.067313	.060600	.034304
Air	.000000	.000003	.000000	.000010	.000021	.000017	.000042	.000185	.000490
Air (Total)	.000000	.000003	.000000	.000010	.000021	.000017	.000042	.000185	.000490
Other	.076843	.019081	.046131	.058995	.015557	.027602	.057730	.038989	.152140
Other (Total)	.076843	.019081	.046131	.058995	.015557	.027602	.057730	.038989	.152140

Appendix C - Computer Programs Developed for Project

This appendix contains computer programs that were developed during phase two of this project. One exception to this is the GUNNAR5 program, which was developed during phase one of the project. The programs are reproduced here so that the reader can see how the programs worked and the research was completed. Those who have some skill with the FORTRAN computer language may find these programs useful. They use a low level of FORTRAN that should work with all popular FORTRAN compilers (Lahey, Microsoft, and so forth).

Each of the programs included here is discussed in Chapter 6. If the reader has questions regarding these, he/she should feel free to contact the project director.

```
      PROGRAM GUNNAR5
      CHARACTER* 15 INFILE
      CHARACTER* 15 OUTFILE
      COMMON DIST(156,156),O(156),A(156),B(156),D(156),OID(156),DID(156)
      WRITE (*,500)
  500 FORMAT('0',"WHAT IS THE FILE CONTAINING TRAFFIC PRODUCTIONS AND AT
     1TRACTIONS?")
      READ (*,501) INFILE
  501 FORMAT (A15)
      WRITE (*,502)
  502 FORMAT(' ',"WHAT IS THE FILE FOR THE OUTPUT?")
      READ (*,503) OUTFILE
  503 FORMAT (A15)
      OPEN (1,FILE= INFILE, STATUS = 'OLD')
      OPEN (2,FILE='gmdist.prj', STATUS = 'OLD')
      OPEN (3, FILE = OUTFILE, STATUS='NEW')
      WRITE(*,10)
   10 FORMAT('0','INPUT THE NUMBER OF OBSERVATIONS: ')
      READ(*,*) N
C     READ PRODUCTIONS AND ATTRACTIONS
      READ(1,*) (O(I),D(I),I=1,N)
      DO 100 I = 1, N
      DO 100 J = 1, N
  100 READ(2,*) OID(I),DID(J),DIST(I,J)
      WRITE(*,13)
   13 FORMAT(' ',' INPUT AVERAGE SHIPMENT LENGTH: ')
      READ(*,*) COBS
      BETA = -1.0/COBS
      TRIPS = 0.0
      DO 101 I = 1,N
  101 TRIPS = TRIPS + O(I)
      DO 102 I = 1,N
      O(I) = O(I)/TRIPS
  102 D(I) = D(I)/TRIPS
      CALL ENT5(N,BETA,COBS,TRIPS)
      CALL OUT(N,BETA,COBS,TRIPS)
      STOP
      END

      SUBROUTINE OUT(N,BETA,COBS,TRIPS)
      COMMON DIST(156,156),O(156),A(156),B(156),D(156),OID(156),DID(156)
      DIMENSION X(156)
      DIMENSION ITEMP (156)
      WRITE(3,101) BETA
  101 FORMAT(' ',' BETA = ',F8.4/' CELL       ORIGIN TRIPS        VALUE
     1              VALUE          DESTINATION TRIPS')
      DO 10 I = 1,N
      XX = O(I) * TRIPS
```

```
      Y = D(I) * TRIPS
   10 WRITE(3,102) I,XX,A(I),B(I),Y
  102 FORMAT(I5,F13.0,2F20.2,F20.0)
      WRITE(3,103)
  103 FORMAT(' ',' INTERACTION MATRIX')
      XMEAN = 0.0
      DO 30 I = 1,N
      X(I)=TRIPS*O(I)*A(I)
   30 CONTINUE
      DO 31 I = 1,N
      DO 20 J = 1,N
      W = X(I)*B(J)*D(J)*EXP(BETA*DIST(I,J))
      XMEAN = XMEAN+W*DIST(I,J)
   20 ITEMP(J) =IFIX(W+0.5)
      DO 25 J = 1,N
   25 WRITE(3,106) I,J,ITEMP(J),DIST(I,J)
  106 FORMAT(2I6,I10,F10.0)
C  30 WRITE(*,104) I,(ITEMP(J), J=1,N)
   31 CONTINUE
  104 FORMAT(' ',' FROM CELL',I6/(8I9))
      XMEAN = XMEAN/TRIPS
      WRITE(3,105) COBS,XMEAN
  105 FORMAT(' ',' OBSERVED MEAN SHIPMENT COST',F10.5/' MODEL MEAN SHIPM
     1ENT COST',F13.5)
      RETURN
      END

      SUBROUTINE ENT5(N,BETA,COBS,TRIPS)
      COMMON DIST(156,156),O(156),A(156),B(156),D(156),OID(156),DID(156)
      DO 10 I = 1,N
   10 B(I) = 1.0
      DO 110 KK = 1,30
      DO 70 K = 1,30
      SUMA = 0.0
      SUMB = 0.0
      DO 30 I =1,N
      A(I) = 0.0
      DO 20 J =1,N
   20 A(I) = A(I) + B(J) *D(J) * EXP(BETA*DIST(I,J))
      A(I) = 1.0/A(I)
   30 SUMA = SUMA + A(I)
      DO 50 J = 1,N
      B(J) = 0.0
      DO 40 I = 1,N
   40 B(J) = B(J) + O(I) * A(I) * EXP(BETA*DIST(I,J))
      B(J) = 1.0/B(J)
   50 SUMB = SUMB + B(J)
      W = SQRT(SUMB/SUMA)
```

```
      DO 60 I = 1,N
      A(I) = A(I) * W
   60 B(I) = B(I) / W
      IF (ABS(W-1.0) .LT. 0.1) GO TO 80
   70 CONTINUE
   80 C = 0.0
      DO 90 I = 1,N
      DO 90 J = 1,N
   90 C = C+O(I)*A(I)*B(J)*D(J)*EXP(BETA*DIST(I,J))*DIST(I,J)
      IF (KK .EQ. 1) GO TO 100
      W = C-CT
      IF (ABS(W) .LT. COBS * 0.0001) GO TO 120
      W = ((COBS-CT) * BETA-(COBS-C)*BT)/W
      CT = C
      BT = BETA
      BETA = W
      GO TO 110
  100 BT = BETA
      CT = C
      BETA = C/COBS*BETA
  110 CONTINUE
  120 RETURN
      END
```

```
      PROGRAM GUNIN
      CHARACTER* 15 INFILE
      CHARACTER* 15 OUTFILE
      COMMON DIST(156,156),O(156),A(156),B(156),D(156),OID(156),DID(156)
      WRITE (*,500)
  500 FORMAT('0',"WHAT IS THE FILE CONTAINING TRAFFIC PRODUCTIONS AND AT
     1TRACTIONS? ")
      READ (*,501) INFILE
  501 FORMAT (A15)
      WRITE (*,502)
  502 FORMAT(' ',"WHAT IS THE FILE FOR THE OUTPUT? ")
      READ (*,503) OUTFILE
  503 FORMAT (A15)
      OPEN (1,FILE= INFILE, STATUS = 'OLD')
      OPEN (2,FILE='gmdist.prj', STATUS = 'OLD')
      OPEN (3, FILE = OUTFILE, STATUS='NEW')
      WRITE(*,10)
   10 FORMAT('0',"INPUT THE NUMBER OF OBSERVATIONS: ")
      READ(*,*) N
C     READ PRODUCTIONS AND ATTRACTIONS
      READ(1,*) (O(I),D(I),I=1,N)
      DO 100 I = 1, N
      DO 100 J = 1, N
  100 READ(2,*) OID(I),DID(J),DIST(I,J)
      WRITE(*,13)
   13 FORMAT(' ',"INPUT AVERAGE SHIPMENT LENGTH: ")
      READ(*,*) COBS
      BETA = -1.0/COBS
      TRIPS = 0.0
      DO 101 I = 1,N
  101 TRIPS = TRIPS + O(I)
      DO 102 I = 1,N
      O(I) = O(I)/TRIPS
  102 D(I) = D(I)/TRIPS
      CALL ENT5(N,BETA,COBS,TRIPS)
      CALL OUT(N,BETA,COBS,TRIPS)
      STOP
      END

      SUBROUTINE OUT(N,BETA,COBS,TRIPS)
      COMMON DIST(156,156),O(156),A(156),B(156),D(156),OID(156),DID(156)
      DIMENSION X(156)
      DIMENSION ITEMP (156)
      DO 10 I = 1,N
      XX = O(I) * TRIPS
   10 Y = D(I) * TRIPS
      XMEAN = 0.0
      DO 30 I = 1,N
```

```
      X(I)=TRIPS*O(I)*A(I)
   30 CONTINUE
      DO 31 I = 1,N
      DO 20 J = 1,N
      W = X(I)*B(J)*D(J)*EXP(BETA*DIST(I,J))
      XMEAN = XMEAN+W*DIST(I,J)
   20 ITEMP(J) =IFIX(W+0.5)
      DO 25 J = 1,N
   25 WRITE(3,106) I,J,ITEMP(J),DIST(I,J)
  106 FORMAT(2I6,I10,F10.0)
   31 CONTINUE
      XMEAN = XMEAN/TRIPS
      WRITE(*,105) COBS,XMEAN
  105 FORMAT(' ',' OBSERVED MEAN SHIPMENT COST',F10.5/' MODEL MEAN SHIPM
     1ENT COST',F13.5)
C
C     THIS PART OF THE PROGRAM IS FOR THE 1997 INTERMODAL PROJECT. IT
C     CALCULATES THE AVERAGE SHIPPING DISTANCE FOR FLOWS FROM INDIANA
C     FOR COMPARISON WITH THE CENSUS VALUE OF THIS AVERAGE.
C
      REWIND (3)
      TONS = 0
      TONMILES = 0
      N = 0
      DO 40 I = 1,145
      DO 40 J = 1,145
      IF (I .LT. 14) GO TO 40
      IF (I .GT. 105) GO TO 40
      READ (3,*)ORIGIN,DESTIN,FLOW,DISTANCE
      IF (FLOW .EQ. 0.0) GO TO 40
      TONMILES = TONMILES + FLOW * DISTANCE
      N = N+1
      TONS = TONS + FLOW
  40  CONTINUE
      MEANFLO = TONMILES/TONS
      WRITE (*,*) TONS, TONMILES, N, MEANFLO
      RETURN
      END

      SUBROUTINE ENT5(N,BETA,COBS,TRIPS)
      COMMON DIST(156,156),O(156),A(156),B(156),D(156),OID(156),DID(156)
      DO 10 I = 1,N
   10 B(I) = 1.0
      DO 110 KK = 1,30
      DO 70 K = 1,30
      SUMA = 0.0
      SUMB = 0.0
      DO 30 I =1,N
```

```
      A(I) = 0.0
      DO 20 J =1,N
   20 A(I) = A(I) + B(J) *D(J) * EXP(BETA*DIST(I,J))
      A(I) = 1.0/A(I)
   30 SUMA = SUMA + A(I)
      DO 50 J = 1,N
      B(J) = 0.0
      DO 40 I = 1,N
   40 B(J) = B(J) + O(I) * A(I) * EXP(BETA*DIST(I,J))
      B(J) = 1.0/B(J)
   50 SUMB = SUMB + B(J)
      W = SQRT(SUMB/SUMA)
      DO 60 I = 1,N
      A(I) = A(I) * W
   60 B(I) = B(I) / W
      IF (ABS(W-1.0) .LT. 0.1) GO TO 80
   70 CONTINUE
   80 C = 0.0
      DO 90 I = 1,N
      DO 90 J = 1,N
   90 C = C+O(I)*A(I)*B(J)*D(J)*EXP(BETA*DIST(I,J))* DIST(I,J)
      IF (KK .EQ. 1) GO TO 100
      W = C-CT
      IF (ABS(W) .LT. COBS * 0.0001) GO TO 120
      W = ((COBS-CT) * BETA-(COBS-C)*BT)/W
      CT = C
      BT = BETA
      BETA = W
      GO TO 110
  100 BT = BETA
      CT = C
      BETA = C/COBS*BETA
  110 CONTINUE
  120 RETURN
      END
```

```
      PROGRAM NEWMODE
C
C     PROGRAM MODAL WILL ALLOCATE MODAL SHARES BASED ON LENGTH OF HAUL
C     FOR ANY COMMODITY FOR WHICH THE MULTIPLIERS ARE KNOWN (e.g.,SEE
C     NEWMODE.20).  AS WRITTEN THE PROGRAM ALLOCATES FLOW SHARES TO
C     PARCEL SERVICE (e.g., UPS, FEDEX), PRIVATE TRUCKING, FOR HIRE
C     TRUCKING, COMBINED PRIVATE AND FOR HIRE TRUCKING, TRUCK/AIR,
C     TRUCK/RAIL, TRUCK/WATER, [HIGHWAY], RAIL, RAIL/WATER, [RAILWAY],
C     INLAND WATER, GREAT LAKES WATER, INLAND WATER/GREAT LAKES, INLAND
C     WATER/DEEP SEA, [WATERWAY], AIR, [AIRWAY], OTHER, [OTHERWAY], AND
C     [[TOTAL]]. VALUES IN SINGLE BRACKETS ARE THE SUM OF THE CATEGORIES
C     IMMEDIATELY PRECEDING IT.  THE TOTAL VALUE IS THE SUM OF THE
C     VALUES IN BRACKETS.
C
C     WRITTEN BY W.R. BLACK, INDIANA UNIVERSITY, JANUARY 1997
C
      CHARACTER * 15 MODCHOIC
      CHARACTER * 15 FLOWS
      CHARACTER * 15 OUTFILE
      OPEN (5,FILE='CONTROL.CRD',STATUS='OLD')
C
C     PROGRAM EXPECTS 15 SETS OF DATA - TESTING MODE
C
      DO 500 KKK=1,1
      READ (5,501) (MODCHOIC,FLOWS,OUTFILE)
  501 FORMAT (A15,A21,A12)
      INTEGER O,D,FLOW,DIST
      REAL PARCEL,PTRUCK,FHTRUCK,TWOTRUCK,TA,TR,TW,HIGHWAY,RAIL,RW,
      REAL RAILWAY,IW,GL,IWGL,IWDS,WATERWAY,AIR,AIRWAY,OTHER,OTHERWAY,
      REAL TOTAL
C
C     OPEN MODAL SHARE PROPORTIONS MODEL
C
      OPEN (1, FILE= MODCHOIC, STATUS='OLD')
C
C     OPEN FILE WITH ORIGIN, DESTINATION, FLOW VOLUME AND DISTANCE
C
      OPEN (2, FILE= FLOWS,STATUS= 'OLD')
      OPEN (3, FILE= OUTFILE,STATUS = 'NEW')
      WRITE (3,5002) KKK
 5002 FORMAT('DATASET ',I2)
C
C
 5000 DIMENSION A(180)
      WRITE (3,5001)
 5001 FORMAT('     O     D  TONS  DIST     1     2     3     4     5
     1 6     7   HWY     8     9   RWY    10    11    12    13   WWY
```

```
    214   AWY    15   OWY CHECK')
      DO 1000 I = 1,180
 1000 READ (1,*) (A(I))
      CLOSE(1)
 6000 READ (2,*,END=9000) O,D,FLOW, DIST
      IF (FLOW .EQ. 0) GO TO 307
      IF (DIST .LE. 49) GO TO 199
      IF (DIST .LE. 99) GO TO 200
      IF (DIST .LE. 249) GO TO 201
      IF (DIST .LE. 499) GO TO 202
      IF (DIST .LE. 749) GO TO 203
      IF (DIST .LE. 999) GO TO 204
      IF (DIST .LE. 1499) GO TO 205
      IF (DIST .LE. 1999) GO TO 206
      IF (DIST .GE. 2000) GO TO 210
C
C     TOTAL FLOW HERE EXCEEDS ACTUAL FLOW SINCE TR, TW, AIR AND PARCEL HAVE
C     BEEN ADDED IN TWICE SINCE THIS WOULD REFLECT ACTUAL CIRCUMSTANCES
C     BETTER, e.g., FREIGHT ARRIVING BY AIR WILL MOST LIKELY BE TRUCKED TO
C     IT ENDPOINT.
C
C     TONS ARE THE UNIT OF MEASURE AND OUTPUT IS TO ONE DECIMAL PLACE
C
  199 PARCEL = A(1) * FLOW
      PTRUCK = A(2) * FLOW
      FHTRUCK = A(3) * FLOW
      TWOTRUCK = A(4) * FLOW
      TA = A(5) * FLOW
      TR = A(6) * FLOW
      TW = A(7) * FLOW
      HIGHWAY = A(8) * FLOW
      RAIL = A(9) * FLOW
      RW = A(10) * FLOW
      RAILWAY = (A(11) * FLOW) + TR
      IW = A(12) * FLOW
      GL = A(13) * FLOW
      IWGL = A(14) * FLOW
      IWDS = A(15) * FLOW
      WATERWAY = (A(16) * FLOW) + TW
      AIR = A(17) * FLOW
      AIRWAY = (A(18) * FLOW) + TA + PARCEL
      OTHER = A(19) * FLOW
      OTHERWAY = A(20) * FLOW
      TOTAL = HIGHWAY+RAILWAY+AIRWAY+WATERWAY+OTHERWAY
      GO TO 207
  200 PARCEL = A(21) * FLOW
      PTRUCK = A(22) * FLOW
      FHTRUCK = A(23) * FLOW
```

```
      TWOTRUCK = A(24) * FLOW
      TA = A(25) * FLOW
      TR = A(26) * FLOW
      TW = A(27) * FLOW
      HIGHWAY = A(28) * FLOW
      RAIL = A(29) * FLOW
      RW = A(30) * FLOW
      RAILWAY = (A(31) * FLOW) + TR
      IW = A(32) * FLOW
      GL = A(33) * FLOW
      IWGL = A(34) * FLOW
      IWDS = A(35) * FLOW
      WATERWAY = (A(36) * FLOW) + TW
      AIR = A(37) * FLOW
      AIRWAY = (A(38) * FLOW) + TA + PARCEL
      OTHER = A(39) * FLOW
      OTHERWAY = A(40) * FLOW
      TOTAL = HIGHWAY+RAILWAY+AIRWAY+WATERWAY+OTHERWAY
      GO TO 207
  201 PARCEL = A(41) * FLOW
      PTRUCK = A(42) * FLOW
      FHTRUCK = A(43) * FLOW
      TWOTRUCK = A(44) * FLOW
      TA = A(45) * FLOW
      TR = A(46) * FLOW
      TW = A(47) * FLOW
      HIGHWAY = A(48) * FLOW
      RAIL = A(49) * FLOW
      RW = A(50) * FLOW
      RAILWAY = (A(51) * FLOW) + TR
      IW = A(52) * FLOW
      GL = A(53) * FLOW
      IWGL = A(54) * FLOW
      IWDS = A(55) * FLOW
      WATERWAY = (A(56) * FLOW) + TW
      AIR = A(57) * FLOW
      AIRWAY = (A(58) * FLOW) + TA + PARCEL
      OTHER = A(59) * FLOW
      OTHERWAY = A(60) * FLOW
      TOTAL = HIGHWAY+RAILWAY+AIRWAY+WATERWAY+OTHERWAY
      GO TO 207
  202 PARCEL = A(61) * FLOW
      PTRUCK = A(62) * FLOW
      FHTRUCK = A(63) * FLOW
      TWOTRUCK = A(64) * FLOW
      TA = A(65) * FLOW
      TR = A(66) * FLOW
      TW = A(67) * FLOW
```

```
      WATERWAY = (A(156) * FLOW) + TW
      AIR = A(157) * FLOW
      AIRWAY = (A(158) * FLOW) + TA + PARCEL
      OTHER = A(159) * FLOW
      OTHERWAY = A(160) * FLOW
      TOTAL = HIGHWAY+RAILWAY+AIRWAY+WATERWAY+OTHERWAY
      GO TO 207
  210 PARCEL = A(161) * FLOW
      PTRUCK = A(162) * FLOW
      FHTRUCK = A(163) * FLOW
      TWOTRUCK = A(164) * FLOW
      TA = A(165) * FLOW
      TR = A(166) * FLOW
      TW = A(167) * FLOW
      HIGHWAY = A(168) * FLOW
      RAIL = A(169) * FLOW
      RW = A(170) * FLOW
      RAILWAY = (A(171) * FLOW) + TR
      IW = A(172) * FLOW
      GL = A(173) * FLOW
      IWGL = A(174) * FLOW
      IWDS = A(175) * FLOW
      WATERWAY = (A(176) * FLOW) + TW
      AIR = A(177) * FLOW
      AIRWAY = (A(178) * FLOW) + TA + PARCEL
      OTHER = A(179) * FLOW
      OTHERWAY = A(180) * FLOW
      TOTAL = HIGHWAY+RAILWAY+AIRWAY+WATERWAY+OTHERWAY
      GO TO 207
  307 PARCEL = 0
      PTRUCK = 0
      FHTRUCK = 0
      TWOTRUCK = 0
      TA = 0
      TR = 0
      TW = 0
      HIGHWAY = 0
      RAIL = 0
      RW = 0
      RAILWAY = 0
      IW = 0
      GL = 0
      IWGL = 0
      IWDS = 0
      WATERWAY = 0
      AIR = 0
      AIRWAY = 0
      OTHER = 0
```

```
      OTHERWAY = 0
      TOTAL = 0
  207 WRITE(3,208)O,D,FLOW,DIST,PARCEL,PTRUCK,FHTRUCK,TWOTRUCK,TA,TR,TW,
     1HIGHWAY,RAIL,RW,RAILWAY,IW,GL,IWGL,IWDS,WATERWAY,AIR,AIRWAY,OTHER,
     2OTHERWAY,TOTAL
  208 FORMAT (4I15,21F15.1)
 3000 GO TO 6000
 9000 CLOSE(2)
      CLOSE(3)
  500 CONTINUE
      CLOSE(5)
      CALL EXIT
      END
```

```
      PROGRAM ALLOHWY
      CHARACTER * 15 INFLOW
      CHARACTER * 15 OUTFLOW1
      CHARACTER * 15 OUTFLOW2
      CHARACTER * 15 OUTFLOW3
      DIMENSION O(145),D(145)
      DIMENSION DENSITY(145),DOLLARS(145)
      REAL HWYTONS(145,145),HWYDOLLS(145,145),HWYTRUCK(145,145)
      OPEN (1,FILE='CONTROL.HWY',STATUS='OLD')
      OPEN (4,FILE='NODES',STATUS='OLD')
C
C     READ IN NUMBER OF NODES (N) AND NUMBER OF COMMODITIES (M)
C
      OPEN (5,FILE='NM', STATUS= 'OLD')
      READ (5,*) N,M
C
C     READ IN NODE IDS THAT MATCH NETWORK TO BE USED
C
      DO 5 K = 1,N
      READ (4,*) O(K)
    5 D(K) = O(K)
      CLOSE (4)
      DO 10 I = 1,M
      READ(1,6)(INFLOW,OUTFLOW1,OUTFLOW2,OUTFLOW3,DENSITY(I),DOLLARS(I))
    6 FORMAT (4A15,2F10.0)
      OPEN (2,FILE= INFLOW,STATUS='OLD')
      OPEN (3,FILE= OUTFLOW1,STATUS='NEW')
C
C     UNITS ARE IN TONS
C
      DO 20 J = 1,N
      DO 20 K = 1,N
   20 READ(2,501) HWYTONS(J,K)
  501 FORMAT(100x,65X,F15.1)
      CLOSE (2)
      DO 30 J = 1,N
      DO 30 K = 1,N
      HWYTONS(J,K) = HWYTONS(J,K) + .5
   30 WRITE (3,503) O(J),D(K),HWYTONS(J,K)
  503 FORMAT (2I10,F15.0)
      CLOSE (3)
      OPEN (3,FILE= OUTFLOW2,STATUS='NEW')
C
C     EXPAND BY DOLLAR VALUE PER TON
C
      DO 40 J = 1,N
      DO 40 K = 1,N
   40 HWYDOLLS(J,K) = HWYTONS(J,K) * DOLLARS(I)
```

```
      DO 50 J = 1,N
      DO 50 K = 1,N
   50 WRITE (3,503) O(J),D(K),HWYDOLLS(J,K)
      CLOSE (3)
      OPEN (3,FILE= OUTFLOW3 ,STATUS='NEW')
C
C     DIVIDE BY COMMODITY DENSITY TO GET VEHICLE UNITS
C
      DO 60 J = 1,N
      DO 60 K = 1,N
   60 HWYTRUCK(J,K) = HWYTONS(J,K) / DENSITY(I)
      DO 70 J = 1,N
      DO 70 K = 1,N
   70 WRITE (3,503) O(J),D(K),HWYTRUCK(J,K)
      CLOSE (3)
   10 CONTINUE
      STOP
      END
```

```
      PROGRAM ALLORWY
      CHARACTER * 15 INFLOW
      CHARACTER * 15 OUTFLOW1
      CHARACTER * 15 OUTFLOW2
      CHARACTER * 15 OUTFLOW3
      DIMENSION O(145),D(145),RWYTONS(145,145),RWYDOLLS(145,145)
      DIMENSION RWYCARS(145,145),DENSITY(145),DOLLARS(145)
      OPEN (1,FILE='CONTROL.RWY',STATUS='OLD')
      OPEN (4,FILE='NODES.RWY',STATUS='OLD')
C
C     READ IN NUMBER OF NODES (N) AND NUMBER OF COMMODITIES (M)
C
      OPEN (5,FILE='NM', STATUS= 'OLD')
      READ (5,*) N,M
C
C     READ IN NODE IDS THAT MATCH NETWORK TO BE USED
C
      DO 5 K = 1,N
      READ (4,*) O(K)
    5 D(K) = O(K)
      CLOSE (4)
      DO 10 I = 1,M
      READ(1,6)(INFLOW,OUTFLOW1,OUTFLOW2,OUTFLOW3,DENSITY(I),DOLLARS(I))
    6 FORMAT (4A15,2F10.0)
      OPEN (2,FILE= INFLOW,STATUS='OLD')
      OPEN (3,FILE= OUTFLOW1,STATUS='NEW')
C
C     READ IN TONS
C
      DO 20 J = 1,N
      DO 20 K = 1,N
   20 READ(2,501) RWYTONS(J,K)
  501 FORMAT(105X,105X,F15.1)
      CLOSE (2)
      DO 30 J = 1,N
      DO 30 K = 1,N
      RWYTONS(J,K) = RWYTONS(J,K) + .5
   30 WRITE (3,503) O(J),D(K),RWYTONS(J,K)
  503 FORMAT (2I10,F15.0)
      CLOSE (3)
      OPEN (3,FILE= OUTFLOW2,STATUS='NEW')
C
C     EXPAND BY DOLLAR VALUE PER TON
C
      DO 40 J = 1,N
      DO 40 K = 1,N
   40 RWYDOLLS(J,K) = RWYTONS(J,K) * DOLLARS(I)
      DO 50 J = 1,N
```

```
      DO 50 K = 1,N
   50 WRITE (3,503) O(J),D(K),RWYDOLLS(J,K)
      CLOSE (3)
      OPEN (3,FILE= OUTFLOW3 ,STATUS='NEW')
C
C     DIVIDE BY COMMODITY DENSITY TO GET VEHICLE UNITS
C
      DO 60 J = 1,N
      DO 60 K = 1,N
   60 RWYCARS(J,K) = RWYTONS(J,K) / DENSITY(I)
      DO 70 J = 1,N
      DO 70 K = 1,N
   70 WRITE (3,503) O(J),D(K),RWYCARS(J,K)
      CLOSE (3)
   10 CONTINUE
      STOP
      END
```

```
      PROGRAM GROWTH
      CHARACTER * 15 INFILE
      CHARACTER * 15 OUTFILE1
      CHARACTER * 15 OUTFILE2
C     AS WRITTEN THIS PROGRAM TAKES PRODUCTION AND ATTRACTION VECTORS
C     FOR 15 COMMODITY GROUPS FOR 1993 AND EXPANDS THESE BASED ON
C     PREDICTED GROWTH IN POPULATION AND INDUSTRY FOR INDIANA COUNTIES
C     AND THE STATES OF THE U.S. FOR 2005 AND 2015
C
C     WRITTEN BY WILLIAM R. BLACK, DEPARTMENT OF GEOGRAPHY, INDIANA
C     UNIVERSITY, MAY 1997

      DIMENSION APGROW05(200),APGROW15(200),APDAT1(200),APDAT2(200),
     *APDAT3(200),AIDAT1(200),AIDAT2(200),AIDAT3(200),AIGROW05(200),
     *AIGROW15(200),AMEAN05(200),AMEAN15(200)
      DIMENSION PRODUCT(200),ATTRACT(200),PROD05P(200),PROD05I(200),
     *PROD05M(200), ATTR05P(200),ATTR05I(200),ATTR05M(200)
      DIMENSION PROD15P(200),PROD15I(200),PROD15M(200), ATTR15P(200),
     *ATTR15I(200),ATTR15M(200)
C
      OPEN (1,FILE="EXPECT",STATUS="OLD")
C
C     FILELIST IS THE LIST OF PRODUCTION AND ATTRACTION FILES FOR EACH
C     OF THE 15 INDUSTRY GROUPS
C
      OPEN (2,FILE="FILELIST",STATUS="OLD")
      OPEN (3,FILE="FACTORS",STATUS="OLD")
C
C     READ IN NATIONAL GROWTH RATE FOR STATE POPULATIONS AND INDUSTRIES
C     APNAT05 = POPULATION GROWTH RATE FROM 1993 TO 2005
C     APNAT15 = POPULATION GROWTH RATE FROM 2005 TO 2015
C     AINAT05 = INDUSTRIAL GROWTH RATE FROM 1993 TO 2005
C     AINAT15 = INDUSTRIAL GROWTH RATE FROM 2005 TO 2015
C
      APNAT05 = .1478
      APNAT15 = .089
      AINAT05 = .073
      AINAT15 = .042
C
C     CALCULATE AVERAGE GROWTH AS A FUNCTION OF EXPECTED POPULATION
C     GROWTH AND INDUSTRIAL GROWTH
C
      DO 20 J = 1,13
      APGROW05(J) = APNAT05
      APGROW15(J) = APNAT15
      AIGROW05(J) = AINAT05
      AIGROW15(J) = AINAT15
      AMEAN05(J) = (APGROW05(J) + AIGROW05(J))/2
```

```
      AMEAN15(J) = (APGROW15(J) + AIGROW15(J))/2
      WRITE (3,100)APGROW05(J),APGROW15(J),AIGROW05(J),AIGROW15(J),
     *AMEAN05(J),AMEAN15(J)
   20 CONTINUE
C
C     NOW READ IN INDIANA COUNTY SPECIFIC GROWTH RATES FOR POPULATION
C     AND INDUSTRIES
C
      DO 21 J = 14,105
      READ (1,*)APDAT1(J),APDAT2(J),APDAT3(J),AIDAT1(J),AIDAT2(J),
     * AIDAT3(J)
      APGROW05(J) = ((APDAT2(J)-APDAT1(J))/APDAT1(J))
      APGROW15(J) = ((APDAT3(J)-APDAT2(J))/APDAT2(J))
      AIGROW05(J) = ((AIDAT2(J)-AIDAT1(J))/AIDAT1(J))
      AIGROW15(J) = ((AIDAT3(J)-AIDAT2(J))/AIDAT2(J))
      AMEAN05(J) = (APGROW05(J) + AIGROW05(J))/2
      AMEAN15(J) = (APGROW15(J) + AIGROW15(J))/2
      WRITE (3,100)APGROW05(J),APGROW15(J),AIGROW05(J),AIGROW15(J),
     *AMEAN05(J),AMEAN15(J)
   21 CONTINUE
      CLOSE (1)
C
C     NOW DO THE LAST FORTY AREAL UNITS OF THE 145 UNITS INCLUDED
C     HERE
C
      DO 22 J = 106,145
      APGROW05(J) = APNAT05
      APGROW15(J) = APNAT15
      AIGROW05(J) = AINAT05
      AIGROW15(J) = AINAT15
      AMEAN05(J) = (APGROW05(J) + AIGROW05(J))/2
      AMEAN15(J) = (APGROW15(J) + AIGROW15(J))/2
      WRITE (3,100)APGROW05(J),APGROW15(J),AIGROW05(J),AIGROW15(J),
     *AMEAN05(J),AMEAN15(J)
   22 CONTINUE
      REWIND (3)
      DO 23 I = 1,15
      READ (2,200) (INFILE,OUTFILE1,OUTFILE2)
      OPEN (4,FILE=INFILE, STATUS = "OLD")
      OPEN (5,FILE=OUTFILE1, STATUS = "NEW")
C
C     BEGIN LOOP TO CALCULATE PRODUCTIONS AND ATTRACTIONS FOR 2005
C     THERE ARE THREE SETS OF PRODUCTIONS AND ATTRACTIONS GENERATED
C     FOR 2005.  THE FIRST ASSUMES THE GROWTH WILL FOLLOW POPULATION
C     GROWTH.  THE SECOND ASSUMES GROWTH WILL FOLLOW INDUSTRIAL GROWTH
C     RATES.  THE THIRD ASSUMES EQUAL INFLUENCES ON THE GROWTH FROM
C     BOTH SECTORS
C
```

```
      DO 24 J = 1,145
      READ (4,*) PRODUCT(J),ATTRACT(J)
      READ (3,300) APGROW05(J),AIGROW05(J),AMEAN05(J)
      PROD05P(J) = PRODUCT(J) + PRODUCT(J) * APGROW05(J)
      PROD05I(J) = PRODUCT(J) + PRODUCT(J) * AIGROW05(J)
      PROD05M(J) = PRODUCT(J) + PRODUCT(J) * AMEAN05(J)
      ATTR05P(J) = ATTRACT(J) + ATTRACT(J) * APGROW05(J)
      ATTR05I(J) = ATTRACT(J) + ATTRACT(J) * AIGROW05(J)
      ATTR05M(J) = ATTRACT(J) + ATTRACT(J) * AMEAN05(J)
      WRITE (5,400) PROD05P(J),ATTR05P(J),PROD05I(J),ATTR05I(J),
     *PROD05M(J),ATTR05M(J)
   24 CONTINUE
      CLOSE (5)
      CLOSE (4)
      CLOSE (3)
      OPEN (5,FILE = OUTFILE1, STATUS = "OLD")
      OPEN (6,FILE = OUTFILE2, STATUS = "NEW")
      OPEN (3,FILE = "FACTORS",STATUS = "OLD")
      DO 25 J = 1,145
      READ (5,400) PROD05P(J),ATTR05P(J),PROD05I(J),ATTR05I(J),
     *PROD05M(J),ATTR05M(J)
      READ (3,500) APGROW15(J),AIGROW15(J),AMEAN15(J)
      PROD15P(J) = PROD05P(J) + PROD05P(J) * APGROW15(J)
      PROD15I(J) = PROD05I(J) + PROD05I(J) * AIGROW15(J)
      PROD15M(J) = PROD05M(J) + PROD05M(J) * AMEAN15(J)
      ATTR15P(J) = ATTR05P(J) + ATTR05P(J) * APGROW15(J)
      ATTR15I(J) = ATTR05I(J) + ATTR05I(J) * AIGROW15(J)
      ATTR15M(J) = ATTR05M(J) + ATTR05M(J) * AMEAN15(J)
      WRITE (6,400) PROD15P(J),ATTR15P(J),PROD15I(J),ATTR15I(J),
     *PROD15M(J),ATTR15M(J)
   25 CONTINUE
      REWIND(3)
   23 CONTINUE
  100 FORMAT(6F10.5)
  200 FORMAT (3A15)
  300 FORMAT(F10.5,10X,F10.5,10X,F10.5,10X)
  400 FORMAT(6F10.0)
  500 FORMAT(10X,F10.5,10X,F10.5,10X,F10.5)
      STOP
      END
```

```
      PROGRAM NEWFLOWS
      CHARACTER * 15 INFILE1
      CHARACTER * 15 INFILE2
      CHARACTER * 15 OUTFILE
      DIMENSION DIST (145,145),F(145,145),A(145),B(145),D(145),X(145)
      REAL O(145)
C
C     READ IN BETA AND NAMES OF FILES
C
      OPEN (1,FILE="INSOUTS", STATUS="OLD")
C
      DO 9 I = 1,30
      READ (1,100) BETA,INFILE1,INFILE2,OUTFILE
      OPEN (2,FILE=INFILE1,STATUS ="OLD")
      OPEN (3,FILE=INFILE2,STATUS ="OLD")
      OPEN (4,FILE="GMDIST.PRJ",STATUS="OLD")
      OPEN (5,FILE=OUTFILE,STATUS="NEW")
      OPEN (6,FILE="TRAFCHEK",STATUS = "NEW")
C
C     READ A AND B PARAMETERS OF THE 1993 GRAVITY MODEL CALIBRATIONS
C     AND NEW PRODUCTIONS AND ATTRACTIONS FOR 2005 AND 2015 AS
C     APPROPRIATE
C
      SUMTRIPO = 0.0
      SUMTRIPD = 0.0
      DO 10 J = 1,145
      READ (2,200) A(J),B(J)
      READ (3,300) O(J),D(J)
      SUMTRIPO = SUMTRIPO+O(J)
      SUMTRIPD = SUMTRIPD+D(J)
   10 CONTINUE
      WRITE (6,600) OUTFILE,SUMTRIPO,SUMTRIPD
      CLOSE (2)
      CLOSE (3)
      DO 8 J =1,145
      O(J) = O(J)/SUMTRIPO
    8 D(J) = D(J)/SUMTRIPO
      DO 7 J = 1,145
      X(J) =SUMTRIPO *O(J) *A(J)
    7 CONTINUE
      DO 11 K = 1,145
      DO 11 L = 1,145
      READ (4,400) DIST(K,L)
      F(K,L)= X(K)*B(L)*D(L)*EXP(BETA*DIST(K,L))
      WRITE (5,500) K,L,F(K,L),DIST(K,L)
   11 CONTINUE
      CLOSE (4)
      CLOSE (5)
```

```
      READ (1,100) BETA,INFILE1,INFILE2,OUTFILE
      OPEN (2,FILE=INFILE1,STATUS ="OLD")
      OPEN (3,FILE=INFILE2,STATUS ="OLD")
      OPEN (4,FILE="GMDIST.PRJ",STATUS="OLD")
      OPEN (5,FILE = OUTFILE,STATUS="NEW")
C
C     READ A AND B PARAMETERS OF THE 1993 GRAVITY MODEL CALIBRATIONS
C     AND NEW PRODUCTIONS AND ATTRACTIONS FOR 2005 AND 2015 AS
C     APPROPRIATE
C
      SUMTRIPO = 0.0
      SUMTRIPD = 0.0
      DO 12 J = 1,145
      READ (2,200) A(J),B(J)
      READ (3,301) O(J),D(J)
      SUMTRIPO = SUMTRIPO + O(J)
      SUMTRIPD = SUMTRIPD + D(J)
   12 CONTINUE
      WRITE (6,600)OUTFILE,SUMTRIPO,SUMTRIPD
      CLOSE (2)
      CLOSE (3)
      DO 6 J = 1,145
      O(J) = O(J)/SUMTRIPO
    6 D(J) = D(J)/SUMTRIPO
      DO 5 J = 1,145
      X(J) =SUMTRIPO * O(J)* A(J)
    5 CONTINUE
      DO 13 K = 1,145
      DO 13 L = 1,145
      READ (4,400) DIST(K,L)
      F(K,L)=X(K)*B(L)*D(L)*EXP(BETA*DIST(K,L))
      WRITE (5,500) K,L,F(K,L),DIST(K,L)
   13 CONTINUE
      CLOSE (4)
      CLOSE (5)
      READ (1,100) BETA,INFILE1,INFILE2,OUTFILE
      OPEN (2,FILE=INFILE1,STATUS ="OLD")
      OPEN (3,FILE=INFILE2,STATUS ="OLD")
      OPEN (4,FILE="GMDIST.PRJ",STATUS="OLD")
      OPEN (5,FILE = OUTFILE,STATUS="NEW")
C
C     READ A AND B PARAMETERS OF THE 1993 GRAVITY MODEL CALIBRATIONS
C     AND NEW PRODUCTIONS AND ATTRACTIONS FOR 2005 AND 2015 AS
C     APPROPRIATE
C
      SUMTRIPO = 0.0
      SUMTRIPD = 0.0
      DO 14 J = 1,145
```

```
      READ (2,200) A(J),B(J)
      READ (3,302) O(J),D(J)
      SUMTRIPO = SUMTRIPO + O(J)
      SUMTRIPD = SUMTRIPD + D(J)
   14 CONTINUE
      WRITE (6,600) OUTFILE,SUMTRIPO,SUMTRIPD
      CLOSE (2)
      CLOSE (3)
      DO 4 J = 1,145
      O(J) = O(J) /SUMTRIPO
    4 D(J) = D(J) /SUMTRIPO
      DO 3 J = 1,145
      X(J) = SUMTRIPO * O(J) * A(J)
    3 CONTINUE
      DO 15 K = 1,145
      DO 15 L = 1,145
      READ (4,400) DIST(K,L)
      F(K,L)=X(K)*B(L)*D(L)*EXP(BETA*DIST(K,L))
      WRITE (5,500) K,L,F(K,L),DIST(K,L)
   15 CONTINUE
      CLOSE (4)
      CLOSE (5)
    9 CONTINUE
  100 FORMAT(F10.5,A15,A15,A15)
  200 FORMAT(2F20.0)
  300 FORMAT(2F10.0)
  301 FORMAT(20X,2F10.0)
  302 FORMAT(40X,2F10.0)
  400 FORMAT(22X,F10.0)
  500 FORMAT(I5,I5,F20.0,F10.0)
  600 FORMAT(A15,2F20.0)
      STOP
      END
```

Appendix D - Matrices Supplied to Sponsor

Table D-1 on the following page lists the 132 matrices supplied to the sponsor as part of the deliverables for this project. Twenty-two groups of goods were examined; the 19 commodities, two types of mail, and a total flow group. Each of these with two exceptions is examined for two modes: railways represented by R and highways represented by H. Other numbers indicate the item being moved. There are three matrices for each item; one for 1993, one for 2005, and one for 2015. The exceptions are the two types of mail; these no longer move by rail.

Table D-1 Flow Matrices Delivered as Part of Project

Highway			Railway		
1993	2005	2015	1993	2005	2015
HCOM0193.ASC	HCOM0105.ASC	HCOM0115.ASC	RCOM0193.ASC	RCOM0105.ASC	RCOM0115.ASC
HCOM1193.ASC	HCOM1105.ASC	HCOM1115.ASC	RCOM1193.ASC	RCOM1105.ASC	RCOM1115.ASC
HCOM1493.ASC	HCOM1405.ASC	HCOM1415.ASC	RCOM1493.ASC	RCOM1405.ASC	RCOM1415.ASC
HCOM2093.ASC	HCOM2005.ASC	HCOM2015.ASC	RCOM2093.ASC	RCOM2005.ASC	RCOM2015.ASC
HCOM2293.ASC	HCOM2205.ASC	HCOM2215.ASC	RCOM2293.ASC	RCOM2205.ASC	RCOM2215.ASC
HCOM2393.ASC	HCOM2305.ASC	HCOM2315.ASC	RCOM2393.ASC	RCOM2305.ASC	RCOM2315.ASC
HCOM2493.ASC	HCOM2405.ASC	HCOM2415.ASC	RCOM2493.ASC	RCOM2405.ASC	RCOM2415.ASC
HCOM2593.ASC	HCOM2505.ASC	HCOM2515.ASC	RCOM2593.ASC	RCOM2505.ASC	RCOM2515.ASC
HCOM2693.ASC	HCOM2605.ASC	HCOM2615.ASC	RCOM2693.ASC	RCOM2605.ASC	RCOM2615.ASC
HCOM2893.ASC	HCOM2805.ASC	HCOM2815.ASC	RCOM2893.ASC	RCOM2805.ASC	RCOM2815.ASC
HCOM2993.ASC	HCOM2905.ASC	HCOM2915.ASC	RCOM2993.ASC	RCOM2905.ASC	RCOM2915.ASC
HCOM3293.ASC	HCOM3205.ASC	HCOM3215.ASC	RCOM3293.ASC	RCOM3205.ASC	RCOM3215.ASC
HCOM3393.ASC	HCOM3305.ASC	HCOM3315.ASC	RCOM3393.ASC	RCOM3305.ASC	RCOM3315.ASC
HCOM3493.ASC	HCOM3405.ASC	HCOM3415.ASC	RCOM3493.ASC	RCOM3405.ASC	RCOM3415.ASC
HCOM3593.ASC	HCOM3505.ASC	HCOM3515.ASC	RCOM3593.ASC	RCOM3505.ASC	RCOM3515.ASC
HCOM3693.ASC	HCOM3605.ASC	HCOM3615.ASC	RCOM3693.ASC	RCOM3605.ASC	RCOM3615.ASC
HCOM3793.ASC	HCOM3705.ASC	HCOM3715.ASC	RCOM3793.ASC	RCOM3705.ASC	RCOM3715.ASC
HCOM4093.ASC	HCOM4005.ASC	HCOM4015.ASC	RCOM4093.ASC	RCOM4005.ASC	RCOM4015.ASC
HCOM5093.ASC	HCOM5005.ASC	HCOM5015.ASC	RCOM5093.ASC	RCOM5005.ASC	RCOM5015.ASC
HCOM6093.ASC	HCOM6005.ASC	HCOM6015.ASC			
HCOM7093.ASC	HCOM7005.ASC	HCOM7015.ASC			
HTOTAL93.ASC	HTOTAL05.ASC	HTOTAL15.ASC	RTOTAL93.ASC	RTOTAL05.ASC	RTOTAL15.ASC

Appendix E - Forecasted Productions and Attractions, 2005

As the title above indicates this appendix contains the forecasted productions and attractions of commodities and mail for 2005. Numerous agencies have requested these data and they are produced here primarily in response to those requests. Agencies wishing to convert this tonnage to rail or motor carriers should use the modal tables of Appendix B to determine the traffic carried by each mode of interest and the traffic density factors noted in the text of the report to determine vehicles needed by each mode.

Table E-1 Productions and Attractions - Farm Products, STCC 01 (Annual Tons)

Alabama	2507128	7018797
Arizona	2370677	3194328
Arkansas	3267690	7572037
California	27210582	33309156
Colorado	11197238	11865956
Connecticut	457999	2339217
Delaware	452066	2307078
District of Columbia	0	0
Florida	7197462	8442069
Georgia	4323698	10667653
Idaho	7640036	3442252
Illinois - north	40181080	28278348
Illinois - south	40181080	28278348
Indiana - Adams	538043	277650
Indiana - Allen	415115	226786
Indiana - Bartholomew	467333	260323
Indiana - Benton	469904	240918
Indiana - Blackford	458712	212003
Indiana - Boone	465128	297744
Indiana - Brown	416392	245059
Indiana - Carroll	537140	281915
Indiana - Cass	504379	256645
Indiana - Clark	433909	251253
Indiana - Clay	458888	224928
Indiana - Clinton	523633	266730
Indiana - Crawford	459486	222934
Indiana - Daviess	454273	296802
Indiana - Dearborn	479961	233662
Indiana - Decatur	491376	275644
Indiana - DeKalb	491480	255851
Indiana - Delaware	334644	172847
Indiana - Dubois	639117	340035
Indiana - Elkhart	530320	271823
Indiana - Fayette	445431	225160
Indiana - Floyd	438674	246350
Indiana - Fountain	494108	245547
Indiana - Franklin	501055	234281
Indiana - Fulton	484426	243209
Indiana - Gibson	529882	252703
Indiana - Grant	505380	238956
Indiana - Greene	477893	257552
Indiana - Hamilton	367693	308056
Indiana - Hancock	485878	286438
Indiana - Harrison	543175	291898
Indiana - Hendricks	482646	302321
Indiana - Henry	483165	236729
Indiana - Howard	483605	241945
Indiana - Huntington	474029	236517
Indiana - Jackson	536129	291889
Indiana - Jasper	543544	286035
Indiana - Jay	527276	246388
Indiana - Jefferson	481039	251708
Indiana - Jennings	507529	262991
Indiana - Johnson	449878	296923
Indiana - Knox	536247	259956
Indiana - Kosciusko	604433	330745
Indiana - Lagrange	566610	298181
Indiana - Lake	356249	169698
Indiana - LaPorte	480618	246048
Indiana - Lawrence	464875	242081
Indiana - Madison	473069	252205
Indiana - Marion	188653	100512
Indiana - Marshall	516317	263495
Indiana - Martin	452425	222314
Indiana - Miami	496048	236366
Indiana - Monroe	453841	238309
Indiana - Montgomery	518996	268520
Indiana - Morgan	473210	272096
Indiana - Newton	511876	256468
Indiana - Noble	495412	262294
Indiana - Ohio	460748	218904
Indiana - Orange	460011	237452
Indiana - Owen	468373	250932
Indiana - Parke	459919	220121
Indiana - Perry	482008	208700
Indiana - Pike	485629	222656
Indiana - Porter	444374	246029
Indiana - Posey	499806	267052
Indiana - Pulaski	532707	255855
Indiana - Putnam	452921	270436
Indiana - Randolph	507787	235206
Indiana - Ripley	492495	237424
Indiana - Rush	523497	257438
Indiana - St Joseph	453983	214263
Indiana - Scott	484130	249505
Indiana - Shelby	471549	281737
Indiana - Spencer	514422	256980
Indiana - Starke	486375	244406
Indiana - Steuben	435259	279268
Indiana - Sullivan	471199	240939
Indiana - Switzerland	479760	225908
Indiana - Tippecanoe	464084	256755
Indiana - Tipton	484776	242201
Indiana - Union	441620	226964
Indiana - Vanderburgh	449700	200582
Indiana - Vermillion	455791	226847
Indiana - Vigo	465070	205766
Indiana - Wabash	583742	270362
Indiana - Warren	460621	214209
Indiana - Warrick	440556	247844
Indiana - Washington	494140	258130
Indiana - Wayne	497108	249345
Indiana - Wells	475478	260784
Indiana - White	542983	277616
Indiana - Whitley	466820	300755
Iowa	64539848	47637144
Kansas	39998948	25186176
Kentucky - west	2622814	2745538
Kentucky - east	2622814	2745538
Louisiana	44465032	88854640
Maine	443760	2264610
Maryland	4850515	13646194
Massachusetts	637164	3252865
Michigan - west	5423013	3750437
Michigan - east	5423013	3750437
Minnesota	46597216	36945388
Mississippi	5867367	5208717
Missouri	27824014	13984795
Montana	8308049	3782001
Nebraska	53259556	16630474
Nevada	427149	1768760
New Hampshire	280020	1427863
New Jersey	1937596	4127489
New Mexico	1432136	3301073
New York	7034908	11044132
North Carolina	6006191	14578208
North Dakota	22726702	7473326
Ohio - north	12925214	8056026
Ohio - central	12925214	8056026
Ohio - south	12925214	8056026
Oklahoma	13503843	9824020
Oregon	26726480	32714596
Pennsylvania	5501917	9773517
Rhode Island	321548	1642502
South Carolina	1766736	4701389
South Dakota	8687737	4023039
Tennessee	6724038	7017649
Texas	58326016	81867984
Utah	1751311	4220461
Vermont	323921	1656275
Virginia	5461576	8478799
Washington	25810482	37263328
West Virginia	246797	2117691
Wisconsin	11972039	12932263
Wyoming	218321	1112218

Table E-2 Productions and Attractions - Coal, STCC 11 (Annual Tons)

Alabama	32746884	50545704	Indiana - Parke	0	0
Arizona	2282709	3951086	Indiana - Perry	0	0
Arkansas	153583	13068248	Indiana - Pike	920413	2805908
California	3803814	6585143	Indiana - Porter	0	0
Colorado	24063122	27366212	Indiana - Posey	242957	740666
Connecticut	0	2634057	Indiana - Pulaski	0	0
Delaware	0	3075872	Indiana - Putnam	0	0
District of Columbia	0	0	Indiana - Randolph	0	0
Florida	11646025	20168840	Indiana - Ripley	0	0
Georgia	0	19803818	Indiana - Rush	0	0
Idaho	0	1361210	Indiana - St Joseph	0	0
Illinois - north	38841824	25954510	Indiana - Scott	0	0
Illinois - south	38841824	25954510	Indiana - Shelby	0	0
Indiana - Adams	0	0	Indiana - Spencer	0	0
Indiana - Allen	0	0	Indiana - Starke	0	0
Indiana - Bartholomew	0	0	Indiana - Steuben	0	0
Indiana - Benton	0	0	Indiana - Sullivan	1449719	4419534
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	0	0
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	0	0	Indiana - Vanderburgh	700804	2136423
Indiana - Clark	0	2780969	Indiana - Vermillion	0	0
Indiana - Clay	685728	2090473	Indiana - Vigo	0	0
Indiana - Clinton	0	0	Indiana - Wabash	0	0
Indiana - Crawford	735489	2242173	Indiana - Warren	0	0
Indiana - Daviess	1622230	4945442	Indiana - Warrick	2735008	8337768
Indiana - Dearborn	0	0	Indiana - Washington	0	0
Indiana - Decatur	0	0	Indiana - Wayne	0	0
Indiana - DeKalb	0	0	Indiana - Wells	0	0
Indiana - Delaware	0	3574887	Indiana - White	0	0
Indiana - Dubois	674744	2056987	Indiana - Whitley	0	0
Indiana - Elkhart	0	0	Iowa	0	24337678
Indiana - Fayette	0	0	Kansas	792111	27782780
Indiana - Floyd	0	0	Kentucky - west	103647624	52354516
Indiana - Fountain	0	0	Kentucky - east	103647624	52354516
Indiana - Franklin	0	0	Louisiana	9156084	33725188
Indiana - Fulton	0	0	Maine	1521105	2634057
Indiana - Gibson	1445875	4407813	Maryland	8555426	14831299
Indiana - Grant	0	0	Massachusetts	3043262	5268115
Indiana - Greene	0	0	Michigan - west	0	16135704
Indiana - Hamilton	0	0	Michigan - east	0	16135704
Indiana - Hancock	0	0	Minnesota	8660620	15011180
Indiana - Harrison	0	0	Mississippi	0	5268115
Indiana - Hendricks	0	0	Missouri	23993694	41580024
Indiana - Henry	0	0	Montana	3043262	5268115
Indiana - Howard	0	0	Nebraska	0	17931366
Indiana - Huntington	0	0	Nevada	0	4360291
Indiana - Jackson	0	0	New Hampshire	0	4492835
Indiana - Jasper	0	0	New Jersey	0	6585143
Indiana - Jay	0	0	New Mexico	23563450	2634057
Indiana - Jefferson	0	0	New York	0	21013548
Indiana - Jennings	0	0	North Carolina	0	31822230
Indiana - Johnson	0	0	North Dakota	4564367	7902172
Indiana - Knox	655329	1997800	Ohio - north	9604560	25044230
Indiana - Kosciusko	0	0	Ohio - central	9604560	25044230
Indiana - Lagrange	0	0	Ohio - south	9604560	25044230
Indiana - Lake	0	0	Oklahoma	1502170	25745174
Indiana - LaPorte	0	0	Oregon	3043262	5268115
Indiana - Lawrence	0	0	Pennsylvania	84646440	66727696
Indiana - Madison	0	0	Rhode Island	0	2104
Indiana - Marion	1553999	8517210	South Carolina	11021173	19032746
Indiana - Marshall	0	0	South Dakota	0	3951086
Indiana - Martin	0	0	Tennessee	3268377	23150038
Indiana - Miami	0	0	Texas	35089556	76089960
Indiana - Monroe	0	3799884	Utah	3043262	5268115
Indiana - Montgomery	0	0	Vermont	0	1317029
Indiana - Morgan	0	0	Virginia	108901008	85745712
Indiana - Newton	0	0	Washington	7084814	15402502
Indiana - Noble	0	0	West Virginia	166548352	56690084
Indiana - Ohio	0	0	Wisconsin	21277586	36859968
Indiana - Orange	0	0	Wyoming	250843456	36677984
Indiana - Owen	0	0			

Table E-3 Productions and Attractions - Non-metallic Minerals, STCC 14 (Annual Tons)

Alabama	28380282	29497442	Indiana - Parke	66475	70085
Arizona	13776203	17302306	Indiana - Perry	184252	194258
Arkansas	21765686	19334652	Indiana - Pike	17914	18886
California	141718368	146313232	Indiana - Porter	1355635	1429256
Colorado	22785016	23913746	Indiana - Posey	287205	302803
Connecticut	15621305	17830378	Indiana - Pulaski	134941	142269
Delaware	2266930	6659831	Indiana - Putnam	254701	268533
District of Columbia	0	0	Indiana - Randolph	318010	335280
Florida	134124424	120602792	Indiana - Ripley	633116	667498
Georgia	66510996	64984632	Indiana - Rush	119662	126161
Idaho	7136360	7469824	Indiana - St Joseph	2366669	2495189
Illinois - north	55738080	51654448	Indiana - Scott	268116	282675
Illinois - south	55738080	51654448	Indiana - Shelby	694045	731736
Indiana - Adams	4315201	4549528	Indiana - Spencer	177316	186946
Indiana - Allen	4966977	5236717	Indiana - Starke	121732	128343
Indiana - Bartholomew	1960881	2067364	Indiana - Steuben	800665	844147
Indiana - Benton	49583	52276	Indiana - Sullivan	63523	66973
Indiana - Blackford	180698	190511	Indiana - Switzerland	76580	80739
Indiana - Boone	168600	177756	Indiana - Tippecanoe	1653679	1743482
Indiana - Brown	10066	10613	Indiana - Tipton	103937	109581
Indiana - Carroll	174844	184339	Indiana - Union	5406	5699
Indiana - Cass	641935	676796	Indiana - Vanderburgh	2141026	2257293
Indiana - Clark	770206	812033	Indiana - Vermillion	207859	219147
Indiana - Clay	189901	200214	Indiana - Vigo	886078	934198
Indiana - Clinton	436980	460711	Indiana - Wabash	611146	644335
Indiana - Crawford	20496	21609	Indiana - Warren	17674	18633
Indiana - Daviess	231707	244290	Indiana - Warrick	457944	482813
Indiana - Dearborn	266594	281072	Indiana - Washington	298328	314529
Indiana - Decatur	489189	515755	Indiana - Wayne	756934	798040
Indiana - DeKalb	1114008	1174506	Indiana - Wells	415557	438124
Indiana - Delaware	1121441	1182343	Indiana - White	431785	455234
Indiana - Dubois	1217741	1283866	Indiana - Whitley	432987	456500
Indiana - Elkhart	6074516	6404406	Iowa	26136496	27277850
Indiana - Fayette	569199	600110	Kansas	27311512	26877060
Indiana - Floyd	668431	704731	Kentucky - west	23186856	18376336
Indiana - Fountain	195078	205672	Kentucky - east	23186856	18376336
Indiana - Franklin	67250	70902	Louisiana	30506252	29914010
Indiana - Fulton	306668	323322	Maine	2044971	3476661
Indiana - Gibson	274254	289147	Maryland	36416052	37533212
Indiana - Grant	1090126	1149328	Massachusetts	27022228	28680086
Indiana - Greene	203756	214821	Michigan - west	42524664	38125452
Indiana - Hamilton	749562	790268	Michigan - east	42524664	38125452
Indiana - Hancock	326927	344681	Minnesota	25375942	29708882
Indiana - Harrison	224926	237141	Mississippi	11824855	12369760
Indiana - Hendricks	157985	166564	Missouri	63833808	70263264
Indiana - Henry	339506	357943	Montana	1818804	3277844
Indiana - Howard	1886449	1988894	Nebraska	14388432	18484686
Indiana - Huntington	963339	1015655	Nevada	12376071	12772652
Indiana - Jackson	619876	653541	New Hampshire	9852468	1775674
Indiana - Jasper	132855	140070	New Jersey	31010132	33724136
Indiana - Jay	371972	392173	New Mexico	8537543	6770284
Indiana - Jefferson	423265	446251	New York	51553464	54077068
Indiana - Jennings	219927	231871	North Carolina	36216180	34902308
Indiana - Johnson	645200	680239	North Dakota	2120711	3857463
Indiana - Knox	210952	222409	Ohio - north	45106824	45847388
Indiana - Kosciusko	1567567	1652701	Ohio - central	45107144	45847388
Indiana - Lagrange	420824	443677	Ohio - south	45107144	45847388
Indiana - Lake	4472152	4715014	Oklahoma	26934918	22516770
Indiana - LaPorte	1372950	1447509	Oregon	51186336	54438936
Indiana - Lawrence	588013	619945	Pennsylvania	99806992	103948480
Indiana - Madison	1541440	1625153	Rhode Island	26439454	4765287
Indiana - Marion	9737499	10266297	South Carolina	20908354	19893232
Indiana - Marshall	794499	837646	South Dakota	5943460	6628273
Indiana - Martin	71661	75553	Tennessee	51994228	53137684
Indiana - Miami	257416	271395	Texas	97696800	114070240
Indiana - Monroe	966916	1019426	Utah	10105985	10257465
Indiana - Montgomery	881638	929515	Vermont	5761474	6912296
Indiana - Morgan	299218	315467	Virginia	51621840	47430912
Indiana - Newton	135180	142521	Washington	66808692	68970432
Indiana - Noble	1156793	1219615	West Virginia	8347142	13176597
Indiana - Ohio	865	912	Wisconsin	39144784	41471672
Indiana - Orange	310077	326916	Wyoming	7390929	4445498
Indiana - Owen	127557	134485			

Table E-4 Productions and Attractions - Food and Kindred Products, STCC 20 (Annual Tons)

Alabama	15220253	18584734
Arizona	9458387	9179596
Arkansas	20323652	18638044
California	87477312	105898536
Colorado	11374938	13868837
Connecticut	4407178	8121595
Delaware	3183517	3905992
District of Columbia	96605	1137966
Florida	44631416	36880364
Georgia	28153082	29008916
Idaho	5829600	7096399
Illinois - north	18261638	35568112
Illinois - south	4564855	10625121
Indiana - Adams	396194	237541
Indiana - Allen	986686	977853
Indiana - Bartholomew	1218683	666943
Indiana - Benton	0	15671
Indiana - Blackford	0	21822
Indiana - Boone	0	68875
Indiana - Brown	0	24982
Indiana - Carroll	67192	61661
Indiana - Cass	1265516	649286
Indiana - Clark	142778	204455
Indiana - Clay	0	42640
Indiana - Clinton	789771	414273
Indiana - Crawford	0	17096
Indiana - Daviess	875770	452998
Indiana - Dearborn	483764	283516
Indiana - Decatur	210271	138539
Indiana - DeKalb	142582	135519
Indiana - Delaware	302259	324856
Indiana - Dubois	628141	357455
Indiana - Elkhart	930024	709993
Indiana - Fayette	0	39802
Indiana - Floyd	572030	380960
Indiana - Fountain	0	28948
Indiana - Franklin	0	31112
Indiana - Fulton	150926	100030
Indiana - Gibson	186378	136227
Indiana - Grant	268674	238058
Indiana - Greene	575407	321895
Indiana - Hamilton	161084	314129
Indiana - Hancock	0	87102
Indiana - Harrison	136530	118580
Indiana - Hendricks	144619	215663
Indiana - Henry	108190	120560
Indiana - Howard	114615	180311
Indiana - Huntington	265746	181179
Indiana - Jackson	0	65639
Indiana - Jasper	54192	68380
Indiana - Jay	93626	75179
Indiana - Jefferson	0	55051
Indiana - Jennings	0	44128
Indiana - Johnson	0	175154
Indiana - Knox	60596	85151
Indiana - Kosciusko	532962	367461
Indiana - Lagrange	0	55009
Indiana - Lake	974837	1109209
Indiana - LaPorte	282435	304994
Indiana - Lawrence	0	77542
Indiana - Madison	219874	301614
Indiana - Marion	3143458	2697180
Indiana - Marshall	406356	261037
Indiana - Martin	0	17024
Indiana - Miami	40266	76077
Indiana - Monroe	80314	237948
Indiana - Montgomery	0	61782
Indiana - Morgan	0	107541
Indiana - Newton	0	22216
Indiana - Noble	590696	343936
Indiana - Ohio	0	7594
Indiana - Orange	44315	52329
Indiana - Owen	0	31575
Indiana - Parke	0	26116
Indiana - Perry	0	27384
Indiana - Pike	0	18643
Indiana - Porter	274032	348746
Indiana - Posey	44668	65406
Indiana - Pulaski	0	21985
Indiana - Putnam	0	53544
Indiana - Randolph	51158	64297
Indiana - Ripley	128134	102889
Indiana - Rush	0	28101
Indiana - St Joseph	282413	502528
Indiana - Scott	275367	162707
Indiana - Shelby	131330	133433
Indiana - Spencer	0	34400
Indiana - Starke	0	38881
Indiana - Steuben	140197	122582
Indiana - Sullivan	39888	48985
Indiana - Switzerland	0	11350
Indiana - Tippecanoe	550826	482130
Indiana - Tipton	30394	38352
Indiana - Union	0	11222
Indiana - Vanderburgh	1814582	1079512
Indiana - Vermillion	0	28653
Indiana - Vigo	572266	421824
Indiana - Wabash	39799	73314
Indiana - Warren	0	13397
Indiana - Warrick	0	74854
Indiana - Washington	0	43057
Indiana - Wayne	248305	224993
Indiana - Wells	323049	195615
Indiana - White	0	40243
Indiana - Whitley	0	57759
Iowa	44171712	19890832
Kansas	21657242	12812887
Kentucky - west	3296778	4022865
Kentucky - east	7691741	8166704
Louisiana	19031146	13196310
Maine	2077558	4012613
Maryland	22388996	14922738
Massachusetts	10559904	17518530
Michigan - west	8085933	7887850
Michigan - east	20264800	20282458
Minnesota	35315160	21008294
Mississippi	8379079	12913356
Missouri	30396090	21971978
Montana	2378477	2074995
Nebraska	18976736	12240828
Nevada	1568995	2683960
New Hampshire	2115312	2655254
New Jersey	26127712	24867128
New Mexico	1617853	3647643
New York	44934556	48641400
North Carolina	27547914	28244122
North Dakota	4419392	2366149
Ohio - north	12135562	17450868
Ohio - central	12134451	9925938
Ohio - south	12134451	8455808
Oklahoma	9932528	10266302
Oregon	9872566	11841001
Pennsylvania	37257252	47388612
Rhode Island	1143712	2433813
South Carolina	7671754	10594365
South Dakota	3395603	3372891
Tennessee	22957520	20536706
Texas	57717480	58151112
Utah	4332781	6200379
Vermont	1470170	2031935
Virginia	21543980	21775142
Washington	16972464	19060424
West Virginia	2410679	4291466
Wisconsin	32409244	25802108
Wyoming	542986	1021094

Table E-5 Productions and Attractions - Basic Textiles, STCC 22 (Annual Tons)

Alabama	1429085	1270810	Indiana - Parke	0	0
Arizona	41085	144775	Indiana - Perry	0	0
Arkansas	68845	305638	Indiana - Pike	0	0
California	1139270	3756127	Indiana - Porter	0	0
Colorado	48858	120646	Indiana - Posey	0	0
Connecticut	52189	193034	Indiana - Pulaski	0	0
Delaware	264275	40215	Indiana - Putnam	0	8401
District of Columbia	0	16085	Indiana - Randolph	0	0
Florida	313133	884740	Indiana - Ripley	0	0
Georgia	5987277	1632749	Indiana - Rush	0	0
Idaho	4442	16085	Indiana - St Joseph	0	7116
Illinois - north	172112	482585	Indiana - Scott	0	0
Illinois - south	43306	144775	Indiana - Shelby	0	0
Indiana - Adams	0	8319	Indiana - Spencer	0	0
Indiana - Allen	0	16357	Indiana - Starke	0	0
Indiana - Bartholomew	0	7786	Indiana - Steuben	0	0
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	0	0
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	0	0	Indiana - Vanderburgh	0	13906
Indiana - Clark	0	0	Indiana - Vermillion	0	0
Indiana - Clay	0	0	Indiana - Vigo	0	0
Indiana - Clinton	0	0	Indiana - Wabash	0	36871
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	8461	Indiana - Warrick	0	0
Indiana - Dearborn	0	0	Indiana - Washington	0	8445
Indiana - Decatur	0	0	Indiana - Wayne	0	7175
Indiana - DeKalb	0	0	Indiana - Wells	0	0
Indiana - Delaware	0	0	Indiana - White	13335	8308
Indiana - Dubois	0	0	Indiana - Whitley	0	0
Indiana - Elkhart	4543	25473	Iowa	24429	160861
Indiana - Fayette	0	0	Kansas	28870	120646
Indiana - Floyd	0	8539	Kentucky - west	36643	257379
Indiana - Fountain	0	0	Kentucky - east	86611	522801
Indiana - Franklin	0	0	Louisiana	56630	257379
Indiana - Fulton	0	7546	Maine	65514	72387
Indiana - Gibson	0	0	Maryland	62182	249336
Indiana - Grant	0	7295	Massachusetts	458595	611275
Indiana - Greene	0	0	Michigan - west	31091	144775
Indiana - Hamilton	0	20709	Michigan - east	72176	386068
Indiana - Hancock	0	8991	Minnesota	121034	201077
Indiana - Harrison	0	0	Mississippi	159898	788223
Indiana - Hendricks	0	0	Missouri	103267	563016
Indiana - Henry	0	6954	Montana	2221	24129
Indiana - Howard	0	0	Nebraska	17766	72387
Indiana - Huntington	0	0	Nevada	113261	16085
Indiana - Jackson	0	0	New Hampshire	42195	56301
Indiana - Jasper	0	0	New Jersey	634038	1045603
Indiana - Jay	0	7021	New Mexico	2221	48258
Indiana - Jefferson	0	0	New York	363101	2911601
Indiana - Jennings	27781	0	North Carolina	6439210	1769481
Indiana - Johnson	0	9412	North Dakota	9994	24129
Indiana - Knox	0	0	Ohio - north	88832	273465
Indiana - Kosciusko	14106	8789	Ohio - central	87722	152819
Indiana - Lagrange	0	8631	Ohio - south	87722	128689
Indiana - Lake	20970	13066	Oklahoma	75507	201077
Indiana - LaPorte	16411	15338	Oregon	56630	96517
Indiana - Lawrence	0	8449	Pennsylvania	843904	1857956
Indiana - Madison	0	0	Rhode Island	180995	64344
Indiana - Marion	0	29512	South Carolina	4417171	820396
Indiana - Marshall	0	0	South Dakota	3331	24129
Indiana - Martin	0	7420	Tennessee	951613	1423628
Indiana - Miami	0	0	Texas	527440	1311025
Indiana - Monroe	4667	0	Utah	46637	144775
Indiana - Montgomery	0	0	Vermont	3331	32172
Indiana - Morgan	0	0	Virginia	1070426	780180
Indiana - Newton	0	0	Washington	176554	209121
Indiana - Noble	0	0	West Virginia	132138	96517
Indiana - Ohio	0	0	Wisconsin	175443	257379
Indiana - Orange	0	0	Wyoming	0	8043
Indiana - Owen	0	0			

Table E-6 Productions and Attractions - Apparel, STCC 23 (Annual Tons)

Alabama	463037	553363	Indiana - Parke	0	0
Arizona	408627	185718	Indiana - Perry	0	0
Arkansas	176554	185718	Indiana - Pike	0	0
California	1716678	2274099	Indiana - Porter	0	7674
Colorado	39974	159187	Indiana - Posey	0	0
Connecticut	74397	170557	Indiana - Pulaski	0	0
Delaware	41085	30321	Indiana - Putnam	28508	3959
District of Columbia	0	26531	Indiana - Randolph	0	0
Florida	400854	776984	Indiana - Ripley	0	0
Georgia	1118173	758032	Indiana - Rush	0	0
Idaho	5552	45482	Indiana - St Joseph	0	10061
Illinois - north	255392	458610	Indiana - Scott	0	0
Illinois - south	63293	136446	Indiana - Shelby	0	0
Indiana - Adams	14115	3920	Indiana - Spencer	0	0
Indiana - Allen	13876	15416	Indiana - Starke	0	0
Indiana - Bartholomew	13210	3669	Indiana - Steuben	0	0
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	0	3875
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	0	0	Indiana - Vanderburgh	23594	9830
Indiana - Clark	0	3532	Indiana - Vermillion	13621	0
Indiana - Clay	0	0	Indiana - Vigo	0	3318
Indiana - Clinton	0	0	Indiana - Wabash	87575	13899
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	14356	3987	Indiana - Warrick	0	0
Indiana - Dearborn	0	0	Indiana - Washington	14328	3979
Indiana - Decatur	0	0	Indiana - Wayne	12174	3381
Indiana - DeKalb	0	0	Indiana - Wells	0	0
Indiana - Delaware	0	3451	Indiana - White	14096	3915
Indiana - Dubois	0	0	Indiana - Whitley	0	0
Indiana - Elkhart	43218	12004	Iowa	91053	151606
Indiana - Fayette	0	0	Kansas	48858	128865
Indiana - Floyd	28975	4024	Kentucky - west	91053	125075
Indiana - Fountain	0	0	Kentucky - east	214307	22741
Indiana - Franklin	0	0	Louisiana	115482	250151
Indiana - Fulton	25605	3556	Maine	73286	68223
Indiana - Gibson	0	0	Maryland	89942	257731
Indiana - Grant	12377	3438	Massachusetts	164339	37901
Indiana - Greene	0	0	Michigan - west	36643	140236
Indiana - Hamilton	35136	9758	Michigan - east	86611	356275
Indiana - Hancock	15255	4237	Minnesota	77728	208459
Indiana - Harrison	0	0	Mississippi	219859	348694
Indiana - Hendricks	0	4380	Missouri	145462	356275
Indiana - Henry	11799	3277	Montana	4442	37901
Indiana - Howard	0	3472	Nebraska	74397	79593
Indiana - Huntington	0	0	Nevada	111040	53062
Indiana - Jackson	0	0	New Hampshire	9994	56852
Indiana - Jasper	0	0	New Jersey	933846	587475
Indiana - Jay	23825	3308	New Mexico	21098	75803
Indiana - Jefferson	0	0	New York	425283	1553968
Indiana - Jennings	0	0	North Carolina	1687808	792144
Indiana - Johnson	15968	4435	North Dakota	5552	34111
Indiana - Knox	0	0	Ohio - north	214307	26531
Indiana - Kosciusko	0	4141	Ohio - central	214307	128865
Indiana - Lagrange	14644	4067	Ohio - south	214307	151606
Indiana - Lake	22168	18472	Oklahoma	73286	185718
Indiana - LaPorte	39034	10842	Oregon	77728	136446
Indiana - Lawrence	14335	3981	Pennsylvania	641811	1011974
Indiana - Madison	0	3399	Rhode Island	7773	53062
Indiana - Marion	37553	34768	South Carolina	505232	386597
Indiana - Marshall	0	3891	South Dakota	8883	34111
Indiana - Martin	12590	0	Tennessee	2867053	621586
Indiana - Miami	0	0	Texas	917190	1057456
Indiana - Monroe	0	4110	Utah	53299	109914
Indiana - Montgomery	0	0	Vermont	5552	30321
Indiana - Morgan	0	4229	Virginia	407517	477561
Indiana - Newton	0	0	Washington	125475	250151
Indiana - Noble	0	0	West Virginia	16656	102334
Indiana - Ohio	0	0	Wisconsin	315354	250151
Indiana - Orange	0	0	Wyoming	0	18950
Indiana - Owen	0	0			

Table E-7 Productions and Attractions - Lumber and Wood Products, STCC 23 (Annual Tons)

Alabama	54992560	30751374	Indiana - Parke	13322	68563
Arizona	2406237	6934985	Indiana - Perry	16173	84598
Arkansas	23446096	21391316	Indiana - Pike	0	0
California	34447940	64584160	Indiana - Porter	0	0
Colorado	2065344	3643642	Indiana - Posey	0	0
Connecticut	977152	2647069	Indiana - Pulaski	0	0
Delaware	1271408	931420	Indiana - Putnam	19528	100820
District of Columbia	0	205105	Indiana - Randolph	49150	254330
Florida	25354874	22544734	Indiana - Ripley	17057	88960
Georgia	43494368	31178476	Indiana - Rush	0	0
Idaho	23085216	13286021	Indiana - St Joseph	54135	279688
Illinois - north	2917021	10262523	Indiana - Scott	12103	63827
Illinois - south	729533	3064520	Indiana - Shelby	27116	139302
Indiana - Adams	99151	511680	Indiana - Spencer	41702	215076
Indiana - Allen	120629	623241	Indiana - Starke	0	0
Indiana - Bartholomew	20073	105119	Indiana - Steuben	0	0
Indiana - Benton	12990	66853	Indiana - Sullivan	14679	77604
Indiana - Blackford	10853	55643	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	0	0
Indiana - Brown	13114	68600	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	22552	116436	Indiana - Vanderburgh	44372	229469
Indiana - Clark	178023	919727	Indiana - Vermillion	0	0
Indiana - Clay	0	0	Indiana - Vigo	17259	88723
Indiana - Clinton	27341	140946	Indiana - Wabash	29294	150437
Indiana - Crawford	24446	128266	Indiana - Warren	12692	65320
Indiana - Daviess	32899	170088	Indiana - Warrick	39240	202375
Indiana - Dearborn	35708	184161	Indiana - Washington	52108	271099
Indiana - Decatur	0	0	Indiana - Wayne	0	0
Indiana - DeKalb	77857	401466	Indiana - Wells	0	0
Indiana - Delaware	23523	120844	Indiana - White	0	0
Indiana - Dubois	472246	2438869	Indiana - Whitley	104493	537880
Indiana - Elkhart	1354279	6997806	Iowa	1734445	8276618
Indiana - Fayette	0	0	Kansas	537434	3245495
Indiana - Floyd	178276	919725	Kentucky - west	1913219	3769119
Indiana - Fountain	0	0	Kentucky - east	4463808	7651648
Indiana - Franklin	0	0	Louisiana	34302476	13450106
Indiana - Fulton	42414	219595	Maine	24153420	12767225
Indiana - Gibson	0	0	Maryland	5047879	4756039
Indiana - Grant	0	0	Massachusetts	2002051	4360306
Indiana - Greene	0	0	Michigan - west	3990778	4493021
Indiana - Hamilton	26694	139796	Michigan - east	9310704	11553482
Indiana - Hancock	14819	75531	Minnesota	7502973	17699412
Indiana - Harrison	62683	323866	Mississippi	36868612	25498256
Indiana - Hendricks	0	0	Missouri	4900195	11941977
Indiana - Henry	13520	70941	Montana	14817178	7714387
Indiana - Howard	0	0	Nebraska	645142	2427486
Indiana - Huntington	0	0	Nevada	243178	1194438
Indiana - Jackson	89510	461000	New Hampshire	3696522	4384436
Indiana - Jasper	46717	241421	New Jersey	15345728	4678823
Indiana - Jay	11870	61089	New Mexico	2209696	2946282
Indiana - Jefferson	0	0	New York	5044547	15735225
Indiana - Jennings	22312	114252	North Carolina	43354456	41115244
Indiana - Johnson	236271	1219848	North Dakota	338672	938660
Indiana - Knox	11524	59307	Ohio - north	4079610	11208422
Indiana - Kosciusko	90633	469364	Ohio - central	4079610	6375168
Indiana - Lagrange	241114	1245553	Ohio - south	4079610	5431681
Indiana - Lake	21260	109761	Oklahoma	1893232	3870465
Indiana - LaPorte	20419	105839	Oregon	82089648	61816440
Indiana - Lawrence	14284	73510	Pennsylvania	11967891	31902378
Indiana - Madison	12196	62766	Rhode Island	0	1360936
Indiana - Marion	156216	807933	South Carolina	28289660	15677312
Indiana - Marshall	107836	557424	South Dakota	1228102	2111381
Indiana - Martin	36691	189231	Tennessee	7783904	19714274
Indiana - Miami	30899	158918	Texas	19548592	29289090
Indiana - Monroe	12166	62810	Utah	1065984	3182757
Indiana - Montgomery	0	0	Vermont	2447322	3498862
Indiana - Morgan	55000	285433	Virginia	26716224	24923958
Indiana - Newton	0	0	Washington	80462912	38552632
Indiana - Noble	20496	105819	West Virginia	6230455	7345196
Indiana - Ohio	0	0	Wisconsin	15052582	27819568
Indiana - Orange	61072	315309	Wyoming	2178605	1587759
Indiana - Owen	16077	82282			

Table E-8 Productions and Attractions - Furniture and Fixtures, STCC 25 (Annual Tons)

Alabama	549648	396275	Indiana - Parke	0	2537
Arizona	346445	328934	Indiana - Perry	15660	4324
Arkansas	316464	248643	Indiana - Pike	0	0
California	1829939	2812778	Indiana - Porter	0	10489
Colorado	222080	295263	Indiana - Posey	0	2665
Connecticut	53299	292674	Indiana - Pulaski	0	0
Delaware	48858	59571	Indiana - Putnam	0	2705
District of Columbia	0	51800	Indiana - Randolph	0	2256
Florida	394192	1170695	Indiana - Ripley	64041	10610
Georgia	780611	606067	Indiana - Rush	0	2366
Idaho	14435	88060	Indiana - St Joseph	1844	18333
Illinois - north	540765	815861	Indiana - Scott	0	2634
Illinois - south	135469	243463	Indiana - Shelby	4375	5437
Indiana - Adams	15094	5358	Indiana - Spencer	13114	2715
Indiana - Allen	16957	28970	Indiana - Starke	0	2584
Indiana - Bartholomew	26233	10029	Indiana - Steuben	2543	3159
Indiana - Benton	0	0	Indiana - Sullivan	0	2379
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	2718	Indiana - Tippecanoe	27704	15887
Indiana - Brown	0	0	Indiana - Tipton	0	2202
Indiana - Carroll	11753	2434	Indiana - Union	0	0
Indiana - Cass	0	2603	Indiana - Vanderburgh	16219	15673
Indiana - Clark	17483	9655	Indiana - Vermillion	0	2585
Indiana - Clay	0	2564	Indiana - Vigo	0	9070
Indiana - Clinton	0	2480	Indiana - Wabash	1911	2374
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	2724	Indiana - Warrick	0	2555
Indiana - Dearborn	0	2325	Indiana - Washington	41586	8158
Indiana - Decatur	0	2734	Indiana - Wayne	5579	6931
Indiana - DeKalb	0	2951	Indiana - Wells	6485	2685
Indiana - Delaware	5694	9433	Indiana - White	2153	2675
Indiana - Dubois	191732	30471	Indiana - Whitley	0	3171
Indiana - Elkhart	125435	32812	Iowa	225411	259003
Indiana - Fayette	0	2285	Kansas	49968	220152
Indiana - Floyd	11065	8249	Kentucky - west	38864	108781
Indiana - Fountain	0	2437	Kentucky - east	91053	222743
Indiana - Franklin	0	2456	Louisiana	27760	365194
Indiana - Fulton	0	2429	Maine	18877	108781
Indiana - Gibson	0	2423	Maryland	113261	422175
Indiana - Grant	5673	7047	Massachusetts	325347	538726
Indiana - Greene	6679	2765	Michigan - west	329789	266773
Indiana - Hamilton	0	13338	Michigan - east	768397	686358
Indiana - Hancock	0	5791	Minnesota	297587	401455
Indiana - Harrison	18197	5652	Mississippi	705104	349654
Indiana - Hendricks	0	5987	Missouri	701773	481746
Indiana - Henry	10814	4479	Montana	14435	69931
Indiana - Howard	1909	7117	Nebraska	129917	145042
Indiana - Huntington	0	2542	Nevada	113261	106191
Indiana - Jackson	0	2674	New Hampshire	26650	98420
Indiana - Jasper	0	2617	New Jersey	5846256	696718
Indiana - Jay	0	2261	New Mexico	14435	132091
Indiana - Jefferson	0	2781	New York	518557	1634311
Indiana - Jennings	0	2787	North Carolina	1504592	950542
Indiana - Johnson	0	9092	North Dakota	29981	59571
Indiana - Knox	1766	2195	Ohio - north	317574	492106
Indiana - Kosciusko	4555	5661	Ohio - central	317574	279723
Indiana - Lagrange	6711	2779	Ohio - south	317574	238283
Indiana - Lake	1693	33661	Oklahoma	64403	279723
Indiana - LaPorte	9938	9879	Oregon	115482	259003
Indiana - Lawrence	0	2720	Pennsylvania	840573	1105944
Indiana - Madison	11218	11615	Rhode Island	0	93240
Indiana - Marion	82222	73653	South Carolina	178774	318574
Indiana - Marshall	2140	5318	South Dakota	7773	59571
Indiana - Martin	0	0	Tennessee	749520	538726
Indiana - Miami	5801	4805	Texas	999360	1522940
Indiana - Monroe	0	11236	Utah	98826	160582
Indiana - Montgomery	0	2691	Vermont	16656	56980
Indiana - Morgan	0	5781	Virginia	752851	631968
Indiana - Newton	0	0	Washington	253171	435126
Indiana - Noble	0	2839	West Virginia	35533	155402
Indiana - Ohio	0	0	Wisconsin	471920	481746
Indiana - Orange	27664	5288	Wyoming	0	38850
Indiana - Owen	0	2848			

Table E-9 Productions and Attractions - Pulp and Paper Products, STCC 26 (Annual Tons)

Alabama	13158240	5590367
Arizona	1080419	2283970
Arkansas	6629088	3846469
California	15830973	22493394
Colorado	1477942	2230375
Connecticut	1892122	2966275
Delaware	247619	645200
District of Columbia	0	333937
Florida	7331971	9348199
Georgia	16091917	8968912
Idaho	932736	845151
Illinois - north	7947133	9243071
Illinois - south	1986506	2760140
Indiana - Adams	28677	17058
Indiana - Allen	125686	297648
Indiana - Bartholomew	63742	119732
Indiana - Benton	23175	33478
Indiana - Blackford	36883	56675
Indiana - Boone	0	21637
Indiana - Brown	3519	8371
Indiana - Carroll	0	9685
Indiana - Cass	6968	20721
Indiana - Clark	50596	44183
Indiana - Clay	0	12248
Indiana - Clinton	7743	15791
Indiana - Crawford	7224	6445
Indiana - Daviess	9722	15180
Indiana - Dearborn	10372	18507
Indiana - Decatur	93904	152336
Indiana - DeKalb	56604	70470
Indiana - Delaware	47332	118249
Indiana - Dubois	142080	33069
Indiana - Elkhart	415849	132747
Indiana - Fayette	0	12732
Indiana - Floyd	69906	63467
Indiana - Fountain	33705	58206
Indiana - Franklin	0	9773
Indiana - Fulton	11921	9669
Indiana - Gibson	0	15431
Indiana - Grant	81727	155190
Indiana - Greene	0	17612
Indiana - Hamilton	16359	87577
Indiana - Hancock	3874	27652
Indiana - Harrison	17647	17994
Indiana - Hendricks	0	47651
Indiana - Henry	21975	48125
Indiana - Howard	0	39653
Indiana - Huntington	0	18214
Indiana - Jackson	75154	93664
Indiana - Jasper	12841	12499
Indiana - Jay	10084	19795
Indiana - Jefferson	0	17710
Indiana - Jennings	28590	46582
Indiana - Johnson	91920	91664
Indiana - Knox	9790	26205
Indiana - Kosciusko	41657	60819
Indiana - Lagrange	68180	17697
Indiana - Lake	100398	346596
Indiana - LaPorte	36348	98276
Indiana - Lawrence	3641	23820
Indiana - Madison	21758	90597
Indiana - Marion	371936	871717
Indiana - Marshall	91321	112168
Indiana - Martin	10657	5705
Indiana - Miami	50361	78395
Indiana - Monroe	20046	87192
Indiana - Montgomery	21604	51403
Indiana - Morgan	15469	32204
Indiana - Newton	0	8122
Indiana - Noble	6332	22598
Indiana - Ohio	0	1908
Indiana - Orange	17688	10521
Indiana - Owen	5082	9069
Indiana - Parke	3396	8078
Indiana - Perry	4821	8603
Indiana - Pike	0	5623
Indiana - Porter	0	68870
Indiana - Posey	0	14847
Indiana - Pulaski	0	6028
Indiana - Putnam	13273	27991
Indiana - Randolph	14087	12568
Indiana - Ripley	4732	12666
Indiana - Rush	18998	37669
Indiana - St Joseph	65413	191506
Indiana - Scott	3526	10485
Indiana - Shelby	54561	90872
Indiana - Spencer	12113	10807
Indiana - Starke	0	12344
Indiana - Steuben	0	17604
Indiana - Sullivan	4246	9470
Indiana - Switzerland	0	3803
Indiana - Tippecanoe	7086	82189
Indiana - Tipton	0	7010
Indiana - Union	0	3760
Indiana - Vanderburgh	30958	103360
Indiana - Vermillion	16143	32921
Indiana - Vigo	187084	317607
Indiana - Wabash	48718	77486
Indiana - Warren	3235	3848
Indiana - Warrick	11398	24406
Indiana - Washington	14555	12986
Indiana - Wayne	18549	62525
Indiana - Wells	0	14962
Indiana - White	0	12776
Indiana - Whitley	38199	30295
Iowa	1574547	2537515
Kansas	1103738	2236559
Kentucky - west	901645	1129617
Kentucky - east	2105319	2294276
Louisiana	11175066	4277291
Maine	5878458	3409464
Maryland	2862611	4104137
Massachusetts	3808672	6699371
Michigan - west	2461757	2393221
Michigan - east	5742989	6151053
Minnesota	6074999	4967841
Mississippi	7783904	2951845
Missouri	4120695	5011129
Montana	618493	558625
Nebraska	591843	1090451
Nevada	215418	711163
New Hampshire	997139	1370794
New Jersey	5846256	7810436
New Mexico	155456	838967
New York	6666842	15892969
North Carolina	9573869	7449700
North Dakota	74397	352490
Ohio - north	3172413	5359497
Ohio - central	3172413	3048729
Ohio - south	3172413	2597295
Oklahoma	2690499	2298399
Oregon	5987277	2943601
Pennsylvania	10472182	12821566
Rhode Island	88832	851335
South Carolina	7465219	4359744
South Dakota	127696	478232
Tennessee	6184928	6045925
Texas	9335133	13359577
Utah	668461	1294524
Vermont	662909	614280
Virginia	7574039	5940796
Washington	8655568	5565632
West Virginia	404186	1158475
Wisconsin	13003894	10514921
Wyoming	24429	243239

Table E-10 Productions and Attractions - Chemical and Allied Prod., STCC 28 (Annual Tons)

Alabama	8646685	9005980
Arizona	3436688	5902997
Arkansas	4799149	5194082
California	29848662	63079484
Colorado	1359130	5594084
Connecticut	1481274	7445578
Delaware	3874186	2637635
District of Columbia	0	829706
Florida	37275016	21768412
Georgia	14301952	13049562
Idaho	2990307	2019810
Illinois - north	22294612	23283272
Illinois - south	5573098	6954485
Indiana - Adams	20128	55303
Indiana - Allen	176430	507429
Indiana - Bartholomew	0	82431
Indiana - Benton	0	11350
Indiana - Blackford	0	17562
Indiana - Boone	0	54045
Indiana - Brown	0	20105
Indiana - Carroll	0	24192
Indiana - Cass	0	51757
Indiana - Clark	226669	252817
Indiana - Clay	0	33336
Indiana - Clinton	48135	70158
Indiana - Crawford	0	14447
Indiana - Daviess	0	39582
Indiana - Dearborn	0	48005
Indiana - Decatur	15407	43901
Indiana - DeKalb	27718	72210
Indiana - Delaware	0	147852
Indiana - Dubois	0	52948
Indiana - Elkhart	963777	825756
Indiana - Fayette	0	31451
Indiana - Floyd	24102	107222
Indiana - Fountain	0	22365
Indiana - Franklin	313710	174649
Indiana - Fulton	0	24151
Indiana - Gibson	0	40766
Indiana - Grant	0	91604
Indiana - Greene	0	44410
Indiana - Hamilton	31315	209049
Indiana - Hancock	0	68625
Indiana - Harrison	0	43215
Indiana - Hendricks	0	119018
Indiana - Henry	0	56504
Indiana - Howard	0	99767
Indiana - Huntington	89154	103042
Indiana - Jackson	93774	112472
Indiana - Jasper	0	34020
Indiana - Jay	0	25930
Indiana - Jefferson	15673	53167
Indiana - Jennings	0	34094
Indiana - Johnson	0	139035
Indiana - Knox	12369	53705
Indiana - Kosciusko	38982	121179
Indiana - Lagrange	0	42500
Indiana - Lake	3074169	2047584
Indiana - LaPorte	60300	175599
Indiana - Lawrence	0	60326
Indiana - Madison	0	158078
Indiana - Marion	3711237	3198851
Indiana - Marshall	0	58959
Indiana - Martin	0	12788
Indiana - Miami	0	45920
Indiana - Monroe	0	158929
Indiana - Montgomery	15164	57610
Indiana - Morgan	101333	148055
Indiana - Newton	0	17555
Indiana - Noble	46222	84668
Indiana - Ohio	0	7334
Indiana - Orange	0	26280
Indiana - Owen	0	26137
Indiana - Parke	0	21342
Indiana - Perry	0	21488
Indiana - Pike	0	16203
Indiana - Porter	47609	206495
Indiana - Posey	1166335	658165
Indiana - Pulaski	0	17372
Indiana - Putnam	0	43436
Indiana - Randolph	0	32773
Indiana - Ripley	0	34474
Indiana - Rush	0	21711
Indiana - St Joseph	107604	362681
Indiana - Scott	0	28204
Indiana - Shelby	0	58197
Indiana - Spencer	0	26994
Indiana - Starke	0	31621
Indiana - Steuben	0	45905
Indiana - Sullivan	0	23654
Indiana - Switzerland	0	9134
Indiana - Tippecanoe	435994	453481
Indiana - Tipton	0	18519
Indiana - Union	0	9031
Indiana - Vanderburgh	553726	539256
Indiana - Vermillion	0	21742
Indiana - Vigo	587694	478461
Indiana - Wabash	104067	92591
Indiana - Warren	0	11090
Indiana - Warrick	0	60569
Indiana - Washington	0	33267
Indiana - Wayne	17360	98929
Indiana - Wells	0	36961
Indiana - White	0	32729
Indiana - Whitley	0	46081
Iowa	8067056	4855466
Kansas	8021530	7421815
Kentucky - west	2513946	2813874
Kentucky - east	5867354	5712896
Louisiana	69709800	19150578
Maine	1034893	1972286
Maryland	6843395	9231723
Massachusetts	3523299	11647576
Michigan - west	3652106	5314874
Michigan - east	8521210	13665406
Minnesota	5784074	8726770
Mississippi	7933808	6069333
Missouri	7749482	11033712
Montana	790605	1851493
Nebraska	4532653	2621793
Nevada	1460176	1897037
New Hampshire	660688	1754463
New Jersey	15199155	24897138
New Mexico	696221	2922785
New York	13751194	32600142
North Carolina	16277354	15150562
North Dakota	759514	1255451
Ohio - north	9255184	12392134
Ohio - central	9255184	7047556
Ohio - south	9255184	6003986
Oklahoma	8908739	7574291
Oregon	3810893	4831705
Pennsylvania	17925188	28530818
Rhode Island	715098	1764363
South Carolina	13840026	10928761
South Dakota	1434637	1053470
Tennessee	12215510	13960457
Texas	107159152	57206192
Utah	5308823	3623778
Vermont	134358	827726
Virginia	7487427	13257484
Washington	5147815	10649552
West Virginia	8983136	4962398
Wisconsin	5825159	8471324
Wyoming	0	1752482

Table E-11 Productions and Attractions - Petroleum and Coal Prod., STCC 29 (Annual Tons)

Alabama	33355306	31689342	Indiana - Parke	0	61617
Arizona	12118906	17001604	Indiana - Perry	0	65167
Arkansas	8523430	19460764	Indiana - Pike	0	47322
California	228463680	254282416	Indiana - Porter	0	533512
Colorado	7400816	19953030	Indiana - Posey	9145485	3461051
Connecticut	9113053	17979630	Indiana - Pulaski	0	50734
Delaware	0	9233779	Indiana - Putnam	0	129116
District of Columbia	0	2476509	Indiana - Randolph	0	96338
Florida	46863320	62864732	Indiana - Ripley	0	102157
Georgia	0	37485936	Indiana - Rush	0	67369
Idaho	1908778	4629901	Indiana - St Joseph	0	892218
Illinois - north	78775104	85081752	Indiana - Scott	0	86042
Illinois - south	19694054	25413496	Indiana - Shelby	0	172991
Indiana - Adams	0	130102	Indiana - Spencer	0	84137
Indiana - Allen	1444737	1777351	Indiana - Starke	0	93067
Indiana - Bartholomew	0	251922	Indiana - Steuben	0	137585
Indiana - Benton	0	37292	Indiana - Sullivan	0	71735
Indiana - Blackford	0	50007	Indiana - Switzerland	0	30011
Indiana - Boone	0	163901	Indiana - Tippecanoe	0	545393
Indiana - Brown	0	57248	Indiana - Tipton	0	55313
Indiana - Carroll	0	71328	Indiana - Union	0	25715
Indiana - Cass	0	156962	Indiana - Vanderburgh	0	581178
Indiana - Clark	0	333453	Indiana - Vermillion	0	69268
Indiana - Clay	0	98785	Indiana - Vigo	1243802	835321
Indiana - Clinton	0	120439	Indiana - Wabash	1302608	608394
Indiana - Crawford	0	42945	Indiana - Warren	0	30364
Indiana - Daviess	0	118636	Indiana - Warrick	0	179735
Indiana - Dearborn	0	142140	Indiana - Washington	0	102464
Indiana - Decatur	0	100735	Indiana - Wayne	0	261177
Indiana - DeKalb	0	163100	Indiana - Wells	0	110191
Indiana - Delaware	0	444286	Indiana - White	0	98567
Indiana - Dubois	0	160037	Indiana - Whitley	0	138112
Indiana - Elkhart	0	673078	Iowa	10695373	12848789
Indiana - Fayette	0	93762	Kansas	33008860	38123496
Indiana - Floyd	0	278588	Kentucky - west	12691872	9678336
Indiana - Fountain	0	67357	Kentucky - east	29614368	19647262
Indiana - Franklin	3934026	1517762	Louisiana	150055008	104716008
Indiana - Fulton	0	71208	Maine	4799149	6529570
Indiana - Gibson	0	121756	Maryland	22178020	27731698
Indiana - Grant	0	275384	Massachusetts	16198515	39745588
Indiana - Greene	0	132010	Michigan - west	19402020	14642197
Indiana - Hamilton	0	572338	Michigan - east	45272120	37652912
Indiana - Hancock	0	208488	Minnesota	15765459	33261556
Indiana - Harrison	0	132514	Mississippi	31577556	26345982
Indiana - Hendricks	0	355926	Missouri	13575750	31220930
Indiana - Henry	0	170637	Montana	11746922	9958083
Indiana - Howard	0	301947	Nebraska	3860861	6958947
Indiana - Huntington	0	142652	Nevada	3799789	6423310
Indiana - Jackson	0	159001	New Hampshire	0	5514679
Indiana - Jasper	0	103004	New Jersey	71154432	65707728
Indiana - Jay	0	75726	New Mexico	17226746	12245926
Indiana - Jefferson	0	130422	New York	43863020	88588336
Indiana - Jennings	0	105011	North Carolina	35024236	31784760
Indiana - Johnson	0	421255	North Dakota	9274061	5865987
Indiana - Knox	0	137845	Ohio - north	29765382	42621112
Indiana - Kosciusko	0	291480	Ohio - central	29765382	24242466
Indiana - Lagrange	0	127995	Ohio - south	29765382	20655648
Indiana - Lake	33695084	13927995	Oklahoma	43826376	40109908
Indiana - LaPorte	0	415623	Oregon	25137236	16676318
Indiana - Lawrence	0	184525	Pennsylvania	83462104	112221432
Indiana - Madison	0	478498	Rhode Island	0	4612552
Indiana - Marion	9741542	6554710	South Carolina	16564947	17483028
Indiana - Marshall	0	175891	South Dakota	1995389	3361286
Indiana - Martin	0	40014	Tennessee	22136934	28557924
Indiana - Miami	0	138797	Texas	428445632	287110240
Indiana - Monroe	0	482158	Utah	12910621	15379512
Indiana - Montgomery	0	146458	Vermont	480803	2383261
Indiana - Morgan	0	254099	Virginia	33747276	31754400
Indiana - Newton	0	53404	Washington	45035604	40341944
Indiana - Noble	0	168803	West Virginia	43544336	10563114
Indiana - Ohio	0	20080	Wisconsin	25030636	22978188
Indiana - Orange	0	77483	Wyoming	15301312	11463071
Indiana - Owen	0	78716			

Table E-12 Productions and Attractions - Stone, Clay and Glass, STCC 32 (Annual Tons)

Alabama	18847930	14428286	Indiana - Parke	65837	54025
Arizona	14968192	13086547	Indiana - Perry	70113	57279
Arkansas	6499171	8394751	Indiana - Pike	49987	40108
California	86482392	106262032	Indiana - Porter	575159	466450
Colorado	12846218	11761963	Indiana - Posey	117859	95827
Connecticut	7119885	11736231	Indiana - Pulaski	53591	44194
Delaware	2703824	2378369	Indiana - Putnam	138782	112634
District of Columbia	0	2167612	Indiana - Randolph	103760	84320
Florida	42046408	46196248	Indiana - Ripley	111039	90349
Georgia	35549456	23130594	Indiana - Rush	72560	59339
Idaho	3106899	3595124	Indiana - St Joseph	962067	780603
Illinois - north	31232220	31428544	Indiana - Scott	93220	76042
Illinois - south	7808333	9387269	Indiana - Shelby	185941	150479
Indiana - Adams	142170	115339	Indiana - Spencer	89678	73238
Indiana - Allen	1346370	1092743	Indiana - Starke	100596	80714
Indiana - Bartholomew	270548	219451	Indiana - Steuben	147199	119602
Indiana - Benton	39392	32778	Indiana - Sullivan	77180	61926
Indiana - Blackford	55533	44557	Indiana - Switzerland	30998	26001
Indiana - Boone	176340	142776	Indiana - Tippecanoe	587042	477286
Indiana - Brown	63574	51008	Indiana - Tipton	59728	48965
Indiana - Carroll	77500	63334	Indiana - Union	27861	22354
Indiana - Cass	170410	137962	Indiana - Vanderburgh	628437	509533
Indiana - Clark	360063	292328	Indiana - Vermillion	73170	59932
Indiana - Clay	107375	87367	Indiana - Vigo	409100	331466
Indiana - Clinton	130149	105600	Indiana - Wabash	141414	114589
Indiana - Crawford	46160	37036	Indiana - Warren	34213	27451
Indiana - Daviess	126926	103130	Indiana - Warrick	194379	158382
Indiana - Dearborn	153574	124323	Indiana - Washington	109037	88774
Indiana - Decatur	109634	89259	Indiana - Wayne	282020	229562
Indiana - DeKalb	177509	143823	Indiana - Wells	118773	96570
Indiana - Delaware	479740	389390	Indiana - White	105697	86073
Indiana - Dubois	173135	140228	Indiana - Whitley	149633	121560
Indiana - Elkhart	725501	588585	Iowa	16922496	9915388
Indiana - Fayette	101064	82172	Kansas	9818157	8848122
Indiana - Floyd	301577	244576	Kentucky - west	7508525	4342577
Indiana - Fountain	73309	59973	Kentucky - east	17519892	8816264
Indiana - Franklin	81105	66236	Louisiana	14495162	15067909
Indiana - Fulton	77369	63227	Maine	2230794	4384238
Indiana - Gibson	131474	106636	Maryland	10765328	17071328
Indiana - Grant	296436	240073	Massachusetts	5292167	21481296
Indiana - Greene	143525	116466	Michigan - west	9559434	9257384
Indiana - Hamilton	617357	500079	Michigan - east	22304604	23803302
Indiana - Hancock	223647	182187	Minnesota	14843827	15621759
Indiana - Harrison	143312	116324	Mississippi	6554691	9187540
Indiana - Hendricks	384801	313000	Missouri	40611768	18270926
Indiana - Henry	183551	148334	Montana	3233485	2852573
Indiana - Howard	325950	264899	Nebraska	10283414	5634077
Indiana - Huntington	152937	123914	Nevada	11250573	4292338
Indiana - Jackson	171901	139192	New Hampshire	3984115	3960273
Indiana - Jasper	111122	90397	New Jersey	10455526	27600606
Indiana - Jay	82658	67391	New Mexico	5166691	5409841
Indiana - Jefferson	141049	114488	New York	31926220	64235588
Indiana - Jennings	111748	90981	North Carolina	23630422	23669740
Indiana - Johnson	453918	368510	North Dakota	1512365	2281568
Indiana - Knox	148845	120466	Ohio - north	13127149	18861536
Indiana - Kosciusko	313739	254412	Ohio - central	13127149	10727783
Indiana - Lagrange	139303	113086	Ohio - south	13127149	9140977
Indiana - Lake	1700675	1379495	Oklahoma	14093197	11232620
Indiana - LaPorte	449956	364534	Oregon	8607821	10148201
Indiana - Lawrence	197325	160902	Pennsylvania	42651576	42425900
Indiana - Madison	516408	418745	Rhode Island	1972070	3581645
Indiana - Marion	3217853	2611122	South Carolina	14343037	12450600
Indiana - Marshall	191287	154740	South Dakota	4130688	2484973
Indiana - Martin	42268	33915	Tennessee	23979088	17414420
Indiana - Miami	150156	122753	Texas	71507536	60653940
Indiana - Monroe	520083	422613	Utah	12208848	6152392
Indiana - Montgomery	157089	127315	Vermont	1749990	2010770
Indiana - Morgan	274377	222885	Virginia	33670660	22091512
Indiana - Newton	58669	47073	Washington	14591766	17377660
Indiana - Noble	182498	147773	West Virginia	5906218	6402360
Indiana - Ohio	21212	17019	Wisconsin	16084144	17467110
Indiana - Orange	82628	67548	Wyoming	3648775	1621114
Indiana - Owen	83991	67391			

Table E-13 Productions and Attractions - Primary Metal Products, STCC 33 (Annual Tons)

Alabama	11766909	7263018	Indiana - Parke	0	0
Arizona	3495539	2345349	Indiana - Perry	0	0
Arkansas	5356570	3426440	Indiana - Pike	0	7241
California	13039427	22189236	Indiana - Porter	3542490	1467431
Colorado	979373	2598201	Indiana - Posey	0	8195
Connecticut	2245229	6259575	Indiana - Pulaski	80191	120327
Delaware	909418	434029	Indiana - Putnam	0	95665
District of Columbia	0	13937	Indiana - Randolph	90768	69370
Florida	3629898	4652871	Indiana - Ripley	0	48934
Georgia	4517107	4780292	Indiana - Rush	75168	29107
Idaho	218749	272761	Indiana - St Joseph	771552	556664
Illinois - north	20232598	16475185	Indiana - Scott	0	0
Illinois - south	5057872	4921651	Indiana - Shelby	184209	121206
Indiana - Adams	85094	80317	Indiana - Spencer	86264	33404
Indiana - Allen	1243636	692393	Indiana - Starke	0	0
Indiana - Bartholomew	371650	294894	Indiana - Steuben	227509	274496
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	0	37082	Indiana - Switzerland	0	7348
Indiana - Boone	0	22990	Indiana - Tippecanoe	835431	378595
Indiana - Brown	0	0	Indiana - Tipton	0	38934
Indiana - Carroll	0	54260	Indiana - Union	0	0
Indiana - Cass	44106	146107	Indiana - Vanderburgh	75861	182449
Indiana - Clark	66442	183685	Indiana - Vermillion	0	37760
Indiana - Clay	0	7886	Indiana - Vigo	249663	132465
Indiana - Clinton	0	20971	Indiana - Wabash	251411	188013
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	1379891	563800
Indiana - Dearborn	0	0	Indiana - Washington	0	48081
Indiana - Decatur	0	159746	Indiana - Wayne	484381	255771
Indiana - DeKalb	518728	446958	Indiana - Wells	85309	107359
Indiana - Delaware	244696	317253	Indiana - White	0	67870
Indiana - Dubois	0	31941	Indiana - Whitley	214946	124362
Indiana - Elkhart	411080	714637	Iowa	2306301	3671328
Indiana - Fayette	0	57974	Kansas	772838	1550957
Indiana - Floyd	0	57073	Kentucky - west	2177495	1853582
Indiana - Fountain	423293	174279	Kentucky - east	5081191	3762913
Indiana - Franklin	0	0	Louisiana	2792656	2263720
Indiana - Fulton	77181	113942	Maine	146573	483802
Indiana - Gibson	0	0	Maryland	5101178	3179562
Indiana - Grant	298478	530940	Massachusetts	1198122	6723468
Indiana - Greene	87857	42526	Michigan - west	6896695	5753871
Indiana - Hamilton	218883	192241	Michigan - east	16090806	14794816
Indiana - Hancock	30655	53417	Minnesota	2642752	5582648
Indiana - Harrison	0	23898	Mississippi	1284733	2341367
Indiana - Hendricks	0	18410	Missouri	5358791	6749351
Indiana - Henry	99587	46482	Montana	332010	416110
Indiana - Howard	748556	319164	Nebraska	1180355	1244349
Indiana - Huntington	70000	101647	Nevada	189878	457920
Indiana - Jackson	124599	123362	New Hampshire	184326	1419553
Indiana - Jasper	27712	48290	New Jersey	4534874	7125642
Indiana - Jay	0	67786	New Mexico	674013	366335
Indiana - Jefferson	0	32073	New York	4785824	11465933
Indiana - Jennings	0	27852	North Carolina	2810423	5544820
Indiana - Johnson	32089	69895	North Dakota	56630	99547
Indiana - Knox	148741	97869	Ohio - north	15108102	15053641
Indiana - Kosciusko	389555	313297	Ohio - central	15108102	8563114
Indiana - Lagrange	0	29912	Ohio - south	15108102	7294873
Indiana - Lake	9626794	4007436	Oklahoma	2402906	3261191
Indiana - LaPorte	878544	626479	Oregon	3396714	3621554
Indiana - Lawrence	702880	340915	Pennsylvania	28044262	24028882
Indiana - Madison	73788	123220	Rhode Island	933846	2064625
Indiana - Marion	1464000	1749653	South Carolina	2833741	3320919
Indiana - Marshall	225231	132867	South Dakota	83280	240906
Indiana - Martin	0	0	Tennessee	6862272	6916591
Indiana - Miami	76309	60944	Texas	17705328	15039704
Indiana - Monroe	0	25912	Utah	4677005	2186072
Indiana - Montgomery	364697	215141	Vermont	34422	597288
Indiana - Morgan	0	24440	Virginia	2055350	3402549
Indiana - Newton	81036	31379	Washington	3773139	4163095
Indiana - Noble	462983	320870	West Virginia	4213968	3139742
Indiana - Ohio	0	0	Wisconsin	4307242	10637693
Indiana - Orange	83982	32520	Wyoming	23318	81629
Indiana - Owen	90489	35040			

Table E-14 Productions and Attractions - Fabricated Metal Products, STCC 34 (Annual Tons)

Alabama	1541235	1625112
Arizona	479693	647371
Arkansas	1013795	1145790
California	6531373	9250346
Colorado	590733	1132423
Connecticut	646253	2411888
Delaware	36643	141314
District of Columbia	0	7638
Florida	2360711	2169362
Georgia	2566135	1401682
Idaho	91053	135584
Illinois - north	5158919	5492154
Illinois - south	1289174	1640390
Indiana - Adams	27125	25679
Indiana - Allen	158214	112627
Indiana - Bartholomew	91390	83191
Indiana - Benton	0	0
Indiana - Blackford	17055	20324
Indiana - Boone	11010	12027
Indiana - Brown	0	0
Indiana - Carroll	26287	30509
Indiana - Cass	65025	72949
Indiana - Clark	79830	88981
Indiana - Clay	3463	3782
Indiana - Clinton	10044	10971
Indiana - Crawford	0	0
Indiana - Daviess	0	0
Indiana - Dearborn	0	0
Indiana - Decatur	77517	90724
Indiana - DeKalb	143436	137098
Indiana - Delaware	119387	125196
Indiana - Dubois	14958	18382
Indiana - Elkhart	289757	312485
Indiana - Fayette	27767	32015
Indiana - Floyd	27841	32439
Indiana - Fountain	24682	3594
Indiana - Franklin	0	0
Indiana - Fulton	44284	46582
Indiana - Gibson	0	0
Indiana - Grant	217243	233843
Indiana - Greene	7469	4078
Indiana - Hamilton	63020	61463
Indiana - Hancock	21498	23482
Indiana - Harrison	11445	12502
Indiana - Hendricks	8083	11035
Indiana - Henry	7558	3302
Indiana - Howard	46441	12245
Indiana - Huntington	39478	41248
Indiana - Jackson	43328	43385
Indiana - Jasper	19434	21228
Indiana - Jay	33575	38344
Indiana - Jefferson	15020	18458
Indiana - Jennings	13169	16439
Indiana - Johnson	28640	31286
Indiana - Knox	26670	21040
Indiana - Kosciusko	97429	89732
Indiana - Lagrange	15008	16394
Indiana - Lake	559485	103927
Indiana - LaPorte	178363	156596
Indiana - Lawrence	64277	36110
Indiana - Madison	50177	53099
Indiana - Marion	643069	662171
Indiana - Marshall	32308	23527
Indiana - Martin	0	0
Indiana - Miami	17838	17713
Indiana - Monroe	11376	14498
Indiana - Montgomery	52676	39683
Indiana - Morgan	11705	12785
Indiana - Newton	3444	0
Indiana - Noble	90082	77465
Indiana - Ohio	0	0
Indiana - Orange	3570	0
Indiana - Owen	3846	0
Indiana - Parke	0	0
Indiana - Perry	0	0
Indiana - Pike	3179	3472
Indiana - Porter	203541	34801
Indiana - Posey	3598	3929
Indiana - Pulaski	47716	50261
Indiana - Putnam	47479	53858
Indiana - Randolph	21319	18297
Indiana - Ripley	23274	27379
Indiana - Rush	3195	0
Indiana - St Joseph	160867	141931
Indiana - Scott	0	0
Indiana - Shelby	33029	26057
Indiana - Spencer	3667	0
Indiana - Starke	0	0
Indiana - Steuben	100250	102518
Indiana - Sullivan	0	0
Indiana - Switzerland	3226	3523
Indiana - Tippecanoe	64342	27333
Indiana - Tipton	19323	21107
Indiana - Union	0	0
Indiana - Vanderburgh	78590	85847
Indiana - Vermillion	19195	20967
Indiana - Vigo	29078	18389
Indiana - Wabash	56098	50773
Indiana - Warren	0	0
Indiana - Warrick	75897	9420
Indiana - Washington	23863	26066
Indiana - Wayne	54586	35776
Indiana - Wells	39883	41586
Indiana - White	34312	39453
Indiana - Whitley	29976	21050
Iowa	1595645	1216447
Kansas	587402	672196
Kentucky - west	456374	483141
Kentucky - east	1065984	979650
Louisiana	1215888	956734
Maine	207645	196693
Maryland	1544566	677926
Massachusetts	917190	2381334
Michigan - west	3859751	2008951
Michigan - east	9007565	5167513
Minnesota	1401325	2442443
Mississippi	973821	838336
Missouri	1950973	2566570
Montana	84390	51560
Nebraska	934957	481232
Nevada	203203	131766
New Hampshire	324237	412484
New Jersey	2843735	2604763
New Mexico	89942	66837
New York	2389581	4115296
North Carolina	2191930	2008951
North Dakota	86611	55379
Ohio - north	3173523	4340635
Ohio - central	3173523	2469178
Ohio - south	3173523	2104435
Oklahoma	869443	1250820
Oregon	652915	781047
Pennsylvania	5048989	5908458
Rhode Island	142131	561437
South Carolina	1555670	110759
South Dakota	136579	97392
Tennessee	2610551	2375604
Texas	5530903	5410039
Utah	950502	567166
Vermont	88832	257803
Virginia	1131498	1111416
Washington	1108179	945277
West Virginia	1004912	397207
Wisconsin	2472861	3639794
Wyoming	49968	28644

Table E-15 Productions and Attractions - Machinery, non-electrical, STCC 35 (Annual Tons)

Alabama	505232	519262
Arizona	314243	301375
Arkansas	398634	335993
California	2282983	4129661
Colorado	458595	539624
Connecticut	364211	902090
Delaware	23318	36653
District of Columbia	0	2035
Florida	855008	578315
Georgia	1085971	619041
Idaho	65514	128288
Illinois - north	2972541	2189046
Illinois - south	742858	653659
Indiana - Adams	8890	10531
Indiana - Allen	106334	115957
Indiana - Bartholomew	116486	128136
Indiana - Benton	1368	1945
Indiana - Blackford	0	0
Indiana - Boone	12029	12825
Indiana - Brown	0	0
Indiana - Carroll	4038	3827
Indiana - Cass	4320	4093
Indiana - Clark	10679	11386
Indiana - Clay	1419	2016
Indiana - Clinton	4115	3899
Indiana - Crawford	0	0
Indiana - Daviess	6028	6426
Indiana - Dearborn	3858	3656
Indiana - Decatur	16635	19347
Indiana - DeKalb	11426	11602
Indiana - Delaware	18261	20396
Indiana - Dubois	1532	2177
Indiana - Elkhart	39319	42995
Indiana - Fayette	61935	68278
Indiana - Floyd	6083	6485
Indiana - Fountain	0	0
Indiana - Franklin	0	0
Indiana - Fulton	8063	9552
Indiana - Gibson	2681	1905
Indiana - Grant	2599	3693
Indiana - Greene	0	0
Indiana - Hamilton	9221	10486
Indiana - Hancock	20817	22764
Indiana - Harrison	0	0
Indiana - Hendricks	3311	2353
Indiana - Henry	2477	3521
Indiana - Howard	3936	5595
Indiana - Huntington	4219	3998
Indiana - Jackson	4438	4205
Indiana - Jasper	0	0
Indiana - Jay	5002	5333
Indiana - Jefferson	19999	21869
Indiana - Jennings	6166	6573
Indiana - Johnson	11734	11914
Indiana - Knox	0	0
Indiana - Kosciusko	10957	13351
Indiana - Lagrange	7686	8741
Indiana - Lake	30252	33081
Indiana - LaPorte	20489	21358
Indiana - Lawrence	9029	8556
Indiana - Madison	7709	9132
Indiana - Marion	152427	166249
Indiana - Marshall	10295	10453
Indiana - Martin	0	0
Indiana - Miami	0	0
Indiana - Monroe	35733	39753
Indiana - Montgomery	14883	16925
Indiana - Morgan	6394	6817
Indiana - Newton	1411	2005
Indiana - Noble	17275	20092
Indiana - Ohio	0	0
Indiana - Orange	0	0
Indiana - Owen	0	0

Indiana - Parke	1403	1994
Indiana - Perry	2391	3399
Indiana - Pike	0	0
Indiana - Porter	18853	20616
Indiana - Posey	0	0
Indiana - Pulaski	0	0
Indiana - Putnam	0	0
Indiana - Randolph	11230	12416
Indiana - Ripley	0	0
Indiana - Rush	7853	9303
Indiana - St Joseph	46895	50448
Indiana - Scott	0	0
Indiana - Shelby	9021	10687
Indiana - Spencer	3004	4270
Indiana - Starke	2859	4064
Indiana - Steuben	5243	7453
Indiana - Sullivan	0	0
Indiana - Switzerland	0	0
Indiana - Tippecanoe	46863	52045
Indiana - Tipton	2436	1731
Indiana - Union	0	0
Indiana - Vanderburgh	19815	21125
Indiana - Vermillion	0	0
Indiana - Vigo	7524	8913
Indiana - Wabash	9193	9335
Indiana - Warren	1337	1900
Indiana - Warrick	1413	2008
Indiana - Washington	7520	8552
Indiana - Wayne	17892	19983
Indiana - Wells	5942	6334
Indiana - White	10358	10517
Indiana - Whitley	3509	4987
Iowa	1179245	800274
Kansas	522998	425591
Kentucky - west	355328	185305
Kentucky - east	828358	376719
Louisiana	333120	211777
Maine	85501	75343
Maryland	389750	266758
Massachusetts	327568	1179029
Michigan - west	599616	676058
Michigan - east	1400214	1736982
Minnesota	1194790	1246229
Mississippi	568525	283049
Missouri	893872	623114
Montana	27760	16290
Nebraska	576298	232140
Nevada	92163	48871
New Hampshire	78838	301375
New Jersey	436387	838964
New Mexico	115482	54980
New York	923853	1989486
North Carolina	1396883	1203466
North Dakota	218749	71271
Ohio - north	906086	1413207
Ohio - central	906086	804347
Ohio - south	906086	684204
Oklahoma	487466	537588
Oregon	308691	325811
Pennsylvania	1712237	1893778
Rhode Island	0	111997
South Carolina	536323	663840
South Dakota	212086	107924
Tennessee	1414650	822673
Texas	3068035	2158501
Utah	194320	171050
Vermont	48858	87562
Virginia	509674	468353
Washington	627376	411337
West Virginia	187658	97743
Wisconsin	1938758	1948760
Wyoming	48858	26472

Table E-16 Productions and Attractions - Electrical Machinery, STCC 36 (Annual Tons)

Alabama	631818	576826	Indiana - Parke	2942	2207
Arizona	363101	387555	Indiana - Perry	2506	1881
Arkansas	868333	367276	Indiana - Pike	0	2049
California	2828189	3796691	Indiana - Porter	100313	15968
Colorado	158787	437126	Indiana - Posey	0	2318
Connecticut	177664	646676	Indiana - Pulaski	11707	8785
Delaware	54410	74356	Indiana - Putnam	12545	11768
District of Columbia	0	47317	Indiana - Randolph	5231	5888
Florida	918301	1347430	Indiana - Ripley	6150	6922
Georgia	1234765	725539	Indiana - Rush	2743	2059
Idaho	22208	99142	Indiana - St Joseph	53132	39873
Illinois - north	1632288	1575007	Indiana - Scott	0	2292
Illinois - south	407517	470924	Indiana - Shelby	12606	7094
Indiana - Adams	12423	6991	Indiana - Spencer	3148	2363
Indiana - Allen	91594	41241	Indiana - Starke	0	2249
Indiana - Bartholomew	29067	17450	Indiana - Steuben	29307	19244
Indiana - Benton	0	0	Indiana - Sullivan	0	2070
Indiana - Blackford	2663	3996	Indiana - Switzerland	0	2079
Indiana - Boone	3152	4730	Indiana - Tippecanoe	30696	13821
Indiana - Brown	0	0	Indiana - Tipton	5106	3831
Indiana - Carroll	5643	6352	Indiana - Union	0	0
Indiana - Cass	30184	15855	Indiana - Vanderburgh	46722	25323
Indiana - Clark	16789	20998	Indiana - Vermillion	2997	4498
Indiana - Clay	0	2231	Indiana - Vigo	15771	9863
Indiana - Clinton	2875	4315	Indiana - Wabash	19270	10329
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	2370	Indiana - Warrick	38513	4446
Indiana - Dearborn	0	2023	Indiana - Washington	6305	7097
Indiana - Decatur	15849	16651	Indiana - Wayne	21429	10051
Indiana - DeKalb	41059	25677	Indiana - Wells	15568	9345
Indiana - Delaware	38275	28723	Indiana - White	9305	9310
Indiana - Dubois	9634	4819	Indiana - Whitley	11032	5519
Indiana - Elkhart	82413	64226	Iowa	630707	412340
Indiana - Fayette	10598	7952	Kansas	892762	299679
Indiana - Floyd	9563	9568	Kentucky - west	350886	171245
Indiana - Fountain	14131	2121	Kentucky - east	818365	349250
Indiana - Franklin	0	2137	Louisiana	239846	479937
Indiana - Fulton	14085	8455	Maine	85501	126180
Indiana - Gibson	11239	2108	Maryland	309802	477684
Indiana - Grant	62639	42920	Massachusetts	454154	851720
Indiana - Greene	6413	2406	Michigan - west	159898	527255
Indiana - Hamilton	19328	20306	Michigan - east	374205	1356444
Indiana - Hancock	3357	7556	Minnesota	578518	734552
Indiana - Harrison	3276	4917	Mississippi	625155	333478
Indiana - Hendricks	3470	7812	Missouri	1360240	81116
Indiana - Henry	2596	3896	Montana	14435	69850
Indiana - Howard	118267	8255	Nebraska	199872	200537
Indiana - Huntington	35375	8848	Nevada	78838	112661
Indiana - Jackson	18604	9307	New Hampshire	58851	153219
Indiana - Jasper	6069	4554	New Jersey	1451293	1018459
Indiana - Jay	7864	7867	New Mexico	27760	126180
Indiana - Jefferson	16123	4839	New York	806150	2052691
Indiana - Jennings	3231	4849	North Carolina	1087082	838201
Indiana - Johnson	14054	13184	North Dakota	19987	58584
Indiana - Knox	7634	5728	Ohio - north	1097075	1115348
Indiana - Kosciusko	26249	19697	Ohio - central	1097075	635410
Indiana - Lagrange	6444	4836	Ohio - south	1097075	540775
Indiana - Lake	268272	47586	Oklahoma	487466	446139
Indiana - LaPorte	51532	34376	Oregon	178774	344744
Indiana - Lawrence	25233	9467	Pennsylvania	1381338	1879192
Indiana - Madison	91565	18189	Rhode Island	61072	168992
Indiana - Marion	170764	165355	South Carolina	983814	450645
Indiana - Marshall	15413	6939	South Dakota	33312	69850
Indiana - Martin	0	0	Tennessee	1791075	763844
Indiana - Miami	8355	6270	Texas	1492378	2187885
Indiana - Monroe	42334	12219	Utah	71066	225322
Indiana - Montgomery	21838	9364	Vermont	13325	85622
Indiana - Morgan	10052	7543	Virginia	405296	655689
Indiana - Newton	5915	0	Washington	258723	527255
Indiana - Noble	32918	14822	West Virginia	172112	202790
Indiana - Ohio	0	0	Wisconsin	1131498	971141
Indiana - Orange	6130	2300	Wyoming	0	40557
Indiana - Owen	3303	2478			

Table E-17 Productions and Attractions - Transportation Equipment, STCC 37 (Annual Tons)

Alabama	1372454	1379619	Indiana - Parke	0	0
Arizona	290925	1867204	Indiana - Perry	15007	9377
Arkansas	621824	649364	Indiana - Pike	0	0
California	7844976	16335228	Indiana - Porter	0	0
Colorado	0	1062801	Indiana - Posey	0	0
Connecticut	177664	4471403	Indiana - Pulaski	0	0
Delaware	339782	456128	Indiana - Putnam	0	0
District of Columbia	0	4494	Indiana - Randolph	67119	39144
Florida	1936538	2451407	Indiana - Ripley	0	0
Georgia	2809312	2316591	Indiana - Rush	0	0
Idaho	112150	94371	Indiana - St Joseph	295430	174951
Illinois - north	3851978	1831253	Indiana - Scott	0	0
Illinois - south	962717	548252	Indiana - Shelby	40439	23584
Indiana - Adams	146121	85995	Indiana - Spencer	0	0
Indiana - Allen	524961	310738	Indiana - Starke	0	0
Indiana - Bartholomew	52215	30453	Indiana - Steuben	188025	112401
Indiana - Benton	0	0	Indiana - Sullivan	16520	10323
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	393875	232013
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	18074	11293	Indiana - Vanderburgh	15543	9712
Indiana - Clark	47871	29315	Indiana - Vermillion	0	0
Indiana - Clay	83935	48952	Indiana - Vigo	33728	19670
Indiana - Clinton	17216	10757	Indiana - Wabash	4709	4120
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	0	0
Indiana - Dearborn	0	0	Indiana - Washington	0	0
Indiana - Decatur	18981	11860	Indiana - Wayne	68741	40090
Indiana - DeKalb	43903	25605	Indiana - Wells	5327	4660
Indiana - Delaware	350803	206642	Indiana - White	79597	46422
Indiana - Dubois	63181	36048	Indiana - Whitley	47186	27519
Indiana - Elkhart	1282543	756703	Iowa	882768	548252
Indiana - Fayette	0	0	Kansas	441939	2849116
Indiana - Floyd	32723	19084	Kentucky - west	1152595	422424
Indiana - Fountain	0	0	Kentucky - east	2688279	858329
Indiana - Franklin	0	0	Louisiana	852787	1552632
Indiana - Fulton	0	0	Maine	56630	885292
Indiana - Gibson	0	0	Maryland	2529491	622401
Indiana - Grant	60573	34648	Massachusetts	354218	1002133
Indiana - Greene	0	0	Michigan - west	5200003	3028870
Indiana - Hamilton	33067	20248	Michigan - east	12133341	777440
Indiana - Hancock	28713	17582	Minnesota	921632	456128
Indiana - Harrison	19618	12258	Mississippi	753962	1372878
Indiana - Hendricks	5937	5194	Missouri	2785994	3502973
Indiana - Henry	131032	77716	Montana	39974	15728
Indiana - Howard	235278	139963	Nebraska	357549	348275
Indiana - Huntington	85738	50739	Nevada	51078	49432
Indiana - Jackson	79572	46407	New Hampshire	58851	157285
Indiana - Jasper	18169	11353	New Jersey	1720010	561734
Indiana - Jay	0	0	New Mexico	0	247163
Indiana - Jefferson	19308	12065	New York	2609440	2613187
Indiana - Jennings	19347	12089	North Carolina	1383558	1217839
Indiana - Johnson	180336	105175	North Dakota	68845	74148
Indiana - Knox	0	0	Ohio - north	3855309	3756878
Indiana - Kosciusko	106655	63839	Ohio - central	3855309	2136836
Indiana - Lagrange	74420	43402	Ohio - south	3855309	1820018
Indiana - Lake	93882	54754	Oklahoma	1138160	977416
Indiana - LaPorte	171433	100697	Oregon	0	680821
Indiana - Lawrence	140303	82614	Pennsylvania	2767117	2741262
Indiana - Madison	34557	20154	Rhode Island	0	119087
Indiana - Marion	1649257	974936	South Carolina	700662	714526
Indiana - Marshall	39555	23069	South Dakota	61072	69654
Indiana - Martin	0	0	Tennessee	3351187	2188515
Indiana - Miami	0	0	Texas	2147514	4882592
Indiana - Monroe	19499	12184	Utah	202093	878552
Indiana - Montgomery	18680	11672	Vermont	34422	182001
Indiana - Morgan	20063	12536	Virginia	1198122	2734521
Indiana - Newton	0	0	Washington	2126416	6747550
Indiana - Noble	123900	71439	West Virginia	280931	85383
Indiana - Ohio	0	0	Wisconsin	2663850	1296482
Indiana - Orange	0	0	Wyoming	0	11234
Indiana - Owen	0	0			

Table E-18 Productions and Attractions - Waste and Scrap, STCC 40 (Annual Tons)

Alabama	2873494	3936837
Arizona	579420	247863
Arkansas	1145964	3050539
California	13211849	12618480
Colorado	1975393	1753282
Connecticut	483923	1050467
Delaware	1132015	404521
District of Columbia	0	0
Florida	11106623	3923961
Georgia	3933618	4991596
Idaho	148074	468901
Illinois - north	4133196	4231376
Illinois - south	4133196	4231376
Indiana - Adams	30411	344876
Indiana - Allen	265750	367735
Indiana - Bartholomew	51863	151310
Indiana - Benton	8707	4466
Indiana - Blackford	11412	14409
Indiana - Boone	33404	14089
Indiana - Brown	12072	834
Indiana - Carroll	16080	14914
Indiana - Cass	36771	60289
Indiana - Clark	60776	50071
Indiana - Clay	23715	18351
Indiana - Clinton	27796	39647
Indiana - Crawford	9969	1934
Indiana - Daviess	27773	21313
Indiana - Dearborn	27317	16408
Indiana - Decatur	23786	44918
Indiana - DeKalb	40067	106461
Indiana - Delaware	93349	88051
Indiana - Dubois	36548	124354
Indiana - Elkhart	153505	595632
Indiana - Fayette	20081	44421
Indiana - Floyd	59619	59243
Indiana - Fountain	15216	16419
Indiana - Franklin	17195	5260
Indiana - Fulton	16175	25394
Indiana - Gibson	27273	23979
Indiana - Grant	59963	86177
Indiana - Greene	30553	19372
Indiana - Hamilton	108076	70411
Indiana - Hancock	45650	30896
Indiana - Harrison	29616	20870
Indiana - Hendricks	75914	15014
Indiana - Henry	35129	24958
Indiana - Howard	65145	160672
Indiana - Huntington	32845	72892
Indiana - Jackson	34821	52476
Indiana - Jasper	22998	11955
Indiana - Jay	16369	28021
Indiana - Jefferson	29630	40781
Indiana - Jennings	23726	20759
Indiana - Johnson	88526	61445
Indiana - Knox	27715	15442
Indiana - Kosciusko	66369	155901
Indiana - Lagrange	29987	42911
Indiana - Lake	318029	296242
Indiana - LaPorte	93132	118221
Indiana - Lawrence	41541	53064
Indiana - Madison	98103	114017
Indiana - Marion	618360	719010
Indiana - Marshall	39680	74473
Indiana - Martin	8793	5561
Indiana - Miami	32563	21820
Indiana - Monroe	103319	86799
Indiana - Montgomery	35841	92775
Indiana - Morgan	56195	28537
Indiana - Newton	12381	11884
Indiana - Noble	40067	102259
Indiana - Ohio	4289	88
Indiana - Orange	17452	27543
Indiana - Owen	17354	11723
Indiana - Parke	14923	5811
Indiana - Perry	13270	13095
Indiana - Pike	10094	1561
Indiana - Porter	111456	114729
Indiana - Posey	24700	28830
Indiana - Pulaski	11577	11851
Indiana - Putnam	27917	21793
Indiana - Randolph	21183	24461
Indiana - Ripley	24466	55938
Indiana - Rush	14919	9382
Indiana - St Joseph	185350	177065
Indiana - Scott	18394	22097
Indiana - Shelby	37803	61447
Indiana - Spencer	19406	18603
Indiana - Starke	20842	11277
Indiana - Steuben	31496	75926
Indiana - Sullivan	15327	5231
Indiana - Switzerland	6244	5407
Indiana - Tippecanoe	122672	154530
Indiana - Tipton	11594	6871
Indiana - Union	5629	441
Indiana - Vanderburgh	122218	160623
Indiana - Vermillion	16058	20301
Indiana - Vigo	84043	74853
Indiana - Wabash	29281	51592
Indiana - Warren	7258	1562
Indiana - Warrick	37499	41353
Indiana - Washington	23511	27696
Indiana - Wayne	56803	59395
Indiana - Wells	25348	32887
Indiana - White	23498	42868
Indiana - Whitley	31759	41178
Iowa	6615045	2332702
Kansas	1101971	919561
Kentucky - west	808506	1502200
Kentucky - east	808506	1502200
Louisiana	1142745	1489324
Maine	302586	550449
Maryland	3360636	1188884
Massachusetts	1395973	1849852
Michigan - west	4032334	1426017
Michigan - east	1601453	1040810
Minnesota	1601453	1040810
Mississippi	649165	1252191
Missouri	2230767	2610609
Montana	82621	618048
Nebraska	368039	1181373
Nevada	275761	200651
New Hampshire	141636	401302
New Jersey	4508746	4698667
New Mexico	742516	268250
New York	5557067	6132195
North Carolina	2100934	1786545
North Dakota	185629	427054
Ohio - north	4093495	3538754
Ohio - central	4093495	3538754
Ohio - south	4093495	3538754
Oklahoma	604099	1467864
Oregon	1316571	3009765
Pennsylvania	6987376	9007835
Rhode Island	1697486	601953
South Carolina	1152402	2347724
South Dakota	169534	945313
Tennessee	1914232	3085948
Texas	8567905	10148434
Utah	770414	1349834
Vermont	2086985	733932
Virginia	1689975	2010802
Washington	2507601	3952932
West Virginia	597661	1042956
Wisconsin	3627813	6180480
Wyoming	565471	200651

Table E-19 Productions and Attractions - Other Manufactured Goods, (Annual Tons)

Alabama	1290285	2021746
Arizona	429725	591894
Arkansas	1361350	1339468
California	8311344	10002714
Colorado	1041555	541820
Connecticut	658467	843518
Delaware	183216	358132
District of Columbia	0	8687
Florida	2196371	1616911
Georgia	3445571	1986302
Idaho	59962	566005
Illinois - north	3813114	2634422
Illinois - south	952723	786911
Indiana - Adams	33091	31128
Indiana - Allen	90172	84842
Indiana - Bartholomew	8533	8006
Indiana - Benton	2871	2688
Indiana - Blackford	2401	2249
Indiana - Boone	0	0
Indiana - Brown	2883	2716
Indiana - Carroll	0	0
Indiana - Cass	6373	6008
Indiana - Clark	42919	40415
Indiana - Clay	6440	6056
Indiana - Clinton	7366	6921
Indiana - Crawford	5437	5106
Indiana - Daviess	7259	6836
Indiana - Dearborn	7855	7394
Indiana - Decatur	1464	1394
Indiana - DeKalb	20579	19364
Indiana - Delaware	32376	30439
Indiana - Dubois	108861	102430
Indiana - Elkhart	397851	374378
Indiana - Fayette	0	0
Indiana - Floyd	41816	39365
Indiana - Fountain	0	0
Indiana - Franklin	62212	58528
Indiana - Fulton	9354	8802
Indiana - Gibson	0	0
Indiana - Grant	4671	4413
Indiana - Greene	0	0
Indiana - Hamilton	8586	8053
Indiana - Hancock	5462	5127
Indiana - Harrison	15347	14447
Indiana - Hendricks	534	521
Indiana - Henry	13160	12379
Indiana - Howard	18236	17157
Indiana - Huntington	6709	6311
Indiana - Jackson	25843	24330
Indiana - Jasper	11711	11027
Indiana - Jay	2623	2456
Indiana - Jefferson	1489	1418
Indiana - Jennings	6395	6020
Indiana - Johnson	66025	62094
Indiana - Knox	2547	2385
Indiana - Kosciusko	28356	26658
Indiana - Lagrange	58989	55489
Indiana - Lake	544833	512704
Indiana - LaPorte	17817	16766
Indiana - Lawrence	14046	13214
Indiana - Madison	5359	5049
Indiana - Marion	316234	297571
Indiana - Marshall	26947	25366
Indiana - Martin	8072	7597
Indiana - Miami	6829	6414
Indiana - Monroe	4225	3956
Indiana - Montgomery	1441	1372
Indiana - Morgan	13668	12873
Indiana - Newton	0	0
Indiana - Noble	14007	13182
Indiana - Ohio	0	0
Indiana - Orange	13482	12699
Indiana - Owen	3523	3325
Indiana - Parke	2944	2757
Indiana - Perry	4768	4467
Indiana - Pike	0	0
Indiana - Porter	0	0
Indiana - Posey	144653	136131
Indiana - Pulaski	0	0
Indiana - Putnam	4345	4065
Indiana - Randolph	16047	15104
Indiana - Ripley	3753	3523
Indiana - Rush	0	0
Indiana - St Joseph	34761	32714
Indiana - Scott	2688	2545
Indiana - Shelby	9113	8571
Indiana - Spencer	9174	8635
Indiana - Starke	0	0
Indiana - Steuben	14662	13822
Indiana - Sullivan	4551	4278
Indiana - Switzerland	0	0
Indiana - Tippecanoe	30512	28705
Indiana - Tipton	0	0
Indiana - Union	0	0
Indiana - Vanderburgh	10989	10334
Indiana - Vermillion	0	0
Indiana - Vigo	26128	24580
Indiana - Wabash	27483	25870
Indiana - Warren	2805	2627
Indiana - Warrick	8632	8125
Indiana - Washington	11509	10836
Indiana - Wayne	5331	5021
Indiana - Wells	479	468
Indiana - White	6172	5814
Indiana - Whitley	26646	25067
Iowa	924963	461651
Kansas	1406877	1619065
Kentucky - west	222080	395001
Kentucky - east	519667	801956
Louisiana	707325	4283650
Maine	298698	683286
Maryland	337562	601937
Massachusetts	2009824	916006
Michigan - west	942730	719217
Michigan - east	2199703	1849388
Minnesota	2129747	1392530
Mississippi	1271408	1836252
Missouri	2088662	1331684
Montana	42195	583658
Nebraska	520778	161412
Nevada	263165	115820
New Hampshire	200982	235604
New Jersey	5228874	1644468
New Mexico	85501	395036
New York	5443181	1571319
North Carolina	3424474	1993008
North Dakota	84390	179204
Ohio - north	1779971	1769115
Ohio - central	1779971	1006251
Ohio - south	1779971	857313
Oklahoma	1213667	1383253
Oregon	213197	2771232
Pennsylvania	5450954	4206923
Rhode Island	205424	90488
South Carolina	1101517	849668
South Dakota	99936	114536
Tennessee	2797098	1413068
Texas	3989667	10620567
Utah	376426	575075
Vermont	71066	166451
Virginia	1406877	1602351
Washington	1112621	3211757
West Virginia	195430	437361
Wisconsin	2170832	1399412
Wyoming	0	455223

Table E-20 Productions and Attractions - U.S. Mail (Daily Tons)

Alabama	220	220
Arizona	200	200
Arkansas	129	129
California	1628	1628
Colorado	179	179
Connecticut	179	179
Delaware	36	36
District of Columbia	32	32
Florida	707	707
Georgia	354	354
Idaho	54	54
Illinois - north	481	481
Illinois - south	143	143
Indiana - Adams	1	1
Indiana - Allen	16	16
Indiana - Bartholomew	3	3
Indiana - Benton	1	1
Indiana - Blackford	1	1
Indiana - Boone	1	1
Indiana - Brown	1	1
Indiana - Carroll	1	1
Indiana - Cass	1	1
Indiana - Clark	5	5
Indiana - Clay	1	1
Indiana - Clinton	1	1
Indiana - Crawford	1	1
Indiana - Daviess	1	1
Indiana - Dearborn	1	1
Indiana - Decatur	1	1
Indiana - DeKalb	1	1
Indiana - Delaware	5	5
Indiana - Dubois	1	1
Indiana - Elkhart	8	8
Indiana - Fayette	1	1
Indiana - Floyd	4	4
Indiana - Fountain	1	1
Indiana - Franklin	1	1
Indiana - Fulton	1	1
Indiana - Gibson	1	1
Indiana - Grant	3	3
Indiana - Greene	1	1
Indiana - Hamilton	8	8
Indiana - Hancock	2	2
Indiana - Harrison	1	1
Indiana - Hendricks	4	4
Indiana - Henry	2	2
Indiana - Howard	3	3
Indiana - Huntington	1	1
Indiana - Jackson	1	1
Indiana - Jasper	1	1
Indiana - Jay	1	1
Indiana - Jefferson	1	1
Indiana - Jennings	1	1
Indiana - Johnson	5	5
Indiana - Knox	1	1
Indiana - Kosciusko	4	4
Indiana - Lagrange	1	1
Indiana - Lake	21	21
Indiana - LaPorte	5	5
Indiana - Lawrence	2	2
Indiana - Madison	6	6
Indiana - Marion	40	40
Indiana - Marshall	2	2
Indiana - Martin	1	1
Indiana - Miami	1	1
Indiana - Monroe	6	6
Indiana - Montgomery	1	1
Indiana - Morgan	2	2
Indiana - Newton	1	1
Indiana - Noble	1	1
Indiana - Ohio	1	1
Indiana - Orange	1	1
Indiana - Owen	1	1
Indiana - Parke	1	1
Indiana - Perry	1	1
Indiana - Pike	1	1
Indiana - Porter	7	7
Indiana - Posey	1	1
Indiana - Pulaski	1	1
Indiana - Putnam	1	1
Indiana - Randolph	1	1
Indiana - Ripley	1	1
Indiana - Rush	1	1
Indiana - St Joseph	11	11
Indiana - Scott	1	1
Indiana - Shelby	1	1
Indiana - Spencer	1	1
Indiana - Starke	1	1
Indiana - Steuben	1	1
Indiana - Sullivan	1	1
Indiana - Switzerland	1	1
Indiana - Tippecanoe	7	7
Indiana - Tipton	1	1
Indiana - Union	1	1
Indiana - Vanderburgh	7	7
Indiana - Vermillion	1	1
Indiana - Vigo	5	5
Indiana - Wabash	1	1
Indiana - Warren	1	1
Indiana - Warrick	2	2
Indiana - Washington	1	1
Indiana - Wayne	3	3
Indiana - Wells	1	1
Indiana - White	1	1
Indiana - Whitley	1	1
Iowa	152	152
Kansas	135	135
Kentucky - west	65	65
Kentucky - east	134	134
Louisiana	231	231
Maine	67	67
Maryland	261	261
Massachusetts	328	328
Michigan - west	141	141
Michigan - east	364	364
Minnesota	239	239
Mississippi	140	140
Missouri	279	279
Montana	44	44
Nebraska	86	86
Nevada	65	65
New Hampshire	60	60
New Jersey	422	422
New Mexico	83	83
New York	984	984
North Carolina	362	362
North Dakota	34	34
Ohio - north	288	288
Ohio - central	139	139
Ohio - south	164	164
Oklahoma	171	171
Oregon	155	155
Pennsylvania	650	650
Rhode Island	54	54
South Carolina	191	191
South Dakota	38	38
Tennessee	266	266
Texas	929	929
Utah	94	94
Vermont	30	30
Virginia	337	337
Washington	265	265
West Virginia	98	98
Wisconsin	267	267
Wyoming	24	24

Table E-21 Productions and Attractions - Express Mail, Non-U.S. (Daily Tons)

Alabama	53	53	Indiana - Parke	1	1
Arizona	47	47	Indiana - Perry	1	1
Arkansas	30	30	Indiana - Pike	1	1
California	389	389	Indiana - Porter	1	1
Colorado	42	42	Indiana - Posey	1	1
Connecticut	42	42	Indiana - Pulaski	1	1
Delaware	8	8	Indiana - Putnam	1	1
District of Columbia	7	7	Indiana - Randolph	1	1
Florida	169	169	Indiana - Ripley	1	1
Georgia	84	84	Indiana - Rush	1	1
Idaho	13	13	Indiana - St Joseph	2	2
Illinois - north	115	115	Indiana - Scott	1	1
Illinois - south	33	33	Indiana - Shelby	1	1
Indiana - Adams	1	1	Indiana - Spencer	1	1
Indiana - Allen	3	3	Indiana - Starke	1	1
Indiana - Bartholomew	1	1	Indiana - Steuben	1	1
Indiana - Benton	1	1	Indiana - Sullivan	1	1
Indiana - Blackford	1	1	Indiana - Switzerland	1	1
Indiana - Boone	1	1	Indiana - Tippecanoe	1	1
Indiana - Brown	1	1	Indiana - Tipton	1	1
Indiana - Carroll	1	1	Indiana - Union	1	1
Indiana - Cass	1	1	Indiana - Vanderburgh	1	1
Indiana - Clark	1	1	Indiana - Vermillion	1	1
Indiana - Clay	1	1	Indiana - Vigo	1	1
Indiana - Clinton	1	1	Indiana - Wabash	1	1
Indiana - Crawford	1	1	Indiana - Warren	1	1
Indiana - Daviess	1	1	Indiana - Warrick	1	1
Indiana - Dearborn	1	1	Indiana - Washington	1	1
Indiana - Decatur	1	1	Indiana - Wayne	1	1
Indiana - DeKalb	1	1	Indiana - Wells	1	1
Indiana - Delaware	1	1	Indiana - White	1	1
Indiana - Dubois	1	1	Indiana - Whitley	1	1
Indiana - Elkhart	1	1	Iowa	36	36
Indiana - Fayette	1	1	Kansas	32	32
Indiana - Floyd	1	1	Kentucky - west	15	15
Indiana - Fountain	1	1	Kentucky - east	32	32
Indiana - Franklin	1	1	Louisiana	55	55
Indiana - Fulton	1	1	Maine	16	16
Indiana - Gibson	1	1	Maryland	62	62
Indiana - Grant	1	1	Massachusetts	78	78
Indiana - Greene	1	1	Michigan - west	33	33
Indiana - Hamilton	2	2	Michigan - east	87	87
Indiana - Hancock	1	1	Minnesota	56	56
Indiana - Harrison	1	1	Mississippi	33	33
Indiana - Hendricks	1	1	Missouri	67	67
Indiana - Henry	1	1	Montana	10	10
Indiana - Howard	1	1	Nebraska	21	21
Indiana - Huntington	1	1	Nevada	15	15
Indiana - Jackson	1	1	New Hampshire	14	14
Indiana - Jasper	1	1	New Jersey	101	101
Indiana - Jay	1	1	New Mexico	20	20
Indiana - Jefferson	1	1	New York	235	235
Indiana - Jennings	1	1	North Carolina	86	86
Indiana - Johnson	1	1	North Dakota	8	8
Indiana - Knox	1	1	Ohio - north	69	69
Indiana - Kosciusko	1	1	Ohio - central	33	33
Indiana - Lagrange	1	1	Ohio - south	39	39
Indiana - Lake	5	5	Oklahoma	40	40
Indiana - LaPorte	1	1	Oregon	37	37
Indiana - Lawrence	1	1	Pennsylvania	155	155
Indiana - Madison	1	1	Rhode Island	13	13
Indiana - Marion	10	10	South Carolina	45	45
Indiana - Marshall	1	1	South Dakota	8	8
Indiana - Martin	1	1	Tennessee	63	63
Indiana - Miami	1	1	Texas	222	222
Indiana - Monroe	1	1	Utah	22	22
Indiana - Montgomery	1	1	Vermont	7	7
Indiana - Morgan	1	1	Virginia	80	80
Indiana - Newton	1	1	Washington	63	63
Indiana - Noble	1	1	West Virginia	23	23
Indiana - Ohio	1	1	Wisconsin	63	63
Indiana - Orange	1	1	Wyoming	6	6
Indiana - Owen	1	1			

Appendix F - Forecasted Productions and Attractions, 2015

As the title above indicates this appendix contains the forecasted productions and attractions of commodities and mail for 2015. Numerous agencies have requested these data and they are produced here primarily in response to those requests. Agencies wishing to convert this tonnage to rail or motor carriers should use the modal tables of Appendix B to determine the traffic carried by each mode of interest and the traffic density factors noted in the text of the report to determine vehicles needed by each mode.

Table F-1 Productions and Attractions - Farm Products, STCC 01 (Annual Tons)

Alabama	2824353	7643470
Arizona	2670637	3478623
Arkansas	3681148	8245948
California	30653514	36273672
Colorado	12614015	12922026
Connecticut	515949	2547407
Delaware	509266	2512408
District of Columbia	0	0
Florida	8108150	9193413
Georgia	4870771	11617074
Idaho	8606723	3748613
Illinois - north	45265156	30795122
Illinois - south	45265156	30795122
Indiana - Adams	592681	292820
Indiana - Allen	458844	248857
Indiana - Bartholomew	500082	282072
Indiana - Benton	551905	238052
Indiana - Blackford	503855	207617
Indiana - Boone	490297	338993
Indiana - Brown	444783	272238
Indiana - Carroll	568401	287894
Indiana - Cass	546922	265006
Indiana - Clark	468165	282504
Indiana - Clay	501601	226999
Indiana - Clinton	562930	269952
Indiana - Crawford	502621	232828
Indiana - Daviess	413286	312177
Indiana - Dearborn	544208	251124
Indiana - Decatur	518487	291758
Indiana - DeKalb	545481	275595
Indiana - Delaware	361528	179460
Indiana - Dubois	708115	368832
Indiana - Elkhart	597893	293379
Indiana - Fayette	472509	226284
Indiana - Floyd	478984	276876
Indiana - Fountain	543519	251437
Indiana - Franklin	552904	238161
Indiana - Fulton	526471	246628
Indiana - Gibson	601476	256668
Indiana - Grant	568130	241697
Indiana - Greene	514453	277065
Indiana - Hamilton	387117	393397
Indiana - Hancock	535282	325253
Indiana - Harrison	609971	325860
Indiana - Hendricks	532186	354662
Indiana - Henry	530501	239928
Indiana - Howard	531913	248287
Indiana - Huntington	519095	241555
Indiana - Jackson	585125	317815
Indiana - Jasper	613201	304950
Indiana - Jay	583665	246388
Indiana - Jefferson	538125	275268
Indiana - Jennings	567806	286003
Indiana - Johnson	486839	351887
Indiana - Knox	606282	264237
Indiana - Kosciusko	674934	364041
Indiana - Lagrange	624762	321147
Indiana - Lake	388999	167004
Indiana - LaPorte	524009	253006
Indiana - Lawrence	505801	261133
Indiana - Madison	502342	262825
Indiana - Marion	205193	105057
Indiana - Marshall	588104	282611
Indiana - Martin	482461	220380
Indiana - Miami	536446	231589
Indiana - Monroe	516802	269904
Indiana - Montgomery	550329	272580
Indiana - Morgan	524350	307986
Indiana - Newton	578544	265981
Indiana - Noble	546977	282370
Indiana - Ohio	508561	227864
Indiana - Orange	507730	251502
Indiana - Owen	525871	279671
Indiana - Parke	501952	217189
Indiana - Perry	545992	208260
Indiana - Pike	550503	225982
Indiana - Porter	496768	272098
Indiana - Posey	548078	285060
Indiana - Pulaski	604653	261358
Indiana - Putnam	479232	298713
Indiana - Randolph	558703	230634
Indiana - Ripley	548840	244732
Indiana - Rush	572431	257579
Indiana - St Joseph	518042	219529
Indiana - Scott	548477	275579
Indiana - Shelby	497366	309778
Indiana - Spencer	588690	272869
Indiana - Starke	553313	257484
Indiana - Steuben	463245	322286
Indiana - Sullivan	513831	247784
Indiana - Switzerland	536680	233680
Indiana - Tippecanoe	494133	274101
Indiana - Tipton	521267	242501
Indiana - Union	469521	231401
Indiana - Vanderburgh	517486	201395
Indiana - Vermillion	499900	231843
Indiana - Vigo	530110	201089
Indiana - Wabash	658234	271438
Indiana - Warren	507799	210702
Indiana - Warrick	482468	271298
Indiana - Washington	540368	275037
Indiana - Wayne	528618	250484
Indiana - Wells	509644	276076
Indiana - White	593914	286078
Indiana - Whitley	497249	348247
Iowa	72706016	51876848
Kansas	45059980	27427746
Kentucky - west	2954676	2989890
Kentucky - east	2954676	2989890
Louisiana	50091152	96762704
Maine	499909	2466160
Maryland	5464247	14860705
Massachusetts	717784	3542370
Michigan - west	6109182	4084225
Michigan - east	6109182	4084225
Minnesota	52493120	40233528
Mississippi	6609760	5672293
Missouri	31344562	15229442
Montana	9359259	4118599
Nebraska	59998440	18110586
Nevada	481196	1926179
New Hampshire	315451	1554943
New Jersey	2182758	4494836
New Mexico	1613343	3594868
New York	7925028	12027060
North Carolina	6766149	15875669
North Dakota	25602292	8138452
Ohio - north	14560630	8773012
Ohio - central	14560630	8773012
Ohio - south	14560630	8773012
Oklahoma	15212472	10698358
Oregon	30108158	35626196
Pennsylvania	6198070	10643360
Rhode Island	362234	1788684
South Carolina	1990280	5119813
South Dakota	9786989	4381090
Tennessee	7574825	7642220
Texas	65705956	89154232
Utah	1972903	4596082
Vermont	364907	1803684
Virginia	6152624	9233412
Washington	29076260	40579764
West Virginia	278024	2306166
Wisconsin	13486851	14083234
Wyoming	245945	1211206

Table F-2 Productions and Attractions - Coal, STCC 11 (Annual Tons)

Alabama	36958764	57046856
Arizona	2576310	4459272
Arkansas	173337	14749076
California	4293058	7432119
Colorado	27158102	30886034
Connecticut	0	2972848
Delaware	0	3471488
District of Columbia	0	0
Florida	13143928	22762940
Georgia	0	22350970
Idaho	0	1536288
Illinois - north	43837628	29292760
Illinois - south	43837628	29292760
Indiana - Adams	0	0
Indiana - Allen	0	0
Indiana - Bartholomew	0	0
Indiana - Benton	0	0
Indiana - Blackford	0	0
Indiana - Boone	0	0
Indiana - Brown	0	0
Indiana - Carroll	0	0
Indiana - Cass	0	0
Indiana - Clark	0	3449976
Indiana - Clay	825235	2515767
Indiana - Clinton	0	0
Indiana - Crawford	911475	2778674
Indiana - Daviess	1868645	5696648
Indiana - Dearborn	0	0
Indiana - Decatur	0	0
Indiana - DeKalb	0	0
Indiana - Delaware	0	4250866
Indiana - Dubois	812263	2476221
Indiana - Elkhart	0	0
Indiana - Fayette	0	0
Indiana - Floyd	0	0
Indiana - Fountain	0	0
Indiana - Franklin	0	0
Indiana - Fulton	0	0
Indiana - Gibson	1741935	5310366
Indiana - Grant	0	0
Indiana - Greene	0	0
Indiana - Hamilton	0	0
Indiana - Hancock	0	0
Indiana - Harrison	0	0
Indiana - Hendricks	0	0
Indiana - Henry	0	0
Indiana - Howard	0	0
Indiana - Huntington	0	0
Indiana - Jackson	0	0
Indiana - Jasper	0	0
Indiana - Jay	0	0
Indiana - Jefferson	0	0
Indiana - Jennings	0	0
Indiana - Johnson	0	0
Indiana - Knox	771256	2351209
Indiana - Kosciusko	0	0
Indiana - Lagrange	0	0
Indiana - Lake	0	0
Indiana - LaPorte	0	0
Indiana - Lawrence	0	0
Indiana - Madison	0	0
Indiana - Marion	1929832	10577088
Indiana - Marshall	0	0
Indiana - Martin	0	0
Indiana - Miami	0	0
Indiana - Monroe	0	4656760
Indiana - Montgomery	0	0
Indiana - Morgan	0	0
Indiana - Newton	0	0
Indiana - Noble	0	0
Indiana - Ohio	0	0
Indiana - Orange	0	0
Indiana - Owen	0	0
Indiana - Parke	0	0
Indiana - Perry	0	0
Indiana - Pike	1083122	3301931
Indiana - Porter	0	0
Indiana - Posey	286790	874291
Indiana - Pulaski	0	0
Indiana - Putnam	0	0
Indiana - Randolph	0	0
Indiana - Ripley	0	0
Indiana - Rush	0	0
Indiana - St Joseph	0	0
Indiana - Scott	0	0
Indiana - Shelby	0	0
Indiana - Spencer	0	0
Indiana - Starke	0	0
Indiana - Steuben	0	0
Indiana - Sullivan	1726592	5263592
Indiana - Switzerland	0	0
Indiana - Tippecanoe	0	0
Indiana - Tipton	0	0
Indiana - Union	0	0
Indiana - Vanderburgh	840692	2562874
Indiana - Vermillion	0	0
Indiana - Vigo	0	0
Indiana - Wabash	0	0
Indiana - Warren	0	0
Indiana - Warrick	3195088	9740339
Indiana - Washington	0	0
Indiana - Wayne	0	0
Indiana - Wells	0	0
Indiana - White	0	0
Indiana - Whitley	0	0
Iowa	0	27467972
Kansas	893991	31356180
Kentucky - west	116978704	59088312
Kentucky - east	116978704	59088312
Louisiana	10333733	38062896
Maine	1716748	2972848
Maryland	9655818	16738889
Massachusetts	3434684	5945696
Michigan - west	0	18211066
Michigan - east	0	18211066
Minnesota	9774542	16941906
Mississippi	0	5945696
Missouri	27079744	46928016
Montana	3434684	5945696
Nebraska	0	20237684
Nevada	0	4921108
New Hampshire	0	5070700
New Jersey	0	7432119
New Mexico	26594164	2972848
New York	0	23716294
North Carolina	0	35915180
North Dakota	5151432	8918543
Ohio - north	10839891	28265400
Ohio - central	10839891	28265400
Ohio - south	10839891	28265400
Oklahoma	1695378	29056498
Oregon	3434684	5945696
Pennsylvania	95533600	75310160
Rhode Island	0	2374
South Carolina	12438708	21480724
South Dakota	0	4459272
Tennessee	3688753	26127578
Texas	39602748	85876592
Utah	3434684	5945696
Vermont	0	1486424
Virginia	122907776	96774264
Washington	7996058	17383560
West Virginia	187969680	63981520
Wisconsin	24014292	41600868
Wyoming	283106752	41395480

Table F-3 Productions and Attractions - Non-metallic Minerals, STCC 14 (Annual Tons)

Alabama	32030532	33291380	Indiana - Parke	75971	80097
Arizona	15548088	19527716	Indiana - Perry	222296	234368
Arkansas	24565172	21821460	Indiana - Pike	21080	22225
California	159946080	165131936	Indiana - Porter	1637264	1726179
Colorado	25715608	26989514	Indiana - Posey	339020	357432
Connecticut	17630506	20123708	Indiana - Pulaski	164609	173548
Delaware	2558501	7516413	Indiana - Putnam	315760	332908
District of Columbia	0	0	Indiana - Randolph	381612	402335
Florida	151375408	136114624	Indiana - Ripley	788712	831544
Georgia	75065592	73342904	Indiana - Rush	147277	155275
Idaho	8054233	8430587	Indiana - St Joseph	2847399	3002024
Illinois - north	62907068	58298204	Indiana - Scott	336704	354988
Illinois - south	62907068	58298204	Indiana - Shelby	849851	896003
Indiana - Adams	5580560	5883600	Indiana - Spencer	208699	220034
Indiana - Allen	6261006	6601019	Indiana - Starke	146078	154011
Indiana - Bartholomew	2405084	2535689	Indiana - Steuben	1031627	1087651
Indiana - Benton	58598	61780	Indiana - Sullivan	75655	79764
Indiana - Blackford	220853	232846	Indiana - Switzerland	96609	101855
Indiana - Boone	206449	217661	Indiana - Tippecanoe	1986344	2094211
Indiana - Brown	12434	13110	Indiana - Tipton	122835	129505
Indiana - Carroll	210120	221531	Indiana - Union	6487	6839
Indiana - Cass	785525	828184	Indiana - Vanderburgh	2568396	2707871
Indiana - Clark	955492	1007380	Indiana - Vermillion	247580	261025
Indiana - Clay	228535	240947	Indiana - Vigo	1054855	1112140
Indiana - Clinton	524376	552854	Indiana - Wabash	733376	773202
Indiana - Crawford	25401	26780	Indiana - Warren	21958	23150
Indiana - Daviess	266903	281398	Indiana - Warrick	534979	564032
Indiana - Dearborn	333242	351339	Indiana - Washington	371300	391464
Indiana - Decatur	614204	647560	Indiana - Wayne	910686	960142
Indiana - DeKalb	1405364	1481685	Indiana - Wells	532766	561698
Indiana - Delaware	1333496	1405913	Indiana - White	518142	546281
Indiana - Dubois	1465928	1545530	Indiana - Whitley	567362	598172
Indiana - Elkhart	6696176	7059828	Iowa	29498152	30786306
Indiana - Fayette	683039	720132	Kansas	30824298	30333968
Indiana - Floyd	816971	861338	Kentucky - west	26169132	20739886
Indiana - Fountain	238110	251041	Kentucky - east	26169132	20739886
Indiana - Franklin	82622	87109	Louisiana	34429944	33761528
Indiana - Fulton	371230	391390	Maine	2307994	3923827
Indiana - Gibson	330411	348353	Maryland	41099856	42360704
Indiana - Grant	1326820	1398876	Massachusetts	30497806	32368896
Indiana - Greene	249768	263332	Michigan - west	47994152	43029120
Indiana - Hamilton	919000	968908	Michigan - east	47994152	43029120
Indiana - Hancock	398962	420627	Minnesota	28639776	33530016
Indiana - Harrison	277770	292855	Mississippi	13345759	13960749
Indiana - Hendricks	193779	204301	Missouri	72044064	79300472
Indiana - Henry	403471	425382	Montana	2052737	3699438
Indiana - Howard	2270134	2393415	Nebraska	16239061	20862172
Indiana - Huntington	1237252	1304444	Nevada	13967872	14415461
Indiana - Jackson	774845	816926	New Hampshire	11119685	2004060
Indiana - Jasper	159024	167660	New Jersey	34998632	38061708
Indiana - Jay	446366	470607	New Mexico	9635635	7641073
Indiana - Jefferson	536135	565252	New York	58184232	61032420
Indiana - Jennings	268463	283043	North Carolina	40874276	39391416
Indiana - Johnson	785461	828117	North Dakota	2393475	4353607
Indiana - Knox	248269	261752	Ohio - north	50908428	51744244
Indiana - Kosciusko	1908892	2012563	Ohio - central	50908792	51744244
Indiana - Lagrange	507891	535473	Ohio - south	50908792	51744244
Indiana - Lake	5344044	5634254	Oklahoma	30399266	25412860
Indiana - LaPorte	1639187	1728204	Oregon	57769884	61440832
Indiana - Lawrence	729947	769587	Pennsylvania	112644088	117318256
Indiana - Madison	1881220	1983385	Rhode Island	29840076	5378195
Indiana - Marion	12092503	12749190	South Carolina	23597570	22451884
Indiana - Marshall	947287	998732	South Dakota	6707903	7480796
Indiana - Martin	89886	94767	Tennessee	58681684	59972212
Indiana - Miami	315077	332187	Texas	110262488	128741864
Indiana - Monroe	1184956	1249307	Utah	11405809	11576772
Indiana - Montgomery	1044401	1101118	Vermont	6502511	7801351
Indiana - Morgan	366966	386894	Virginia	58261400	53531440
Indiana - Newton	164366	173292	Washington	75401576	77841360
Indiana - Noble	1454254	1533230	West Virginia	9420745	14871361
Indiana - Ohio	865	912	Wisconsin	44179556	46805728
Indiana - Orange	384924	405827	Wyoming	8341544	5017274
Indiana - Owen	158347	166946			

Table F-4 Productions and Attractions - Food and Kindred Products, STCC 20 (Annual Tons)

Alabama	16217180	19802034
Arizona	10077911	9780860
Arkansas	21654852	19858836
California	93207072	112834888
Colorado	12119996	14777246
Connecticut	4695848	8653559
Delaware	3392037	4161835
District of Columbia	102933	1212503
Florida	47554772	39296028
Georgia	29997108	30909000
Idaho	6211439	7561213
Illinois - north	19457776	37897824
Illinois - south	4863853	11321066
Indiana - Adams	421903	252955
Indiana - Allen	1055784	1046332
Indiana - Bartholomew	1280287	700657
Indiana - Benton	0	16231
Indiana - Blackford	0	21883
Indiana - Boone	0	75165
Indiana - Brown	0	26368
Indiana - Carroll	68846	63179
Indiana - Cass	1332816	683815
Indiana - Clark	149394	213929
Indiana - Clay	0	44242
Indiana - Clinton	813440	426689
Indiana - Crawford	0	19020
Indiana - Daviess	933860	483045
Indiana - Dearborn	495698	290510
Indiana - Decatur	225104	148312
Indiana - DeKalb	156926	149152
Indiana - Delaware	310335	333536
Indiana - Dubois	680082	387013
Indiana - Elkhart	1002817	765564
Indiana - Fayette	0	39154
Indiana - Floyd	624325	415787
Indiana - Fountain	0	29697
Indiana - Franklin	0	32211
Indiana - Fulton	154387	102324
Indiana - Gibson	190762	139431
Indiana - Grant	272438	241393
Indiana - Greene	621687	347785
Indiana - Hamilton	189707	369947
Indiana - Hancock	0	96666
Indiana - Harrison	150102	130368
Indiana - Hendricks	163311	243537
Indiana - Henry	108723	121154
Indiana - Howard	117031	184112
Indiana - Huntington	276437	188468
Indiana - Jackson	0	70374
Indiana - Jasper	57401	72429
Indiana - Jay	91460	73440
Indiana - Jefferson	0	59824
Indiana - Jennings	0	47950
Indiana - Johnson	0	198733
Indiana - Knox	60118	84479
Indiana - Kosciusko	583348	402201
Indiana - Lagrange	0	59533
Indiana - Lake	947473	1078074
Indiana - LaPorte	291744	315047
Indiana - Lawrence	0	83424
Indiana - Madison	224892	308497
Indiana - Marion	3218681	2761724
Indiana - Marshall	433874	278714
Indiana - Martin	0	17225
Indiana - Miami	40756	77002
Indiana - Monroe	88224	261384
Indiana - Montgomery	0	65229
Indiana - Morgan	0	119033
Indiana - Newton	0	23277
Indiana - Noble	643398	374622
Indiana - Ohio	0	7749
Indiana - Orange	47083	55597
Indiana - Owen	0	34793
Indiana - Parke	0	26813
Indiana - Perry	0	26873
Indiana - Pike	0	19331
Indiana - Porter	293573	373615
Indiana - Posey	47671	69804
Indiana - Pulaski	0	22840
Indiana - Putnam	0	57861
Indiana - Randolph	51025	64130
Indiana - Ripley	135356	108688
Indiana - Rush	0	28381
Indiana - St Joseph	284895	506945
Indiana - Scott	295199	174425
Indiana - Shelby	141964	144237
Indiana - Spencer	0	36858
Indiana - Starke	0	40991
Indiana - Steuben	159973	139873
Indiana - Sullivan	40455	49681
Indiana - Switzerland	0	11659
Indiana - Tippecanoe	586933	513734
Indiana - Tipton	30042	37908
Indiana - Union	0	11332
Indiana - Vanderburgh	1807578	1075345
Indiana - Vermillion	0	29944
Indiana - Vigo	568455	419015
Indiana - Wabash	40405	74430
Indiana - Warren	0	13531
Indiana - Warrick	0	79355
Indiana - Washington	0	46239
Indiana - Wayne	251319	227724
Indiana - Wells	344810	208792
Indiana - White	0	42619
Indiana - Whitley	0	66023
Iowa	47064960	21193682
Kansas	23075792	13652131
Kentucky - west	3512717	4286363
Kentucky - east	8195550	8701623
Louisiana	20277686	14060668
Maine	2213638	4275439
Maryland	23855476	15900177
Massachusetts	11251578	18665994
Michigan - west	8615562	8404504
Michigan - east	21592144	21610958
Minnesota	37628304	22384338
Mississippi	8927909	13759181
Missouri	32387034	23411142
Montana	2534267	2210907
Nebraska	20219712	13042602
Nevada	1671764	2859760
New Hampshire	2253865	2829173
New Jersey	27839078	26495924
New Mexico	1723822	3886564
New York	47877768	51827412
North Carolina	29352302	30094112
North Dakota	4708862	2521132
Ohio - north	12930441	18593900
Ohio - central	12929258	10576087
Ohio - south	12929258	9009663
Oklahoma	10583109	10938745
Oregon	10519219	12616587
Pennsylvania	39697600	50492568
Rhode Island	1218625	2593228
South Carolina	8174254	11288296
South Dakota	3618015	3593815
Tennessee	24461238	21881860
Texas	61497976	61960008
Utah	4616578	6606504
Vermont	1566466	2165027
Virginia	22955110	23201414
Washington	18084160	20308882
West Virginia	2568579	4572557
Wisconsin	34532048	27492146
Wyoming	578552	1087976

Table F-5 Productions and Attractions - Basic Textiles, STCC 22 (Annual Tons)

Alabama	1522690	1354048
Arizona	43776	154258
Arkansas	73354	325657
California	1213892	4002153
Colorado	52058	128548
Connecticut	55607	205678
Delaware	281585	42849
District of Columbia	0	17139
Florida	333643	942691
Georgia	6379444	1739694
Idaho	4733	17139
Illinois - north	183385	514194
Illinois - south	46143	154258
Indiana - Adams	0	8859
Indiana - Allen	0	17502
Indiana - Bartholomew	0	8180
Indiana - Benton	0	0
Indiana - Blackford	0	0
Indiana - Boone	0	0
Indiana - Brown	0	0
Indiana - Carroll	0	0
Indiana - Cass	0	0
Indiana - Clark	0	0
Indiana - Clay	0	0
Indiana - Clinton	0	0
Indiana - Crawford	0	0
Indiana - Daviess	0	9022
Indiana - Dearborn	0	0
Indiana - Decatur	0	0
Indiana - DeKalb	0	0
Indiana - Delaware	0	0
Indiana - Dubois	0	0
Indiana - Elkhart	4899	27467
Indiana - Fayette	0	0
Indiana - Floyd	0	9320
Indiana - Fountain	0	0
Indiana - Franklin	0	0
Indiana - Fulton	0	7719
Indiana - Gibson	0	0
Indiana - Grant	0	7397
Indiana - Greene	0	0
Indiana - Hamilton	0	24389
Indiana - Hancock	0	9978
Indiana - Harrison	0	0
Indiana - Hendricks	0	0
Indiana - Henry	0	6988
Indiana - Howard	0	0
Indiana - Huntington	0	0
Indiana - Jackson	0	0
Indiana - Jasper	0	0
Indiana - Jay	0	6859
Indiana - Jefferson	0	0
Indiana - Jennings	30187	0
Indiana - Johnson	0	10679
Indiana - Knox	0	0
Indiana - Kosciusko	15440	9620
Indiana - Lagrange	0	9341
Indiana - Lake	20381	12699
Indiana - LaPorte	16952	15844
Indiana - Lawrence	0	9090
Indiana - Madison	0	0
Indiana - Marion	0	30218
Indiana - Marshall	0	0
Indiana - Martin	0	7507
Indiana - Miami	0	0
Indiana - Monroe	5127	0
Indiana - Montgomery	0	0
Indiana - Morgan	0	0
Indiana - Newton	0	0
Indiana - Noble	0	0
Indiana - Ohio	0	0
Indiana - Orange	0	0
Indiana - Owen	0	0

Indiana - Parke	0	0
Indiana - Perry	0	0
Indiana - Pike	0	0
Indiana - Porter	0	0
Indiana - Posey	0	0
Indiana - Pulaski	0	0
Indiana - Putnam	0	9078
Indiana - Randolph	0	0
Indiana - Ripley	0	0
Indiana - Rush	0	0
Indiana - St Joseph	0	7179
Indiana - Scott	0	0
Indiana - Shelby	0	0
Indiana - Spencer	0	0
Indiana - Starke	0	0
Indiana - Steuben	0	0
Indiana - Sullivan	0	0
Indiana - Switzerland	0	0
Indiana - Tippecanoe	0	0
Indiana - Tipton	0	0
Indiana - Union	0	0
Indiana - Vanderburgh	0	13852
Indiana - Vermillion	0	0
Indiana - Vigo	0	0
Indiana - Wabash	0	37432
Indiana - Warren	0	0
Indiana - Warrick	0	0
Indiana - Washington	0	9069
Indiana - Wayne	0	7262
Indiana - Wells	0	0
Indiana - White	14122	8799
Indiana - Whitley	0	0
Iowa	26029	171397
Kansas	30761	128548
Kentucky - west	39043	274237
Kentucky - east	92284	557044
Louisiana	60339	274237
Maine	69805	77128
Maryland	66255	265668
Massachusetts	488633	651314
Michigan - west	33127	154258
Michigan - east	76904	411355
Minnesota	128962	214248
Mississippi	170371	839852
Missouri	110031	599894
Montana	2366	25709
Nebraska	18930	77128
Nevada	120680	17139
New Hampshire	44959	59989
New Jersey	675568	1114090
New Mexico	2366	51419
New York	386884	3102311
North Carolina	6860978	1885382
North Dakota	10649	25709
Ohio - north	94650	291377
Ohio - central	93468	162829
Ohio - south	93468	137118
Oklahoma	80453	214248
Oregon	60339	102839
Pennsylvania	899180	1979652
Rhode Island	192850	68559
South Carolina	4706496	874132
South Dakota	3549	25709
Tennessee	1013944	1516876
Texas	561987	1396897
Utah	49692	154258
Vermont	3549	34279
Virginia	1140539	831282
Washington	188118	222818
West Virginia	140793	102839
Wisconsin	186935	274237
Wyoming	0	8570

Table F-6 Productions and Attractions - Apparel, STCC 23 (Annual Tons)

Alabama	493366	589608	Indiana - Parke	0	0
Arizona	435392	197883	Indiana - Perry	0	0
Arkansas	188118	197883	Indiana - Pike	0	0
California	1829120	2423053	Indiana - Porter	0	8221
Colorado	42592	169614	Indiana - Posey	0	0
Connecticut	79270	181728	Indiana - Pulaski	0	0
Delaware	43776	32307	Indiana - Putnam	30807	4278
District of Columbia	0	28269	Indiana - Randolph	0	0
Florida	427110	827876	Indiana - Ripley	0	0
Georgia	1191413	807683	Indiana - Rush	0	0
Idaho	5916	48461	Indiana - St Joseph	0	10149
Illinois - north	272120	488649	Indiana - Scott	0	0
Illinois - south	67439	145383	Indiana - Shelby	0	0
Indiana - Adams	15031	4174	Indiana - Spencer	0	0
Indiana - Allen	14848	16496	Indiana - Starke	0	0
Indiana - Bartholomew	13878	3854	Indiana - Steuben	0	0
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	0	4129
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	0	0	Indiana - Vanderburgh	23503	9792
Indiana - Clark	0	3696	Indiana - Vermillion	14234	0
Indiana - Clay	0	0	Indiana - Vigo	0	3296
Indiana - Clinton	0	0	Indiana - Wabash	88908	14111
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	15308	4251	Indiana - Warrick	0	0
Indiana - Dearborn	0	0	Indiana - Washington	15387	4273
Indiana - Decatur	0	0	Indiana - Wayne	12322	3422
Indiana - DeKalb	0	0	Indiana - Wells	0	0
Indiana - Delaware	0	3543	Indiana - White	14928	4146
Indiana - Dubois	0	0	Indiana - Whitley	0	0
Indiana - Elkhart	46601	12944	Iowa	97017	161536
Indiana - Fayette	0	0	Kansas	52058	137306
Indiana - Floyd	31624	4392	Kentucky - west	97017	133267
Indiana - Fountain	0	0	Kentucky - east	228344	24231
Indiana - Franklin	0	0	Louisiana	123046	266536
Indiana - Fulton	26192	3638	Maine	78086	72692
Indiana - Gibson	0	0	Maryland	95833	274612
Indiana - Grant	12550	3486	Massachusetts	175103	40384
Indiana - Greene	0	0	Michigan - west	39043	149421
Indiana - Hamilton	41379	11492	Michigan - east	92284	379611
Indiana - Hancock	16930	4702	Minnesota	82819	222113
Indiana - Harrison	0	0	Mississippi	234260	371533
Indiana - Hendricks	0	4946	Missouri	154990	379611
Indiana - Henry	11857	3293	Montana	4733	40384
Indiana - Howard	0	3545	Nebraska	79270	84806
Indiana - Huntington	0	0	Nevada	118313	56538
Indiana - Jackson	0	0	New Hampshire	10649	60576
Indiana - Jasper	0	0	New Jersey	995013	625955
Indiana - Jay	23274	3231	New Mexico	22480	80768
Indiana - Jefferson	0	0	New York	453139	1655753
Indiana - Jennings	0	0	North Carolina	1798359	844029
Indiana - Johnson	18118	5032	North Dakota	5916	36345
Indiana - Knox	0	0	Ohio - north	228344	28269
Indiana - Kosciusko	0	4532	Ohio - central	228344	137306
Indiana - Lagrange	15848	4402	Ohio - south	228344	161536
Indiana - Lake	21546	17953	Oklahoma	78086	197883
Indiana - LaPorte	40321	11199	Oregon	82819	145383
Indiana - Lawrence	15422	4283	Pennsylvania	683850	1078258
Indiana - Madison	0	3477	Rhode Island	8282	56538
Indiana - Marion	38452	35600	South Carolina	538325	411919
Indiana - Marshall	0	4154	South Dakota	9465	36345
Indiana - Martin	12738	0	Tennessee	3054845	662300
Indiana - Miami	0	0	Texas	977266	1126719
Indiana - Monroe	0	4515	Utah	56790	117113
Indiana - Montgomery	0	0	Vermont	5916	32307
Indiana - Morgan	0	4681	Virginia	434209	508841
Indiana - Newton	0	0	Washington	133694	266536
Indiana - Noble	0	0	West Virginia	17747	109037
Indiana - Ohio	0	0	Wisconsin	336010	266536
Indiana - Orange	0	0	Wyoming	0	20191
Indiana - Owen	0	0			

Table F-7 Productions and Attractions - Lumber and Wood Prod, STCC 24 (Annual Tons)

Alabama	58594572	32765588
Arizona	2563846	7389227
Arkansas	24981816	22792448
California	36704280	68814424
Colorado	2200624	3882301
Connecticut	1041155	2820452
Delaware	1354685	992428
District of Columbia	0	218539
Florida	27015618	24021414
Georgia	46343248	33220666
Idaho	24597298	14156255
Illinois - north	3108086	10934718
Illinois - south	777317	3265246
Indiana - Adams	105585	544883
Indiana - Allen	129077	666887
Indiana - Bartholomew	21088	110433
Indiana - Benton	13454	69240
Indiana - Blackford	10883	55799
Indiana - Boone	0	0
Indiana - Brown	13841	72405
Indiana - Carroll	0	0
Indiana - Cass	23751	122628
Indiana - Clark	186273	962347
Indiana - Clay	0	0
Indiana - Clinton	28160	145170
Indiana - Crawford	27197	142700
Indiana - Daviess	35081	181370
Indiana - Dearborn	36589	188704
Indiana - Decatur	0	0
Indiana - DeKalb	85689	441853
Indiana - Delaware	24152	124073
Indiana - Dubois	511296	2640539
Indiana - Elkhart	1460278	7545525
Indiana - Fayette	0	0
Indiana - Floyd	194574	1003806
Indiana - Fountain	0	0
Indiana - Franklin	0	0
Indiana - Fulton	43387	224630
Indiana - Gibson	0	0
Indiana - Grant	0	0
Indiana - Greene	0	0
Indiana - Hamilton	31437	164636
Indiana - Hancock	16446	83824
Indiana - Harrison	68914	356062
Indiana - Hendricks	0	0
Indiana - Henry	13587	71291
Indiana - Howard	0	0
Indiana - Huntington	0	0
Indiana - Jackson	95967	494257
Indiana - Jasper	49483	255716
Indiana - Jay	11595	59676
Indiana - Jefferson	0	0
Indiana - Jennings	24244	124147
Indiana - Johnson	268078	1384064
Indiana - Knox	11433	58839
Indiana - Kosciusko	99201	513738
Indiana - Lagrange	260946	1348000
Indiana - Lake	20663	106680
Indiana - LaPorte	21092	109327
Indiana - Lawrence	15367	79086
Indiana - Madison	12474	64198
Indiana - Marion	159954	827267
Indiana - Marshall	115139	595173
Indiana - Martin	37123	191460
Indiana - Miami	31275	160850
Indiana - Monroe	13364	68996
Indiana - Montgomery	0	0
Indiana - Morgan	60877	315934
Indiana - Newton	0	0
Indiana - Noble	22325	115260
Indiana - Ohio	0	0
Indiana - Orange	64887	335003
Indiana - Owen	17715	90667
Indiana - Parke	13677	70392
Indiana - Perry	15871	83019
Indiana - Pike	0	0
Indiana - Porter	0	0
Indiana - Posey	0	0
Indiana - Pulaski	0	0
Indiana - Putnam	21103	108949
Indiana - Randolph	49022	253669
Indiana - Ripley	18018	93974
Indiana - Rush	0	0
Indiana - St Joseph	54611	282146
Indiana - Scott	12975	68424
Indiana - Shelby	29312	150581
Indiana - Spencer	44682	230443
Indiana - Starke	0	0
Indiana - Steuben	0	0
Indiana - Sullivan	14888	78707
Indiana - Switzerland	0	0
Indiana - Tippecanoe	0	0
Indiana - Tipton	0	0
Indiana - Union	0	0
Indiana - Vanderburgh	44201	228583
Indiana - Vermillion	0	0
Indiana - Vigo	17144	88132
Indiana - Wabash	29740	152727
Indiana - Warren	12819	65973
Indiana - Warrick	41600	214544
Indiana - Washington	55959	291136
Indiana - Wayne	0	0
Indiana - Wells	0	0
Indiana - White	0	0
Indiana - Whitley	119443	614835
Iowa	1848051	8818736
Kansas	572636	3458075
Kentucky - west	2038535	4015996
Kentucky - east	4756188	8152831
Louisiana	36549288	14331088
Maine	25735468	13603478
Maryland	5378515	5067560
Massachusetts	2133185	4645906
Michigan - west	4252174	4787314
Michigan - east	9920555	12310235
Minnesota	7994418	18858724
Mississippi	39283508	27168392
Missouri	5221158	12724176
Montana	15787703	8219680
Nebraska	687399	2586486
Nevada	259106	1272674
New Hampshire	3938644	4671617
New Jersey	16350873	4985286
New Mexico	2354431	3139264
New York	5374965	16765882
North Carolina	46194172	43808292
North Dakota	360855	1000142
Ohio - north	4346825	11942574
Ohio - central	4346825	6792742
Ohio - south	4346825	5787456
Oklahoma	2017239	4123981
Oregon	87466520	65865416
Pennsylvania	12751788	33991984
Rhode Island	0	1450077
South Carolina	30142632	16704176
South Dakota	1308543	2249677
Tennessee	8293750	21005558
Texas	20829024	31207526
Utah	1135806	3391228
Vermont	2607622	3728038
Virginia	28466136	26556478
Washington	85733232	41077828
West Virginia	6638550	7826307
Wisconsin	16038526	29641750
Wyoming	2321304	1691757

Table F-8 Productions and Attractions - Furniture and Fixtures, STCC 25 (Annual Tons)

Alabama	585650	422231	Indiana - Parke	0	2605
Arizona	369137	350479	Indiana - Perry	15368	4243
Arkansas	337192	264929	Indiana - Pike	0	0
California	1949800	2997015	Indiana - Porter	0	11237
Colorado	236626	314603	Indiana - Posey	0	2844
Connecticut	56790	311844	Indiana - Pulaski	0	0
Delaware	52058	63473	Indiana - Putnam	0	2923
District of Columbia	0	55193	Indiana - Randolph	0	2250
Florida	420012	1247376	Indiana - Ripley	67650	11208
Georgia	831741	645764	Indiana - Rush	0	2390
Idaho	15380	93828	Indiana - St Joseph	1860	18494
Illinois - north	576185	869300	Indiana - Scott	0	2824
Illinois - south	144342	259410	Indiana - Shelby	4729	5877
Indiana - Adams	16073	5706	Indiana - Spencer	14051	2909
Indiana - Allen	18144	30999	Indiana - Starke	0	2724
Indiana - Bartholomew	27559	10536	Indiana - Steuben	2902	3605
Indiana - Benton	0	0	Indiana - Sullivan	0	2413
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	2966	Indiana - Tippecanoe	29520	16928
Indiana - Brown	0	0	Indiana - Tipton	0	2177
Indiana - Carroll	12042	2494	Indiana - Union	0	0
Indiana - Cass	0	2741	Indiana - Vanderburgh	16156	15613
Indiana - Clark	18293	10102	Indiana - Vermillion	0	2701
Indiana - Clay	0	2660	Indiana - Vigo	0	9010
Indiana - Clinton	0	2554	Indiana - Wabash	1940	2410
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	2905	Indiana - Warrick	0	2709
Indiana - Dearborn	0	2382	Indiana - Washington	44660	8761
Indiana - Decatur	0	2927	Indiana - Wayne	5647	7015
Indiana - DeKalb	0	3248	Indiana - Wells	6922	2866
Indiana - Delaware	5846	9685	Indiana - White	2280	2833
Indiana - Dubois	207586	32991	Indiana - Whitley	0	3625
Indiana - Elkhart	135253	35380	Iowa	240175	275968
Indiana - Fayette	0	2248	Kansas	53241	234572
Indiana - Floyd	12077	9003	Kentucky - west	41410	115906
Indiana - Fountain	0	2500	Kentucky - east	97017	237333
Indiana - Franklin	0	2543	Louisiana	29578	389114
Indiana - Fulton	0	2485	Maine	20113	115906
Indiana - Gibson	0	2480	Maryland	120680	449827
Indiana - Grant	5752	7146	Massachusetts	346657	574013
Indiana - Greene	7216	2987	Michigan - west	351390	284247
Indiana - Hamilton	0	15708	Michigan - east	818727	731314
Indiana - Hancock	0	6427	Minnesota	317079	427750
Indiana - Harrison	20006	6214	Mississippi	751288	372556
Indiana - Hendricks	0	6761	Missouri	747739	513300
Indiana - Henry	10867	4501	Montana	15380	74511
Indiana - Howard	1949	7267	Nebraska	138427	154542
Indiana - Huntington	0	2644	Nevada	120680	113147
Indiana - Jackson	0	2867	New Hampshire	28396	104867
Indiana - Jasper	0	2772	New Jersey	6229186	742353
Indiana - Jay	0	2209	New Mexico	15380	140743
Indiana - Jefferson	0	3022	New York	552523	1741358
Indiana - Jennings	0	3028	North Carolina	1603143	1012803
Indiana - Johnson	0	10316	North Dakota	31945	63473
Indiana - Knox	1752	2178	Ohio - north	338375	524339
Indiana - Kosciusko	4986	6196	Ohio - central	338375	298045
Indiana - Lagrange	7263	3008	Ohio - south	338375	253891
Indiana - Lake	1645	32716	Oklahoma	68621	298045
Indiana - LaPorte	10266	10205	Oregon	123046	275968
Indiana - Lawrence	0	2926	Pennsylvania	895631	1178383
Indiana - Madison	11474	11880	Rhode Island	0	99347
Indiana - Marion	84190	75416	South Carolina	190484	339441
Indiana - Marshall	2285	5678	South Dakota	8282	63473
Indiana - Martin	0	0	Tennessee	798614	574013
Indiana - Miami	5872	4863	Texas	1064818	1622693
Indiana - Monroe	0	12343	Utah	105299	171100
Indiana - Montgomery	0	2841	Vermont	17747	60712
Indiana - Morgan	0	6399	Virginia	802163	673362
Indiana - Newton	0	0	Washington	269754	463627
Indiana - Noble	0	3092	West Virginia	37860	165581
Indiana - Ohio	0	0	Wisconsin	502831	513300
Indiana - Orange	29392	5618	Wyoming	0	41395
Indiana - Owen	0	3138			

Table F-9 Productions and Attractions - Pulp and Paper Products, STCC 26 (Annual Tons)

Alabama	14020105	5956536	Indiana - Parke	3487	8293
Arizona	1151187	2433570	Indiana - Perry	4731	8442
Arkansas	7063294	4098413	Indiana - Pike	0	5830
California	16867902	23966712	Indiana - Porter	0	73781
Colorado	1574747	2376465	Indiana - Posey	0	15845
Connecticut	2016056	3160566	Indiana - Pulaski	0	6262
Delaware	263838	687461	Indiana - Putnam	14343	30248
District of Columbia	0	355810	Indiana - Randolph	14050	12535
Florida	7812215	9960506	Indiana - Ripley	4999	13380
Georgia	17145938	9556376	Indiana - Rush	19188	38045
Idaho	993830	900508	Indiana - St Joseph	65988	193189
Illinois - north	8467670	9848492	Indiana - Scott	3780	11240
Illinois - south	2116622	2940929	Indiana - Shelby	58979	98230
Indiana - Adams	30538	18165	Indiana - Spencer	12978	11579
Indiana - Allen	134488	318492	Indiana - Starke	0	13014
Indiana - Bartholomew	66964	125784	Indiana - Steuben	0	20087
Indiana - Benton	24003	34674	Indiana - Sullivan	4306	9605
Indiana - Blackford	36987	56834	Indiana - Switzerland	0	3906
Indiana - Boone	0	23613	Indiana - Tippecanoe	7550	87576
Indiana - Brown	3714	8835	Indiana - Tipton	0	6929
Indiana - Carroll	0	9923	Indiana - Union	0	3797
Indiana - Cass	7339	21823	Indiana - Vanderburgh	30839	102961
Indiana - Clark	52941	46230	Indiana - Vermillion	16870	34404
Indiana - Clay	0	12708	Indiana - Vigo	185838	315492
Indiana - Clinton	7975	16264	Indiana - Wabash	49459	78665
Indiana - Crawford	8037	7170	Indiana - Warren	3267	3886
Indiana - Daviess	10367	16187	Indiana - Warrick	12083	25874
Indiana - Dearborn	10628	18964	Indiana - Washington	15631	13946
Indiana - Decatur	100528	163082	Indiana - Wayne	18774	63284
Indiana - DeKalb	62298	77559	Indiana - Wells	0	15970
Indiana - Delaware	48597	121409	Indiana - White	0	13530
Indiana - Dubois	153829	35803	Indiana - Whitley	43664	34629
Indiana - Elkhart	448398	143137	Iowa	1677680	2703722
Indiana - Fayette	0	12525	Kansas	1176033	2383054
Indiana - Floyd	76297	69269	Kentucky - west	960703	1203607
Indiana - Fountain	34577	59712	Kentucky - east	2243218	2444551
Indiana - Franklin	0	10118	Louisiana	11907033	4557454
Indiana - Fulton	12194	9891	Maine	6263497	3632784
Indiana - Gibson	0	15794	Maryland	3050112	4372958
Indiana - Grant	82872	157364	Massachusetts	4058140	7138180
Indiana - Greene	0	19029	Michigan - west	2623002	2549977
Indiana - Hamilton	19266	103139	Michigan - east	6119155	6553947
Indiana - Hancock	4299	30688	Minnesota	6472912	5293235
Indiana - Harrison	19401	19783	Mississippi	8293750	3145191
Indiana - Hendricks	0	53810	Missouri	4390601	5339358
Indiana - Henry	22083	48362	Montana	659004	595215
Indiana - Howard	0	40489	Nebraska	630609	1161876
Indiana - Huntington	0	18947	Nevada	229528	757744
Indiana - Jackson	80576	100421	New Hampshire	1062452	1460581
Indiana - Jasper	13601	13239	New Jersey	6229186	8322020
Indiana - Jay	9851	19337	New Mexico	165638	893919
Indiana - Jefferson	0	19246	New York	7103520	16933958
Indiana - Jennings	31066	50616	North Carolina	10200957	7937656
Indiana - Johnson	104294	104004	North Dakota	79270	375578
Indiana - Knox	9713	25998	Ohio - north	3380206	5710544
Indiana - Kosciusko	45595	66569	Ohio - central	3380206	3248421
Indiana - Lagrange	73788	19153	Ohio - south	3380206	2767418
Indiana - Lake	97580	336867	Oklahoma	2866727	2448944
Indiana - LaPorte	37546	101515	Oregon	6379444	3136407
Indiana - Lawrence	3917	25627	Pennsylvania	11158110	13661379
Indiana - Madison	22255	92664	Rhode Island	94650	907097
Indiana - Marion	380836	892577	South Carolina	7954191	4645307
Indiana - Marshall	97505	119764	South Dakota	136060	509556
Indiana - Martin	10783	5772	Tennessee	6590041	6441933
Indiana - Miami	50973	79348	Texas	9946584	14234629
Indiana - Monroe	22020	95780	Utah	712245	1379315
Indiana - Montgomery	22809	54271	Vermont	706330	654515
Indiana - Morgan	17122	35645	Virginia	8070139	6329918
Indiana - Newton	0	8510	Washington	9222508	5930181
Indiana - Noble	6897	24614	West Virginia	430660	1234355
Indiana - Ohio	0	1947	Wisconsin	13855649	11203648
Indiana - Orange	18793	11178	Wyoming	26029	259171
Indiana - Owen	5600	9993			

Table F-10 Productions and Attractions - Chemical and Allied Prod., STCC 28 (Annual Tons)

Alabama	9213043	9595872
Arizona	3661791	6289644
Arkansas	5113494	5534295
California	31803750	67211192
Colorado	1448153	5960497
Connecticut	1578298	7933264
Delaware	4127945	2810400
District of Columbia	0	884052
Florida	39716528	23194242
Georgia	15238730	13904308
Idaho	3186172	2152108
Illinois - north	23754910	24808326
Illinois - south	5938136	7410004
Indiana - Adams	21434	58892
Indiana - Allen	188785	542964
Indiana - Bartholomew	0	86598
Indiana - Benton	0	11755
Indiana - Blackford	0	17611
Indiana - Boone	0	58981
Indiana - Brown	0	21220
Indiana - Carroll	0	24788
Indiana - Cass	0	54509
Indiana - Clark	237173	264533
Indiana - Clay	0	34588
Indiana - Clinton	49578	72261
Indiana - Crawford	0	16073
Indiana - Daviess	0	42207
Indiana - Dearborn	0	49189
Indiana - Decatur	16494	46998
Indiana - DeKalb	30506	79474
Indiana - Delaware	0	151803
Indiana - Dubois	0	57326
Indiana - Elkhart	1039212	890388
Indiana - Fayette	0	30939
Indiana - Floyd	26305	117024
Indiana - Fountain	0	22944
Indiana - Franklin	324787	180816
Indiana - Fulton	0	24705
Indiana - Gibson	0	41725
Indiana - Grant	0	92887
Indiana - Greene	0	47982
Indiana - Hamilton	36879	246195
Indiana - Hancock	0	76160
Indiana - Harrison	0	47511
Indiana - Hendricks	0	134401
Indiana - Henry	0	56783
Indiana - Howard	0	101870
Indiana - Huntington	92741	107187
Indiana - Jackson	100539	120586
Indiana - Jasper	0	36034
Indiana - Jay	0	25330
Indiana - Jefferson	17032	57777
Indiana - Jennings	0	37047
Indiana - Johnson	0	157752
Indiana - Knox	12271	53281
Indiana - Kosciusko	42667	132635
Indiana - Lagrange	0	45996
Indiana - Lake	2987877	1990108
Indiana - LaPorte	62287	181387
Indiana - Lawrence	0	64902
Indiana - Madison	0	161685
Indiana - Marion	3800047	3275400
Indiana - Marshall	0	62952
Indiana - Martin	0	12939
Indiana - Miami	0	46478
Indiana - Monroe	0	174582
Indiana - Montgomery	16010	60824
Indiana - Morgan	112161	163876
Indiana - Newton	0	18393
Indiana - Noble	50346	92222
Indiana - Ohio	0	7484
Indiana - Orange	0	27921
Indiana - Owen	0	28801
Indiana - Parke	0	21911
Indiana - Perry	0	21087
Indiana - Pike	0	16801
Indiana - Porter	51004	221220
Indiana - Posey	1244759	702420
Indiana - Pulaski	0	18047
Indiana - Putnam	0	46938
Indiana - Randolph	0	32688
Indiana - Ripley	0	36417
Indiana - Rush	0	21928
Indiana - St Joseph	108550	365869
Indiana - Scott	0	30235
Indiana - Shelby	0	62909
Indiana - Spencer	0	28923
Indiana - Starke	0	33337
Indiana - Steuben	0	52380
Indiana - Sullivan	0	23990
Indiana - Switzerland	0	9382
Indiana - Tippecanoe	464573	483207
Indiana - Tipton	0	18305
Indiana - Union	0	9119
Indiana - Vanderburgh	551589	537175
Indiana - Vermillion	0	22721
Indiana - Vigo	583780	475274
Indiana - Wabash	105651	94000
Indiana - Warren	0	11201
Indiana - Warrick	0	64211
Indiana - Washington	0	35726
Indiana - Wayne	17571	100130
Indiana - Wells	0	39451
Indiana - White	0	34662
Indiana - Whitley	0	52674
Iowa	8595448	5173499
Kansas	8546940	7907944
Kentucky - west	2678610	2998183
Kentucky - east	6251666	6087091
Louisiana	74275792	20404940
Maine	1102679	2101471
Maryland	7291638	9836401
Massachusetts	3754075	12410492
Michigan - west	3891319	5662998
Michigan - east	9079349	14560490
Minnesota	6162931	9298373
Mississippi	8453472	6466875
Missouri	8257073	11756420
Montana	842390	1972766
Nebraska	4829542	2793521
Nevada	1555818	2021293
New Hampshire	703963	1869380
New Jersey	16194700	26527900
New Mexico	741824	3114228
New York	14651897	34735452
North Carolina	17343520	16142924
North Dakota	809262	1337683
Ohio - north	9861399	13203819
Ohio - central	9861399	7509171
Ohio - south	9861399	6397247
Oklahoma	9492261	8070407
Oregon	4060507	5148182
Pennsylvania	19099288	30399586
Rhode Island	761937	1879929
South Carolina	14746548	11644595
South Dakota	1528606	1122472
Tennessee	13015626	14874867
Texas	114178080	60953196
Utah	5656551	3861136
Vermont	143158	881942
Virginia	7977854	14125849
Washington	5484997	11347098
West Virginia	9571531	5287435
Wisconsin	6206707	9026196
Wyoming	0	1867270

Table F-11 Productions and Attractions - Petroleum and Coal Prod., STCC 29 (Annual Tons)

Alabama	35540080	33764992	Indiana - Parke	0	63260
Arizona	12912694	18115210	Indiana - Perry	0	63951
Arkansas	9081715	20735444	Indiana - Pike	0	49067
California	243428048	270937920	Indiana - Porter	0	571557
Colorado	7885570	21259954	Indiana - Posey	9760427	3693772
Connecticut	9709958	19157296	Indiana - Pulaski	0	52707
Delaware	0	9838592	Indiana - Putnam	0	139527
District of Columbia	0	2638720	Indiana - Randolph	0	96088
Florida	49932868	66982372	Indiana - Ripley	0	107915
Georgia	0	39941264	Indiana - Rush	0	68041
Idaho	2033803	4933160	Indiana - St Joseph	0	900061
Illinois - north	83934872	90654608	Indiana - Scott	0	92239
Illinois - south	20984014	27078080	Indiana - Shelby	0	186998
Indiana - Adams	0	138544	Indiana - Spencer	0	90149
Indiana - Allen	1545912	1901819	Indiana - Starke	0	98119
Indiana - Bartholomew	0	264657	Indiana - Steuben	0	156993
Indiana - Benton	0	38624	Indiana - Sullivan	0	72754
Indiana - Blackford	0	50148	Indiana - Switzerland	0	30827
Indiana - Boone	0	178870	Indiana - Tippecanoe	0	581144
Indiana - Brown	0	60423	Indiana - Tipton	0	54673
Indiana - Carroll	0	73084	Indiana - Union	0	25966
Indiana - Cass	0	165309	Indiana - Vanderburgh	0	578935
Indiana - Clark	0	348905	Indiana - Vermillion	0	72388
Indiana - Clay	0	102496	Indiana - Vigo	1235518	829758
Indiana - Clinton	0	124049	Indiana - Wabash	1322434	617654
Indiana - Crawford	0	47778	Indiana - Warren	0	30668
Indiana - Daviess	0	126505	Indiana - Warrick	0	190542
Indiana - Dearborn	0	145647	Indiana - Washington	0	110037
Indiana - Decatur	0	107841	Indiana - Wayne	0	264348
Indiana - DeKalb	0	179508	Indiana - Wells	0	117613
Indiana - Delaware	0	456157	Indiana - White	0	104387
Indiana - Dubois	0	173270	Indiana - Whitley	0	157872
Indiana - Elkhart	0	725760	Iowa	11395920	13690385
Indiana - Fayette	0	92236	Kansas	35170940	40620584
Indiana - Floyd	0	304057	Kentucky - west	13523190	10312267
Indiana - Fountain	0	69100	Kentucky - east	31554110	20934158
Indiana - Franklin	4072937	1571354	Louisiana	159883616	111574904
Indiana - Fulton	0	72841	Maine	5113494	6957257
Indiana - Gibson	0	124620	Maryland	23630680	29548124
Indiana - Grant	0	279242	Massachusetts	17259518	42348924
Indiana - Greene	0	142628	Michigan - west	20672852	15601261
Indiana - Hamilton	0	674037	Michigan - east	48237444	40119176
Indiana - Hancock	0	231380	Minnesota	16798096	35440188
Indiana - Harrison	0	145687	Mississippi	33645884	28071644
Indiana - Hendricks	0	401929	Missouri	14464962	33265900
Indiana - Henry	0	171478	Montana	12516345	10610337
Indiana - Howard	0	308312	Nebraska	4113748	7414758
Indiana - Huntington	0	148391	Nevada	4048675	6844037
Indiana - Jackson	0	170471	New Hampshire	0	5875891
Indiana - Jasper	0	109103	New Jersey	75815048	70011584
Indiana - Jay	0	73974	New Mexico	18355098	13048034
Indiana - Jefferson	0	141731	New York	46736048	94390872
Indiana - Jennings	0	114106	North Carolina	37318324	33866660
Indiana - Johnson	0	477964	North Dakota	9881512	6250209
Indiana - Knox	0	136757	Ohio - north	31715014	45412796
Indiana - Kosciusko	0	319037	Ohio - central	31715014	25830348
Indiana - Lagrange	0	138523	Ohio - south	31715014	22008592
Indiana - Lake	32749264	13537036	Oklahoma	46697004	42737108
Indiana - LaPorte	0	429322	Oregon	26783724	17768616
Indiana - Lawrence	0	198521	Pennsylvania	88928872	119571936
Indiana - Madison	0	489417	Rhode Island	0	4914674
Indiana - Marion	9974657	6711564	South Carolina	17649952	18628166
Indiana - Marshall	0	187802	South Dakota	2126087	3581450
Indiana - Martin	0	40485	Tennessee	23586904	30428468
Indiana - Miami	0	140485	Texas	456508832	305915968
Indiana - Monroe	0	529646	Utah	13756267	16386870
Indiana - Montgomery	0	154629	Vermont	512296	2539365
Indiana - Morgan	0	281252	Virginia	35957724	33834312
Indiana - Newton	0	55954	Washington	47985436	42984340
Indiana - Noble	0	183864	West Virginia	46396488	11254998
Indiana - Ohio	0	20491	Wisconsin	26670142	24483260
Indiana - Orange	0	82323	Wyoming	16303548	12213902
Indiana - Owen	0	86738			

Table F-12 Productions and Attractions - Stone, Clay and Glass, STCC 32 (Annual Tons)

Alabama	20082470	15373339
Arizona	15948609	13943716
Arkansas	6924867	8944607
California	92146992	113222192
Colorado	13687645	12532372
Connecticut	7586238	12504954
Delaware	2880925	2534152
District of Columbia	0	2309591
Florida	44800448	49222104
Georgia	37877944	24645648
Idaho	3310401	3830605
Illinois - north	33277930	33487114
Illinois - south	8319779	10002135
Indiana - Adams	151395	122823
Indiana - Allen	1440656	1169268
Indiana - Bartholomew	284224	230544
Indiana - Benton	40799	33949
Indiana - Blackford	55689	44682
Indiana - Boone	192445	155816
Indiana - Brown	67100	53837
Indiana - Carroll	79408	64893
Indiana - Cass	179472	145299
Indiana - Clark	376748	305874
Indiana - Clay	111409	90649
Indiana - Clinton	134050	108765
Indiana - Crawford	51354	41204
Indiana - Daviess	135345	109971
Indiana - Dearborn	157363	127390
Indiana - Decatur	117368	95555
Indiana - DeKalb	195366	158292
Indiana - Delaware	492559	399795
Indiana - Dubois	187452	151823
Indiana - Elkhart	782286	634654
Indiana - Fayette	99419	80834
Indiana - Floyd	329147	266935
Indiana - Fountain	75206	61525
Indiana - Franklin	83969	68575
Indiana - Fulton	79143	64677
Indiana - Gibson	134566	109144
Indiana - Grant	300589	243436
Indiana - Greene	155069	125833
Indiana - Hamilton	727055	588938
Indiana - Hancock	248203	202191
Indiana - Harrison	157559	127888
Indiana - Hendricks	434537	353455
Indiana - Henry	184456	149065
Indiana - Howard	332821	270483
Indiana - Huntington	159090	128899
Indiana - Jackson	184302	149233
Indiana - Jasper	117702	95749
Indiana - Jay	80746	65832
Indiana - Jefferson	153279	124415
Indiana - Jennings	121426	98861
Indiana - Johnson	515024	418119
Indiana - Knox	147671	119516
Indiana - Kosciusko	343400	278464
Indiana - Lagrange	150761	122387
Indiana - Lake	1652937	1340773
Indiana - LaPorte	464787	376549
Indiana - Lawrence	212292	173106
Indiana - Madison	528192	428301
Indiana - Marion	3294856	2673606
Indiana - Marshall	204241	165219
Indiana - Martin	42766	34315
Indiana - Miami	151982	124246
Indiana - Monroe	571306	464236
Indiana - Montgomery	165853	134418
Indiana - Morgan	303697	246702
Indiana - Newton	61470	49320
Indiana - Noble	198780	160957
Indiana - Ohio	21646	17367
Indiana - Orange	87789	71767
Indiana - Owen	92551	74259
Indiana - Parke	67593	55466
Indiana - Perry	68805	56210
Indiana - Pike	51831	41587
Indiana - Porter	616174	499713
Indiana - Posey	125784	102270
Indiana - Pulaski	55675	45912
Indiana - Putnam	149972	121716
Indiana - Randolph	103490	84101
Indiana - Ripley	117297	95441
Indiana - Rush	73284	59931
Indiana - St Joseph	970524	787465
Indiana - Scott	99934	81519
Indiana - Shelby	200997	162663
Indiana - Spencer	96085	78471
Indiana - Starke	106056	85095
Indiana - Steuben	167963	136473
Indiana - Sullivan	78277	62806
Indiana - Switzerland	31841	26708
Indiana - Tippecanoe	625523	508572
Indiana - Tipton	59037	48398
Indiana - Union	28133	22573
Indiana - Vanderburgh	626011	507566
Indiana - Vermillion	76466	62631
Indiana - Vigo	406375	329258
Indiana - Wabash	143566	116333
Indiana - Warren	34555	27726
Indiana - Warrick	206067	167906
Indiana - Washington	117096	95335
Indiana - Wayne	285444	232349
Indiana - Wells	126774	103075
Indiana - White	111938	91156
Indiana - Whitley	171041	138952
Iowa	18030920	10564846
Kansas	10461246	9427674
Kentucky - west	8000334	4627016
Kentucky - east	18667444	9393729
Louisiana	15444595	16054857
Maine	2376911	4671406
Maryland	11470457	18189500
Massachusetts	5638804	22888320
Michigan - west	10185577	9863743
Michigan - east	23765556	25362418
Minnesota	15816098	16644984
Mississippi	6984024	9789324
Missouri	43271840	19467672
Montana	3445278	3039417
Nebraska	10956978	6003109
Nevada	11987486	4573486
New Hampshire	4245075	4219671
New Jersey	11140363	29408446
New Mexico	5505110	5764186
New York	34017388	68443016
North Carolina	25178214	25220108
North Dakota	1611425	2431011
Ohio - north	13986977	20096966
Ohio - central	13986977	11430453
Ohio - south	13986977	9739711
Oklahoma	15016301	11968357
Oregon	9171633	10812908
Pennsylvania	45445256	45204796
Rhode Island	2101241	3816243
South Carolina	15282506	13266114
South Dakota	4401248	2647739
Tennessee	25549718	18555064
Texas	76191280	64626772
Utah	13008528	6555374
Vermont	1864614	2142476
Virginia	35876088	23538506
Washington	15547527	18515896
West Virginia	6293076	6821715
Wisconsin	17137656	18611206
Wyoming	3887770	1727297

Table F-13 Productions and Attractions - Primary Metal Products, STCC 33 (Annual Tons)

Alabama	12537642	7738746	Indiana - Parke	0	0
Arizona	3724497	2498969	Indiana - Perry	0	0
Arkansas	5707426	3650872	Indiana - Pike	0	7508
California	13893509	23642630	Indiana - Porter	3795105	1572074
Colorado	1043522	2768383	Indiana - Posey	0	8746
Connecticut	2392292	6669577	Indiana - Pulaski	83309	125005
Delaware	968985	462458	Indiana - Putnam	0	103378
District of Columbia	0	14850	Indiana - Randolph	90532	69190
Florida	3867656	4957634	Indiana - Ripley	0	51692
Georgia	4812978	5093401	Indiana - Rush	75918	29397
Idaho	233077	290627	Indiana - St Joseph	778334	561557
Illinois - north	21557834	17554310	Indiana - Scott	0	0
Illinois - south	5389163	5244019	Indiana - Shelby	199124	131020
Indiana - Adams	90616	85529	Indiana - Spencer	92428	35791
Indiana - Allen	1330728	740881	Indiana - Starke	0	0
Indiana - Bartholomew	390437	309801	Indiana - Steuben	259601	313216
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	0	37186	Indiana - Switzerland	0	7548
Indiana - Boone	0	25090	Indiana - Tippecanoe	890194	403412
Indiana - Brown	0	0	Indiana - Tipton	0	38484
Indiana - Carroll	0	55596	Indiana - Union	0	0
Indiana - Cass	46452	153877	Indiana - Vanderburgh	75568	181745
Indiana - Clark	69521	192197	Indiana - Vermillion	0	39461
Indiana - Clay	0	8182	Indiana - Vigo	248000	131583
Indiana - Clinton	0	21600	Indiana - Wabash	255237	190875
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	1462864	597701
Indiana - Dearborn	0	0	Indiana - Washington	0	51635
Indiana - Decatur	0	171014	Indiana - Wayne	490261	258876
Indiana - DeKalb	570912	491922	Indiana - Wells	91055	114591
Indiana - Delaware	251234	325730	Indiana - White	0	71878
Indiana - Dubois	0	34582	Indiana - Whitley	245698	142154
Indiana - Elkhart	443255	770572	Iowa	2457364	3911800
Indiana - Fayette	0	57030	Kansas	823459	1652545
Indiana - Floyd	0	62291	Kentucky - west	2320121	1974992
Indiana - Fountain	434248	178789	Kentucky - east	5414009	4009384
Indiana - Franklin	0	0	Louisiana	2975575	2411994
Indiana - Fulton	78951	116555	Maine	156174	515491
Indiana - Gibson	0	0	Maryland	5435305	3387823
Indiana - Grant	302660	538379	Massachusetts	1276599	7163855
Indiana - Greene	94923	45946	Michigan - west	7348429	6130750
Indiana - Hamilton	257776	226400	Michigan - east	17144754	15763876
Indiana - Hancock	34021	59282	Minnesota	2815852	5948312
Indiana - Harrison	0	26274	Mississippi	1368883	2494727
Indiana - Hendricks	0	20789	Missouri	5709792	7191434
Indiana - Henry	100078	46711	Montana	353757	443365
Indiana - Howard	764336	325892	Nebraska	1257668	1325854
Indiana - Huntington	72816	105736	Nevada	202315	487914
Indiana - Jackson	133588	132261	New Hampshire	196399	1512534
Indiana - Jasper	29353	51149	New Jersey	4831908	7592372
Indiana - Jay	0	66218	New Mexico	718161	390330
Indiana - Jefferson	0	34854	New York	5099296	12216952
Indiana - Jennings	0	30264	North Carolina	2994506	5908006
Indiana - Johnson	36409	79304	North Dakota	60339	106067
Indiana - Knox	147567	97097	Ohio - north	16097683	16039654
Indiana - Kosciusko	426384	342916	Ohio - central	16097683	9123998
Indiana - Lagrange	0	32372	Ohio - south	16097683	7772687
Indiana - Lake	9356570	3894947	Oklahoma	2560296	3474799
Indiana - LaPorte	907501	647128	Oregon	3619199	3858766
Indiana - Lawrence	756193	366773	Pennsylvania	29881162	25602774
Indiana - Madison	75472	126032	Rhode Island	995013	2199858
Indiana - Marion	1499034	1791522	South Carolina	3019351	3538439
Indiana - Marshall	240484	141865	South Dakota	88735	256685
Indiana - Martin	0	0	Tennessee	7311751	7369628
Indiana - Miami	77237	61685	Texas	18865026	16024805
Indiana - Monroe	0	28464	Utah	4983349	2329260
Indiana - Montgomery	385043	227144	Vermont	36677	636410
Indiana - Morgan	0	27052	Virginia	2189976	3625416
Indiana - Newton	84905	32877	Washington	4020280	4435778
Indiana - Noble	504290	349498	West Virginia	4489983	3345395
Indiana - Ohio	0	0	Wisconsin	4589367	11334462
Indiana - Orange	89228	34551	Wyoming	24845	86976
Indiana - Owen	99711	38611			

Table F-14 Productions and Attractions - Fabricated Metal Products, STCC 34 (Annual Tons)

Alabama	1642186	1731557	Indiana - Parke	0	0
Arizona	511113	689774	Indiana - Perry	0	0
Arkansas	1080199	1220839	Indiana - Pike	3296	3600
California	6959178	9856244	Indiana - Porter	218056	37283
Colorado	629426	1206597	Indiana - Posey	3840	4193
Connecticut	688583	2569867	Indiana - Pulaski	49571	52215
Delaware	39043	150570	Indiana - Putnam	51307	58201
District of Columbia	0	8138	Indiana - Randolph	21264	18249
Florida	2515338	2311455	Indiana - Ripley	24586	28922
Georgia	2734217	1493492	Indiana - Rush	3227	0
Idaho	97017	144465	Indiana - St Joseph	162281	143179
Illinois - north	5496828	5851890	Indiana - Scott	0	0
Illinois - south	1373615	1747836	Indiana - Shelby	35703	28167
Indiana - Adams	28885	27345	Indiana - Spencer	3929	0
Indiana - Allen	169294	120514	Indiana - Starke	0	0
Indiana - Bartholomew	96010	87396	Indiana - Steuben	114391	116979
Indiana - Benton	0	0	Indiana - Sullivan	0	0
Indiana - Blackford	17103	20381	Indiana - Switzerland	3314	3619
Indiana - Boone	12016	13125	Indiana - Tippecanoe	68560	29125
Indiana - Brown	0	0	Indiana - Tipton	19099	20863
Indiana - Carroll	26934	31260	Indiana - Union	0	0
Indiana - Cass	68483	76828	Indiana - Vanderburgh	78287	85516
Indiana - Clark	83529	93104	Indiana - Vermillion	20060	21911
Indiana - Clay	3593	3924	Indiana - Vigo	28884	18267
Indiana - Clinton	10345	11300	Indiana - Wabash	56952	51546
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	80461	9986
Indiana - Dearborn	0	0	Indiana - Washington	25627	27993
Indiana - Decatur	82985	97124	Indiana - Wayne	55249	36210
Indiana - DeKalb	157866	150890	Indiana - Wells	42570	44387
Indiana - Delaware	122577	128541	Indiana - White	36338	41783
Indiana - Dubois	16195	19902	Indiana - Whitley	34265	24062
Indiana - Elkhart	312436	336943	Iowa	1700160	1296124
Indiana - Fayette	27315	31494	Kansas	625877	716225
Indiana - Floyd	30386	35405	Kentucky - west	486267	514787
Indiana - Fountain	25321	3687	Kentucky - east	1135806	1043817
Indiana - Franklin	0	0	Louisiana	1295529	1019400
Indiana - Fulton	45299	47650	Maine	221246	209576
Indiana - Gibson	0	0	Maryland	1645735	722330
Indiana - Grant	220287	237119	Massachusetts	977266	2537311
Indiana - Greene	8070	4406	Michigan - west	4112565	2140537
Indiana - Hamilton	74218	72384	Michigan - east	9597560	5505985
Indiana - Hancock	23858	26060	Minnesota	1493112	2602423
Indiana - Harrison	12583	13745	Mississippi	1037606	893247
Indiana - Hendricks	9128	12461	Missouri	2078762	2734680
Indiana - Henry	7595	3318	Montana	89918	54937
Indiana - Howard	47420	12503	Nebraska	996197	512753
Indiana - Huntington	41066	42907	Nevada	216513	140397
Indiana - Jackson	46454	46515	New Hampshire	345475	439502
Indiana - Jasper	20585	22485	New Jersey	3030000	2775375
Indiana - Jay	32798	37457	New Mexico	95833	71215
Indiana - Jefferson	16322	20058	New York	2546099	4384848
Indiana - Jennings	14310	17863	North Carolina	2335502	2140537
Indiana - Johnson	32496	35498	North Dakota	92284	59006
Indiana - Knox	26460	20874	Ohio - north	3381389	4624947
Indiana - Kosciusko	106640	98215	Ohio - central	3381389	2630909
Indiana - Lagrange	16242	17742	Ohio - south	3381389	2242276
Indiana - Lake	543780	101010	Oklahoma	926392	1332749
Indiana - LaPorte	184242	161757	Oregon	695681	832206
Indiana - Lawrence	69152	38849	Pennsylvania	5379698	6295462
Indiana - Madison	51322	54311	Rhode Island	151441	598211
Indiana - Marion	658458	678017	South Carolina	1657566	118014
Indiana - Marshall	34496	25120	South Dakota	145525	103771
Indiana - Martin	0	0	Tennessee	2781542	2531206
Indiana - Miami	18055	17928	Texas	5893177	5764397
Indiana - Monroe	12496	15926	Utah	1012760	604315
Indiana - Montgomery	55615	41897	Vermont	94650	274689
Indiana - Morgan	12956	14151	Virginia	1205611	1184214
Indiana - Newton	3608	0	Washington	1180765	1007193
Indiana - Noble	98119	84376	West Virginia	1070734	423224
Indiana - Ohio	0	0	Wisconsin	2634834	3878201
Indiana - Orange	3793	0	Wyoming	53241	30520
Indiana - Owen	4238	0			

Table F-15 Productions and Attractions - Basic Textiles, STCC 22 (Annual Tons)

Alabama	538325	553274	Indiana - Parke	1440	2047
Arizona	334826	321115	Indiana - Perry	2346	3336
Arkansas	424745	358001	Indiana - Pike	0	0
California	2432519	4400154	Indiana - Porter	20197	22086
Colorado	488633	574969	Indiana - Posey	0	0
Connecticut	388067	961177	Indiana - Pulaski	0	0
Delaware	24845	39054	Indiana - Putnam	0	0
District of Columbia	0	2168	Indiana - Randolph	11201	12384
Florida	911011	616195	Indiana - Ripley	0	0
Georgia	1157102	659588	Indiana - Rush	7931	9396
Idaho	69805	136691	Indiana - St Joseph	47307	50891
Illinois - north	3167243	2332429	Indiana - Scott	0	0
Illinois - south	791515	696474	Indiana - Shelby	9751	11552
Indiana - Adams	9467	11214	Indiana - Spencer	3219	4575
Indiana - Allen	113781	124077	Indiana - Starke	3014	4285
Indiana - Bartholomew	122374	134613	Indiana - Steuben	5983	8504
Indiana - Benton	1417	2014	Indiana - Sullivan	0	0
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	13128	13996	Indiana - Tippecanoe	49935	55457
Indiana - Brown	0	0	Indiana - Tipton	2408	1711
Indiana - Carroll	4137	3921	Indiana - Union	0	0
Indiana - Cass	4550	4311	Indiana - Vanderburgh	19739	21043
Indiana - Clark	11174	11914	Indiana - Vermillion	0	0
Indiana - Clay	1472	2092	Indiana - Vigo	7474	8854
Indiana - Clinton	4238	4016	Indiana - Wabash	9333	9477
Indiana - Crawford	0	0	Indiana - Warren	1350	1919
Indiana - Daviess	6428	6852	Indiana - Warrick	1498	2129
Indiana - Dearborn	3953	3746	Indiana - Washington	8076	9184
Indiana - Decatur	17808	20712	Indiana - Wayne	18109	20226
Indiana - DeKalb	12575	12769	Indiana - Wells	6342	6761
Indiana - Delaware	18749	20941	Indiana - White	10970	11138
Indiana - Dubois	1659	2357	Indiana - Whitley	4011	5700
Indiana - Elkhart	42397	46360	Iowa	1256486	852692
Indiana - Fayette	60927	67166	Kansas	557254	453467
Indiana - Floyd	6639	7078	Kentucky - west	378602	197442
Indiana - Fountain	0	0	Kentucky - east	882615	401394
Indiana - Franklin	0	0	Louisiana	354939	225648
Indiana - Fulton	8248	9771	Maine	91101	80278
Indiana - Gibson	2744	1950	Maryland	415279	284231
Indiana - Grant	2635	3745	Massachusetts	349024	1256255
Indiana - Greene	0	0	Michigan - west	638891	720340
Indiana - Hamilton	10859	12349	Michigan - east	1491928	1850754
Indiana - Hancock	23103	25263	Minnesota	1273049	1327857
Indiana - Harrison	0	0	Mississippi	605763	301589
Indiana - Hendricks	3739	2657	Missouri	952421	663928
Indiana - Henry	2489	3538	Montana	29578	17357
Indiana - Howard	4019	5713	Nebraska	614046	247345
Indiana - Huntington	4389	4159	Nevada	98200	52072
Indiana - Jackson	4758	4508	New Hampshire	84002	321115
Indiana - Jasper	0	0	New Jersey	464970	893916
Indiana - Jay	4886	5210	New Mexico	123046	58581
Indiana - Jefferson	21733	23765	New York	984365	2119797
Indiana - Jennings	6700	7142	North Carolina	1488379	1282293
Indiana - Johnson	13314	13518	North Dakota	233077	75939
Indiana - Knox	0	0	Ohio - north	965435	1505772
Indiana - Kosciusko	11993	14613	Ohio - central	965435	857032
Indiana - Lagrange	8318	9460	Ohio - south	965435	729019
Indiana - Lake	29403	32152	Oklahoma	519395	572800
Indiana - LaPorte	21164	22062	Oregon	328910	347152
Indiana - Lawrence	9714	9205	Pennsylvania	1824389	2017821
Indiana - Madison	7885	9340	Rhode Island	0	119333
Indiana - Marion	156075	170227	South Carolina	571452	707322
Indiana - Marshall	10992	11161	South Dakota	225978	114993
Indiana - Martin	0	0	Tennessee	1507310	876558
Indiana - Miami	0	0	Texas	3268991	2299883
Indiana - Monroe	39252	43668	Utah	207048	182254
Indiana - Montgomery	15713	17869	Vermont	52058	93297
Indiana - Morgan	7077	7545	Virginia	543058	499030
Indiana - Newton	1478	2101	Washington	668469	438280
Indiana - Noble	18816	21885	West Virginia	199950	104145
Indiana - Ohio	0	0	Wisconsin	2065747	2076404
Indiana - Orange	0	0	Wyoming	52058	28206
Indiana - Owen	0	0			

Table F-16 Productions and Attractions - Electrical Machinery, STCC 36 (Annual Tons)

Alabama	673202	614608	Indiana - Parke	3020	2266
Arizona	386884	412940	Indiana - Perry	2459	1846
Arkansas	925209	391333	Indiana - Pike	0	2125
California	3013436	4045374	Indiana - Porter	107466	17107
Colorado	169188	465758	Indiana - Posey	0	2474
Connecticut	189301	689033	Indiana - Pulaski	12162	9127
Delaware	57974	79226	Indiana - Putnam	13557	12717
District of Columbia	0	50416	Indiana - Randolph	5217	5873
Florida	978450	1435687	Indiana - Ripley	6497	7312
Georgia	1315642	773062	Indiana - Rush	2770	2080
Idaho	23663	105636	Indiana - St Joseph	53599	40223
Illinois - north	1739203	1678170	Indiana - Scott	0	2457
Illinois - south	434209	501770	Indiana - Shelby	13627	7668
Indiana - Adams	13229	7445	Indiana - Spencer	3373	2532
Indiana - Allen	98008	44129	Indiana - Starke	0	2371
Indiana - Bartholomew	30536	18332	Indiana - Steuben	33441	21959
Indiana - Benton	0	0	Indiana - Sullivan	0	2099
Indiana - Blackford	2670	4007	Indiana - Switzerland	0	2136
Indiana - Boone	3440	5162	Indiana - Tippecanoe	32708	14727
Indiana - Brown	0	0	Indiana - Tipton	5047	3787
Indiana - Carroll	5782	6508	Indiana - Union	0	0
Indiana - Cass	31789	16698	Indiana - Vanderburgh	46542	25225
Indiana - Clark	17567	21971	Indiana - Vermillion	3132	4701
Indiana - Clay	0	2315	Indiana - Vigo	15666	9797
Indiana - Clinton	2961	4444	Indiana - Wabash	19563	10486
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	2527	Indiana - Warrick	40829	4713
Indiana - Dearborn	0	2073	Indiana - Washington	6771	7622
Indiana - Decatur	16967	17826	Indiana - Wayne	21689	10173
Indiana - DeKalb	45190	28260	Indiana - Wells	16617	9974
Indiana - Delaware	39298	29490	Indiana - White	9854	9860
Indiana - Dubois	10431	5217	Indiana - Whitley	12610	6309
Indiana - Elkhart	88863	69253	Iowa	672018	439348
Indiana - Fayette	10425	7823	Kansas	951238	319308
Indiana - Floyd	10437	10443	Kentucky - west	373869	182462
Indiana - Fountain	14497	2176	Kentucky - east	871968	372126
Indiana - Franklin	0	2212	Louisiana	255556	511373
Indiana - Fulton	14408	8649	Maine	91101	134445
Indiana - Gibson	11503	2158	Maryland	330094	508972
Indiana - Grant	63517	43521	Massachusetts	483901	907508
Indiana - Greene	6929	2600	Michigan - west	170371	561790
Indiana - Hamilton	22762	23914	Michigan - east	398715	1445291
Indiana - Hancock	3726	8386	Minnesota	616411	782665
Indiana - Harrison	3602	5406	Mississippi	666103	355321
Indiana - Hendricks	3918	8822	Missouri	1449336	86429
Indiana - Henry	2609	3915	Montana	15380	74425
Indiana - Howard	120760	8429	Nebraska	212964	213672
Indiana - Huntington	36798	9204	Nevada	84002	120040
Indiana - Jackson	19946	9978	New Hampshire	62706	163255
Indiana - Jasper	6428	4824	New Jersey	1546353	1085168
Indiana - Jay	7682	7685	New Mexico	29578	134445
Indiana - Jefferson	17521	5259	New York	858953	2187142
Indiana - Jennings	3511	5269	North Carolina	1158286	893103
Indiana - Johnson	15946	14959	North Dakota	21296	62421
Indiana - Knox	7574	5683	Ohio - north	1168933	1188403
Indiana - Kosciusko	28731	21559	Ohio - central	1168933	677029
Indiana - Lagrange	6974	5234	Ohio - south	1168933	576196
Indiana - Lake	260742	46250	Oklahoma	519395	475361
Indiana - LaPorte	53230	35509	Oregon	190484	367325
Indiana - Lawrence	27147	10185	Pennsylvania	1471816	2002279
Indiana - Madison	93655	18604	Rhode Island	65072	180061
Indiana - Marion	174850	169312	South Carolina	1048254	480162
Indiana - Marshall	16457	7409	South Dakota	35494	74425
Indiana - Martin	0	0	Tennessee	1908390	813876
Indiana - Miami	8457	6346	Texas	1590129	2331192
Indiana - Monroe	46503	13422	Utah	75721	240081
Indiana - Montgomery	23056	9886	Vermont	14198	91230
Indiana - Morgan	11126	8349	Virginia	431843	698637
Indiana - Newton	6197	0	Washington	275669	561790
Indiana - Noble	35855	16144	West Virginia	183385	216073
Indiana - Ohio	0	0	Wisconsin	1205611	1034751
Indiana - Orange	6513	2444	Wyoming	0	43213
Indiana - Owen	3640	2731			

Table F-17 Productions and Attractions - Transportation Equipment, STCC 37 (Annual Tons)

Alabama	1462350	1469984	Indiana - Parke	0	0
Arizona	309981	1989506	Indiana - Perry	14727	9202
Arkansas	662554	691897	Indiana - Pike	0	0
California	8358822	17405186	Indiana - Porter	0	0
Colorado	0	1132415	Indiana - Posey	0	0
Connecticut	189301	4764280	Indiana - Pulaski	0	0
Delaware	362038	486004	Indiana - Putnam	0	0
District of Columbia	0	4788	Indiana - Randolph	66944	39042
Florida	2063381	2611974	Indiana - Ripley	0	0
Georgia	2993322	2468328	Indiana - Rush	0	0
Idaho	119496	100552	Indiana - St Joseph	298027	176489
Illinois - north	4104283	1951200	Indiana - Scott	0	0
Illinois - south	1025775	584163	Indiana - Shelby	43713	25494
Indiana - Adams	155603	91575	Indiana - Spencer	0	0
Indiana - Allen	561724	332499	Indiana - Starke	0	0
Indiana - Bartholomew	54854	31992	Indiana - Steuben	214548	128256
Indiana - Benton	0	0	Indiana - Sullivan	16755	10470
Indiana - Blackford	0	0	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	419694	247221
Indiana - Brown	0	0	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	19035	11894	Indiana - Vanderburgh	15483	9675
Indiana - Clark	50089	30673	Indiana - Vermillion	0	0
Indiana - Clay	87088	50791	Indiana - Vigo	33503	19539
Indiana - Clinton	17732	11079	Indiana - Wabash	4781	4183
Indiana - Crawford	0	0	Indiana - Warren	0	0
Indiana - Daviess	0	0	Indiana - Warrick	0	0
Indiana - Dearborn	0	0	Indiana - Washington	0	0
Indiana - Decatur	20320	12697	Indiana - Wayne	69576	40577
Indiana - DeKalb	48320	28181	Indiana - Wells	5686	4974
Indiana - Delaware	360176	212163	Indiana - White	84297	49163
Indiana - Dubois	68405	39029	Indiana - Whitley	53937	31456
Indiana - Elkhart	1382928	815930	Iowa	940589	584163
Indiana - Fayette	0	0	Kansas	470886	3035733
Indiana - Floyd	35715	20829	Kentucky - west	1228090	450093
Indiana - Fountain	0	0	Kentucky - east	2864361	914550
Indiana - Franklin	0	0	Louisiana	908645	1654329
Indiana - Fulton	0	0	Maine	60339	943279
Indiana - Gibson	0	0	Maryland	2695173	663168
Indiana - Grant	61422	35133	Massachusetts	377419	1067773
Indiana - Greene	0	0	Michigan - west	5540603	3227261
Indiana - Hamilton	38943	23846	Michigan - east	12928075	828362
Indiana - Hancock	31866	19513	Minnesota	981999	486004
Indiana - Harrison	21568	13477	Mississippi	803347	1462802
Indiana - Hendricks	6704	5865	Missouri	2968477	3732418
Indiana - Henry	131678	78099	Montana	42592	16758
Indiana - Howard	240238	142913	Nebraska	380968	371087
Indiana - Huntington	89187	52780	Nevada	54424	52670
Indiana - Jackson	85312	49755	New Hampshire	62706	167587
Indiana - Jasper	19245	12025	New Jersey	1832671	598528
Indiana - Jay	0	0	New Mexico	0	263352
Indiana - Jefferson	20982	13111	New York	2780358	2784351
Indiana - Jennings	21023	13136	North Carolina	1474181	1297608
Indiana - Johnson	204613	119334	North Dakota	73354	79005
Indiana - Knox	0	0	Ohio - north	4107832	4002954
Indiana - Kosciusko	116738	69874	Ohio - central	4107832	2276799
Indiana - Lagrange	80541	46972	Ohio - south	4107832	1939229
Indiana - Lake	91247	53217	Oklahoma	1212710	1041437
Indiana - LaPorte	177083	104016	Oregon	0	725415
Indiana - Lawrence	150945	88880	Pennsylvania	2948363	2920815
Indiana - Madison	35346	20614	Rhode Island	0	126887
Indiana - Marion	1688724	998266	South Carolina	746555	761327
Indiana - Marshall	42234	24631	South Dakota	65072	74216
Indiana - Martin	0	0	Tennessee	3570690	2331863
Indiana - Miami	0	0	Texas	2288176	5202402
Indiana - Monroe	21419	13384	Utah	215330	936097
Indiana - Montgomery	19722	12323	Vermont	36677	193922
Indiana - Morgan	22207	13876	Virginia	1276599	2913632
Indiana - Newton	0	0	Washington	2265696	7189515
Indiana - Noble	134954	77813	West Virginia	299332	90976
Indiana - Ohio	0	0	Wisconsin	2838332	1381402
Indiana - Orange	0	0	Wyoming	0	11970
Indiana - Owen	0	0			

Table F-18 Productions and Attractions - Waste and Scrap, STCC 40 (Annual Tons)

Alabama	2994181	4102184	Indiana - Parke	15917	6198
Arizona	603756	258273	Indiana - Perry	12802	12634
Arkansas	1194095	3178662	Indiana - Pike	10688	1653
California	13766747	13148456	Indiana - Porter	115542	118935
Colorado	2058360	1826920	Indiana - Posey	26356	30764
Connecticut	504248	1094587	Indiana - Pulaski	12229	12517
Delaware	1179560	421511	Indiana - Putnam	29500	23028
District of Columbia	0	0	Indiana - Randolph	21485	24810
Florida	11573101	4088767	Indiana - Ripley	26471	60522
Georgia	4098830	5201243	Indiana - Rush	15209	9564
Idaho	154293	488595	Indiana - St Joseph	184050	175824
Illinois - north	4306790	4409094	Indiana - Scott	19122	22971
Illinois - south	4306790	4409094	Indiana - Shelby	40162	65281
Indiana - Adams	32696	370790	Indiana - Spencer	20979	20111
Indiana - Allen	277111	383455	Indiana - Starke	21989	11898
Indiana - Bartholomew	52773	153967	Indiana - Steuben	35530	85650
Indiana - Benton	9433	4838	Indiana - Sullivan	15327	5231
Indiana - Blackford	11712	14789	Indiana - Switzerland	6369	5515
Indiana - Boone	34877	14711	Indiana - Tippecanoe	130466	164349
Indiana - Brown	12072	834	Indiana - Tipton	11311	6704
Indiana - Carroll	16531	15332	Indiana - Union	5629	441
Indiana - Cass	39484	64737	Indiana - Vanderburgh	120780	158733
Indiana - Clark	58850	48484	Indiana - Vermillion	17150	21682
Indiana - Clay	25279	19561	Indiana - Vigo	84834	75558
Indiana - Clinton	29126	41545	Indiana - Wabash	30056	52957
Indiana - Crawford	11770	2284	Indiana - Warren	7521	1619
Indiana - Daviess	30018	23036	Indiana - Warrick	38461	42414
Indiana - Dearborn	26624	15991	Indiana - Washington	25447	29976
Indiana - Decatur	25751	48629	Indiana - Wayne	57922	60565
Indiana - DeKalb	45036	119666	Indiana - Wells	27276	35389
Indiana - Delaware	94766	89388	Indiana - White	25557	46625
Indiana - Dubois	39497	134387	Indiana - Whitley	35832	46459
Indiana - Elkhart	165360	641633	Iowa	6892877	2430676
Indiana - Fayette	19327	42753	Kansas	1148254	958183
Indiana - Floyd	63132	62734	Kentucky - west	842463	1565292
Indiana - Fountain	15639	16875	Kentucky - east	842463	1565292
Indiana - Franklin	18124	5545	Louisiana	1190740	1551876
Indiana - Fulton	16689	26201	Maine	315295	573568
Indiana - Gibson	28129	24731	Maryland	3501783	1238817
Indiana - Grant	60956	87604	Massachusetts	1454604	1927546
Indiana - Greene	33154	21021	Michigan - west	4201692	1485910
Indiana - Hamilton	116544	75928	Michigan - east	1668714	1084524
Indiana - Hancock	49488	33494	Minnesota	1668714	1084524
Indiana - Harrison	32059	22591	Mississippi	676430	1304783
Indiana - Hendricks	82395	16295	Missouri	2324459	2720255
Indiana - Henry	35001	24867	Montana	86091	644006
Indiana - Howard	66184	163235	Nebraska	383497	1230991
Indiana - Huntington	34787	77203	Nevada	287343	209078
Indiana - Jackson	36752	55387	New Hampshire	147585	418157
Indiana - Jasper	24201	12580	New Jersey	4698114	4896011
Indiana - Jay	15612	26725	New Mexico	773702	279517
Indiana - Jefferson	31995	44036	New York	5790464	6389747
Indiana - Jennings	25760	22538	North Carolina	2189173	1861580
Indiana - Johnson	95974	66615	North Dakota	193425	444990
Indiana - Knox	26821	14944	Ohio - north	4265422	3687382
Indiana - Kosciusko	72236	169684	Ohio - central	4265422	3687382
Indiana - Lagrange	32611	46665	Ohio - south	4265422	3687382
Indiana - Lake	305229	284318	Oklahoma	629471	1529514
Indiana - LaPorte	96638	122672	Oregon	1371867	3136175
Indiana - Lawrence	44574	56938	Pennsylvania	7280846	9386164
Indiana - Madison	98449	114420	Rhode Island	1768780	627235
Indiana - Marion	619998	720916	South Carolina	1200803	2446329
Indiana - Marshall	42175	79157	South Dakota	176654	985016
Indiana - Martin	9077	5741	Tennessee	1994630	3215558
Indiana - Miami	34012	22792	Texas	8927757	10574668
Indiana - Monroe	109973	92389	Utah	802771	1406527
Indiana - Montgomery	39298	101724	Vermont	2174638	764757
Indiana - Morgan	60792	30872	Virginia	1760954	2095256
Indiana - Newton	13104	12578	Washington	2612920	4118955
Indiana - Noble	44150	112679	West Virginia	622763	1086760
Indiana - Ohio	4289	88	Wisconsin	3780181	6440060
Indiana - Orange	18600	29354	Wyoming	589221	209078
Indiana - Owen	18904	12770			

Table F-19 Productions and Attractions - Other Manufactured Goods (Annual Tons)

Alabama	1374799	2154170	Indiana - Parke	3023	2831
Arizona	457872	630663	Indiana - Perry	4679	4384
Arkansas	1450518	1427203	Indiana - Pike	0	0
California	8855737	10657892	Indiana - Porter	0	0
Colorado	1109777	577309	Indiana - Posey	154379	145284
Connecticut	701597	898768	Indiana - Pulaski	0	0
Delaware	195217	381590	Indiana - Putnam	4695	4393
District of Columbia	0	9256	Indiana - Randolph	16005	15065
Florida	2340233	1722819	Indiana - Ripley	3965	3722
Georgia	3671256	2116405	Indiana - Rush	0	0
Idaho	63890	603078	Indiana - St Joseph	35067	33002
Illinois - north	4062873	2806977	Indiana - Scott	2882	2728
Illinois - south	1015126	838454	Indiana - Shelby	9851	9265
Indiana - Adams	35238	33148	Indiana - Spencer	9829	9252
Indiana - Allen	96487	90783	Indiana - Starke	0	0
Indiana - Bartholomew	8964	8411	Indiana - Steuben	16730	15772
Indiana - Benton	2974	2784	Indiana - Sullivan	4616	4339
Indiana - Blackford	2408	2255	Indiana - Switzerland	0	0
Indiana - Boone	0	0	Indiana - Tippecanoe	32512	30587
Indiana - Brown	3043	2867	Indiana - Tipton	0	0
Indiana - Carroll	0	0	Indiana - Union	0	0
Indiana - Cass	6712	6328	Indiana - Vanderburgh	10947	10294
Indiana - Clark	44908	42288	Indiana - Vermillion	0	0
Indiana - Clay	6682	6284	Indiana - Vigo	25954	24416
Indiana - Clinton	7587	7128	Indiana - Wabash	27901	26264
Indiana - Crawford	6049	5681	Indiana - Warren	2833	2653
Indiana - Daviess	7740	7289	Indiana - Warrick	9151	8614
Indiana - Dearborn	8049	7576	Indiana - Washington	12360	11637
Indiana - Decatur	1567	1492	Indiana - Wayne	5396	5082
Indiana - DeKalb	22649	21312	Indiana - Wells	511	500
Indiana - Delaware	33241	31252	Indiana - White	6536	6157
Indiana - Dubois	117863	110900	Indiana - Whitley	30458	28653
Indiana - Elkhart	428991	403681	Iowa	985548	491889
Indiana - Fayette	0	0	Kansas	1499028	1725114
Indiana - Floyd	45639	42964	Kentucky - west	236626	420874
Indiana - Fountain	0	0	Kentucky - east	553705	854484
Indiana - Franklin	64409	60595	Louisiana	753655	4564229
Indiana - Fulton	9568	9004	Maine	318263	728041
Indiana - Gibson	0	0	Maryland	359672	641364
Indiana - Grant	4736	4475	Massachusetts	2141468	976004
Indiana - Greene	0	0	Michigan - west	1004479	766326
Indiana - Hamilton	10112	9484	Michigan - east	2343784	1970523
Indiana - Hancock	6062	5690	Minnesota	2269246	1483741
Indiana - Harrison	16873	15883	Mississippi	1354685	1956527
Indiana - Hendricks	603	588	Missouri	2225469	1418909
Indiana - Henry	13225	12440	Montana	44959	621888
Indiana - Howard	18620	17519	Nebraska	554889	171984
Indiana - Huntington	6979	6565	Nevada	280402	123406
Indiana - Jackson	27707	26085	New Hampshire	214146	251036
Indiana - Jasper	12404	11680	New Jersey	5571365	1752181
Indiana - Jay	2562	2399	New Mexico	91101	420911
Indiana - Jefferson	1618	1541	New York	5799710	1674240
Indiana - Jennings	6949	6541	North Carolina	3648777	2123550
Indiana - Johnson	74913	70453	North Dakota	89918	190942
Indiana - Knox	2527	2366	Ohio - north	1896559	1884992
Indiana - Kosciusko	31037	29178	Ohio - central	1896559	1072161
Indiana - Lagrange	63841	60053	Ohio - south	1896559	913467
Indiana - Lake	529540	498312	Oklahoma	1293162	1473856
Indiana - LaPorte	18404	17319	Oregon	227161	2952748
Indiana - Lawrence	15111	14216	Pennsylvania	5807992	4482477
Indiana - Madison	5481	5164	Rhode Island	218879	96415
Indiana - Marion	323801	304692	South Carolina	1173666	905321
Indiana - Marshall	28772	27084	South Dakota	106482	122038
Indiana - Martin	8167	7686	Tennessee	2980308	1505624
Indiana - Miami	6912	6492	Texas	4250990	11316214
Indiana - Monroe	4641	4346	Utah	401082	612742
Indiana - Montgomery	1521	1449	Vermont	75721	177354
Indiana - Morgan	15129	14249	Virginia	1499028	1707305
Indiana - Newton	0	0	Washington	1185498	3422127
Indiana - Noble	15257	14358	West Virginia	208231	466008
Indiana - Ohio	0	0	Wisconsin	2313022	1491074
Indiana - Orange	14324	13492	Wyoming	0	485040
Indiana - Owen	3882	3664			

Table F-20 Productions and Attractions - U.S. Mail, (Daily Tons)

Alabama	240	240	Indiana - Parke	1	1
Arizona	217	217	Indiana - Perry	1	1
Arkansas	140	140	Indiana - Pike	1	1
California	1772	1772	Indiana - Porter	8	8
Colorado	195	195	Indiana - Posey	1	1
Connecticut	195	195	Indiana - Pulaski	1	1
Delaware	39	39	Indiana - Putnam	1	1
District of Columbia	35	35	Indiana - Randolph	1	1
Florida	770	770	Indiana - Ripley	1	1
Georgia	385	385	Indiana - Rush	1	1
Idaho	59	59	Indiana - St Joseph	12	12
Illinois - north	524	524	Indiana - Scott	1	1
Illinois - south	156	156	Indiana - Shelby	1	1
Indiana - Adams	1	1	Indiana - Spencer	1	1
Indiana - Allen	18	18	Indiana - Starke	1	1
Indiana - Bartholomew	4	4	Indiana - Steuben	1	1
Indiana - Benton	1	1	Indiana - Sullivan	1	1
Indiana - Blackford	1	1	Indiana - Switzerland	1	1
Indiana - Boone	1	1	Indiana - Tippecanoe	7	7
Indiana - Brown	1	1	Indiana - Tipton	1	1
Indiana - Carroll	1	1	Indiana - Union	1	1
Indiana - Cass	1	1	Indiana - Vanderburgh	7	7
Indiana - Clark	5	5	Indiana - Vermillion	1	1
Indiana - Clay	1	1	Indiana - Vigo	5	5
Indiana - Clinton	1	1	Indiana - Wabash	1	1
Indiana - Crawford	1	1	Indiana - Warren	1	1
Indiana - Daviess	1	1	Indiana - Warrick	3	3
Indiana - Dearborn	1	1	Indiana - Washington	1	1
Indiana - Decatur	1	1	Indiana - Wayne	3	3
Indiana - DeKalb	1	1	Indiana - Wells	1	1
Indiana - Delaware	5	5	Indiana - White	1	1
Indiana - Dubois	1	1	Indiana - Whitley	2	2
Indiana - Elkhart	9	9	Iowa	165	165
Indiana - Fayette	1	1	Kansas	147	147
Indiana - Floyd	4	4	Kentucky - west	71	71
Indiana - Fountain	1	1	Kentucky - east	146	146
Indiana - Franklin	1	1	Louisiana	251	251
Indiana - Fulton	1	1	Maine	72	72
Indiana - Gibson	1	1	Maryland	284	284
Indiana - Grant	3	3	Massachusetts	357	357
Indiana - Greene	1	1	Michigan - west	154	154
Indiana - Hamilton	10	10	Michigan - east	396	396
Indiana - Hancock	3	3	Minnesota	260	260
Indiana - Harrison	1	1	Mississippi	152	152
Indiana - Hendricks	5	5	Missouri	304	304
Indiana - Henry	2	2	Montana	47	47
Indiana - Howard	3	3	Nebraska	94	94
Indiana - Huntington	1	1	Nevada	71	71
Indiana - Jackson	1	1	New Hampshire	65	65
Indiana - Jasper	1	1	New Jersey	460	460
Indiana - Jay	1	1	New Mexico	90	90
Indiana - Jefferson	1	1	New York	1071	1071
Indiana - Jennings	1	1	North Carolina	394	394
Indiana - Johnson	6	6	North Dakota	37	37
Indiana - Knox	1	1	Ohio - north	314	314
Indiana - Kosciusko	4	4	Ohio - central	151	151
Indiana - Lagrange	1	1	Ohio - south	179	179
Indiana - Lake	21	21	Oklahoma	186	186
Indiana - LaPorte	5	5	Oregon	169	169
Indiana - Lawrence	2	2	Pennsylvania	707	707
Indiana - Madison	7	7	Rhode Island	59	59
Indiana - Marion	42	42	South Carolina	207	207
Indiana - Marshall	2	2	South Dakota	41	41
Indiana - Martin	1	1	Tennessee	290	290
Indiana - Miami	1	1	Texas	1011	1011
Indiana - Monroe	7	7	Utah	102	102
Indiana - Montgomery	1	1	Vermont	32	32
Indiana - Morgan	3	3	Virginia	367	367
Indiana - Newton	1	1	Washington	289	289
Indiana - Noble	1	1	West Virginia	106	106
Indiana - Ohio	1	1	Wisconsin	291	291
Indiana - Orange	1	1	Wyoming	26	26
Indiana - Owen	1	1			

Table F-21 Productions and Attractions - Express Mail, Non- U.S. (Daily Tons)

Alabama	57	57	Indiana - Parke	1	1
Arizona	51	51	Indiana - Perry	1	1
Arkansas	32	32	Indiana - Pike	1	1
California	424	424	Indiana - Porter	1	1
Colorado	46	46	Indiana - Posey	1	1
Connecticut	46	46	Indiana - Pulaski	1	1
Delaware	9	9	Indiana - Putnam	1	1
District of Columbia	7	7	Indiana - Randolph	1	1
Florida	184	184	Indiana - Ripley	1	1
Georgia	91	91	Indiana - Rush	1	1
Idaho	14	14	Indiana - St Joseph	2	2
Illinois - north	125	125	Indiana - Scott	1	1
Illinois - south	36	36	Indiana - Shelby	1	1
Indiana - Adams	1	1	Indiana - Spencer	1	1
Indiana - Allen	4	4	Indiana - Starke	1	1
Indiana - Bartholomew	1	1	Indiana - Steuben	1	1
Indiana - Benton	1	1	Indiana - Sullivan	1	1
Indiana - Blackford	1	1	Indiana - Switzerland	1	1
Indiana - Boone	1	1	Indiana - Tippecanoe	1	1
Indiana - Brown	1	1	Indiana - Tipton	1	1
Indiana - Carroll	1	1	Indiana - Union	1	1
Indiana - Cass	1	1	Indiana - Vanderburgh	1	1
Indiana - Clark	1	1	Indiana - Vermillion	1	1
Indiana - Clay	1	1	Indiana - Vigo	1	1
Indiana - Clinton	1	1	Indiana - Wabash	1	1
Indiana - Crawford	1	1	Indiana - Warren	1	1
Indiana - Daviess	1	1	Indiana - Warrick	1	1
Indiana - Dearborn	1	1	Indiana - Washington	1	1
Indiana - Decatur	1	1	Indiana - Wayne	1	1
Indiana - DeKalb	1	1	Indiana - Wells	1	1
Indiana - Delaware	1	1	Indiana - White	1	1
Indiana - Dubois	1	1	Indiana - Whitley	2	2
Indiana - Elkhart	1	1	Iowa	39	39
Indiana - Fayette	1	1	Kansas	35	35
Indiana - Floyd	1	1	Kentucky - west	16	16
Indiana - Fountain	1	1	Kentucky - east	35	35
Indiana - Franklin	1	1	Louisiana	60	60
Indiana - Fulton	1	1	Maine	17	17
Indiana - Gibson	1	1	Maryland	67	67
Indiana - Grant	1	1	Massachusetts	85	85
Indiana - Greene	1	1	Michigan - west	36	36
Indiana - Hamilton	2	2	Michigan - east	95	95
Indiana - Hancock	1	1	Minnesota	61	61
Indiana - Harrison	1	1	Mississippi	36	36
Indiana - Hendricks	2	2	Missouri	72	72
Indiana - Henry	1	1	Montana	11	11
Indiana - Howard	1	1	Nebraska	22	22
Indiana - Huntington	1	1	Nevada	16	16
Indiana - Jackson	1	1	New Hampshire	15	15
Indiana - Jasper	1	1	New Jersey	110	110
Indiana - Jay	1	1	New Mexico	21	21
Indiana - Jefferson	1	1	New York	256	256
Indiana - Jennings	1	1	North Carolina	94	94
Indiana - Johnson	2	2	North Dakota	9	9
Indiana - Knox	1	1	Ohio - north	75	75
Indiana - Kosciusko	1	1	Ohio - central	36	36
Indiana - Lagrange	1	1	Ohio - south	42	42
Indiana - Lake	5	5	Oklahoma	44	44
Indiana - LaPorte	1	1	Oregon	40	40
Indiana - Lawrence	1	1	Pennsylvania	169	169
Indiana - Madison	1	1	Rhode Island	14	14
Indiana - Marion	10	10	South Carolina	49	49
Indiana - Marshall	1	1	South Dakota	9	9
Indiana - Martin	1	1	Tennessee	69	69
Indiana - Miami	1	1	Texas	241	241
Indiana - Monroe	1	1	Utah	24	24
Indiana - Montgomery	1	1	Vermont	7	7
Indiana - Morgan	1	1	Virginia	87	87
Indiana - Newton	1	1	Washington	69	69
Indiana - Noble	1	1	West Virginia	25	25
Indiana - Ohio	1	1	Wisconsin	69	69
Indiana - Orange	1	1	Wyoming	6	6
Indiana - Owen	1	1			

Appendix G - Beta, A and B Gravity Model Parameters, 1993 Model

This appendix begins with the table G-1 giving the 21 beta parameters of the gravity models obtained based on the analysis of the 21 sets of commodity flows examined here. Tables G-2 through G-22 give the A and B parameters of the gravity model. There is a body of research that has attempted to interpret these values, and the reader should feel free to undertake such an exercise. However, the relative magnitude of the flows may influence the values, which creates some difficulties in terms of comparing different commodities.

Some of the values here are quite large and this is due to the model trying to constrain the movement to very small average shipping distances. This is perhaps most notable for non-metallic minerals, STCC 14.

The reader will note that the mail and express mail parameters are the same. This is because each set of productions and attractions was generated using a linear function of population.

Table G-1 Beta Values for Fully-constrained Gravity Models

STCC	Commodity	Beta
01	Farm Products	-.0033
11	Coal	-.0030
14	Non-metallic Minerals	-.0471
20	Food or Kindred Products	-.0048
22	Textile Mill Products	-.0061
23	Apparel or Other Finished Textile Products	-.0033
24	Lumber or Wood Products	-.0186
25	Furniture or Fixtures	-.0017
26	Pulp, Paper, or Allied Products	-.0054
28	Chemicals or Allied Products	-.0082
29	Petroleum and Coal Products	-.0392
32	Clay, Concrete, Stone, or Glass Products	-.0116
33	Primary Metal Products	-.0035
34	Fabricated Metal Products	-.0039
35	Machinery, except electrical	-.0023
36	Electrical Machinery, Equipment, Supplies	-.0023
37	Transportation Equipment	-.0061
40	Waste or Scrap Materials	-.0116
(50)	Miscellaneous Products of Manufacturing	-.0036
(60)	U.S. Mail	-.0010
(70)	Express or Overnight Mail	-.0010

Table G-2 Farm Products - A and B Gravity Model Parameters

Alabama	2.36628	2.81882
Arizona	5.67154	10.32797
Arkansas	2.07292	2.03109
California	2.31724	10.62838
Colorado	3.98869	2.99937
Connecticut	3.26486	6.87427
Delaware	2.65575	4.60121
District of Columbia	2.51815	3.93646
Florida	4.52539	7.51827
Georgia	2.63721	3.19806
Idaho	2.32225	7.25818
Illinois - north	2.53595	1.48256
Illinois - south	2.27601	1.46191
Indiana - Adams	2.48216	1.68533
Indiana - Allen	2.50136	1.66617
Indiana - Bartholomew	2.33481	1.63281
Indiana - Benton	2.37697	1.45471
Indiana - Blackford	2.43408	1.62941
Indiana - Boone	2.35774	1.53394
Indiana - Brown	2.32745	1.60729
Indiana - Carroll	2.38810	1.50470
Indiana - Cass	2.40922	1.52446
Indiana - Clark	2.33648	1.76620
Indiana - Clay	2.31808	1.52521
Indiana - Clinton	2.37135	1.52492
Indiana - Crawford	2.31184	1.70362
Indiana - Daviess	2.29669	1.59554
Indiana - Dearborn	2.36254	1.75119
Indiana - Decatur	2.35148	1.66575
Indiana - DeKalb	2.54384	1.68445
Indiana - Delaware	2.40154	1.63312
Indiana - Dubois	2.29943	1.64146
Indiana - Elkhart	2.54087	1.59157
Indiana - Fayette	2.37215	1.68040
Indiana - Floyd	2.33323	1.75346
Indiana - Fountain	2.34707	1.48072
Indiana - Franklin	2.36699	1.70638
Indiana - Fulton	2.44406	1.54090
Indiana - Gibson	2.28332	1.60319
Indiana - Grant	2.41715	1.59645
Indiana - Greene	2.30875	1.57229
Indiana - Hamilton	2.37178	1.57590
Indiana - Hancock	2.36281	1.60767
Indiana - Harrison	2.32457	1.74138
Indiana - Hendricks	2.34069	1.72873
Indiana - Henry	2.38373	1.64103
Indiana - Howard	2.39766	1.55224
Indiana - Huntington	2.46207	1.61824
Indiana - Jackson	2.32752	1.65615
Indiana - Jasper	2.40135	1.46347
Indiana - Jay	2.44043	1.67934
Indiana - Jefferson	2.34491	1.73681
Indiana - Jennings	2.33852	1.67752
Indiana - Johnson	2.33999	1.60065
Indiana - Knox	2.29006	1.57077
Indiana - Kosciusko	2.48398	1.58209
Indiana - Lagrange	2.57017	1.65809
Indiana - Lake	2.44388	1.44531
Indiana - LaPorte	2.48464	1.50457
Indiana - Lawrence	2.31465	1.62405
Indiana - Madison	2.38448	1.60406
Indiana - Marion	2.35176	1.57638
Indiana - Marshall	2.47145	1.53952
Indiana - Martin	2.30525	1.62190
Indiana - Miami	2.41841	1.54884
Indiana - Monroe	2.32016	1.58888
Indiana - Montgomery	2.34864	1.50456
Indiana - Morgan	2.32911	1.57619
Indiana - Newton	2.39329	1.44479
Indiana - Noble	2.54885	1.66721
Indiana - Ohio	2.35944	1.77120
Indiana - Orange	2.31201	1.65839
Indiana - Owen	2.31825	1.56023
Indiana - Parke	2.32985	1.49939
Indiana - Perry	2.30563	1.72315
Indiana - Pike	2.29220	1.60647
Indiana - Porter	2.44796	1.46830
Indiana - Posey	2.27268	1.63968
Indiana - Pulaski	2.43106	1.50578
Indiana - Putnam	2.32859	1.53695
Indiana - Randolph	2.41658	1.68321
Indiana - Ripley	2.34989	1.71251
Indiana - Rush	2.36166	1.65084
Indiana - St Joseph	2.52244	1.55852
Indiana - Scott	2.33195	1.70137
Indiana - Shelby	2.34965	1.62435
Indiana - Spencer	2.29373	1.70047
Indiana - Starke	2.46402	1.50817
Indiana - Steuben	2.59491	1.71851
Indiana - Sullivan	2.30055	1.53874
Indiana - Switzerland	2.35542	1.77142
Indiana - Tippecanoe	2.36865	1.49263
Indiana - Tipton	2.38305	1.55782
Indiana - Union	2.38027	1.70793
Indiana - Vanderburgh	2.28346	1.66024
Indiana - Vermillion	2.32788	1.48741
Indiana - Vigo	2.31279	1.50791
Indiana - Wabash	2.43721	1.57596
Indiana - Warren	2.35759	1.46674
Indiana - Warrick	2.29010	1.66598
Indiana - Washington	2.32364	1.68577
Indiana - Wayne	2.39279	1.70022
Indiana - Wells	2.47246	1.66105
Indiana - White	2.39408	1.48607
Indiana - Whitley	2.49531	1.62464
Iowa	2.66358	1.36477
Kansas	2.56075	1.68918
Kentucky - west	2.32511	1.93184
Kentucky - east	2.40453	1.98466
Louisiana	2.01447	3.16845
Maine	5.68476	13.86410
Maryland	2.55249	4.08544
Massachusetts	3.74067	8.78723
Michigan - west	2.86561	1.78691
Michigan - east	2.84389	2.11621
Minnesota	3.52740	1.66135
Mississippi	1.94602	2.65390
Missouri	2.33322	1.42366
Montana	4.46081	4.71928
Nebraska	3.17819	1.69058
Nevada	1.82012	8.05130
New Hampshire	3.74745	8.42342
New Jersey	2.92468	5.47774
New Mexico	4.77567	5.00066
New York	3.17906	4.69366
North Carolina	2.92684	4.23261
North Dakota	4.81181	2.16607
Ohio - north	2.70971	2.31901
Ohio - central	2.49200	2.01402
Ohio - south	2.39204	1.81783
Oklahoma	2.31833	1.93529
Oregon	1.55613	8.55844
Pennsylvania	2.59839	3.94427
Rhode Island	3.56676	8.24093
South Carolina	3.00577	4.10333
South Dakota	4.46052	2.62894
Tennessee	2.33383	2.09120
Texas	2.58290	2.72052
Utah	3.43482	5.96219
Vermont	3.93315	7.83809
Virginia	2.72067	4.14424
Washington	1.60961	8.95133
West Virginia	2.52523	2.52636
Wisconsin	2.79334	1.57666
Wyoming	3.91091	2.76256

Table G-3 Coal - A and B Gravity Model Parameters

Alabama	1.79330	2.63338	Indiana - Parke	1.53670	1.88047
Arizona	12.90958	3.83921	Indiana - Perry	1.44036	1.74873
Arkansas	1.94709	2.65837	Indiana - Pike	1.47206	1.80160
California	12.72328	7.23923	Indiana - Porter	1.66687	2.05885
Colorado	5.05319	0.99135	Indiana - Posey	1.50120	1.84728
Connecticut	2.75017	4.24822	Indiana - Pulaski	1.61850	2.00578
Delaware	1.90380	2.52831	Indiana - Putnam	1.50547	1.84317
District of Columbia	1.68531	2.12183	Indiana - Randolph	1.50160	1.84840
Florida	3.53632	6.21892	Indiana - Ripley	1.43053	1.72095
Georgia	1.78102	2.51806	Indiana - Rush	1.46474	1.78528
Idaho	9.90514	3.75604	Indiana - St Joseph	1.67252	2.09949
Illinois - north	1.75220	2.15687	Indiana - Scott	1.42910	1.72020
Illinois - south	1.66433	2.00443	Indiana - Shelby	1.46681	1.78839
Indiana - Adams	1.56451	1.95546	Indiana - Spencer	1.45576	1.77853
Indiana - Allen	1.59175	1.99925	Indiana - Starke	1.65000	2.05130
Indiana - Bartholomew	1.45421	1.76659	Indiana - Steuben	1.65662	2.11094
Indiana - Benton	1.61053	1.97196	Indiana - Sullivan	1.50236	1.83791
Indiana - Blackford	1.54324	1.91530	Indiana - Switzerland	1.41532	1.68666
Indiana - Boone	1.52712	1.87740	Indiana - Tippecanoe	1.56904	1.92766
Indiana - Brown	1.46289	1.78190	Indiana - Tipton	1.53394	1.89190
Indiana - Carroll	1.57689	1.94368	Indiana - Union	1.45697	1.76977
Indiana - Cass	1.58296	1.96014	Indiana - Vanderburgh	1.47885	1.81478
Indiana - Clark	1.41829	1.69759	Indiana - Vermillion	1.54631	1.89004
Indiana - Clay	1.51061	1.84817	Indiana - Vigo	1.52412	1.86268
Indiana - Clinton	1.54527	1.90280	Indiana - Wabash	1.57627	1.96122
Indiana - Crawford	1.43649	1.74032	Indiana - Warren	1.58404	1.93848
Indiana - Daviess	1.47258	1.80079	Indiana - Warrick	1.46447	1.79262
Indiana - Dearborn	1.42574	1.71024	Indiana - Washington	1.43430	1.73192
Indiana - Decatur	1.45006	1.75847	Indiana - Wayne	1.47186	1.79647
Indiana - DeKalb	1.62395	2.05350	Indiana - Wells	1.56612	1.95566
Indiana - Delaware	1.50939	1.86087	Indiana - White	1.59795	1.96866
Indiana - Dubois	1.45583	1.77548	Indiana - Whitley	1.60654	2.01715
Indiana - Elkhart	1.66917	2.10446	Iowa	2.31892	2.20217
Indiana - Fayette	1.46090	1.77748	Kansas	2.49893	2.02263
Indiana - Floyd	1.42039	1.70314	Kentucky - west	1.46212	1.81299
Indiana - Fountain	1.56347	1.91448	Kentucky - east	1.42341	1.68267
Indiana - Franklin	1.44609	1.75033	Louisiana	2.46771	4.23087
Indiana - Fulton	1.60588	1.99772	Maine	5.23660	9.00569
Indiana - Gibson	1.48665	1.82207	Maryland	1.73532	2.21700
Indiana - Grant	1.54412	1.91347	Massachusetts	3.33865	5.43552
Indiana - Greene	1.47883	1.80689	Michigan - west	1.88366	2.42080
Indiana - Hamilton	1.51155	1.86050	Michigan - east	1.78029	2.32998
Indiana - Hancock	1.48628	1.82146	Minnesota	3.13604	2.78019
Indiana - Harrison	1.42556	1.71572	Mississippi	2.03479	3.25506
Indiana - Hendricks	1.42284	1.70550	Missouri	1.90091	2.12971
Indiana - Henry	1.48832	1.82533	Montana	8.94016	2.16975
Indiana - Howard	1.55152	1.91790	Nebraska	3.23597	1.56247
Indiana - Huntington	1.57689	1.96816	Nevada	10.72569	5.47488
Indiana - Jackson	1.44330	1.74800	New Hampshire	3.33306	5.51259
Indiana - Jasper	1.62413	1.99624	New Jersey	2.24377	3.18658
Indiana - Jay	1.52617	1.89028	New Mexico	6.78185	2.08585
Indiana - Jefferson	1.42149	1.70169	New York	2.35707	3.43186
Indiana - Jennings	1.43769	1.73593	North Carolina	1.83134	2.33437
Indiana - Johnson	1.47223	1.79803	North Dakota	4.84436	2.93928
Indiana - Knox	1.49081	1.82545	Ohio - north	1.67228	2.14799
Indiana - Kosciusko	1.61927	2.02821	Ohio - central	1.48880	1.79526
Indiana - Lagrange	1.66095	2.10709	Ohio - south	1.43123	1.70256
Indiana - Lake	1.68278	2.06824	Oklahoma	2.44047	2.33659
Indiana - LaPorte	1.67398	2.08338	Oregon	8.80347	7.06583
Indiana - Lawrence	1.45469	1.76924	Pennsylvania	1.81529	2.38310
Indiana - Madison	1.50727	1.85571	Rhode Island	3.14095	4.99311
Indiana - Marion	1.49360	1.83108	South Carolina	1.94078	2.65516
Indiana - Marshall	1.63472	2.04018	South Dakota	5.53865	1.41199
Indiana - Martin	1.45761	1.77609	Tennessee	1.51161	1.91049
Indiana - Miami	1.57447	1.95237	Texas	2.83464	3.28312
Indiana - Monroe	1.46974	1.79330	Utah	9.01208	2.07455
Indiana - Montgomery	1.54257	1.89236	Vermont	3.38133	5.55934
Indiana - Morgan	1.48006	1.80851	Virginia	1.75671	2.20748
Indiana - Newton	1.63445	2.00154	Washington	9.03364	7.50102
Indiana - Noble	1.63660	2.07109	West Virginia	1.48491	1.72712
Indiana - Ohio	1.41695	1.69071	Wisconsin	1.98263	2.41189
Indiana - Orange	1.44361	1.75177	Wyoming	5.17224	1.14516
Indiana - Owen	1.48599	1.81728			

Table G-4 Non-metallic Minerals - A and B Gravity Model Parameters

Alabama	1164.14648	6.37968	Indiana - Parke	221.42593	5.37264
Arizona	134.16437	2202.74683	Indiana - Perry	344.62241	3.37883
Arkansas	3260.78687	6.24294	Indiana - Pike	250.87457	4.48272
California	3143.41699	43.67733	Indiana - Porter	88.81427	0.78204
Colorado	19241.59570	6.75659	Indiana - Posey	306.28238	4.62867
Connecticut	5921.39014	0.03199	Indiana - Pulaski	184.70018	2.21237
Delaware	60.82970	2.18805	Indiana - Putnam	171.12645	4.24376
District of Columbia	73.68474	1.94260	Indiana - Randolph	149.41678	3.40028
Florida	39215.45310	0.08896	Indiana - Ripley	68.99680	1.50645
Georgia	1153.87500	6.15966	Indiana - Rush	103.01817	2.41265
Idaho	1579.24280	141.03288	Indiana - St Joseph	130.95413	1.32367
Illinois - north	259.24686	2.29316	Indiana - Scott	152.43080	3.09661
Illinois - south	114.45456	10.81126	Indiana - Shelby	103.79153	2.51364
Indiana - Adams	130.45703	2.43835	Indiana - Spencer	296.27963	3.05238
Indiana - Allen	128.59848	2.17535	Indiana - Starke	144.51015	1.44031
Indiana - Bartholomew	120.53191	2.84634	Indiana - Steuben	210.88033	2.51830
Indiana - Benton	280.24899	3.54160	Indiana - Sullivan	289.65399	7.21468
Indiana - Blackford	141.17255	2.84569	Indiana - Switzerland	61.97967	1.27688
Indiana - Boone	131.23265	3.04419	Indiana - Tippecanoe	177.64671	3.36344
Indiana - Brown	132.75645	3.18410	Indiana - Tipton	124.99259	2.75064
Indiana - Carroll	170.15936	2.96599	Indiana - Union	71.93488	1.63253
Indiana - Cass	168.17911	2.78982	Indiana - Vanderburgh	228.65718	2.98492
Indiana - Clark	179.72211	3.02848	Indiana - Vermillion	255.80826	6.20049
Indiana - Clay	201.91238	5.12659	Indiana - Vigo	232.16049	6.10250
Indiana - Clinton	143.30305	3.03663	Indiana - Wabash	148.40642	2.58887
Indiana - Crawford	290.40671	4.12453	Indiana - Warren	277.02655	4.89995
Indiana - Daviess	252.93575	4.90461	Indiana - Warrick	242.51889	3.10277
Indiana - Dearborn	30.16530	0.66251	Indiana - Washington	192.78336	3.76015
Indiana - Decatur	95.16615	2.17846	Indiana - Wayne	101.00484	2.32858
Indiana - DeKalb	153.13783	2.23887	Indiana - Wells	118.43766	2.19976
Indiana - Delaware	129.51151	2.94434	Indiana - White	203.20274	2.91532
Indiana - Dubois	234.24193	3.90081	Indiana - Whitley	138.71271	2.13598
Indiana - Elkhart	135.42863	1.43453	Iowa	135.05600	118.13480
Indiana - Fayette	87.97456	2.01309	Kansas	629.98743	72.43173
Indiana - Floyd	183.95006	3.11210	Kentucky - west	164.31528	0.61037
Indiana - Fountain	236.33223	4.91249	Kentucky - east	243.73088	4.61222
Indiana - Franklin	58.67677	1.31467	Louisiana	1477.11609	6.13883
Indiana - Fulton	169.88507	2.37668	Maine	6647.10645	5.08287
Indiana - Gibson	279.65823	4.86659	Maryland	43.55501	1.58297
Indiana - Grant	136.57529	2.78463	Massachusetts	35959.03910	0.00883
Indiana - Greene	223.08250	5.16602	Michigan - west	457.80759	3.49916
Indiana - Hamilton	106.53799	2.54003	Michigan - east	417.84470	3.82397
Indiana - Hancock	99.87840	2.44412	Minnesota	21.95813	2882.24487
Indiana - Harrison	258.65616	3.84626	Mississippi	2111.72070	9.43943
Indiana - Hendricks	119.93275	2.42734	Missouri	285.43582	32.59700
Indiana - Henry	118.13591	2.77360	Montana	22.71704	262956.71900
Indiana - Howard	133.06660	2.69448	Nebraska	116.72437	652.36707
Indiana - Huntington	134.73492	2.37435	Nevada	57.00141	0.79149
Indiana - Jackson	154.82047	3.39912	New Hampshire	39857.83200	0.01922
Indiana - Jasper	201.93140	2.16024	New Jersey	371.34586	0.80704
Indiana - Jay	160.97566	3.41648	New Mexico	81934.16410	10.30083
Indiana - Jefferson	102.44852	2.09764	New York	872.26624	6.57148
Indiana - Jennings	115.10630	2.55452	North Carolina	1106.68005	6.79885
Indiana - Johnson	102.52371	2.54062	North Dakota	7.49115	39287.47660
Indiana - Knox	302.85925	6.42735	Ohio - north	208.97855	2.28648
Indiana - Kosciusko	153.20137	2.07298	Ohio - central	131.25008	3.98654
Indiana - Lagrange	174.99304	2.00840	Ohio - south	131.84282	2.83632
Indiana - Lake	51.33271	0.43614	Oklahoma	181.80290	24.70942
Indiana - LaPorte	114.64700	1.04699	Oregon	347.05637	68.32393
Indiana - Lawrence	191.26660	4.10647	Pennsylvania	220.56679	7.92488
Indiana - Madison	115.46983	2.70214	Rhode Island	18984.13870	0.00479
Indiana - Marion	89.83083	2.25309	South Carolina	1303.47034	4.03467
Indiana - Marshall	157.84598	1.82616	South Dakota	194.18922	951.82037
Indiana - Martin	222.34387	4.32888	Tennessee	863.83899	3.00026
Indiana - Miami	150.62688	2.66088	Texas	4360.39160	607.03363
Indiana - Monroe	158.53931	3.79278	Utah	3314.07886	52.27553
Indiana - Montgomery	171.53265	3.80388	Vermont	14372.12300	0.11687
Indiana - Morgan	134.94348	3.33727	Virginia	664.63757	4.90375
Indiana - Newton	204.51663	2.00816	Washington	200.18341	39.36974
Indiana - Noble	158.48982	2.14029	West Virginia	143.40181	35.83674
Indiana - Ohio	39.28474	0.84088	Wisconsin	471.63083	3.92206
Indiana - Orange	221.41519	4.14425	Wyoming	1007.20685	0.41527
Indiana - Owen	178.34433	4.37111			

Table G-5 Food and Kindred Products - A and B Gravity Model Parameters

Alabama	4.47859	2.33785	Indiana - Parke	3.63842	1.87764
Arizona	3.01237	25.22386	Indiana - Perry	3.71375	1.95341
Arkansas	4.76337	2.17022	Indiana - Pike	3.75466	1.92872
California	0.66569	29.54186	Indiana - Porter	3.44012	1.80785
Colorado	4.67415	6.53962	Indiana - Posey	3.89380	1.95194
Connecticut	3.12001	3.50780	Indiana - Pulaski	3.45371	1.84628
Delaware	2.68818	2.46795	Indiana - Putnam	3.59372	1.88837
District of Columbia	2.76417	2.33584	Indiana - Randolph	3.37187	1.93348
Florida	7.91968	3.23764	Indiana - Ripley	3.44426	1.92906
Georgia	4.41815	2.44675	Indiana - Rush	3.42894	1.91216
Idaho	1.22466	30.03148	Indiana - St Joseph	3.45368	1.87238
Illinois - north	3.69909	1.82190	Indiana - Scott	3.53931	1.93636
Illinois - south	4.19364	1.87479	Indiana - Shelby	3.46532	1.90428
Indiana - Adams	3.37407	1.94595	Indiana - Spencer	3.77006	1.95244
Indiana - Allen	3.39189	1.93923	Indiana - Starke	3.44314	1.84045
Indiana - Bartholomew	3.51226	1.91136	Indiana - Steuben	3.43681	1.98278
Indiana - Benton	3.55965	1.83332	Indiana - Sullivan	3.73136	1.90648
Indiana - Blackford	3.39795	1.91534	Indiana - Switzerland	3.45277	1.94916
Indiana - Boone	3.50938	1.87444	Indiana - Tippecanoe	3.53214	1.85611
Indiana - Brown	3.54891	1.90757	Indiana - Tipton	3.45875	1.88130
Indiana - Carroll	3.48912	1.85549	Indiana - Union	3.37956	1.93007
Indiana - Cass	3.45778	1.86171	Indiana - Vanderburgh	3.83440	1.95037
Indiana - Clark	3.57527	1.95916	Indiana - Vermillion	3.65929	1.87394
Indiana - Clay	3.65386	1.89118	Indiana - Vigo	3.69610	1.88966
Indiana - Clinton	3.49224	1.86746	Indiana - Wabash	3.42292	1.88861
Indiana - Crawford	3.66716	1.94716	Indiana - Warren	3.59528	1.85067
Indiana - Daviess	3.72798	1.92361	Indiana - Warrick	3.78482	1.94598
Indiana - Dearborn	3.39383	1.93463	Indiana - Washington	3.58758	1.93687
Indiana - Decatur	3.44828	1.91641	Indiana - Wayne	3.37336	1.93233
Indiana - DeKalb	3.40865	1.95462	Indiana - Wells	3.38444	1.93368
Indiana - Delaware	3.40114	1.91224	Indiana - White	3.49707	1.84415
Indiana - Dubois	3.71373	1.93493	Indiana - Whitley	3.41218	1.91731
Indiana - Elkhart	3.45849	1.89754	Iowa	5.34937	1.86267
Indiana - Fayette	3.39879	1.92141	Kansas	5.43937	2.35158
Indiana - Floyd	3.58316	1.95615	Kentucky - west	3.73132	1.98058
Indiana - Fountain	3.60275	1.86194	Kentucky - east	3.54954	2.05883
Indiana - Franklin	3.39805	1.92702	Louisiana	6.64931	3.02961
Indiana - Fulton	3.43800	1.86759	Maine	6.88306	9.14329
Indiana - Gibson	3.81820	1.93498	Maryland	2.68816	2.34928
Indiana - Grant	3.41623	1.89838	Massachusetts	3.69081	4.56820
Indiana - Greene	3.66035	1.90982	Michigan - west	3.87240	2.11474
Indiana - Hamilton	3.45405	1.88672	Michigan - east	3.55170	2.29156
Indiana - Hancock	3.44720	1.89850	Minnesota	7.28187	2.44901
Indiana - Harrison	3.62412	1.95556	Mississippi	5.24345	2.48057
Indiana - Hendricks	3.50783	1.94191	Missouri	4.72163	1.89191
Indiana - Henry	3.40829	1.91181	Montana	4.49807	16.52301
Indiana - Howard	3.45028	1.87770	Nebraska	6.18403	2.85733
Indiana - Huntington	3.40680	1.91246	Nevada	0.44766	19.78808
Indiana - Jackson	3.55551	1.92479	New Hampshire	3.72539	4.55532
Indiana - Jasper	3.49952	1.82572	New Jersey	2.81755	2.80315
Indiana - Jay	3.37254	1.93731	New Mexico	4.98782	10.70495
Indiana - Jefferson	3.48992	1.94260	New York	3.17282	3.06655
Indiana - Jennings	3.49159	1.92354	North Carolina	3.99345	2.88061
Indiana - Johnson	3.50059	1.89845	North Dakota	10.92841	4.02772
Indiana - Knox	3.77817	1.92250	Ohio - north	3.22486	2.26873
Indiana - Kosciusko	3.42989	1.89264	Ohio - central	3.27329	2.08579
Indiana - Lagrange	3.45106	1.94439	Ohio - south	3.41065	1.98542
Indiana - Lake	3.43464	1.78559	Oklahoma	4.94462	2.28192
Indiana - LaPorte	3.44167	1.83079	Oregon	0.92589	37.92627
Indiana - Lawrence	3.62196	1.92245	Pennsylvania	2.72991	2.40834
Indiana - Madison	3.42731	1.89883	Rhode Island	3.46058	4.18984
Indiana - Marion	3.48921	1.88876	South Carolina	4.58894	2.85984
Indiana - Marshall	3.43930	1.86376	South Dakota	6.61984	6.30204
Indiana - Martin	3.67209	1.92621	Tennessee	3.95460	2.08894
Indiana - Miami	3.44075	1.87506	Texas	6.76590	3.21500
Indiana - Monroe	3.58860	1.90625	Utah	1.94112	19.11149
Indiana - Montgomery	3.56047	1.86795	Vermont	4.11583	4.74536
Indiana - Morgan	3.56166	1.89898	Virginia	3.31327	2.63792
Indiana - Newton	3.52814	1.81607	Washington	1.06710	42.64330
Indiana - Noble	3.42578	1.94712	West Virginia	3.38618	2.29411
Indiana - Ohio	3.41848	1.94385	Wisconsin	4.16565	2.01688
Indiana - Orange	3.63710	1.93291	Wyoming	4.41768	6.00156
Indiana - Owen	3.61413	1.89945			

Table G-6 Textile Mill Products - A and B Gravity Model Parameters

Alabama	84.08072	0.05082
Arizona	0.19889	161.16519
Arkansas	30.78040	0.26009
California	0.01535	1794.02844
Colorado	0.83379	17.08381
Connecticut	56.15714	0.20116
Delaware	58.48143	0.09030
District of Columbia	70.94976	0.06184
Florida	260.70071	0.14637
Georgia	112.10228	0.03713
Idaho	0.05824	597.07935
Illinois - north	46.43755	0.30285
Illinois - south	39.06580	0.22690
Indiana - Adams	62.70942	0.16178
Indiana - Allen	60.80484	0.17704
Indiana - Bartholomew	64.17572	0.11622
Indiana - Benton	49.75814	0.21377
Indiana - Blackford	61.37479	0.15766
Indiana - Boone	57.35455	0.15982
Indiana - Brown	62.46089	0.12186
Indiana - Carroll	53.99689	0.18824
Indiana - Cass	54.76824	0.18896
Indiana - Clark	68.82500	0.08776
Indiana - Clay	56.29066	0.15075
Indiana - Clinton	56.25026	0.16964
Indiana - Crawford	64.34039	0.09725
Indiana - Daviess	58.82197	0.12249
Indiana - Dearborn	70.54786	0.09740
Indiana - Decatur	66.31789	0.11268
Indiana - DeKalb	60.26903	0.19113
Indiana - Delaware	62.97851	0.14191
Indiana - Dubois	61.01936	0.11042
Indiana - Elkhart	54.33131	0.22935
Indiana - Fayette	66.79790	0.11687
Indiana - Floyd	68.21912	0.08949
Indiana - Fountain	52.90984	0.18311
Indiana - Franklin	68.34969	0.10875
Indiana - Fulton	54.51162	0.19966
Indiana - Gibson	56.76907	0.12306
Indiana - Grant	59.85089	0.16143
Indiana - Greene	59.06247	0.13033
Indiana - Hamilton	60.08057	0.14830
Indiana - Hancock	62.55317	0.13358
Indiana - Harrison	66.77264	0.09095
Indiana - Hendricks	68.65850	0.09511
Indiana - Henry	64.11879	0.13200
Indiana - Howard	57.45047	0.16986
Indiana - Huntington	59.45625	0.17479
Indiana - Jackson	64.88191	0.10818
Indiana - Jasper	49.63328	0.22041
Indiana - Jay	64.17691	0.14513
Indiana - Jefferson	69.22119	0.09451
Indiana - Jennings	66.59844	0.10579
Indiana - Johnson	62.27495	0.12756
Indiana - Knox	56.53467	0.13155
Indiana - Kosciusko	55.97079	0.20156
Indiana - Lagrange	57.81609	0.21507
Indiana - Lake	45.78839	0.26144
Indiana - LaPorte	49.50393	0.24561
Indiana - Lawrence	62.32135	0.11489
Indiana - Madison	61.66001	0.14378
Indiana - Marion	60.57104	0.14005
Indiana - Marshall	53.13763	0.21611
Indiana - Martin	61.23573	0.11488
Indiana - Miami	56.30624	0.18173
Indiana - Monroe	60.95261	0.12598
Indiana - Montgomery	55.11122	0.16988
Indiana - Morgan	60.47533	0.13269
Indiana - Newton	48.21372	0.22965
Indiana - Noble	59.14211	0.20012
Indiana - Ohio	71.25443	0.09212
Indiana - Orange	63.42303	0.10597
Indiana - Owen	59.00410	0.13580
Indiana - Parke	54.50358	0.16638
Indiana - Perry	63.47951	0.09432
Indiana - Pike	58.62685	0.11989
Indiana - Porter	47.82127	0.24640
Indiana - Posey	55.75878	0.11769
Indiana - Pulaski	52.13506	0.21122
Indiana - Putnam	57.64844	0.14781
Indiana - Randolph	65.39165	0.13386
Indiana - Ripley	68.64711	0.10115
Indiana - Rush	65.30912	0.12040
Indiana - St Joseph	52.43848	0.23675
Indiana - Scott	67.06944	0.09879
Indiana - Shelby	63.83030	0.12362
Indiana - Spencer	61.05299	0.09967
Indiana - Starke	50.79703	0.22998
Indiana - Steuben	60.45324	0.20452
Indiana - Sullivan	56.00019	0.14288
Indiana - Switzerland	70.98107	0.09065
Indiana - Tippecanoe	53.62123	0.18518
Indiana - Tipton	58.48685	0.16064
Indiana - Union	68.10476	0.11307
Indiana - Vanderburgh	58.14619	0.11034
Indiana - Vermillion	53.40235	0.17280
Indiana - Vigo	54.58669	0.15837
Indiana - Wabash	57.50439	0.17936
Indiana - Warren	51.45633	0.19620
Indiana - Warrick	59.66090	0.10695
Indiana - Washington	65.56876	0.10103
Indiana - Wayne	67.28645	0.11978
Indiana - Wells	61.68522	0.16511
Indiana - White	52.07639	0.20195
Indiana - Whitley	58.44004	0.18935
Iowa	19.32229	0.95604
Kansas	8.71516	1.42571
Kentucky - west	66.76212	0.06932
Kentucky - east	79.88053	0.06909
Louisiana	61.86628	0.28229
Maine	148.29333	0.71624
Maryland	63.93021	0.07129
Massachusetts	68.33264	0.26965
Michigan - west	59.48796	0.32568
Michigan - east	70.11115	0.21292
Minnesota	22.92721	1.85850
Mississippi	55.43775	0.15042
Missouri	26.45565	0.42220
Montana	0.52712	87.58125
Nebraska	4.85570	3.37482
Nevada	0.00911	1068.95239
New Hampshire	66.85796	0.30209
New Jersey	53.62315	0.13216
New Mexico	0.72244	23.96941
New York	50.85516	0.22017
North Carolina	144.40884	0.03121
North Dakota	11.46241	6.01980
Ohio - north	69.80573	0.14539
Ohio - central	75.81943	0.10057
Ohio - south	73.12283	0.09342
Oklahoma	9.02919	1.31154
Oregon	0.04901	2127.58862
Pennsylvania	57.93433	0.09308
Rhode Island	64.07042	0.23302
South Carolina	163.27373	0.02751
South Dakota	1.69484	16.77183
Tennessee	70.14015	0.06354
Texas	16.38379	1.15709
Utah	0.10590	149.79762
Vermont	71.34602	0.37855
Virginia	101.56776	0.04224
Washington	0.06925	2162.87109
West Virginia	93.32088	0.05580
Wisconsin	47.85737	0.43281
Wyoming	0.88697	18.14985

Table G-7 Apparel or Other Finished Textile Products - A and B Gravity Model Parameters

Alabama	3.52482	1.13689	Indiana - Parke	3.21570	1.26776
Arizona	1.65229	16.63120	Indiana - Perry	3.20148	1.04363
Arkansas	3.33722	1.69811	Indiana - Pike	3.21761	1.12769
California	0.52968	23.30046	Indiana - Porter	3.21333	1.47936
Colorado	2.28142	9.18562	Indiana - Posey	3.23089	1.11673
Connecticut	3.39352	2.11946	Indiana - Pulaski	3.20299	1.39832
Delaware	2.82675	1.49870	Indiana - Putnam	3.20239	1.22057
District of Columbia	2.85325	1.35175	Indiana - Randolph	3.15695	1.23562
Florida	5.73461	2.51405	Indiana - Ripley	3.16329	1.11540
Georgia	3.57481	1.09462	Indiana - Rush	3.16350	1.17128
Idaho	0.84184	28.49482	Indiana - St Joseph	3.23370	1.48105
Illinois - north	3.33691	1.61051	Indiana - Scott	3.18124	1.08809
Illinois - south	3.28103	1.44176	Indiana - Shelby	3.17190	1.17056
Indiana - Adams	3.17445	1.32415	Indiana - Spencer	3.20898	1.05710
Indiana - Allen	3.18849	1.36109	Indiana - Starke	3.21372	1.44792
Indiana - Bartholomew	3.17975	1.14165	Indiana - Steuben	3.22923	1.45627
Indiana - Benton	3.21659	1.39105	Indiana - Sullivan	3.22262	1.19938
Indiana - Blackford	3.17340	1.28937	Indiana - Switzerland	3.16481	1.08658
Indiana - Boone	3.19010	1.25948	Indiana - Tippecanoe	3.20321	1.32213
Indiana - Brown	3.18744	1.15200	Indiana - Tipton	3.18342	1.27079
Indiana - Carroll	3.19734	1.33440	Indiana - Union	3.15038	1.16907
Indiana - Cass	3.19392	1.34278	Indiana - Vanderburgh	3.22238	1.09191
Indiana - Clark	3.18665	1.04921	Indiana - Vermillion	3.22042	1.28300
Indiana - Clay	3.21331	1.22503	Indiana - Vigo	3.22153	1.24442
Indiana - Clinton	3.19047	1.28647	Indiana - Wabash	3.18645	1.33175
Indiana - Crawford	3.19834	1.06057	Indiana - Warren	3.21768	1.34658
Indiana - Daviess	3.21531	1.13806	Indiana - Warrick	3.21524	1.08136
Indiana - Dearborn	3.15043	1.11779	Indiana - Washington	3.18964	1.08582
Indiana - Decatur	3.16673	1.14545	Indiana - Wayne	3.15132	1.19255
Indiana - DeKalb	3.20615	1.40845	Indiana - Wells	3.17736	1.32447
Indiana - Delaware	3.16512	1.24146	Indiana - White	3.20344	1.36746
Indiana - Dubois	3.20898	1.09953	Indiana - Whitley	3.19819	1.37953
Indiana - Elkhart	3.23644	1.47340	Iowa	3.62529	2.64489
Indiana - Fayette	3.15530	1.17163	Kansas	3.20187	3.06301
Indiana - Floyd	3.18768	1.05270	Kentucky - west	3.18777	0.93977
Indiana - Fountain	3.21430	1.31289	Kentucky - east	3.18623	1.04349
Indiana - Franklin	3.15366	1.14991	Louisiana	4.38698	2.23305
Indiana - Fulton	3.19861	1.37633	Maine	6.67419	4.51723
Indiana - Gibson	3.22566	1.13494	Maryland	2.80166	1.39545
Indiana - Grant	3.17686	1.28760	Massachusetts	4.18434	2.66243
Indiana - Greene	3.20796	1.16572	Michigan - west	3.49626	1.76529
Indiana - Hamilton	3.17634	1.23869	Michigan - east	3.30796	1.60990
Indiana - Hancock	3.17060	1.20142	Minnesota	4.50518	3.83330
Indiana - Harrison	3.19249	1.04870	Mississippi	3.73670	1.64000
Indiana - Hendricks	3.17607	1.08420	Missouri	3.36566	1.87167
Indiana - Henry	3.16308	1.21070	Montana	2.13338	21.33032
Indiana - Howard	3.18515	1.29679	Nebraska	3.29173	4.57608
Indiana - Huntington	3.18593	1.33571	Nevada	0.40329	18.07807
Indiana - Jackson	3.18665	1.11289	New Hampshire	4.10031	2.72976
Indiana - Jasper	3.20952	1.41038	New Jersey	2.95942	1.69309
Indiana - Jay	3.16348	1.27004	New Mexico	2.38745	10.06454
Indiana - Jefferson	3.17267	1.08741	New York	3.01912	1.99273
Indiana - Jennings	3.17306	1.11720	North Carolina	3.57749	1.22633
Indiana - Johnson	3.17941	1.17428	North Dakota	5.07609	7.08387
Indiana - Knox	3.22487	1.16370	Ohio - north	3.09601	1.46858
Indiana - Kosciusko	3.20540	1.39699	Ohio - central	3.10882	1.23272
Indiana - Lagrange	3.23454	1.46115	Ohio - south	3.15814	1.12529
Indiana - Lake	3.21653	1.50998	Oklahoma	3.06888	2.86038
Indiana - LaPorte	3.22422	1.48746	Oregon	0.73107	41.64165
Indiana - Lawrence	3.19803	1.12353	Pennsylvania	2.76882	1.47127
Indiana - Madison	3.17052	1.23469	Rhode Island	3.94737	2.44900
Indiana - Marion	3.18083	1.20933	South Carolina	3.79110	1.18001
Indiana - Marshall	3.21035	1.42130	South Dakota	2.97740	10.15057
Indiana - Martin	3.20547	1.11795	Tennessee	3.25929	1.00331
Indiana - Miami	3.18918	1.32959	Texas	3.88255	3.13581
Indiana - Monroe	3.19458	1.15911	Utah	1.13776	19.22459
Indiana - Montgomery	3.20294	1.28051	Vermont	4.07502	2.87530
Indiana - Morgan	3.19309	1.18115	Virginia	3.20150	1.29024
Indiana - Newton	3.21646	1.42955	Washington	0.87175	51.80860
Indiana - Noble	3.21680	1.42567	West Virginia	3.11931	1.14789
Indiana - Ohio	3.15640	1.09835	Wisconsin	3.59987	1.92785
Indiana - Orange	3.19678	1.09318	Wyoming	2.26923	9.59964
Indiana - Owen	3.20209	1.18477			

Table G-8 Lumber and Wood Products - A and B Gravity Model Parameters

Alabama	12.87254	4.32012	Indiana - Parke	0.06796	708.86188
Arizona	3.03803	609.03253	Indiana - Perry	0.34300	94.50751
Arkansas	8.05843	11.32203	Indiana - Pike	0.22707	180.10411
California	692.78748	0.47928	Indiana - Porter	0.01233	3068.93701
Colorado	19.67547	62.13869	Indiana - Posey	0.42882	111.27857
Connecticut	1.55720	94.98829	Indiana - Pulaski	0.01861	2192.88354
Delaware	0.50160	93.49093	Indiana - Putnam	0.08005	541.61517
District of Columbia	0.55621	58.10544	Indiana - Randolph	0.06000	728.85736
Florida	302.14093	0.80678	Indiana - Ripley	0.13473	258.15329
Georgia	12.43505	5.50575	Indiana - Rush	0.08744	440.02896
Idaho	10391.39750	0.02399	Indiana - St Joseph	0.01263	3007.74731
Illinois - north	0.01040	4088.98096	Indiana - Scott	0.17645	190.57388
Illinois - south	0.26733	331.98529	Indiana - Shelby	0.08814	429.90286
Indiana - Adams	0.03567	1318.54138	Indiana - Spencer	0.37988	92.94897
Indiana - Allen	0.02765	1656.87573	Indiana - Starke	0.01419	2757.26465
Indiana - Bartholomew	0.11391	320.29922	Indiana - Steuben	0.02266	2309.32153
Indiana - Benton	0.02632	1786.41956	Indiana - Sullivan	0.13949	343.04276
Indiana - Blackford	0.03855	1127.97681	Indiana - Switzerland	0.17168	191.62503
Indiana - Boone	0.05056	840.15894	Indiana - Tippecanoe	0.03566	1258.81262
Indiana - Brown	0.11248	334.58725	Indiana - Tipton	0.04265	982.44135
Indiana - Carroll	0.02956	1463.67236	Indiana - Union	0.09357	416.00375
Indiana - Cass	0.02598	1608.70911	Indiana - Vanderburgh	0.38851	107.05351
Indiana - Clark	0.24577	126.30809	Indiana - Vermillion	0.06614	755.15344
Indiana - Clay	0.09269	496.39050	Indiana - Vigo	0.09496	523.60107
Indiana - Clinton	0.04039	1054.32727	Indiana - Wabash	0.02686	1541.17627
Indiana - Crawford	0.26516	122.75898	Indiana - Warren	0.03743	1303.33105
Indiana - Daviess	0.19532	209.50287	Indiana - Warrick	0.33917	111.91518
Indiana - Dearborn	0.13040	255.29019	Indiana - Washington	0.19057	176.76242
Indiana - Decatur	0.10689	345.51691	Indiana - Wayne	0.08085	507.59988
Indiana - DeKalb	0.02382	2006.33240	Indiana - Wells	0.03330	1362.03394
Indiana - Delaware	0.05313	794.51788	Indiana - White	0.02487	1753.60913
Indiana - Dubois	0.23231	156.18820	Indiana - Whitley	0.02235	1907.64209
Indiana - Elkhart	0.01361	2859.60889	Iowa	0.05480	6474.02637
Indiana - Fayette	0.08962	434.24557	Kansas	2.34740	345.27707
Indiana - Floyd	0.24070	129.29251	Kentucky - west	0.84606	31.69917
Indiana - Fountain	0.04656	1035.87097	Kentucky - east	0.36139	111.13242
Indiana - Franklin	0.10568	349.85458	Louisiana	63.68441	1.85929
Indiana - Fulton	0.02033	1989.68188	Maine	17.08492	8.94416
Indiana - Gibson	0.27824	163.15569	Maryland	0.43007	76.82114
Indiana - Grant	0.03686	1139.78210	Massachusetts	2.51523	45.40944
Indiana - Greene	0.13568	307.57449	Michigan - west	0.01587	5391.89160
Indiana - Hamilton	0.05307	769.39215	Michigan - east	0.04961	2441.43286
Indiana - Hancock	0.06924	571.80292	Minnesota	0.02445	23314.53710
Indiana - Harrison	0.26611	117.64203	Mississippi	31.49203	2.15498
Indiana - Hendricks	0.17760	188.11604	Missouri	0.26482	470.31104
Indiana - Henry	0.06624	617.59045	Montana	484.33582	1.79069
Indiana - Howard	0.03501	1199.76624	Nebraska	0.98582	1287.08972
Indiana - Huntington	0.02812	1525.02588	Nevada	150.70023	0.13182
Indiana - Jackson	0.14987	236.26646	New Hampshire	2.50663	31.21995
Indiana - Jasper	0.01985	2172.66675	New Jersey	0.97341	82.22954
Indiana - Jay	0.04806	942.31781	New Mexico	7.83386	640.67078
Indiana - Jefferson	0.17243	195.15446	New York	0.74167	361.40689
Indiana - Jennings	0.13564	259.97284	North Carolina	3.00261	23.32420
Indiana - Johnson	0.08837	429.32724	North Dakota	0.09358	2165.88745
Indiana - Knox	0.20176	229.81226	Ohio - north	0.06643	1184.96423
Indiana - Kosciusko	0.01865	2149.67725	Ohio - central	0.11717	489.20477
Indiana - Lagrange	0.01757	2564.16650	Ohio - south	0.15440	272.38931
Indiana - Lake	0.01061	3307.60889	Oklahoma	4.09262	46.85495
Indiana - LaPorte	0.01192	3165.04883	Oregon	54902.41410	0.00098
Indiana - Lawrence	0.15875	233.90347	Pennsylvania	0.64883	146.25075
Indiana - Madison	0.05401	760.37115	Rhode Island	2.06903	70.98140
Indiana - Marion	0.06823	585.21240	South Carolina	8.57239	9.82165
Indiana - Marshall	0.01589	2452.50146	South Dakota	9.93967	15.46207
Indiana - Martin	0.18547	201.09279	Tennessee	1.94312	16.12535
Indiana - Miami	0.02752	1509.74792	Texas	23.00001	79.47712
Indiana - Monroe	0.11692	333.31949	Utah	562.26685	0.54099
Indiana - Montgomery	0.05004	900.86206	Vermont	2.58074	40.84510
Indiana - Morgan	0.09490	418.85452	Virginia	1.58615	39.23096
Indiana - Newton	0.01965	2275.97559	Washington	80831.24220	0.00079
Indiana - Noble	0.02073	2212.03613	West Virginia	0.54403	134.81197
Indiana - Ohio	0.15341	212.81564	Wisconsin	0.01637	9243.48730
Indiana - Orange	0.19833	174.39822	Wyoming	11.86207	32.46109
Indiana - Owen	0.10578	394.35721			

Table G-9 Furniture and Fixtures - A and B Gravity Model Parameters

Alabama	1.76638	1.53853
Arizona	1.84731	5.48358
Arkansas	1.69110	1.78181
California	1.29223	6.34207
Colorado	1.76482	3.49758
Connecticut	2.29136	1.20794
Delaware	1.96081	1.07033
District of Columbia	1.86643	1.10245
Florida	2.52757	2.27924
Georgia	1.79907	1.45915
Idaho	1.48496	5.79229
Illinois - north	1.65955	1.42770
Illinois - south	1.61076	1.50104
Indiana - Adams	1.63077	1.27280
Indiana - Allen	1.63538	1.28479
Indiana - Bartholomew	1.59906	1.28937
Indiana - Benton	1.61290	1.36838
Indiana - Blackford	1.61943	1.28170
Indiana - Boone	1.60316	1.31777
Indiana - Brown	1.59778	1.30101
Indiana - Carroll	1.61157	1.33310
Indiana - Cass	1.61597	1.32516
Indiana - Clark	1.60432	1.28727
Indiana - Clay	1.59772	1.34152
Indiana - Clinton	1.60629	1.32075
Indiana - Crawford	1.60012	1.31557
Indiana - Daviess	1.59653	1.34156
Indiana - Dearborn	1.60822	1.25013
Indiana - Decatur	1.60282	1.27179
Indiana - DeKalb	1.64586	1.29193
Indiana - Delaware	1.61199	1.27553
Indiana - Dubois	1.59760	1.33242
Indiana - Elkhart	1.64860	1.33422
Indiana - Fayette	1.60712	1.26150
Indiana - Floyd	1.60342	1.29001
Indiana - Fountain	1.60418	1.35309
Indiana - Franklin	1.60715	1.25655
Indiana - Fulton	1.62428	1.32485
Indiana - Gibson	1.59791	1.36511
Indiana - Grant	1.61552	1.29162
Indiana - Greene	1.59616	1.33025
Indiana - Hamilton	1.60506	1.29637
Indiana - Hancock	1.60342	1.28493
Indiana - Harrison	1.60241	1.30111
Indiana - Hendricks	1.60303	1.27525
Indiana - Henry	1.60830	1.27212
Indiana - Howard	1.61168	1.30865
Indiana - Huntington	1.62629	1.29286
Indiana - Jackson	1.59887	1.29348
Indiana - Jasper	1.61823	1.36349
Indiana - Jay	1.62139	1.26590
Indiana - Jefferson	1.60391	1.27021
Indiana - Jennings	1.60068	1.27794
Indiana - Johnson	1.59907	1.29444
Indiana - Knox	1.59682	1.35813
Indiana - Kosciusko	1.63303	1.31655
Indiana - Lagrange	1.65376	1.31356
Indiana - Lake	1.63390	1.38908
Indiana - LaPorte	1.63937	1.36307
Indiana - Lawrence	1.59694	1.31218
Indiana - Madison	1.60786	1.28548
Indiana - Marion	1.60104	1.29996
Indiana - Marshall	1.63207	1.33506
Indiana - Martin	1.59684	1.32415
Indiana - Miami	1.61708	1.31393
Indiana - Monroe	1.59662	1.31241
Indiana - Montgomery	1.60285	1.33581
Indiana - Morgan	1.59778	1.31089
Indiana - Newton	1.61835	1.37674
Indiana - Noble	1.64777	1.30101
Indiana - Ohio	1.60814	1.25255
Indiana - Orange	1.59772	1.31148
Indiana - Owen	1.59669	1.32426
Indiana - Parke	1.60030	1.34844
Indiana - Perry	1.60159	1.32809
Indiana - Pike	1.59710	1.34753
Indiana - Porter	1.63186	1.37291
Indiana - Posey	1.60127	1.38458
Indiana - Pulaski	1.62294	1.34189
Indiana - Putnam	1.59840	1.32762
Indiana - Randolph	1.61626	1.26093
Indiana - Ripley	1.60408	1.26412
Indiana - Rush	1.60411	1.27167
Indiana - St Joseph	1.64563	1.34554
Indiana - Scott	1.60071	1.28460
Indiana - Shelby	1.60122	1.28329
Indiana - Spencer	1.60101	1.34614
Indiana - Starke	1.63242	1.35197
Indiana - Steuben	1.65866	1.29775
Indiana - Sullivan	1.59677	1.35337
Indiana - Switzerland	1.60714	1.25900
Indiana - Tippecanoe	1.60771	1.34057
Indiana - Tipton	1.60837	1.30512
Indiana - Union	1.60980	1.25387
Indiana - Vanderburgh	1.60066	1.36626
Indiana - Vermillion	1.60081	1.35670
Indiana - Vigo	1.59808	1.35528
Indiana - Wabash	1.62088	1.30509
Indiana - Warren	1.60760	1.36136
Indiana - Warrick	1.59977	1.35177
Indiana - Washington	1.59947	1.29689
Indiana - Wayne	1.61201	1.25518
Indiana - Wells	1.62841	1.27860
Indiana - White	1.61436	1.34622
Indiana - Whitley	1.63452	1.30028
Iowa	1.74180	1.86914
Kansas	1.70590	2.21630
Kentucky - west	1.61755	1.33719
Kentucky - east	1.62679	1.25255
Louisiana	2.02215	2.14491
Maine	3.29376	1.86731
Maryland	1.88619	1.08820
Massachusetts	2.55945	1.38217
Michigan - west	1.73749	1.39752
Michigan - east	1.73410	1.27802
Minnesota	1.99119	2.11889
Mississippi	1.82784	1.82227
Missouri	1.64421	1.68126
Montana	1.96774	4.73218
Nebraska	1.79099	2.50522
Nevada	1.13201	5.52346
New Hampshire	2.54261	1.40685
New Jersey	2.08721	1.07580
New Mexico	1.86340	4.03784
New York	2.06062	1.21744
North Carolina	1.92913	1.26409
North Dakota	2.24700	2.81513
Ohio - north	1.71775	1.20440
Ohio - central	1.64770	1.20429
Ohio - south	1.61568	1.24237
Oklahoma	1.71604	2.30237
Oregon	1.57756	7.61884
Pennsylvania	1.87845	1.08515
Rhode Island	2.47243	1.31559
South Carolina	1.91629	1.39970
South Dakota	1.96150	3.44670
Tennessee	1.64274	1.38297
Texas	1.91168	2.47307
Utah	1.55419	4.82687
Vermont	2.52796	1.45253
Virginia	1.90598	1.16165
Washington	1.78787	8.26450
West Virginia	1.69210	1.18316
Wisconsin	1.73947	1.51156
Wyoming	1.77898	3.48001

Table G-10 Pulp, Paper, or Allied Products - A and B Gravity Model Parameters

Alabama	6.66686	1.24091	Indiana - Parke	3.63797	2.09169
Arizona	3.48556	49.13272	Indiana - Perry	4.20509	1.79653
Arkansas	6.89344	1.67888	Indiana - Pike	4.12489	1.92114
California	1.40207	20.73810	Indiana - Porter	3.08429	2.09273
Colorado	5.65162	15.46536	Indiana - Posey	4.49503	1.85054
Connecticut	2.00422	5.04194	Indiana - Pulaski	3.16714	2.13222
Delaware	2.02359	3.38116	Indiana - Putnam	3.61792	2.05819
District of Columbia	2.27243	2.85880	Indiana - Randolph	3.19750	2.14476
Florida	10.95596	2.95439	Indiana - Ripley	3.50371	1.96707
Georgia	6.18446	1.35683	Indiana - Rush	3.38274	2.04374
Idaho	3.34185	17.77620	Indiana - St Joseph	3.06725	2.17111
Illinois - north	3.27139	2.18191	Indiana - Scott	3.73283	1.91308
Illinois - south	4.67375	2.16989	Indiana - Shelby	3.44927	2.03222
Indiana - Adams	3.09654	2.23026	Indiana - Spencer	4.31495	1.79922
Indiana - Allen	3.08456	2.23977	Indiana - Starke	3.10013	2.12926
Indiana - Bartholomew	3.58290	1.98954	Indiana - Steuben	3.04902	2.32538
Indiana - Benton	3.36316	2.12804	Indiana - Sullivan	3.93349	2.01929
Indiana - Blackford	3.17347	2.17206	Indiana - Switzerland	3.57237	1.92570
Indiana - Boone	3.41201	2.09646	Indiana - Tippecanoe	3.38249	2.11997
Indiana - Brown	3.63695	1.99632	Indiana - Tipton	3.30555	2.11837
Indiana - Carroll	3.29383	2.12712	Indiana - Union	3.30238	2.05906
Indiana - Cass	3.22687	2.13734	Indiana - Vanderburgh	4.39850	1.83648
Indiana - Clark	3.88218	1.84551	Indiana - Vermillion	3.65866	2.10055
Indiana - Clay	3.72812	2.05527	Indiana - Vigo	3.78577	2.06820
Indiana - Clinton	3.35045	2.11195	Indiana - Wabash	3.16986	2.16438
Indiana - Crawford	4.05711	1.84211	Indiana - Warren	3.46849	2.12759
Indiana - Daviess	4.04146	1.94326	Indiana - Warrick	4.29669	1.83755
Indiana - Dearborn	3.41199	1.97792	Indiana - Washington	3.83333	1.90148
Indiana - Decatur	3.45749	2.00756	Indiana - Wayne	3.25834	2.09274
Indiana - DeKalb	3.05983	2.27580	Indiana - Wells	3.11276	2.21627
Indiana - Delaware	3.23853	2.12862	Indiana - White	3.27547	2.12599
Indiana - Dubois	4.08508	1.89083	Indiana - Whitley	3.09811	2.21830
Indiana - Elkhart	3.07380	2.20572	Iowa	5.58550	3.56099
Indiana - Fayette	3.33170	2.05444	Kansas	6.81563	3.75824
Indiana - Floyd	3.89125	1.84949	Kentucky - west	4.51421	1.57262
Indiana - Fountain	3.51826	2.11616	Kentucky - east	3.82528	1.87420
Indiana - Franklin	3.36458	2.02532	Louisiana	11.15623	1.51269
Indiana - Fulton	3.15381	2.15420	Maine	4.04580	8.54842
Indiana - Gibson	4.26160	1.91309	Maryland	2.13292	3.00260
Indiana - Grant	3.20694	2.15062	Massachusetts	2.26860	6.01548
Indiana - Greene	3.84011	1.99415	Michigan - west	3.31368	2.53286
Indiana - Hamilton	3.33654	2.09656	Michigan - east	3.03287	2.82827
Indiana - Hancock	3.37245	2.06979	Minnesota	6.85907	4.76816
Indiana - Harrison	3.98731	1.83286	Mississippi	8.46421	1.28073
Indiana - Hendricks	3.67823	1.91378	Missouri	5.42089	2.62952
Indiana - Henry	3.29109	2.09591	Montana	8.79532	30.15103
Indiana - Howard	3.26062	2.13311	Nebraska	7.33368	6.90892
Indiana - Huntington	3.13598	2.19541	Nevada	0.89817	13.65790
Indiana - Jackson	3.71635	1.94714	New Hampshire	2.27792	5.93284
Indiana - Jasper	3.24238	2.11668	New Jersey	1.95754	4.07820
Indiana - Jay	3.15480	2.18184	New Mexico	5.54607	20.70190
Indiana - Jefferson	3.63843	1.92135	New York	2.18511	4.74163
Indiana - Jennings	3.58719	1.96141	North Carolina	4.24701	2.40224
Indiana - Johnson	3.51021	2.02744	North Dakota	11.39716	9.54533
Indiana - Knox	4.10604	1.96607	Ohio - north	2.73030	2.79322
Indiana - Kosciusko	3.11182	2.18965	Ohio - central	3.04694	2.29935
Indiana - Lagrange	3.06747	2.27036	Ohio - south	3.42320	2.02893
Indiana - Lake	3.06113	2.06746	Oklahoma	6.41262	2.93219
Indiana - LaPorte	3.06086	2.11707	Oregon	3.54952	7.78359
Indiana - Lawrence	3.83360	1.94943	Pennsylvania	2.09085	3.29191
Indiana - Madison	3.29160	2.10746	Rhode Island	2.15943	5.73344
Indiana - Marion	3.43793	2.06495	South Carolina	5.73886	1.83714
Indiana - Marshall	3.11019	2.15542	South Dakota	8.40971	17.29876
Indiana - Martin	3.95396	1.92974	Tennessee	5.08936	1.47596
Indiana - Miami	3.20738	2.14770	Texas	9.67184	3.07165
Indiana - Monroe	3.70419	1.99745	Utah	3.66999	28.12445
Indiana - Montgomery	3.47921	2.10174	Vermont	2.58793	6.46092
Indiana - Morgan	3.61462	2.02661	Virginia	3.03981	2.76947
Indiana - Newton	3.27618	2.11725	Washington	4.80205	7.57560
Indiana - Noble	3.06723	2.26830	West Virginia	3.35014	2.26609
Indiana - Ohio	3.48999	1.94629	Wisconsin	3.66021	2.55773
Indiana - Orange	3.92468	1.90153	Wyoming	5.12836	14.50821
Indiana - Owen	3.71242	2.02174			

Table G-11 Chemicals and Allied Products - A and B Gravity Model Parameters

Alabama	82.57529	0.16658	Indiana - Parke	19.95524	0.63512
Arizona	2.18989	19.46462	Indiana - Perry	26.66394	0.46245
Arkansas	152.84544	0.09498	Indiana - Pike	26.26546	0.49982
California	0.07507	575.34399	Indiana - Porter	13.88414	0.72071
Colorado	10.52548	2.50043	Indiana - Posey	32.81453	0.41331
Connecticut	1.89185	9.53067	Indiana - Pulaski	14.49648	0.76057
Delaware	2.56609	3.61841	Indiana - Putnam	19.31793	0.63172
District of Columbia	3.59534	2.52894	Indiana - Randolph	13.48481	0.81438
Florida	275.59726	0.12928	Indiana - Ripley	16.52522	0.64493
Georgia	56.96524	0.27957	Indiana - Rush	15.61713	0.69616
Idaho	0.27888	213.89827	Indiana - St Joseph	13.31249	0.84474
Illinois - north	16.64436	0.82232	Indiana - Scott	19.49942	0.58495
Illinois - south	40.26759	0.41982	Indiana - Shelby	16.55173	0.66964
Indiana - Adams	12.53174	0.91758	Indiana - Spencer	28.79529	0.43979
Indiana - Allen	12.57653	0.92937	Indiana - Starke	13.86606	0.77304
Indiana - Bartholomew	18.09661	0.62909	Indiana - Steuben	11.91906	1.04057
Indiana - Benton	16.90527	0.69280	Indiana - Sullivan	23.86358	0.55698
Indiana - Blackford	13.65701	0.83409	Indiana - Switzerland	16.91279	0.62417
Indiana - Boone	16.82290	0.68999	Indiana - Tippecanoe	16.83285	0.69961
Indiana - Brown	18.96759	0.61692	Indiana - Tipton	15.48384	0.73655
Indiana - Carroll	15.77199	0.72835	Indiana - Union	14.34311	0.73149
Indiana - Cass	14.95758	0.76035	Indiana - Vanderburgh	30.63564	0.43017
Indiana - Clark	21.09437	0.54399	Indiana - Vermillion	20.35912	0.63090
Indiana - Clay	20.95576	0.60754	Indiana - Vigo	21.96442	0.59644
Indiana - Clinton	16.23112	0.71226	Indiana - Wabash	14.03351	0.81500
Indiana - Crawford	24.30864	0.50179	Indiana - Warren	18.05901	0.67710
Indiana - Daviess	24.98788	0.52188	Indiana - Warrick	28.72880	0.44976
Indiana - Dearborn	15.18765	0.66668	Indiana - Washington	21.01788	0.56110
Indiana - Decatur	16.34417	0.66589	Indiana - Wayne	13.95208	0.76308
Indiana - DeKalb	12.23676	0.97826	Indiana - Wells	12.85093	0.89606
Indiana - Delaware	14.25156	0.78177	Indiana - White	15.70947	0.72375
Indiana - Dubois	25.27685	0.50375	Indiana - Whitley	13.00889	0.89756
Indiana - Elkhart	13.13366	0.88897	Iowa	52.31711	0.75263
Indiana - Fayette	14.84111	0.71800	Kansas	110.19997	0.19138
Indiana - Floyd	21.32412	0.54219	Kentucky - west	31.23314	0.36578
Indiana - Fountain	18.56828	0.66564	Kentucky - east	18.59607	0.62028
Indiana - Franklin	14.99232	0.69738	Louisiana	359.79739	0.04449
Indiana - Fulton	14.13796	0.79795	Maine	4.70967	50.22645
Indiana - Gibson	28.68561	0.46927	Maryland	3.09781	2.85118
Indiana - Grant	14.23795	0.79947	Massachusetts	2.01445	15.97134
Indiana - Greene	22.08655	0.57314	Michigan - west	14.44888	1.26923
Indiana - Hamilton	15.66712	0.71773	Michigan - east	9.54023	1.62162
Indiana - Hancock	15.79894	0.70038	Minnesota	50.27608	1.92994
Indiana - Harrison	22.87651	0.51771	Mississippi	203.73416	0.05447
Indiana - Hendricks	18.55689	0.59759	Missouri	59.93697	0.38112
Indiana - Henry	14.71227	0.74617	Montana	3.42477	37.64774
Indiana - Howard	15.08482	0.75787	Nebraska	59.49316	0.76816
Indiana - Huntington	13.39043	0.86298	Nevada	0.03823	296.92886
Indiana - Jackson	19.63305	0.59433	New Hampshire	2.14126	16.53891
Indiana - Jasper	15.50919	0.71172	New Jersey	2.10084	5.40979
Indiana - Jay	13.10838	0.85566	New Mexico	10.89479	1.83757
Indiana - Jefferson	17.99422	0.60850	New York	2.83859	6.79740
Indiana - Jennings	17.81522	0.62458	North Carolina	13.27192	1.18457
Indiana - Johnson	17.43359	0.64941	North Dakota	63.01273	4.46920
Indiana - Knox	26.31835	0.51109	Ohio - north	7.15745	1.65869
Indiana - Kosciusko	13.45727	0.85570	Ohio - central	10.35407	1.01600
Indiana - Lagrange	12.55607	0.97117	Ohio - south	14.89561	0.72077
Indiana - Lake	13.74487	0.69210	Oklahoma	128.46968	0.07628
Indiana - LaPorte	13.57942	0.77154	Oregon	0.08732	1173.76221
Indiana - Lawrence	21.52427	0.56830	Pennsylvania	2.98447	3.33232
Indiana - Madison	15.00257	0.74480	Rhode Island	1.87750	13.33521
Indiana - Marion	16.74550	0.67391	South Carolina	31.26795	0.52755
Indiana - Marshall	13.76327	0.80961	South Dakota	16.00831	5.80821
Indiana - Martin	23.34437	0.53857	Tennessee	41.84072	0.31026
Indiana - Miami	14.58234	0.78211	Texas	273.60361	0.10408
Indiana - Monroe	20.01711	0.60210	Utah	0.83440	34.58783
Indiana - Montgomery	17.86843	0.67241	Vermont	2.92324	17.81428
Indiana - Morgan	18.91936	0.62634	Virginia	6.39481	2.01311
Indiana - Newton	15.97702	0.69531	Washington	0.08622	1341.60034
Indiana - Noble	12.44577	0.96781	West Virginia	10.96968	1.06388
Indiana - Ohio	15.93957	0.64388	Wisconsin	18.76566	1.05155
Indiana - Orange	22.60745	0.53998	Wyoming	10.00396	3.40276
Indiana - Owen	20.38781	0.60414			

Table G-12 Petroleum and Coal Products - A and B Gravity Model Parameters

Alabama	205.31390	2.86495
Arizona	163.96996	477.44412
Arkansas	848913.31300	0.00221
California	30.83108	612.33893
Colorado	57.77535	77.47838
Connecticut	0.00024	424579.00000
Delaware	0.01232	8934.85156
District of Columbia	0.02685	2371.03394
Florida	0.58517	6556.59814
Georgia	106.62610	47.50194
Idaho	992.91510	86.94039
Illinois - north	280.58707	0.91246
Illinois - south	1022.90344	1.68429
Indiana - Adams	100.84609	7.44781
Indiana - Allen	93.39679	6.22455
Indiana - Bartholomew	182.37868	2.85061
Indiana - Benton	318.72491	1.63086
Indiana - Blackford	141.44734	5.28014
Indiana - Boone	183.34981	2.71194
Indiana - Brown	197.01279	3.29441
Indiana - Carroll	242.03671	2.64392
Indiana - Cass	215.56805	2.58771
Indiana - Clark	219.85210	2.70085
Indiana - Clay	297.76367	3.16002
Indiana - Clinton	205.72739	3.18390
Indiana - Crawford	389.69794	3.87959
Indiana - Daviess	484.72113	2.98873
Indiana - Dearborn	65.80523	0.74846
Indiana - Decatur	141.76509	1.89060
Indiana - DeKalb	83.27254	6.70552
Indiana - Delaware	146.09381	4.00997
Indiana - Dubois	468.16211	2.91013
Indiana - Elkhart	155.20203	2.02251
Indiana - Fayette	122.23118	1.75036
Indiana - Floyd	231.24135	3.03047
Indiana - Fountain	360.05246	3.82258
Indiana - Franklin	98.01575	1.21688
Indiana - Fulton	194.37854	2.19054
Indiana - Gibson	652.52448	1.14915
Indiana - Grant	154.04945	4.24207
Indiana - Greene	330.11920	4.10444
Indiana - Hamilton	141.24464	2.40403
Indiana - Hancock	132.89383	2.07474
Indiana - Harrison	304.16727	3.80026
Indiana - Hendricks	167.81061	2.04944
Indiana - Henry	142.31552	2.87436
Indiana - Howard	179.94749	3.42952
Indiana - Huntington	124.63409	4.58603
Indiana - Jackson	229.12730	3.70599
Indiana - Jasper	218.62918	0.95165
Indiana - Jay	135.71150	6.22772
Indiana - Jefferson	148.44577	1.74016
Indiana - Jennings	172.75838	2.37668
Indiana - Johnson	147.18607	2.13902
Indiana - Knox	606.23712	2.30739
Indiana - Kosciusko	158.37724	2.89923
Indiana - Lagrange	110.91573	4.38752
Indiana - Lake	63.46520	0.21433
Indiana - LaPorte	128.58798	0.54788
Indiana - Lawrence	293.10938	4.59528
Indiana - Madison	144.50783	3.07199
Indiana - Marion	125.79329	1.71259
Indiana - Marshall	184.57132	1.51573
Indiana - Martin	381.35397	4.12506
Indiana - Miami	183.66870	3.03511
Indiana - Monroe	228.27632	3.81525
Indiana - Montgomery	261.48868	3.51401
Indiana - Morgan	188.50388	2.91451
Indiana - Newton	211.60382	0.82265
Indiana - Noble	96.63891	5.61253
Indiana - Ohio	77.68403	0.84514
Indiana - Orange	341.50436	4.53302
Indiana - Owen	250.61606	3.65730
Indiana - Parke	335.07312	3.69815
Indiana - Perry	413.17044	2.75706
Indiana - Pike	538.44470	2.16847
Indiana - Porter	99.62689	0.34710
Indiana - Posey	596.93060	0.51951
Indiana - Pulaski	210.13129	1.29981
Indiana - Putnam	235.91757	3.17050
Indiana - Randolph	140.22881	4.38138
Indiana - Ripley	116.97881	1.38202
Indiana - Rush	140.26753	2.05702
Indiana - St Joseph	158.64005	1.24335
Indiana - Scott	210.05968	2.95804
Indiana - Shelby	145.63464	2.12870
Indiana - Spencer	461.34851	1.60983
Indiana - Starke	163.08264	0.79836
Indiana - Steuben	69.76473	7.46861
Indiana - Sullivan	460.47437	3.37723
Indiana - Switzerland	103.18029	1.09371
Indiana - Tippecanoe	271.81137	3.04900
Indiana - Tipton	169.18642	3.18890
Indiana - Union	105.38884	1.51829
Indiana - Vanderburgh	527.81006	0.72917
Indiana - Vermillion	387.79031	3.82912
Indiana - Vigo	362.08212	3.05264
Indiana - Wabash	158.49345	3.39010
Indiana - Warren	383.50851	3.08093
Indiana - Warrick	519.40387	1.28089
Indiana - Washington	269.03189	4.05287
Indiana - Wayne	122.37895	2.27546
Indiana - Wells	105.29036	6.32924
Indiana - White	259.42429	1.78942
Indiana - Whitley	115.36836	4.50304
Iowa	333.12231	15.70232
Kansas	1040586.060	0.00240
Kentucky - west	118.61958	1.72892
Kentucky - east	262.80316	2.70158
Louisiana	217104.344	0.00379
Maine	0.00010	134264576.00
Maryland	0.01471	4017.35132
Massachusetts	0.00005	5794870.50
Michigan - west	199.74841	4.69761
Michigan - east	18.46278	32.97095
Minnesota	18.35513	1106.64783
Mississippi	52893.20310	0.01177
Missouri	2882.12988	1.42179
Montana	7451.22119	45.49508
Nebraska	53656.62500	0.35418
Nevada	1.06774	21.36360
New Hampshire	0.00009	9801140.0
New Jersey	0.00392	29818.53130
New Mexico	25450.97460	4.09621
New York	0.00774	230578.43800
North Carolina	2.89635	1142.66296
North Dakota	120.70196	326.99936
Ohio - north	5.33295	38.88663
Ohio - central	47.52374	7.24526
Ohio - south	138.32724	1.95213
Oklahoma	4090997.75	0.00005
Oregon	371902.31300	0.02592
Pennsylvania	0.04037	14884.34670
Rhode Island	0.00004	2360927.25
South Carolina	5.87321	582.88098
South Dakota	428.61768	317.13855
Tennessee	392.82010	5.11761
Texas	154884400.0	0.00063
Utah	16.80756	2449.49048
Vermont	0.00041	8997477.0
Virginia	0.65161	1789.85327
Washington	327466.46900	0.01616
West Virginia	41.88863	16.02378
Wisconsin	397.07397	1.81218
Wyoming	59.86810	141.13977

Table G-13 Clay, Concrete, Stone, or Glass Products - A and B Gravity Model Parameters

Alabama	17.08429	3.05691	Indiana - Parke	9.06829	3.22913
Arizona	55.05239	6.55482	Indiana - Perry	11.23831	2.77243
Arkansas	30.81980	3.04944	Indiana - Pike	11.86953	2.97662
California	4.70796	17.85733	Indiana - Porter	5.33623	2.82300
Colorado	89.55135	2.88331	Indiana - Posey	14.69763	2.79983
Connecticut	0.33393	85.36329	Indiana - Pulaski	5.92208	3.25989
Delaware	0.61550	24.42981	Indiana - Putnam	8.58815	3.23252
District of Columbia	0.88812	15.62243	Indiana - Randolph	5.50857	3.86428
Florida	6.33912	11.52791	Indiana - Ripley	6.68878	3.11808
Georgia	14.55826	3.34864	Indiana - Rush	6.45641	3.34535
Idaho	24.88677	16.95537	Indiana - St Joseph	5.24258	3.40911
Illinois - north	6.75436	3.29450	Indiana - Scott	8.13041	3.03189
Illinois - south	19.55695	1.91638	Indiana - Shelby	6.93260	3.26419
Indiana - Adams	5.04009	4.25658	Indiana - Spencer	12.26905	2.76138
Indiana - Allen	5.04493	4.20713	Indiana - Starke	5.49525	3.15293
Indiana - Bartholomew	7.64866	3.17076	Indiana - Steuben	4.63695	4.57351
Indiana - Benton	7.22129	3.12187	Indiana - Sullivan	11.08016	3.10073
Indiana - Blackford	5.62933	3.86630	Indiana - Switzerland	6.74713	3.00912
Indiana - Boone	7.26600	3.32339	Indiana - Tippecanoe	7.29019	3.28349
Indiana - Brown	8.15071	3.16455	Indiana - Tipton	6.55262	3.45226
Indiana - Carroll	6.69695	3.32870	Indiana - Union	5.78867	3.46227
Indiana - Cass	6.26149	3.41814	Indiana - Vanderburgh	13.45898	2.80506
Indiana - Clark	8.69507	2.90711	Indiana - Vermillion	9.32894	3.20515
Indiana - Clay	9.53845	3.19663	Indiana - Vigo	10.18262	3.15975
Indiana - Clinton	6.96105	3.35555	Indiana - Wabash	5.80688	3.67234
Indiana - Crawford	10.36756	2.89208	Indiana - Warren	7.97421	3.20937
Indiana - Daviess	11.31064	3.02868	Indiana - Warrick	12.53180	2.81819
Indiana - Dearborn	5.96823	3.10948	Indiana - Washington	8.91389	3.01976
Indiana - Decatur	6.73759	3.23226	Indiana - Wayne	5.66153	3.62271
Indiana - DeKalb	4.83682	4.34928	Indiana - Wells	5.20514	4.12342
Indiana - Delaware	5.89870	3.67586	Indiana - White	6.61100	3.23738
Indiana - Dubois	11.15894	2.96584	Indiana - Whitley	5.25645	3.97421
Indiana - Elkhart	5.21367	3.66364	Iowa	31.80286	2.42739
Indiana - Fayette	6.05411	3.41363	Kansas	48.69379	2.44827
Indiana - Floyd	8.83442	2.91569	Kentucky - west	11.24055	2.29738
Indiana - Fountain	8.29232	3.24367	Kentucky - east	7.80763	3.52777
Indiana - Franklin	6.04233	3.30625	Louisiana	25.00272	4.38926
Indiana - Fulton	5.80514	3.48012	Maine	0.77006	550.75153
Indiana - Gibson	13.09902	2.90958	Maryland	0.75119	17.89689
Indiana - Grant	5.92097	3.69219	Massachusetts	0.30601	147.89616
Indiana - Greene	9.93125	3.13952	Michigan - west	5.92990	5.18991
Indiana - Hamilton	6.61107	3.40010	Michigan - east	3.49110	7.84187
Indiana - Hancock	6.61996	3.35560	Minnesota	31.88391	5.46465
Indiana - Harrison	9.57735	2.88472	Mississippi	22.47218	3.88659
Indiana - Hendricks	7.60708	3.01624	Missouri	30.14081	2.00039
Indiana - Henry	6.08247	3.53455	Montana	173.70403	8.76898
Indiana - Howard	6.35502	3.49652	Nebraska	86.51810	2.83472
Indiana - Huntington	5.47981	3.90927	Nevada	1.78156	7.12300
Indiana - Jackson	8.34123	3.10078	New Hampshire	0.33899	147.25166
Indiana - Jasper	6.38146	3.06334	New Jersey	0.46204	45.27960
Indiana - Jay	5.34482	4.03745	New Mexico	94.11917	7.53051
Indiana - Jefferson	7.32881	3.02879	New York	0.59950	56.97598
Indiana - Jennings	7.39656	3.12422	North Carolina	4.09864	11.54832
Indiana - Johnson	7.40468	3.21656	North Dakota	61.50820	10.81393
Indiana - Knox	12.18147	3.00688	Ohio - north	2.42922	8.80161
Indiana - Kosciusko	5.46336	3.70920	Ohio - central	4.03085	5.43958
Indiana - Lagrange	4.97116	4.15701	Ohio - south	6.07901	3.54708
Indiana - Lake	5.10854	2.60523	Oklahoma	23.82647	1.50105
Indiana - LaPorte	5.25232	3.02477	Oregon	5.27927	36.03296
Indiana - Lawrence	9.40095	3.09558	Pennsylvania	0.75060	24.88515
Indiana - Madison	6.26607	3.50824	Rhode Island	0.28492	124.04269
Indiana - Marion	7.12536	3.27122	South Carolina	8.96572	6.52316
Indiana - Marshall	5.54492	3.40569	South Dakota	142.17400	4.12048
Indiana - Martin	10.32425	3.04949	Tennessee	14.74300	2.75857
Indiana - Miami	6.08449	3.53171	Texas	49.79401	3.53171
Indiana - Monroe	8.75657	3.15933	Utah	62.97334	4.97793
Indiana - Montgomery	7.87402	3.27920	Vermont	0.54977	161.43697
Indiana - Morgan	8.22967	3.19833	Virginia	1.92332	14.79264
Indiana - Newton	6.57551	2.97885	Washington	4.77285	34.86248
Indiana - Noble	4.93922	4.23977	West Virginia	4.41181	7.81277
Indiana - Ohio	6.28278	3.03689	Wisconsin	8.05362	4.15499
Indiana - Orange	9.78865	3.01399	Wyoming	54.22277	1.74793
Indiana - Owen	9.06617	3.18179			

Table G-14 Primary Metal Products - A and B Gravity Model Parameters

Alabama	3.84920	1.82312	Indiana - Parke	2.52433	1.17960
Arizona	2.99506	15.98038	Indiana - Perry	2.71346	1.25897
Arkansas	3.82363	1.97573	Indiana - Pike	2.68221	1.25070
California	0.93184	24.61897	Indiana - Porter	2.38580	1.12365
Colorado	3.86833	7.73283	Indiana - Posey	2.82151	1.32941
Connecticut	2.73842	2.75485	Indiana - Pulaski	2.37882	1.11593
Delaware	2.50656	1.79492	Indiana - Putnam	2.50562	1.16437
District of Columbia	2.56585	1.65198	Indiana - Randolph	2.34845	1.09485
Florida	7.86605	4.42150	Indiana - Ripley	2.45611	1.12739
Georgia	3.79625	1.83109	Indiana - Rush	2.40906	1.11096
Idaho	1.49457	20.79661	Indiana - St Joseph	2.37463	1.13008
Illinois - north	2.53100	1.22725	Indiana - Scott	2.53927	1.16864
Illinois - south	2.96585	1.47750	Indiana - Shelby	2.43376	1.12273
Indiana - Adams	2.32877	1.10078	Indiana - Spencer	2.75204	1.28154
Indiana - Allen	2.33323	1.10648	Indiana - Starke	2.37378	1.11869
Indiana - Bartholomew	2.48223	1.14370	Indiana - Steuben	2.35394	1.13506
Indiana - Benton	2.45729	1.15492	Indiana - Sullivan	2.62193	1.22607
Indiana - Blackford	2.34635	1.09873	Indiana - Switzerland	2.48808	1.14189
Indiana - Boone	2.43221	1.13043	Indiana - Tippecanoe	2.43789	1.13821
Indiana - Brown	2.50288	1.15537	Indiana - Tipton	2.39186	1.11229
Indiana - Carroll	2.40566	1.12332	Indiana - Union	2.38240	1.09927
Indiana - Cass	2.38141	1.11337	Indiana - Vanderburgh	2.78272	1.30302
Indiana - Clark	2.60060	1.19871	Indiana - Vermillion	2.53669	1.18834
Indiana - Clay	2.54936	1.18855	Indiana - Vigo	2.57624	1.20610
Indiana - Clinton	2.41436	1.12401	Indiana - Wabash	2.35554	1.10415
Indiana - Crawford	2.65762	1.22980	Indiana - Warren	2.48125	1.16374
Indiana - Daviess	2.65209	1.23505	Indiana - Warrick	2.74420	1.27979
Indiana - Dearborn	2.42588	1.11193	Indiana - Washington	2.57454	1.18699
Indiana - Decatur	2.43679	1.12113	Indiana - Wayne	2.36709	1.09614
Indiana - DeKalb	2.33939	1.11782	Indiana - Wells	2.33339	1.10077
Indiana - Delaware	2.36166	1.09871	Indiana - White	2.41054	1.12793
Indiana - Dubois	2.66567	1.23801	Indiana - Whitley	2.34250	1.10876
Indiana - Elkhart	2.37170	1.13160	Iowa	3.67934	2.23580
Indiana - Fayette	2.39136	1.10305	Kansas	4.10897	2.83021
Indiana - Floyd	2.60206	1.19965	Kentucky - west	2.86228	1.33384
Indiana - Fountain	2.48971	1.16514	Kentucky - east	2.61573	1.21871
Indiana - Franklin	2.40428	1.10584	Louisiana	5.63572	2.85215
Indiana - Fulton	2.36414	1.11023	Maine	5.49368	6.42452
Indiana - Gibson	2.73382	1.28130	Maryland	2.49215	1.65260
Indiana - Grant	2.35801	1.10138	Massachusetts	3.15775	3.60503
Indiana - Greene	2.58041	1.19858	Michigan - west	2.60257	1.30443
Indiana - Hamilton	2.39838	1.11299	Michigan - east	2.45164	1.25810
Indiana - Hancock	2.40717	1.11335	Minnesota	4.59865	3.00884
Indiana - Harrison	2.63580	1.21715	Mississippi	4.46510	2.18930
Indiana - Hendricks	2.52189	1.15898	Missouri	3.34195	1.81115
Indiana - Henry	2.37774	1.10163	Montana	3.88238	16.42464
Indiana - Howard	2.38055	1.10985	Nebraska	4.54473	4.01545
Indiana - Huntington	2.34341	1.10269	Nevada	0.69832	18.48664
Indiana - Jackson	2.53108	1.16635	New Hampshire	3.21978	3.60086
Indiana - Jasper	2.41716	1.13444	New Jersey	2.58085	2.13832
Indiana - Jay	2.33834	1.09612	New Mexico	4.21258	8.92309
Indiana - Jefferson	2.50825	1.15236	New York	2.75411	2.13264
Indiana - Jennings	2.48466	1.14248	North Carolina	3.55535	2.08311
Indiana - Johnson	2.45713	1.13480	North Dakota	6.58343	5.68032
Indiana - Knox	2.67992	1.25449	Ohio - north	2.34602	1.23737
Indiana - Kosciusko	2.35400	1.11189	Ohio - central	2.34951	1.13907
Indiana - Lagrange	2.36189	1.13264	Ohio - south	2.44148	1.13349
Indiana - Lake	2.39884	1.13418	Oklahoma	4.04063	2.63148
Indiana - LaPorte	2.37989	1.12698	Oregon	1.23759	27.32542
Indiana - Lawrence	2.57353	1.18993	Pennsylvania	2.46986	1.67109
Indiana - Madison	2.38042	1.10495	Rhode Island	2.97471	3.30611
Indiana - Marion	2.43354	1.12660	South Carolina	4.01939	2.15645
Indiana - Marshall	2.36493	1.11532	South Dakota	4.97742	8.43867
Indiana - Martin	2.61785	1.21342	Tennessee	3.08289	1.44146
Indiana - Miami	2.36923	1.10804	Texas	5.17581	3.14115
Indiana - Monroe	2.52839	1.16985	Utah	2.02911	14.07969
Indiana - Montgomery	2.46459	1.14864	Vermont	3.49737	3.57947
Indiana - Morgan	2.49757	1.15605	Virginia	2.99909	1.87346
Indiana - Newton	2.44089	1.14922	Washington	1.45006	30.07801
Indiana - Noble	2.34795	1.12222	West Virginia	2.60569	1.32828
Indiana - Ohio	2.45749	1.12688	Wisconsin	2.79531	1.40667
Indiana - Orange	2.60673	1.20532	Wyoming	3.79174	7.93275
Indiana - Owen	2.53556	1.17666			

Table G-15 Fabricated Metal Products - A and B Gravity Model Parameters

Alabama	4.69788	1.80379	Indiana - Parke	2.93919	1.23298
Arizona	2.47269	25.74672	Indiana - Perry	3.21375	1.31183
Arkansas	4.14385	2.09399	Indiana - Pike	3.14784	1.31152
California	0.65695	30.65062	Indiana - Porter	2.75390	1.16100
Colorado	3.67125	8.20336	Indiana - Posey	3.29509	1.39556
Connecticut	3.07087	2.54406	Indiana - Pulaski	2.75938	1.14699
Delaware	2.99388	1.76286	Indiana - Putnam	2.92884	1.21329
District of Columbia	3.14922	1.62236	Indiana - Randolph	2.76496	1.11283
Florida	9.63943	3.24460	Indiana - Ripley	2.91536	1.16378
Georgia	4.84633	1.75348	Indiana - Rush	2.84070	1.14357
Idaho	1.25720	28.80920	Indiana - St Joseph	2.74376	1.13544
Illinois - north	2.91318	1.25853	Indiana - Scott	3.01355	1.21146
Illinois - south	3.34964	1.55226	Indiana - Shelby	2.86493	1.15899
Indiana - Adams	2.72717	1.10247	Indiana - Spencer	3.24705	1.33912
Indiana - Allen	2.72391	1.10411	Indiana - Starke	2.74691	1.14452
Indiana - Bartholomew	2.92740	1.18521	Indiana - Steuben	2.73746	1.10949
Indiana - Benton	2.84373	1.20383	Indiana - Sullivan	3.06105	1.28610
Indiana - Blackford	2.74667	1.11394	Indiana - Switzerland	2.96890	1.17887
Indiana - Boone	2.83943	1.17066	Indiana - Tippecanoe	2.83530	1.18295
Indiana - Brown	2.94573	1.20040	Indiana - Tipton	2.79457	1.14431
Indiana - Carroll	2.79805	1.16160	Indiana - Union	2.81981	1.12719
Indiana - Cass	2.77053	1.14414	Indiana - Vanderburgh	3.26570	1.36649
Indiana - Clark	3.10100	1.24127	Indiana - Vermillion	2.94916	1.24383
Indiana - Clay	2.97654	1.24321	Indiana - Vigo	3.00043	1.26385
Indiana - Clinton	2.81498	1.16234	Indiana - Wabash	2.74564	1.12272
Indiana - Crawford	3.14887	1.28073	Indiana - Warren	2.87777	1.21479
Indiana - Daviess	3.11258	1.29429	Indiana - Warrick	3.22925	1.34035
Indiana - Dearborn	2.88616	1.14537	Indiana - Washington	3.05105	1.23363
Indiana - Decatur	2.87936	1.15651	Indiana - Wayne	2.79697	1.12089
Indiana - DeKalb	2.72518	1.10499	Indiana - Wells	2.72980	1.10538
Indiana - Delaware	2.77215	1.12111	Indiana - White	2.79816	1.16881
Indiana - Dubois	3.14107	1.29512	Indiana - Whitley	2.72817	1.11089
Indiana - Elkhart	2.74420	1.12908	Iowa	4.00873	2.20866
Indiana - Fayette	2.82510	1.13265	Kansas	4.22018	2.89611
Indiana - Floyd	3.09951	1.24320	Kentucky - west	3.41544	1.36815
Indiana - Fountain	2.89292	1.21651	Kentucky - east	3.17477	1.24835
Indiana - Franklin	2.84843	1.13753	Louisiana	6.22813	2.83389
Indiana - Fulton	2.74686	1.13215	Maine	6.43631	5.89904
Indiana - Gibson	3.19911	1.34570	Maryland	3.03157	1.63735
Indiana - Grant	2.75659	1.12201	Massachusetts	3.54270	3.27267
Indiana - Greene	3.02665	1.25357	Michigan - west	3.00329	1.25587
Indiana - Hamilton	2.80698	1.14508	Michigan - east	2.87896	1.20292
Indiana - Hancock	2.82668	1.14631	Minnesota	5.07312	2.91171
Indiana - Harrison	3.13470	1.26360	Mississippi	5.04481	2.23058
Indiana - Hendricks	2.99962	1.19957	Missouri	3.67718	1.87980
Indiana - Henry	2.79668	1.12835	Montana	3.90952	18.84513
Indiana - Howard	2.77759	1.13913	Nebraska	4.71285	3.91265
Indiana - Huntington	2.73549	1.11257	Nevada	0.47432	22.17485
Indiana - Jackson	2.99259	1.21127	New Hampshire	3.61816	3.26252
Indiana - Jasper	2.79747	1.17831	New Jersey	2.97930	2.02698
Indiana - Jay	2.74665	1.10821	New Mexico	3.89083	11.09782
Indiana - Jefferson	2.98529	1.19162	New York	3.20652	2.05925
Indiana - Jennings	2.94187	1.18257	North Carolina	4.61724	1.89282
Indiana - Johnson	2.88732	1.17468	North Dakota	7.32103	5.49026
Indiana - Knox	3.13333	1.31727	Ohio - north	2.78419	1.19808
Indiana - Kosciusko	2.73525	1.12094	Ohio - central	2.81735	1.14575
Indiana - Lagrange	2.74053	1.11691	Ohio - south	2.92031	1.16279
Indiana - Lake	2.75692	1.17311	Oklahoma	4.02324	2.74002
Indiana - LaPorte	2.74594	1.14917	Oregon	1.11641	37.50580
Indiana - Lawrence	3.03393	1.24089	Pennsylvania	2.96118	1.64040
Indiana - Madison	2.79081	1.13289	Rhode Island	3.32942	3.02012
Indiana - Marion	2.85125	1.16436	South Carolina	5.37416	1.90004
Indiana - Marshall	2.74151	1.13317	South Dakota	5.17124	8.40459
Indiana - Martin	3.08338	1.26825	Tennessee	3.70874	1.48385
Indiana - Miami	2.75987	1.13368	Texas	5.32656	3.36365
Indiana - Monroe	2.97128	1.21877	Utah	1.71677	18.85710
Indiana - Montgomery	2.87116	1.19550	Vermont	3.99270	3.30796
Indiana - Morgan	2.93023	1.20194	Virginia	3.76250	1.77881
Indiana - Newton	2.81874	1.19708	Washington	1.39943	42.11655
Indiana - Noble	2.73069	1.10966	West Virginia	3.23665	1.32818
Indiana - Ohio	2.93080	1.16197	Wisconsin	3.18569	1.40037
Indiana - Orange	3.08074	1.25627	Wyoming	3.58155	8.07086
Indiana - Owen	2.97114	1.22761			

Table G-16 Machinery, except electrical - A and B Gravity Model Parameters

Alabama	2.33450	1.66551	Indiana - Parke	1.66752	1.33522
Arizona	3.11010	5.94246	Indiana - Perry	1.75846	1.36229
Arkansas	2.35945	1.63603	Indiana - Pike	1.74105	1.35390
California	1.65935	7.09468	Indiana - Porter	1.61435	1.33686
Colorado	2.89469	3.12889	Indiana - Posey	1.80786	1.37479
Connecticut	1.86280	2.68591	Indiana - Pulaski	1.60728	1.33699
Delaware	1.73559	2.06155	Indiana - Putnam	1.65949	1.33388
District of Columbia	1.73424	1.87757	Indiana - Randolph	1.58714	1.35001
Florida	4.13173	2.93971	Indiana - Ripley	1.63806	1.34315
Georgia	2.26332	1.69692	Indiana - Rush	1.61593	1.33754
Idaho	2.21859	6.11636	Indiana - St Joseph	1.60071	1.35829
Illinois - north	1.66556	1.37614	Indiana - Scott	1.67544	1.34521
Illinois - south	1.86745	1.40762	Indiana - Shelby	1.62721	1.33474
Indiana - Adams	1.57638	1.36321	Indiana - Spencer	1.77682	1.36607
Indiana - Allen	1.57826	1.36474	Indiana - Starke	1.60547	1.34234
Indiana - Bartholomew	1.64900	1.33641	Indiana - Steuben	1.58297	1.39207
Indiana - Benton	1.64068	1.33252	Indiana - Sullivan	1.71120	1.34510
Indiana - Blackford	1.58698	1.34783	Indiana - Switzerland	1.65304	1.35081
Indiana - Boone	1.62780	1.33083	Indiana - Tippecanoe	1.63135	1.33093
Indiana - Brown	1.65822	1.33597	Indiana - Tipton	1.61011	1.33394
Indiana - Carroll	1.61774	1.33200	Indiana - Union	1.60391	1.34586
Indiana - Cass	1.60672	1.33521	Indiana - Vanderburgh	1.79032	1.36952
Indiana - Clark	1.70417	1.35540	Indiana - Vermillion	1.67281	1.33609
Indiana - Clay	1.67855	1.33739	Indiana - Vigo	1.69014	1.33982
Indiana - Clinton	1.62040	1.33090	Indiana - Wabash	1.59303	1.34307
Indiana - Crawford	1.73104	1.35519	Indiana - Warren	1.64984	1.33302
Indiana - Daviess	1.72660	1.34993	Indiana - Warrick	1.77241	1.36400
Indiana - Dearborn	1.62557	1.34784	Indiana - Washington	1.69178	1.34663
Indiana - Decatur	1.62859	1.33843	Indiana - Wayne	1.59637	1.34738
Indiana - DeKalb	1.57925	1.37609	Indiana - Wells	1.57924	1.35856
Indiana - Delaware	1.59441	1.34207	Indiana - White	1.62090	1.33215
Indiana - Dubois	1.73397	1.35317	Indiana - Whitley	1.58406	1.35904
Indiana - Elkhart	1.59686	1.36545	Iowa	2.11569	1.64462
Indiana - Fayette	1.60776	1.34159	Kansas	2.46279	1.84632
Indiana - Floyd	1.70484	1.35434	Kentucky - west	1.83492	1.39407
Indiana - Fountain	1.65298	1.33290	Kentucky - east	1.70484	1.39233
Indiana - Franklin	1.61436	1.34381	Louisiana	3.23377	2.14689
Indiana - Fulton	1.59859	1.34150	Maine	2.92783	4.46133
Indiana - Gibson	1.76518	1.36086	Maryland	1.71605	1.91768
Indiana - Grant	1.59362	1.34150	Massachusetts	2.07401	3.16454
Indiana - Greene	1.69300	1.34116	Michigan - west	1.67112	1.47608
Indiana - Hamilton	1.61223	1.33312	Michigan - east	1.61167	1.52497
Indiana - Hancock	1.61556	1.33426	Minnesota	2.40085	1.98387
Indiana - Harrison	1.72076	1.35603	Mississippi	2.68452	1.82153
Indiana - Hendricks	1.66782	1.34700	Missouri	2.02098	1.50590
Indiana - Henry	1.60165	1.33981	Montana	3.37304	4.83851
Indiana - Howard	1.60529	1.33534	Nebraska	2.61335	2.13669
Indiana - Huntington	1.58554	1.35188	Nevada	1.37450	5.90141
Indiana - Jackson	1.67131	1.34135	New Hampshire	2.07076	3.13158
Indiana - Jasper	1.62523	1.33210	New Jersey	1.77224	2.30838
Indiana - Jay	1.58200	1.35438	New Mexico	3.25058	3.78006
Indiana - Jefferson	1.66164	1.34738	New York	1.77308	2.23259
Indiana - Jennings	1.65033	1.34016	North Carolina	2.06667	1.90723
Indiana - Johnson	1.63780	1.33319	North Dakota	3.13655	2.73141
Indiana - Knox	1.73869	1.35297	Ohio - north	1.57593	1.54004
Indiana - Kosciusko	1.59133	1.35258	Ohio - central	1.58351	1.42013
Indiana - Lagrange	1.58884	1.37914	Ohio - south	1.62811	1.36321
Indiana - Lake	1.62068	1.33514	Oklahoma	2.57342	1.86153
Indiana - LaPorte	1.60769	1.34590	Oregon	2.35948	7.72195
Indiana - Lawrence	1.69060	1.34273	Pennsylvania	1.67746	1.91917
Indiana - Madison	1.60364	1.33677	Rhode Island	1.99838	3.01049
Indiana - Marion	1.62789	1.33196	South Carolina	2.26783	1.86712
Indiana - Marshall	1.59886	1.34624	South Dakota	3.15713	3.18974
Indiana - Martin	1.71112	1.34695	Tennessee	1.94091	1.44850
Indiana - Miami	1.60038	1.33807	Texas	3.05565	2.16138
Indiana - Monroe	1.66964	1.33682	Utah	2.43206	4.90835
Indiana - Montgomery	1.64214	1.33108	Vermont	2.12868	3.07955
Indiana - Morgan	1.65585	1.33441	Virginia	1.87742	1.90816
Indiana - Newton	1.63531	1.33239	Washington	2.84258	8.36619
Indiana - Noble	1.58324	1.37531	West Virginia	1.68808	1.52036
Indiana - Ohio	1.63969	1.35028	Wisconsin	1.75556	1.47357
Indiana - Orange	1.70642	1.34732	Wyoming	2.87189	3.10810
Indiana - Owen	1.67267	1.33643			

Table G-17 Electrical Machinery, Equipment, Supplies - A and B Gravity Model Parameters

Alabama	2.29485	1.51192	Indiana - Parke	1.83320	1.27046
Arizona	2.32490	7.39236	Indiana - Perry	1.88463	1.25392
Arkansas	2.30028	1.62270	Indiana - Pike	1.88051	1.26270
California	1.23880	8.66317	Indiana - Porter	1.80840	1.31792
Colorado	2.39937	3.93247	Indiana - Posey	1.93360	1.28281
Connecticut	2.05431	2.28403	Indiana - Pulaski	1.79113	1.29689
Delaware	1.84287	1.78784	Indiana - Putnam	1.81998	1.25840
District of Columbia	1.82958	1.65906	Indiana - Randolph	1.74789	1.26255
Florida	3.53750	2.66896	Indiana - Ripley	1.78428	1.23662
Georgia	2.26076	1.50761	Indiana - Rush	1.77129	1.24327
Idaho	1.59373	8.42911	Indiana - St Joseph	1.79205	1.33239
Illinois - north	1.87282	1.37468	Indiana - Scott	1.81642	1.23871
Illinois - south	2.01442	1.36139	Indiana - Shelby	1.78278	1.24326
Indiana - Adams	1.74593	1.29271	Indiana - Spencer	1.90168	1.26198
Indiana - Allen	1.75240	1.30362	Indiana - Starke	1.79492	1.31325
Indiana - Bartholomew	1.80013	1.24116	Indiana - Steuben	1.76396	1.34671
Indiana - Benton	1.82304	1.29418	Indiana - Sullivan	1.86368	1.26759
Indiana - Blackford	1.75505	1.27436	Indiana - Switzerland	1.79304	1.23653
Indiana - Boone	1.79467	1.26109	Indiana - Tippecanoe	1.80610	1.27619
Indiana - Brown	1.81035	1.24468	Indiana - Tipton	1.77825	1.26309
Indiana - Carroll	1.79410	1.27845	Indiana - Union	1.75725	1.24564
Indiana - Cass	1.78385	1.28167	Indiana - Vanderburgh	1.91674	1.27244
Indiana - Clark	1.83649	1.24110	Indiana - Vermillion	1.83981	1.27498
Indiana - Clay	1.83794	1.26380	Indiana - Vigo	1.85050	1.27097
Indiana - Clinton	1.79098	1.26653	Indiana - Wabash	1.76760	1.28316
Indiana - Crawford	1.86320	1.24867	Indiana - Warren	1.82642	1.28491
Indiana - Daviess	1.86945	1.26030	Indiana - Warrick	1.90112	1.26453
Indiana - Dearborn	1.77100	1.23716	Indiana - Washington	1.83145	1.24199
Indiana - Decatur	1.78029	1.23971	Indiana - Wayne	1.75238	1.25122
Indiana - DeKalb	1.75717	1.32331	Indiana - Wells	1.74980	1.28991
Indiana - Delaware	1.75740	1.25961	Indiana - White	1.80132	1.28691
Indiana - Dubois	1.87085	1.25567	Indiana - Whitley	1.76178	1.30508
Indiana - Elkhart	1.78601	1.33482	Iowa	2.28120	1.74992
Indiana - Fayette	1.76226	1.24446	Kansas	2.37744	2.00053
Indiana - Floyd	1.83781	1.24150	Kentucky - west	1.93525	1.26604
Indiana - Fountain	1.82521	1.27743	Kentucky - east	1.83007	1.26048
Indiana - Franklin	1.76524	1.24108	Louisiana	2.91603	2.14462
Indiana - Fulton	1.77919	1.29398	Maine	3.26372	3.85488
Indiana - Gibson	1.90133	1.27178	Maryland	1.81529	1.68785
Indiana - Grant	1.76265	1.27052	Massachusetts	2.31859	2.68496
Indiana - Greene	1.84348	1.25585	Michigan - west	1.88177	1.47945
Indiana - Hamilton	1.77649	1.25550	Michigan - east	1.78870	1.46618
Indiana - Hancock	1.77508	1.24823	Minnesota	2.61031	2.21252
Indiana - Harrison	1.85188	1.24454	Mississippi	2.52085	1.75596
Indiana - Hendricks	1.80818	1.23723	Missouri	2.14633	1.51224
Indiana - Henry	1.76141	1.25167	Montana	2.60495	6.47685
Indiana - Howard	1.77648	1.26981	Nebraska	2.50771	2.43843
Indiana - Huntington	1.75903	1.28898	Nevada	1.03418	7.17718
Indiana - Jackson	1.81688	1.24134	New Hampshire	2.31515	2.68900
Indiana - Jasper	1.81095	1.29786	New Jersey	1.90771	1.96308
Indiana - Jay	1.74631	1.27350	New Mexico	2.57143	4.70012
Indiana - Jefferson	1.80251	1.23683	New York	1.92937	1.99782
Indiana - Jennings	1.79723	1.23788	North Carolina	2.16133	1.67852
Indiana - Johnson	1.79386	1.24484	North Dakota	3.18544	3.23778
Indiana - Knox	1.88281	1.26896	Ohio - north	1.72999	1.44151
Indiana - Kosciusko	1.77256	1.30600	Ohio - central	1.72924	1.30626
Indiana - Lagrange	1.77347	1.34002	Ohio - south	1.77144	1.24992
Indiana - Lake	1.81871	1.32537	Oklahoma	2.39385	2.06275
Indiana - LaPorte	1.80200	1.32624	Oregon	1.58575	11.72922
Indiana - Lawrence	1.83591	1.24761	Pennsylvania	1.78737	1.69245
Indiana - Madison	1.76692	1.25566	Rhode Island	2.22544	2.54416
Indiana - Marion	1.78860	1.25037	South Carolina	2.31460	1.63417
Indiana - Marshall	1.78440	1.30865	South Dakota	2.75150	4.02225
Indiana - Martin	1.85346	1.25224	Tennessee	2.01530	1.31703
Indiana - Miami	1.77536	1.27961	Texas	2.78191	2.34099
Indiana - Monroe	1.82178	1.24842	Utah	1.81805	6.52076
Indiana - Montgomery	1.81136	1.26792	Vermont	2.36220	2.70066
Indiana - Morgan	1.81181	1.24958	Virginia	1.97968	1.68533
Indiana - Newton	1.82288	1.30331	Washington	1.85100	13.34815
Indiana - Noble	1.76374	1.32775	West Virginia	1.80805	1.36687
Indiana - Ohio	1.78166	1.23643	Wisconsin	1.97876	1.51271
Indiana - Orange	1.84597	1.24672	Wyoming	2.40299	3.96862
Indiana - Owen	1.82777	1.25414			

Table G-18 Transportation Equipment - A and B Gravity Model Parameters

Alabama	34.82077	0.35332
Arizona	0.19800	188.51059
Arkansas	14.75865	0.72498
California	0.01919	1052.01257
Colorado	0.78692	13.09409
Connecticut	32.82389	0.40167
Delaware	46.33323	0.20716
District of Columbia	50.31218	0.18310
Florida	58.64688	0.98415
Georgia	46.25535	0.31312
Idaho	0.04943	335.22769
Illinois - north	37.55151	0.12346
Illinois - south	23.74820	0.24483
Indiana - Adams	44.32740	0.08824
Indiana - Allen	44.06461	0.08802
Indiana - Bartholomew	39.57422	0.11149
Indiana - Benton	36.39715	0.11827
Indiana - Blackford	42.42852	0.09261
Indiana - Boone	38.38867	0.10819
Indiana - Brown	38.72615	0.11566
Indiana - Carroll	38.50319	0.10629
Indiana - Cass	39.49910	0.10143
Indiana - Clark	40.32337	0.12579
Indiana - Clay	36.15908	0.12846
Indiana - Clinton	38.58853	0.10624
Indiana - Crawford	37.75204	0.13885
Indiana - Daviess	35.64788	0.14420
Indiana - Dearborn	42.60447	0.10072
Indiana - Decatur	40.99579	0.10398
Indiana - DeKalb	44.84698	0.08658
Indiana - Delaware	41.86476	0.09494
Indiana - Dubois	36.31344	0.14409
Indiana - Elkhart	42.17197	0.09243
Indiana - Fayette	42.03667	0.09801
Indiana - Floyd	40.04185	0.12656
Indiana - Fountain	36.33920	0.12132
Indiana - Franklin	42.24800	0.09912
Indiana - Fulton	40.38076	0.09751
Indiana - Gibson	33.81308	0.16196
Indiana - Grant	41.37883	0.09516
Indiana - Greene	36.63755	0.13134
Indiana - Hamilton	39.77970	0.10131
Indiana - Hancock	40.21611	0.10144
Indiana - Harrison	39.06239	0.13289
Indiana - Hendricks	40.96313	0.11450
Indiana - Henry	41.55704	0.09683
Indiana - Howard	39.94245	0.09992
Indiana - Huntington	42.53661	0.09153
Indiana - Jackson	39.33772	0.11838
Indiana - Jasper	37.37212	0.11149
Indiana - Jay	43.59108	0.09084
Indiana - Jefferson	41.34475	0.11232
Indiana - Jennings	40.48281	0.11061
Indiana - Johnson	39.18235	0.10871
Indiana - Knox	34.43363	0.15205
Indiana - Kosciusko	41.77708	0.09297
Indiana - Lagrange	44.24237	0.08820
Indiana - Lake	37.28128	0.11008
Indiana - LaPorte	39.51823	0.10114
Indiana - Lawrence	37.89854	0.12715
Indiana - Madison	40.77619	0.09810
Indiana - Marion	39.03819	0.10596
Indiana - Marshall	40.50898	0.09687
Indiana - Martin	36.97839	0.13556
Indiana - Miami	40.27987	0.09838
Indiana - Monroe	37.89619	0.12097
Indiana - Montgomery	37.27045	0.11521
Indiana - Morgan	38.12351	0.11612
Indiana - Newton	36.46860	0.11677
Indiana - Noble	44.43475	0.08745
Indiana - Ohio	42.61285	0.10445
Indiana - Orange	37.94132	0.13166
Indiana - Owen	37.17746	0.12368
Indiana - Parke	36.08708	0.12572
Indiana - Perry	36.75040	0.14895
Indiana - Pike	35.18468	0.14993
Indiana - Porter	38.17746	0.10644
Indiana - Posey	32.32124	0.18032
Indiana - Pulaski	39.22417	0.10214
Indiana - Putnam	37.20798	0.11967
Indiana - Randolph	43.21737	0.09253
Indiana - Ripley	41.58804	0.10550
Indiana - Rush	41.10897	0.10082
Indiana - St Joseph	41.14721	0.09508
Indiana - Scott	40.12437	0.11813
Indiana - Shelby	40.11586	0.10463
Indiana - Spencer	35.29392	0.15885
Indiana - Starke	39.54023	0.10062
Indiana - Steuben	46.02045	0.08541
Indiana - Sullivan	35.03538	0.14182
Indiana - Switzerland	42.27463	0.10856
Indiana - Tippecanoe	37.57558	0.11201
Indiana - Tipton	39.74269	0.10123
Indiana - Union	42.71181	0.09655
Indiana - Vanderburgh	33.77169	0.16905
Indiana - Vermillion	35.58194	0.12905
Indiana - Vigo	35.25214	0.13492
Indiana - Wabash	41.23820	0.09506
Indiana - Warren	36.20727	0.12099
Indiana - Warrick	34.83084	0.15960
Indiana - Washington	39.15876	0.12456
Indiana - Wayne	42.96190	0.09486
Indiana - Wells	43.64780	0.08927
Indiana - White	38.01714	0.10850
Indiana - Whitley	42.96822	0.08995
Iowa	14.45841	0.50819
Kansas	5.89059	1.57537
Kentucky - west	36.39805	0.16846
Kentucky - east	45.74532	0.12581
Louisiana	22.54742	1.32245
Maine	61.72157	1.55587
Maryland	48.65588	0.18633
Massachusetts	37.79486	0.62350
Michigan - west	50.43721	0.10421
Michigan - east	56.57595	0.09098
Minnesota	18.20197	0.65950
Mississippi	21.59275	0.74439
Missouri	16.35644	0.40637
Montana	0.34486	40.49487
Nebraska	3.89349	2.25726
Nevada	0.01149	604.78979
New Hampshire	39.13915	0.60465
New Jersey	40.76188	0.26768
New Mexico	0.63668	28.67325
New York	51.44234	0.25580
North Carolina	71.44603	0.28975
North Dakota	7.62894	2.18276
Ohio - north	55.44076	0.09283
Ohio - central	49.82065	0.09566
Ohio - south	44.67192	0.10371
Oklahoma	5.51438	2.01581
Oregon	0.02107	1384.02258
Pennsylvania	49.04151	0.18380
Rhode Island	35.31077	0.54719
South Carolina	67.69324	0.34139
South Dakota	1.32232	8.19899
Tennessee	35.81451	0.20924
Texas	9.56193	2.67724
Utah	0.11325	103.77234
Vermont	48.27333	0.57896
Virginia	61.35946	0.23184
Washington	0.02204	1380.62439
West Virginia	56.69133	0.13999
Wisconsin	41.07280	0.14179
Wyoming	0.80038	12.03811

Table G-19 Waste or Scrap Material- A and B Gravity Model Parameters

Alabama	28.03803	1.34706	Indiana - Parke	20.09878	1.19239
Arizona	78.03447	17.89603	Indiana - Perry	19.14256	1.44800
Arkansas	10.92971	6.36991	Indiana - Pike	20.02893	1.42756
California	1.49109	65.88786	Indiana - Porter	16.23045	0.84415
Colorado	12.74566	19.90525	Indiana - Posey	19.99819	1.63599
Connecticut	40.40154	0.73350	Indiana - Pulaski	17.80359	0.92729
Delaware	27.15203	0.53308	Indiana - Putnam	19.39415	1.14231
District of Columbia	30.78272	0.60437	Indiana - Randolph	18.51305	0.88673
Florida	711.76056	0.06675	Indiana - Ripley	17.22358	0.92235
Georgia	35.42595	1.03522	Indiana - Rush	17.59996	0.92099
Idaho	0.88487	491.96417	Indiana - St Joseph	17.57825	0.85175
Illinois - north	18.26998	0.96779	Indiana - Scott	18.47671	1.10542
Illinois - south	20.87266	1.60636	Indiana - Shelby	17.79736	0.96974
Indiana - Adams	19.57288	0.90627	Indiana - Spencer	19.29655	1.52178
Indiana - Allen	19.60165	0.90955	Indiana - Starke	17.13679	0.87374
Indiana - Bartholomew	18.18365	1.03969	Indiana - Steuben	21.47646	0.90539
Indiana - Benton	19.06305	1.05085	Indiana - Sullivan	20.41726	1.33651
Indiana - Blackford	18.73007	0.92361	Indiana - Switzerland	17.36305	0.94425
Indiana - Boone	18.63108	1.03412	Indiana - Tippecanoe	19.01204	1.05334
Indiana - Brown	18.59279	1.09166	Indiana - Tipton	18.32735	0.97739
Indiana - Carroll	18.55872	1.00242	Indiana - Union	17.28517	0.84908
Indiana - Cass	18.32869	0.96614	Indiana - Vanderburgh	19.71892	1.57810
Indiana - Clark	18.88694	1.20308	Indiana - Vermillion	20.32831	1.21323
Indiana - Clay	20.04493	1.22294	Indiana - Vigo	20.42840	1.27036
Indiana - Clinton	18.58484	1.01651	Indiana - Wabash	18.47492	0.93701
Indiana - Crawford	19.31961	1.35538	Indiana - Warren	19.74144	1.11588
Indiana - Daviess	20.05072	1.37919	Indiana - Warrick	19.55037	1.51608
Indiana - Dearborn	16.32045	0.82465	Indiana - Washington	18.94759	1.19234
Indiana - Decatur	17.51154	0.93760	Indiana - Wayne	17.75447	0.86057
Indiana - DeKalb	20.30512	0.90584	Indiana - Wells	19.24003	0.91224
Indiana - Delaware	18.29069	0.91775	Indiana - White	18.47422	0.99482
Indiana - Dubois	19.71028	1.39267	Indiana - Whitley	19.07282	0.90971
Indiana - Elkhart	18.33189	0.86601	Iowa	43.97522	1.34350
Indiana - Fayette	17.42555	0.87958	Kansas	16.56495	8.00953
Indiana - Floyd	18.91201	1.21263	Kentucky - west	18.17747	1.55369
Indiana - Fountain	19.84196	1.13885	Kentucky - east	21.93942	1.21679
Indiana - Franklin	16.99708	0.85703	Louisiana	22.99027	4.80239
Indiana - Fulton	18.14185	0.92765	Maine	139.20628	2.79987
Indiana - Gibson	20.12264	1.50636	Maryland	27.13640	0.55103
Indiana - Grant	18.46740	0.93875	Massachusetts	52.13741	0.82418
Indiana - Greene	19.86668	1.26013	Michigan - west	25.17371	1.07162
Indiana - Hamilton	18.09675	0.96776	Michigan - east	32.48355	1.03092
Indiana - Hancock	17.84406	0.95159	Minnesota	79.05315	2.66704
Indiana - Harrison	19.13132	1.29297	Mississippi	18.96889	3.70908
Indiana - Hendricks	18.10262	1.04796	Missouri	25.56800	1.84049
Indiana - Henry	17.93818	0.91133	Montana	4.61055	338.41089
Indiana - Howard	18.38571	0.97032	Nebraska	25.35729	8.24889
Indiana - Huntington	18.87279	0.92340	Nevada	0.57920	24.57545
Indiana - Jackson	18.65184	1.11886	New Hampshire	54.48377	0.83666
Indiana - Jasper	18.02637	0.96829	New Jersey	30.65787	0.62182
Indiana - Jay	18.99596	0.90045	New Mexico	59.79017	17.96432
Indiana - Jefferson	17.91356	1.01469	New York	44.15448	0.92868
Indiana - Jennings	17.92275	1.01134	North Carolina	64.31983	1.46972
Indiana - Johnson	18.10091	1.01814	North Dakota	64.22456	8.37670
Indiana - Knox	20.35270	1.42605	Ohio - north	29.87797	0.88896
Indiana - Kosciusko	18.48999	0.90826	Ohio - central	22.35385	0.87011
Indiana - Lagrange	19.97102	0.88951	Ohio - south	19.04350	0.95135
Indiana - Lake	15.46483	0.81207	Oklahoma	6.19158	6.95033
Indiana - LaPorte	16.55582	0.83691	Oregon	0.08694	1013.01691
Indiana - Lawrence	19.33673	1.22374	Pennsylvania	33.19732	0.66240
Indiana - Madison	18.08569	0.93931	Rhode Island	45.94635	0.72267
Indiana - Marion	18.08131	1.00025	South Carolina	58.33853	1.11242
Indiana - Marshall	17.76314	0.89419	South Dakota	7.53200	46.14430
Indiana - Martin	19.67630	1.31081	Tennessee	21.74459	1.81777
Indiana - Miami	18.36642	0.95379	Texas	13.04103	16.13049
Indiana - Monroe	19.09618	1.15275	Utah	3.26673	112.39516
Indiana - Montgomery	19.28630	1.09585	Vermont	68.51019	0.88535
Indiana - Morgan	18.82232	1.10211	Virginia	50.72601	1.08543
Indiana - Newton	18.17223	0.98465	Washington	0.07572	1696.41553
Indiana - Noble	20.05089	0.90149	West Virginia	35.57993	1.34732
Indiana - Ohio	16.74760	0.87408	Wisconsin	25.41591	1.17863
Indiana - Orange	19.35219	1.27610	Wyoming	6.80224	13.41976
Indiana - Owen	19.47581	1.18132			

Table G-20 Miscellaneous Products of Manufacturing - A and B Gravity Model Parameters

Alabama	3.29925	1.49212
Arizona	0.85809	35.59316
Arkansas	2.15003	2.14380
California	0.22243	55.31169
Colorado	1.19173	9.37691
Connecticut	10.83202	0.66437
Delaware	7.71854	0.60363
District of Columbia	6.88497	0.65542
Florida	7.68889	2.63535
Georgia	4.10926	1.31019
Idaho	0.27642	45.59504
Illinois - north	3.88027	1.05106
Illinois - south	3.04554	1.35649
Indiana - Adams	4.23355	0.86710
Indiana - Allen	4.22646	0.87694
Indiana - Bartholomew	3.79645	0.94979
Indiana - Benton	3.69923	1.00596
Indiana - Blackford	4.08790	0.88813
Indiana - Boone	3.78516	0.95998
Indiana - Brown	3.73983	0.96952
Indiana - Carroll	3.81683	0.95919
Indiana - Cass	3.88836	0.94069
Indiana - Clark	3.76171	0.97650
Indiana - Clay	3.60690	1.02692
Indiana - Clinton	3.81076	0.95472
Indiana - Crawford	3.59551	1.03024
Indiana - Daviess	3.51104	1.06279
Indiana - Dearborn	4.02794	0.88339
Indiana - Decatur	3.91166	0.91461
Indiana - DeKalb	4.29596	0.87846
Indiana - Delaware	4.03303	0.89132
Indiana - Dubois	3.52613	1.05547
Indiana - Elkhart	4.13559	0.92215
Indiana - Fayette	4.01318	0.88759
Indiana - Floyd	3.74350	0.98111
Indiana - Fountain	3.66420	1.01184
Indiana - Franklin	4.01726	0.88566
Indiana - Fulton	3.96265	0.92877
Indiana - Gibson	3.39546	1.11501
Indiana - Grant	4.01115	0.90365
Indiana - Greene	3.59561	1.02690
Indiana - Hamilton	3.88354	0.92743
Indiana - Hancock	3.89733	0.91967
Indiana - Harrison	3.67443	1.00477
Indiana - Hendricks	3.84409	0.94187
Indiana - Henry	4.00006	0.89490
Indiana - Howard	3.91012	0.92916
Indiana - Huntington	4.10762	0.89325
Indiana - Jackson	3.74898	0.96926
Indiana - Jasper	3.76502	0.98287
Indiana - Jay	4.16670	0.86901
Indiana - Jefferson	3.87682	0.93198
Indiana - Jennings	3.84179	0.93645
Indiana - Johnson	3.79940	0.94748
Indiana - Knox	3.45359	1.09023
Indiana - Kosciusko	4.07267	0.91238
Indiana - Lagrange	4.27311	0.89887
Indiana - Lake	3.79398	0.98286
Indiana - LaPorte	3.93951	0.95387
Indiana - Lawrence	3.65031	1.00461
Indiana - Madison	3.95357	0.90923
Indiana - Marion	3.81583	0.94453
Indiana - Marshall	3.98833	0.93193
Indiana - Martin	3.58202	1.03198
Indiana - Miami	3.94207	0.92606
Indiana - Monroe	3.68262	0.99055
Indiana - Montgomery	3.71382	0.98820
Indiana - Morgan	3.71910	0.97818
Indiana - Newton	3.71653	1.00201
Indiana - Noble	4.27248	0.88783
Indiana - Ohio	4.00118	0.89481
Indiana - Orange	3.62986	1.01300
Indiana - Owen	3.64962	1.00513
Indiana - Parke	3.62771	1.02295
Indiana - Perry	3.52375	1.06017
Indiana - Pike	3.47386	1.07859
Indiana - Porter	3.83796	0.96850
Indiana - Posey	3.29212	1.16343
Indiana - Pulaski	3.88572	0.94857
Indiana - Putnam	3.67658	0.99736
Indiana - Randolph	4.12959	0.87003
Indiana - Ripley	3.93119	0.91033
Indiana - Rush	3.94232	0.90572
Indiana - St Joseph	4.06271	0.93405
Indiana - Scott	3.78343	0.95960
Indiana - Shelby	3.86580	0.92717
Indiana - Spencer	3.43853	1.09406
Indiana - Starke	3.92592	0.94809
Indiana - Steuben	4.39077	0.88005
Indiana - Sullivan	3.51588	1.06512
Indiana - Switzerland	3.95302	0.91129
Indiana - Tippecanoe	3.74991	0.97976
Indiana - Tipton	3.88779	0.93172
Indiana - Union	4.06766	0.87527
Indiana - Vanderburgh	3.36423	1.12891
Indiana - Vermillion	3.60246	1.03494
Indiana - Vigo	3.55915	1.04958
Indiana - Wabash	4.01124	0.91113
Indiana - Warren	3.67121	1.01335
Indiana - Warrick	3.42463	1.10034
Indiana - Washington	3.70982	0.98518
Indiana - Wayne	4.09569	0.87138
Indiana - Wells	4.18651	0.87567
Indiana - White	3.79386	0.96975
Indiana - Whitley	4.15515	0.89373
Iowa	3.06767	1.97878
Kansas	1.97984	3.15196
Kentucky - west	3.48174	1.09297
Kentucky - east	4.09907	0.92380
Louisiana	2.55452	3.08084
Maine	20.86164	1.34601
Maryland	7.05586	0.62618
Massachusetts	13.26576	0.78822
Michigan - west	4.70328	0.99390
Michigan - east	5.23763	0.84207
Minnesota	3.93841	2.37245
Mississippi	2.44255	2.22508
Missouri	2.75401	1.72262
Montana	0.78260	19.48608
Nebraska	2.08904	3.97056
Nevada	0.16861	40.74172
New Hampshire	13.16970	0.79832
New Jersey	8.94088	0.59709
New Mexico	1.31010	14.03703
New York	9.04106	0.67528
North Carolina	6.77027	0.94372
North Dakota	3.33961	4.37136
Ohio - north	5.39208	0.75358
Ohio - central	4.65587	0.79609
Ohio - south	4.13685	0.87676
Oklahoma	1.69463	3.42590
Oregon	0.18044	88.99262
Pennsylvania	7.19974	0.61740
Rhode Island	12.45261	0.73992
South Carolina	5.78307	1.16854
South Dakota	1.46224	8.20788
Tennessee	3.37497	1.19584
Texas	2.13650	4.13759
Utah	0.47905	25.97860
Vermont	13.34347	0.85652
Virginia	7.05289	0.76877
Washington	0.19184	103.50900
West Virginia	5.08255	0.80808
Wisconsin	4.25293	1.15515
Wyoming	1.18164	9.00148

Table G-21 U.S. Mail - A and B Gravity Model Parameters

Alabama	1.40876	1.40881
Arizona	2.13170	2.13115
Arkansas	1.42770	1.42770
California	2.15516	2.15429
Colorado	1.75035	1.75008
Connecticut	1.54517	1.54531
Delaware	1.40346	1.40358
District of Columbia	1.36656	1.36667
Florida	1.78834	1.78844
Georgia	1.40299	1.40306
Idaho	2.06509	2.06442
Illinois - north	1.33297	1.33301
Illinois - south	1.33431	1.33433
Indiana - Adams	1.29379	1.29384
Indiana - Allen	1.29769	1.29775
Indiana - Bartholomew	1.28794	1.28799
Indiana - Benton	1.30616	1.30620
Indiana - Blackford	1.29173	1.29179
Indiana - Boone	1.29347	1.29352
Indiana - Brown	1.28977	1.28982
Indiana - Carroll	1.29901	1.29906
Indiana - Cass	1.29888	1.29892
Indiana - Clark	1.29107	1.29113
Indiana - Clay	1.29704	1.29709
Indiana - Clinton	1.29499	1.29503
Indiana - Crawford	1.29564	1.29569
Indiana - Daviess	1.29852	1.29856
Indiana - Dearborn	1.28349	1.28355
Indiana - Decatur	1.28554	1.28559
Indiana - DeKalb	1.30254	1.30260
Indiana - Delaware	1.28826	1.28831
Indiana - Dubois	1.29772	1.29777
Indiana - Elkhart	1.31183	1.31188
Indiana - Fayette	1.28450	1.28456
Indiana - Floyd	1.29131	1.29136
Indiana - Fountain	1.30059	1.30063
Indiana - Franklin	1.28384	1.28390
Indiana - Fulton	1.30165	1.30169
Indiana - Gibson	1.30412	1.30416
Indiana - Grant	1.29236	1.29241
Indiana - Greene	1.29521	1.29526
Indiana - Hamilton	1.29009	1.29014
Indiana - Hancock	1.28764	1.28769
Indiana - Harrison	1.29352	1.29357
Indiana - Hendricks	1.28732	1.28738
Indiana - Henry	1.28664	1.28670
Indiana - Howard	1.29437	1.29442
Indiana - Huntington	1.29616	1.29621
Indiana - Jackson	1.28935	1.28940
Indiana - Jasper	1.30702	1.30706
Indiana - Jay	1.28941	1.28946
Indiana - Jefferson	1.28658	1.28664
Indiana - Jennings	1.28653	1.28658
Indiana - Johnson	1.28846	1.28851
Indiana - Knox	1.30162	1.30166
Indiana - Kosciusko	1.30300	1.30305
Indiana - Lagrange	1.30944	1.30949
Indiana - Lake	1.31755	1.31759
Indiana - LaPorte	1.31432	1.31436
Indiana - Lawrence	1.29251	1.29256
Indiana - Madison	1.28883	1.28888
Indiana - Marion	1.28977	1.28982
Indiana - Marshall	1.30633	1.30638
Indiana - Martin	1.29525	1.29529
Indiana - Miami	1.29707	1.29711
Indiana - Monroe	1.29163	1.29168
Indiana - Montgomery	1.29691	1.29695
Indiana - Morgan	1.29128	1.29132
Indiana - Newton	1.30965	1.30969
Indiana - Noble	1.30497	1.30502
Indiana - Ohio	1.28426	1.28432
Indiana - Orange	1.29329	1.29333
Indiana - Owen	1.29368	1.29372
Indiana - Parke	1.29879	1.29883
Indiana - Perry	1.29931	1.29936
Indiana - Pike	1.30020	1.30025
Indiana - Porter	1.31361	1.31365
Indiana - Posey	1.31008	1.31012
Indiana - Pulaski	1.30444	1.30448
Indiana - Putnam	1.29439	1.29443
Indiana - Randolph	1.28693	1.28699
Indiana - Ripley	1.28488	1.28494
Indiana - Rush	1.28555	1.28561
Indiana - St Joseph	1.31302	1.31307
Indiana - Scott	1.28852	1.28857
Indiana - Shelby	1.28690	1.28696
Indiana - Spencer	1.30273	1.30277
Indiana - Starke	1.30967	1.30971
Indiana - Steuben	1.30797	1.30802
Indiana - Sullivan	1.29980	1.29984
Indiana - Switzerland	1.28542	1.28548
Indiana - Tippecanoe	1.29925	1.29929
Indiana - Tipton	1.29267	1.29272
Indiana - Union	1.28399	1.28404
Indiana - Vanderburgh	1.30625	1.30629
Indiana - Vermillion	1.30052	1.30056
Indiana - Vigo	1.29976	1.29979
Indiana - Wabash	1.29665	1.29670
Indiana - Warren	1.30318	1.30321
Indiana - Warrick	1.30303	1.30308
Indiana - Washington	1.29083	1.29088
Indiana - Wayne	1.28471	1.28477
Indiana - Wells	1.29412	1.29418
Indiana - White	1.30241	1.30246
Indiana - Whitley	1.30031	1.30036
Iowa	1.44361	1.44358
Kansas	1.50270	1.50262
Kentucky - west	1.30966	1.30971
Kentucky - east	1.29230	1.29236
Louisiana	1.60672	1.60673
Maine	1.94005	1.94023
Maryland	1.37313	1.37324
Massachusetts	1.65798	1.65814
Michigan - west	1.35236	1.35241
Michigan - east	1.32899	1.32906
Minnesota	1.56268	1.56264
Mississippi	1.48563	1.48565
Missouri	1.37947	1.37946
Montana	2.00966	2.00926
Nebraska	1.57732	1.57720
Nevada	1.97769	1.97690
New Hampshire	1.65107	1.65122
New Jersey	1.45674	1.45687
New Mexico	1.87660	1.87627
New York	1.44641	1.44653
North Carolina	1.41801	1.41812
North Dakota	1.75879	1.75868
Ohio - north	1.31177	1.31185
Ohio - central	1.28769	1.28776
Ohio - south	1.28446	1.28452
Oklahoma	1.52913	1.52905
Oregon	2.39415	2.39324
Pennsylvania	1.36712	1.36723
Rhode Island	1.62197	1.62212
South Carolina	1.43546	1.43555
South Dakota	1.79300	1.79276
Tennessee	1.32840	1.32845
Texas	1.62100	1.62093
Utah	1.92485	1.92434
Vermont	1.64404	1.64418
Virginia	1.39277	1.39288
Washington	2.53689	2.53596
West Virginia	1.30411	1.30419
Wisconsin	1.37395	1.37398
Wyoming	1.75338	1.75312

Appendix H - Production and Attraction of Solid Waste

Indiana Counties, 1991

As part of this project data were compiled on solid waste flows to landfills in Indiana from quarterly reports submitted to the Indiana Department of Environmental Management. These reports identify four categories of solid waste: municipal, construction, other, and total. Table H-1 on the following two pages give production (P) and attraction (A) values for each of these categories for each of the 92 counties of Indiana. The counties are listed alphabetically from 1 to 92 and the reader need only consult one of the alphabetical county lists in these appendices to identify the county name.

Garth Banninga, a graduate student in geography at the time this project began, compiled the data and performed several statistical operations on the data. With regard to county-level waste production he found that this was a positive function of county population and median family income, and a negative function of the amount of recycling that took place in the county of production. The direction of these variable relationships are consistent with expectations. A model using these variables to predict total waste production was able to explain 65% of the variation in the data.

Waste attraction was found to be related to landfill space available in the county. This variable alone explained 85% of the waste attracted to each county.

Table H-1 Production and Attraction of Solid Waste, Indiana Counties, 1991 (annual tons)

County	P-Municipal-A		P-Construction-A		P-Other-A		P-Total-A	
1	27853	9084	832	33	6310	5912	34997	15029
2	299155	483187	15810	31756	2786	64579	317751	578218
3	80989	59154	24248	24236	28658	20925	133895	104315
4	2006	0	45	0	18	0	2069	0
5	4258	3961	336	330	13604	7984	18195	12275
6	27862	157284	3877	9061	1057	0	34823	166255
7	7354	6648	456	293	68	0	7878	6941
8	22233	14828	260	0	1434	0	23927	14828
9	38279	363145	2954	21985	3759	52676	44992	437896
10	75551	193017	12282	21144	26877	49620	114710	263781
11	13374	247750	91	2581	840	8271	14305	258459
12	11549	11362	6103	5684	244	0	17896	17046
13	3354	0	48	0	62	0	3464	0
14	17467	17360	803	803	7785	2918	26055	21081
15	4432	1781	0	0	2470	2299	6902	4080
16	19958	28531	1027	1094	3162	18114	24147	47739
17	53661	6580	577	0	94322	0	147256	6580
18	157640	43704	22480	0	8179	0	188349	43704
19	30797	11258	3072	2372	7704	6288	41573	19918
20	273713	242490	30312	30346	116661	116250	420517	389086
21	9608	0	1330	0	3187	0	14125	0
22	64359	0	6476	0	18849	0	89684	0
23	10238	10238	968	968	3783	4452	14989	15658
24	11806	2275	2058	1011	98	0	13908	3232
25	8327	28952	520	7410	3832	26932	12679	63284
26	7724	3928	4348	4346	455298	454034	465278	462308
27	59263	0	1029	0	2571	0	62863	0
28	8795	50497	591	2079	3177	88493	12563	140869
29	199899	49764	69265	46078	10050	5293	279124	101185
30	128550	60426	23204	8485	7956	119	159710	69030
31	46888	12617	2878	528	5208	1223	54974	14368
32	56910	434719	2881	75214	8313	559823	681041	69752
33	28287	59849	1978	3712	10522	13913	40787	77474
34	151658	38785	2829	0	18095	0	172672	38785
35	29141	26451	133	16	4201	3690	33475	30157
36	32597	187375	1084	8909	6193	11010	39874	207294
37	26558	6402	947	0	456235	456212	483739	462614
38	14194	13550	961	1239	383	118	15538	14907
39	65708	11808	9742	4645	88170	87186	163620	103639

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40	10343	6692	332	341	197	150	10872	7183
41	99808	28394	2398	0	10533	0	112739	28394
42	28570	28556	3002	2992	44150	10696	75722	42244
43	116343	86961	2335	285	48684	45470	167362	132716
44	28066	10438	313	240	1586	2413	53394	36520
45	431325	335481	32685	53096	252824	160972	716865	549549
46	110072	413192	3240	2630	39100	53438	152412	469260
47	27785	22355	7524	7329	19269	0	54578	29684
48	109001	85624	24377	18463	28589	24843	161968	128930
49	11888491	77673	170343	137337	565994	70036	19251861	287073
50	34879	0	4702	0	16852	0	56433	0
51	4691	2300	432	400	219	196	5342	2896
52	28705	69551	1948	1321	1703	6351	32351	77218
53	115341	54521	6169	6150	18097	5011	139396	65682
54	107171	34092	421	0	8513	0	116105	34092
55	28081	7557	1251	689	668	0	30000	8246
56	6677	0	481	0	214	0	7372	0
57	32111	8723	912	832	5082	0	38105	9555
58	196	0	0	0	0	0	196	0
59	23803	8131	68	45	57	0	23928	8176
60	6066	4269	1439	1341	82	0	7587	5610
61	4033	0	104	0	304	0	4437	0
62	8997	0	144	0	745	0	9886	0
63	97	0	29	0	621781	626916	621907	626916
64	158272	322924	5773	6585	13830	101827	177875	431335
65	15027	11151	21443	21383	269742	55128	307212	87662
66	15735	3963	1026	419	202	0	16963	4382
67	26354	6400	10113	7461	18217	7951	54684	21812
68	12266	84413	597	9077	1604	14742	14467	108229
69	15122	4282	216	0	1960	0	17298	4282
70	9044	0	4553	0	24775	0	38372	0
71	244985	462147	15154	14986	7072	14241	267211	491205
72	38268	7970	510	226	189	0	38967	8196
73	26265	38981	10306	31692	30403	52084	66974	122758
74	19385	37969	123	250	165744	146274	185248	184489
75	10462	0	85	0	1197	0	11734	0
76	41206	17354	1924	800	941	0	44071	18154
77	4788	4200	1340	1283	874649	874612	880777	880095
78	1411	0	84	80	0	0	1495	80
79	309357	94147	31716	15466	11723	0	352796	109613
80	4108	3886	1048	1048	6215	6104	11371	11038

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81	3662	1213	96	0	65	0	3823	1213
82	193395	200609	2502	2213	17325	234155	213222	435885
83	19179	29448	2510	3538	16726	31632	38415	64618
84	15375	29791	13832	13384	81190	88615	110397	131790
85	32992	325520	12368	12464	83484	81273	128844	419257
86	2526	2501	17	0	742	0	3285	2501
87	20790	44317	32736	33833	92603	105403	146129	183542
88	10021	9528	791	783	3564	3531	14376	13842
89	91997	89126	5180	6069	5330	200	102507	95395
90	25463	154796	984	3533	997	1908	73769	206564
91	18307	111788	906	5153	987	23684	20200	140625
92	21813	0	237	0	743	0	22793	0