
Report No. K-TRAN: KSU-10-4
FINAL REPORT

**ECONOMIC IMPACTS OF THE KANSAS COMPREHENSIVE
TRANSPORTATION PROGRAM (CTP) HIGHWAY
CONSTRUCTION AND MAINTENANCE ACTIVITIES**

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July 2010

A COOPERATIVE TRANSPORTATION RESEARCH PROGRAM
BETWEEN:

KANSAS DEPARTMENT OF TRANSPORTATION
KANSAS STATE UNIVERSITY TRANSPORTATION CENTER
UNIVERSITY OF KANSAS



1 Report No. K-TRAN: KSU-10-4	2 Government Accession No.	3 Recipient Catalog No.	
4 Title and Subtitle Economic Impacts of the Kansas Comprehensive Transportation Program (CTP) Highway Construction and Maintenance Activities		5 Report Date July 2010	
		6 Performing Organization Code	
7 Author(s) Michael W. Babcock, Ph.D., John C. Leatherman, Ph.D., Mark Melichar, E. Dean Landman		8 Performing Organization Report No. KSUTC-10-3	
9 Performing Organization Name and Address Department of Civil Engineering Kansas State University Transportation Center 2118 Fiedler Hall Manhattan, Kansas 66506		10 Work Unit No. (TRAIS)	
		11 Contract or Grant No. C1820	
12 Sponsoring Agency Name and Address Kansas Department of Transportation Bureau of Materials and Research 700 SW Harrison Street Topeka, Kansas 66603-3745		13 Type of Report and Period Covered Final Report May 2009 - June 2010	
		14 Sponsoring Agency Code RE-0523-01	
15 Supplementary Notes For more information write to address in block 9.			
16 Abstract <p>The Kansas Comprehensive Transportation Program (CTP) provided \$5.24 billion in highway construction and maintenance funds for contracts let between July 1999 and July 2009. As the Executive and Legislative branches of the Kansas government consider the next state highway program it is appropriate to measure the construction economic impacts of the CTP to facilitate an evaluation of the state's investment in highways.</p> <p>The CTP was established by KSA 68-2314a and was titled, "Comprehensive Transportation Program." The first CTP contracts were awarded in July 1999. After the final contracts for construction are awarded, approximately \$5.98 billion will have been spent on CTP road projects. After deducting \$738.4 million for preliminary engineering, utility adjustments, right-of-way acquisition and construction engineering from the \$5.98 billion results in about \$5.24 billion for K-jurisdiction highway construction contracts. These projects are typically those on the state highway system outside of cities except Interstate highways, which are classified as K-jurisdiction construction projects regardless of location. This study measures the economic impact of the \$5.24 billion devoted to K-jurisdiction construction projects. This is achieved through an analysis of a sample of these construction contracts which have a total contract value of \$1.98 billion.</p> <p>Given the need for measuring the economic impacts of the CTP, the objectives of the study are as follows:</p> <p>Objective 1. Measure the direct output, value added (income) and employment impacts by highway improvement type.</p> <p>Objective 2. Measure the indirect and induced output, value added, and employment impacts by highway improvement type.</p>			
17 Key Words Economic impacts, CTP, Comprehensive Transportation Program		18 Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161	
19 Security Classification (of this report) Unclassified	20 Security Classification (of this page) Unclassified	21 No. of pages 79	22 Price

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A Report on Research Sponsored By

THE KANSAS DEPARTMENT OF TRANSPORTATION
TOPEKA, KANSAS

July 2010

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PREFACE

The Kansas Department of Transportation's (KDOT) Kansas Transportation Research and New-Developments (K-TRAN) Research Program funded this research project. It is an ongoing, cooperative and comprehensive research program addressing transportation needs of the state of Kansas utilizing academic and research resources from KDOT, Kansas State University and the University of Kansas. Transportation professionals in KDOT and the universities jointly develop the projects included in the research program.

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ABSTRACT

The Kansas Comprehensive Transportation Program (CTP) provided \$5.24 billion in highway construction and maintenance funds for contracts let between July 1999 and July 2009. As the Executive and Legislative branches of the Kansas government consider the next state highway program it is appropriate to measure the construction economic impacts of the CTP to facilitate an evaluation of the state's investment in highways.

The CTP was established by KSA 68-23 14a and was titled, "Comprehensive Transportation Program." The first CTP contracts were awarded in July 1999. After the final contracts for construction are awarded, approximately \$5.98 billion will have been spent on CTP road projects. After deducting \$738.4 million for preliminary engineering, utility adjustments, right-of-way acquisition and construction engineering from the \$5.98 billion results in about \$5.24 billion for K-jurisdiction highway construction contracts. These projects are typically those on the state highway system outside of cities except Interstate highways, which are classified as K-jurisdiction construction projects regardless of location. This study measures the economic impact of the \$5.24 billion devoted to K-jurisdiction construction projects. This is achieved through an analysis of a sample of these construction contracts which have a total contract value of \$1.98 billion.

Given the need for measuring the economic impacts of the CTP, the objectives of the study are as follows:

Objective 1. Measure the *direct* output, value added (income) and employment impacts by highway improvement type.

Objective 2. Measure the *indirect* and *induced* output, value added, and employment impacts by highway improvement type.

The output impact is the increase in Kansas production, resulting from CTP projects. It is the most general measure of impact or the overall increased value of production. For most sectors (industries) output can be interpreted as the total value of sales. Value added is a comprehensive accounting of income generated in the Kansas economy by CTP projects and is the broadest measure of total income. Value added is the sum of employee compensation, proprietors' income, property income, and indirect business taxes. The value added impact is the increase in Kansas value added generated by CTP projects. The employment impact is the increase in Kansas employment as a result of the CTP.

The direct impact is CTP related output, value added, and employment within the highway construction industry. The indirect impact is the CTP related output, value added, and employment of the industries that supply the construction industry with materials, goods, and services. The induced impact is the additional output, value added, and employment in various consumer markets produced by the increased consumer spending of people employed both directly and indirectly by CTP projects.

In cooperation with personnel of the KDOT Financial and Investment Management Office, the following highway improvement types were selected by the research team for analysis.

Category Highway Improvement Type

1	Resurfacing
2	Restoration and Rehabilitation; Reconstruction and Minor Widening
3	New Bridges and Bridge Replacement
4	Major and Minor Bridge Rehabilitation
5	New Construction; Relocation; Major Widening
6	Safety/Traffic Operations/Traffic Systems Management; Environmentally Related; Physical Maintenance; Traffic Services

The objectives are achieved through the use of a 345 industry sector input-output model for the state of Kansas based on secondary government data. Information from contractor surveys was input to the 107 industry sectors most closely associated with highway construction. The input-output data for these construction types was obtained by surveying highway contractors who obtained CTP (K-jurisdiction) contracts during the January 1, 2004 to December 31, 2007 period. The relatively small amount of Category 4 (Major and Minor Bridge Rehabilitation) contract value in returned contractor's questionnaires resulted in combining Category 3 (New Bridges and Bridge Replacement) with Category 4. The combined category is referred to as Category 3-4.

The research team did not attempt to survey all the contractors that received CTP (K-jurisdiction) highway contracts during the sample period since the larger contracts were obtained by a relatively small group of firms. Thus, the research team surveyed contractors who account for a large percentage of the value of CTP highway construction contracts awarded during the sample period.

The major findings of the study include the following:

1. The economic impact of the Kansas CTP (K -jurisdiction) highway construction contracts as measured by output is \$6.7 billion.

Highway Improvement Type	Value of CTP Contracts	Value of CTP Contracts Spent in Kansas	In-state Output Multiplier	Output Impact
1	\$1,240,934,211	\$1,045,226,437	1.74047	\$1,819,192,241
2	\$2,684,791,829	\$2,178,896,284	1.60446	\$3,495,973,173
3-4	\$638,865,242	\$421,063,094	1.50128	\$632,136,472
5	\$503,152,560	\$354,900,856	1.52279	\$540,441,136
6	\$169,224,802	\$138,107,886	1.54372	\$213,200,167
Total	\$5,236,968,645	\$4,138,194,557	1.61929	\$6,700,943,189

Figures in table reported in dollars are measured in \$2009.

The output impact for each highway improvement type is obtained by multiplying value of CTP contracts spent in Kansas by the in-state output multiplier.

2. The economic impact of the Kansas CTP (K -jurisdiction) highway construction contracts as measured by value added (income) is \$3.1 billion distributed by highway improvement type as follows:

Highway Improvement Type	Value of CTP Contracts	Direct Value Added (Income)	Value Added Multiplier	Total Value Added (Income) Impact
1	\$1,240,934,211	\$463,875,286	1.78454	\$827,808,555
2	\$2,684,791,829	\$973,537,493	1.68217	\$1,637,661,853
3-4	\$638,865,242	\$174,278,818	1.64579	\$286,828,010
5	\$503,152,560	\$157,080,456	1.62144	\$254,696,910
6	\$169,224,802	\$61,054,547	1.63245	\$99,668,973
Total	\$5,236,968,645	\$1,829,826,600	1.69779	\$3,106,664,301

Figures in the above table measured in dollars are reported in \$2009.

The value added impact for each highway improvement type is obtained by multiplying the direct value added by the value added multiplier.

3. The economic impact of the Kansas CTP (K -jurisdiction) highway construction contracts as measured by employment is 94,007 distributed by highway improvement type as follows:

Highway Improvement Type	Value of CTP Contracts	Direct Employment	Indirect Employment	Employment Multiplier	Total Employment Impact
1	\$1,240,934,211	11,962	10,854	1.90737	22,816
2	\$2,684,791,829	25,881	23,254	1.89845	49,134
3-4	\$638,865,242	6,158	4,271	1.69373	10,430
5	\$503,152,560	4,850	3,687	1.76020	8,537
6	\$169,224,802	1,631	1,459	1.89454	3,090
Total	\$5,236,968,645	50,483	43,525	1.86215	94,007

The employment impact for each highway improvement type is obtained by multiplying the direct employment by the employment multiplier.

4. An output multiplier measures the increase in Kansas total output (production) in response to an increase in the output of one of the Kansas CTP highway improvement categories. A value added multiplier measures the increase in Kansas value added (income) in response to an increase in the value added generated by one of the various Kansas highway improvement types. The employment impact multiplier measures the increase in Kansas total employment as a result of an increase in a CTP construction category. The output, value added, and employment multipliers by highway improvement type are as follows:

Highway Improvement Type	Output Multiplier	Value Added Multiplier	Employment Multiplier
1	1.74047	1.78454	1.90737
2	1.60446	1.68217	1.89845
3-4	1.50128	1.64579	1.69373
5	1.52279	1.62144	1.76020
6	1.54372	1.63245	1.89454
Total	1.61929	1.69779	1.86215

5. The major construction inputs for Category 1 CTP construction projects were Petroleum and Coal Products, Non-Metallic Minerals, Motor Freight, and Construction and Industrial Machinery. For Category 2 the major supplying industries were Non-Metallic Minerals, Petroleum and Coal Products, Cement and Concrete, Motor Freight, and Fabricated Metal. For bridge projects (Category 3-4) Fabricated Metal and Cement and Concrete were the major inputs. The major supplying industries for Category 5 CTP projects were Fabricated Metal, Non-Metallic Minerals, Cement and Concrete, and Motor Freight. Fabricated Metal and Cement and Concrete were the major inputs for Category 6 projects.

For the CTP projects as a group the major supplying industries ranked by size are:

1. Petroleum and Coal Products
2. Non-Metallic Minerals
3. Fabricated Metal
4. Motor Freight
5. Cement and Concrete

Petroleum and Coal Products includes asphalt, paving material, oil, greases, and diesel fuel. Non-Metallic Minerals consists mostly of crushed stone, sand, gravel, dirt, and aggregates. Fabricated Metal includes fabricated structural steel, reinforcing steel, rebar, guard rail, bridge rails, sheet metal, and metal pipe. Cement and Concrete consists of hydraulic cement, and concrete products such as pipe, pre-stressed beams, and drilled shaft casings.

ACKNOWLEDGEMENTS

This research project could not have been completed without the assistance and cooperation of many people. Daniel Wadsworth of the Kansas Department of Transportation provided computer support to yield the CTP construction contract data used in the study. He also managed the project in a professional manner. Crystal Strauss typed the final report.

Special thanks go to the CEOs and their support staff of the construction firms that build and maintain Kansas highways and bridges. Without their assistance and cooperation, this study would not have been possible.

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Chapter 1 - INTRODUCTION

1.1 The Kansas Comprehensive Transportation Program

The Kansas Comprehensive Transportation Program (CTP) provided \$5.24 billion in highway construction and maintenance funds for contracts let between July 1999 and July 2009. As the executive and legislative branches of the Kansas government consider the next state highway program, it is appropriate to measure the construction economic impacts of the CTP to facilitate an evaluation of the state's investment in highways.

The CTP was established by K.S.A. 68-2314a and was titled, "Comprehensive Transportation Program." The first contracts were awarded in July 1999. After the final contracts for construction are awarded, approximately \$5.98 billion will have been spent on CTP projects. After deducting \$738.4 million for preliminary engineering, utility adjustments, right-of-way acquisition, and construction engineering from the \$5.98 billion results in about \$5.24 billion for K-jurisdiction highway contracts. These projects are typically those on the state highway system outside of cities except for Interstate highways, which are classified as K-jurisdiction projects regardless of location. This study measures the economic impact of the \$5.24 billion devoted to K-jurisdiction construction projects. This is achieved through analysis of a sample of these construction contracts which have a total contract value of \$1.98 billion.

1.2 Research Objectives

Given the need for measuring economic impacts of the Kansas Comprehensive Transportation Program (CTP), the objectives of the study are as follows:

Objective A - Measure the *direct* output, value added, and employment impacts by highway improvement type of the CTP.

Objective B - Measure the *indirect* and *induced* output, value added, and employment impacts by highway improvement type of the CTP.

The output impact is the increase in Kansas production as a result of the CTP. The output impact is the most general measure of impact and for most sectors; output can be interpreted as the total value of sales. Value added (income) is the sum of employee compensation (total payroll including value of benefits), proprietors' income (payments to self employed individuals), property income (such as rents, royalties, dividends, and corporate profits), and indirect business taxes (excise taxes, property taxes, licenses, fees, and sales taxes paid by business). The value added impact is the increase in Kansas value added generated by the CTP. The employment impact is the increase in Kansas employment as a result of the CTP.

The *direct* impact is CTP induced output, value added, and employment within the highway construction industry itself. The *indirect* impact is the CTP induced output, value added, and employment of the industries that supply the construction industry with materials, goods, and services. The *induced* impact is the additional output, value added, and employment in various consumer markets produced by the increased consumer spending of people employed both directly and indirectly by CTP projects.

In cooperation with personnel from the KDOT Financial & Investment Management office, the research team selected the following highway improvement types for analysis.

Category Highway Improvement Type

- | | |
|---|---|
| 1 | Resurfacing |
| 2 | Restoration and Rehabilitation; Reconstruction and Minor Widening |
| 3 | New Bridges and Bridge Replacement |
| 4 | Major and Minor Bridge Rehabilitation |
| 5 | New Construction; Relocation; Major Widening |
| 6 | Safety/Traffic Operations/Traffic Systems Management; Environmentally Related; Physical Maintenance; Traffic Services |

The above categories are combinations of Federal Highway Administration (FHWA) highway improvement types. See Appendix A for FHWA definitions.

1.3 Methodology

The objectives of the research are achieved with input-output modeling. An input-output model is quantitative framework of analysis for examining the complicated interdependence within the production system of an economy. There are three components to the standard input-output model : an interindustry transactions matrix; a direct requirements matrix; and a direct, indirect, and induced requirements matrix. Each of these can be explained with the aid of a simple illustrative example from Professor Steven Deller.

The transactions matrix describes the flows of goods and services between all individual industries of the economy in a given year. The columns show purchases by a particular industry from all other industries. For example, in the highly simplified

example of an input-output transactions matrix appearing in Table 1, the data in the Agriculture sector column show that, in order to produce its \$50 million output, that sector purchases \$10 million from farm enterprises, \$4 million from manufacturing firms, and \$6 million for service establishments. Agriculture firms also made purchases from non-processing sectors of the economy, such as the household sector (\$16 million) and imports from other regions (\$14 million). Purchases from the household sector represent value added or income to people in the form of wages, salaries, and investment returns. The data in the Agriculture sector row indicate that Agriculture sold \$10 million to farm enterprises, \$6 million to manufacturing, \$2 million to services, and the remaining \$32 million was sold to households within the region or exported out of the region. In this case \$20 million of Agriculture output was sold to households within the region and \$12 million was sold to firms or households outside the region. Note that total Agriculture output (sum of the row) is exactly equal to Agriculture purchases (sum of the column), or demand equals supply. This is the case for each sector.

The transactions table is significant because it provides a quantitative framework for the region's economy. Not only does it show the total output of each sector but also the interdependencies between sectors. It also reveals the degree of "openness" of the region through imports and exports. More open economies have a high percentage of total expenditures devoted to imports and thus smaller multipliers.

The direct requirements matrix indicates the input requirement from each industry for a particular industry to produce an average \$1 of output. These purchase coefficients are obtained by dividing purchase data in each industry column of the transactions matrix by the corresponding output value for that industry. The resulting

purchase coefficients, or input ratios, may be thought of as production recipes for a particular product. From the data in the simplistic transactions matrix in Table 1, a direct requirements matrix can be calculated (Table 2). As an example, the first column (Agriculture) shows that to produce an average \$1 of output, the Agriculture sector buys \$.20 from farming enterprises, \$.08 from manufacturing firms, and \$.12 from services firms. The Agriculture column also shows that the sector makes payments of \$.32 to households and \$.28 to imports. Households and imports are referred to as final payments sectors.

Table 1.1: Illustrative Transactions

	Purchasing Sectors (Demand)			Final Demand		Total Output
	Agr.	Mfg.	Serv.	HH	Exports	
Processing Sectors (Sellers)						
Agriculture	10	6	2	20	12	50
Manufacturing	4	4	3	24	14	49
Services	6	2	1	34	10	53
Households	16	25	38	1	52	132
Imports	14	12	9	53	0	88
Total Inputs	50	49	53	132	88	372

Table 1.2: Illustrative Direct Requirements

Processing Sectors (Sellers)	Purchasing Sectors (Demand)		
	Agr.	Mfg.	Serv.
Agriculture	0.20	0.12	0.04
Manufacturing	0.08	0.08	0.06
Services	0.12	0.04	0.02
Households	0.32	0.51	0.72
Imports	0.28	0.24	0.17
Total Inputs	1.00	1.00	1.00

Table 1.3: illustrative Total Requirements

Processing Sectors (Sellers)	Purchasing Sectors (Demand)		
	Agr.	Mfg.	Serv.
Agriculture	1.28	0.17	0.06
Manufacturing	0.12	1.11	0.07
Services	0.16	0.17	1.03
Total Inputs	1.56	1.35	1.16

The direct and indirect requirements matrix is one of the two matrices that measure the interaction among industries. The other, the direct, indirect, and induced requirements matrix, is similar but includes the effects of household income and spending in addition to the interindustry interaction. It is referred to as the total requirement table. The data in the columns of Table 3 for each industry indicate the total requirements of all industries necessary for that industry to deliver \$1 of output to final demand. As an example, for the Agriculture sector to increase output to final demand by \$1, it must increase its overall output by \$1.28 (including the initial \$1 increase), the Manufacturing sector must increase its output \$.12 and the Services sector must increase its output \$.16. The total output increase of Agriculture in this simplistic economy is the sum of these three values or 1.56 times larger than the initial output expansion in Agriculture. The corresponding values for Manufacturing and Services are 1.35 and 1.16 respectively. These three numbers are output multipliers.

1.4 Implementing the Input-Output Methodology

The objectives of the study are accomplished through the use of a 345 sector input-output model originally developed by the U.S. Forest Service (Minnesota IMPLAN® Group Inc., 1999¹). The objectives are achieved by identifying the input sectors most closely allied to the five highway improvement types discussed previously. The relatively small amount of Category 4 (Major and Minor Bridge Rehabilitation) contract value in returned contractor surveys resulted in combining Category 4 with Category 3 (New Bridges and Bridge Replacement). The combined category is Category 3-4. The input-output data for these five construction types was obtained by

¹ Minnesota IMPLAN Group, Inc. 1999. IMPLAN Professional, Version 2.0: User's Guide, Analysis Guide, Data Guide. Stillwater, Minnesota: MIG, Inc.

surveying highway contractors who obtained Kansas CTP (K-jurisdiction) highway construction contracts during the period January 1, 2004 to December 31, 2007. The value of these sample contracts as well as the value of total K-jurisdiction contracts by highway improvement type is displayed in Table 4. An examination of the data in Table 4 indicates that most of the contract value is in Categories 1 and 2, which together account for 75% of the CTP program.

We did not attempt to survey all the contractors that received CTP (K-jurisdiction) highway prime contracts or subcontracts during the sample period since the larger contracts were obtained by a relatively small number of firms. Thus we surveyed the firms that account for a large percentage of the value of Kansas CTP highway construction contracts awarded during the sample period. The surveys include both a personal interview of representatives of the contracting firm and questionnaires containing the firm's purchase and employment data. The questionnaires for both prime and subcontracts are in Appendix B.

The survey information was placed in the appropriate sector of the 107 sectors most closely associated with highway construction. Sector definitions and examples for the 43 sectors (industries) used in the contractor survey are in Table 5. The corresponding IMPLAN® and NAICS (North American Industry Classification System) sectors used to calculate the impacts are in Table 6. Definitions of NAICS sectors are in Appendix C.

Table 1.4: Value of CTP (K-jurisdiction) Highway Construction Contracts by Highway Improvement Type* (Millions of Dollars)

Highway Improvement Type	Value of CTP K-jurisdiction Construction Contracts July 1999 to July 2009		Value of CTP K-jurisdiction Sample Construction Contracts January 1, 2004 to December 31, 2007	
Resurfacing	\$1,240.9	23.7%	\$518.8	26.2%
Restoration and Rehabilitation; Reconstruction and Minor Widening	\$2,684.8	51.3%	\$945.6	47.7%
New Bridges and Bridge Replacement	\$439.1	8.4%	\$160.1	8.1%
Major and Minor Bridge Rehabilitation	\$199.8	3.8%	\$79.3	4.0%
New Construction; Relocation; Major Widening	\$503.2	9.6%	\$184.8	9.3%
Safety/Traffic Operations/Traffic Systems Management; Environmentally Related; Physical Maintenance; Traffic Services	\$169.2	3.2%	\$93.6	4.7%
Grand Total	\$5,237.0	100%	\$1,982.2	100%

*K-jurisdiction highway construction projects are typically those projects on the state highway system outside of cities except for Interstate highways, which are classified as K-jurisdiction projects regardless of location.

Table 1.5: Contractor Survey Sector Definitions, Examples

1. Agricultural Services – landscaping, grass seeding
2. Non-Metallic Minerals – rocks, stone, sand, dirt, aggregates
3. Other Mining – Oil, gas, coal, other minerals
4. Construction Maintenance and Repair – maintenance and repair of capital assets including construction machinery and vehicles
5. Heavy Construction – general contractors engaged in the construction of highways, streets, and bridges. *Doesn't include payments to subcontractors.* Only includes purchases from other construction firms
6. Special Trade Contractors – plumbing, plastering, painters, carpenters
7. Paper and Allied Products – paper bags, boxes, all types of paper
8. Printing and Publishing – brochures, reports, any type of published material
9. Industrial Chemicals – basic industrial chemicals such as industrial gases, pigments, dyes, etc.
10. Agricultural Chemicals – fertilizer, pesticides
11. Other Chemicals – explosives, paint, cleaning preparations, glue, ink
12. Petroleum and Coal Products – asphalt, lubricating oils, and greases
13. Rubber and Plastic Products – tires, cold plastic and thermal plastic pavement markings, plastic cones and barrels
14. Cement and Concrete Products – hydraulic cement, concrete products like pipe, pre-stressed beams, drilled shaft casings
15. Stone, Clay, and Glass Products – lime, gypsum, abrasives, cut stone products, glass products, flat glass, bricks
16. Primary Metal Products – iron, steel, aluminum, copper, iron pipe
17. Fabricated Structural Metal – rebar, structural steel, corrugated metal pipe, signs, sign supports, guard rail
18. Other Fabricated Metal – tools, containers, fasteners, wire, nuts, bolts, valves
19. Farm Machinery and Equipment – tractors, combines, bailers
20. Construction and Industrial Machinery – construction machinery parts, equipment, and rentals. *Does not include construction machinery repairs (see sector 4)*
21. Electrical Machinery – air conditioning, refrigeration, materials handling machines, power driven hand tools, lighting fixtures, electric motors, generators, batteries
22. Other Machinery – engines, turbines, machine tools
23. Motor Vehicles and Equipment – purchases of cars and car parts
24. Other Transport Equipment – railroads, boat, aircraft equipment and parts

Table 1.5: Contractor Survey Sector Definitions, Examples (cont'd)

25. Other Manufacturing – lumber and wood products, furniture, leather products, scientific instruments, metal filing cabinets, miscellaneous manufacturing
26. Railroad Transportation – transport by railroad
27. Motor Freight Transportation – transport by truck
28. Other Transportation – transport by air, water, or oil pipeline
29. Communications – phones, cell phones, internet connection fees, anything involving oral or visual communication
30. Electric, Gas, and Sanitary Services – expenditures for electricity, natural gas, water, garbage collection
31. Wholesale Trade, Machinery and Equipment – purchases from wholesalers of machinery, equipment, and supplies
32. Other Wholesale Trade – purchases from wholesalers other than for machinery, equipment, and supplies
33. Gasoline Service Stations – purchases of gas or diesel fuel
34. Eating and Drinking Places – restaurant purchases
35. Other Retail Trade – all other purchases from retail stores, except fuel and food.
36. Banking – interest payments on bank loans
37. Other Financial Institutions – interest on all non-bank loans
38. Insurance and Real Estate – performance bonds, liability insurance, employee health insurance, building or other rental payments.
39. Lodging Services – payments to hotels and motels
40. Personal Services – services involving care of the person or the person's clothing.
41. Business Services – licenses, filing fees, advertising, data and word processing, professional and legal services, consulting, vehicle rental or leasing, accounting, tax preparation
42. Medical and Health Services – payments for medical or surgical services to persons. *Doesn't include health insurance for employees (see sector 38)*
43. Other Services – payments for all other services not enumerated above like automotive repair, entertainment, education

Table 1.6: Correspondence of Contractor Survey, IMPLAN® and NAICS Sector Definitions

Survey Sector Definitions	IMPLAN® Sectors	NAICS Sector
Agricultural		
1. Agricultural Services	Agricultural and Forestry Support Activities (18)	Agriculture, Forestry, Fishing, Hunting (11)
Mining		
2. Non Metallic Minerals	Stone Mining and Quarrying (24) Sand, Gravel, Clay, and Refractory Mining (25)	Mining, Quarrying, Oil & Gas Extraction (21)
3. Other Mining	Other Non Metallic Mineral Mining (26)	Mining, Quarrying, Oil & Gas Extraction (21)
Construction		
4. Construction Machinery Maintenance and Repair	Commercial Machinery Repair and Maintenance (485)	Construction (23)
5. Heavy Construction	Highway, Street, Bridge, and Tunnel Construction (39)	Construction (23)
6. Special Trade Construction	Water, Sewer, and Pipeline Construction (40)	Construction (23)
Manufacturing		
7. Paper and Allied Products	Paperboard and Paper Mills (125)	Manufacturing (31-33)
	Paperboard Container Manufacturing (126)	
	Surface Coated Paperboard Manufacturing (128)	
	Coated and Uncoated Paper Bag Manufacturing (130)	
8. Printing and Publishing	Commercial Printing (139)	Manufacturing (31-33)
9. Industrial Chemicals	Industrial Gas Manufacturing (148)	Manufacturing (31-33)
	Synthetic Dye and Pigment Manufacturing (149)	
	Other Basic Inorganic Chemical Manufacturing (150)	
	Other Basic Organic Chemical Manufacturing (151)	
10. Agricultural Chemicals	Nitrogenous Fertilizer Manufacturing (156)	Manufacturing (31-33)
	Phosphate Fertilizer Manufacturing (157)	
	Fertilizer, Mixing Only, Manufacturing (158)	

Table 1.6: Correspondence of Contractor Survey, IMPLAN® and NAICS Sector Definitions (cont'd)

	Pesticide and Other Agricultural Chemical Manufacturing (159)	
11. Other Chemicals	Plastics and Resin Manufacturing (152)	Manufacturing (31-33)
	Synthetic Rubber Manufacturing (153)	
	Cellulosic Organic Fiber Manufacturing (155)	
	Surface Active Agent Manufacturing (165)	
12. Petroleum and Coal Products	Asphalt Paving Mixture and Block Manufacturing (143)	Manufacturing (31-33)
	Petroleum Lubricating Oil and Grease Manufacturing (145)	
	All Other Petroleum and Coal Products Manufacturing (146)	
13. Rubber and Plastic Products	Rubber and Plastic Hose and Belting Manufacturing (180)	Manufacturing (31-33)
	Other Rubber Product Manufacturing (181)	
	Gasket Packing and Sealing Device Manufacturing (385)	
14. Cement and Concrete	Cement Manufacturing (191)	Manufacturing (31-33)
	Ready-Mix Concrete Manufacturing (192)	
	Concrete Pipe Manufacturing (194)	
	Other Concrete Product Manufacturing (195)	
	Lime Manufacturing (196)	
	Gypsum Product Manufacturing (197)	
15. Other Stone, Clay, & Glass Products	Abrasive Product Manufacturing (198) Cut Stone and Stone Product Manufacturing (199)	Manufacturing (31-33)
	Ground or Treated Minerals and Earths Manufacturing (200)	
	Miscellaneous Nonmetallic Mineral Products (202)	
16. Primary Metal	Iron and Steel Mills (203)	Manufacturing (31-33)
	Ferroalloy and Related Product Manufacturing (204)	
17. Fabricated Metal	Iron and Steel Pipe and Tube from Purchased Steel (205)	Manufacturing (31-33)
	Rolled Steel Shape Manufacturing (206)	

Table 1.6: Correspondence of Contractor Survey, IMPLAN® and NAICS Sector Definitions (cont'd)

	Steel Wire Drawing (207)	
	Non-Ferrous Metal, Except Copper and Aluminum (219)	
	Secondary Processing and Other Non-Ferrous (220)	
18. Other Fabricated Structural Metal	Custom Roll Forming (226) Fabricated Structural Metal Manufacturing (233)	Manufacturing (31-33)
	Plate Work Manufacturing (234)	
	Sheet Metal Work Manufacturing (236)	
19. Farm Machinery & Equipment	Farm Machinery & Equipment Manufacturing (257)	Manufacturing (31-33)
20. Construction & Industrial Machinery	Construction Machinery Manufacturing (259) Conveyor and Conveying Equipment	Manufacturing (31-33)
	Manufacturing (292)	
	Overhead Cranes, Hoists, and Monorail Systems (293)	
	Industrial Truck Trailer and Stacker Manufacturing (294)	
21. Electrical Machinery	Electric Power and Specialty Transformer Manufacturing (333)	Manufacturing (31-33)
	Motor and Generator Manufacturing (334)	
	Switchgear and Switchboard Apparatus Manufacturing (335)	
	Fiber Optic Cable Manufacturing (339)	
	Other Communication and Energy Wire Manufacturing (340)	
	Miscellaneous Electrical Equipment Manufacturing (343)	
22. Other Machinery	Other Commercial and Service Industry Machinery (273)	Manufacturing (31-33)
	Metal Cutting Machine Tool Manufacturing (280)	
	Metal Forming Machine Tool Manufacturing (281)	
	Special Tool, Die, Jig, and Fixture Manufacturing (282)	
	Cutting Tool and Machine Tool Accessory Manufacturing (283)	
	Rolling Mill and Other Metal Working Machinery (284)	

Table 1.6: Correspondence of Contractor Survey, IMPLAN® and NAICS Sector Definitions (cont'd)

	Other Engine Equipment Manufacturing (286)	
23. Motor Vehicles & Equipment	Automobile and Light Truck Manufacturing (344)	Manufacturing (31-33)
	Heavy Duty Truck Manufacturing (345)	
	Motor Vehicle Body Manufacturing (346)	
	Truck Trailer Manufacturing (347)	
24. Other Transport Equipment	Other Transport Equipment Manufacturing (361)	Manufacturing (31-33)
25. Other Manufacturing	Sawmills (112)	Manufacturing (31-33)
	Wood Preservation (113)	
	Wood Container and Pallet Manufacturing (120)	
Transportation		
26. Railroad Transportation	Rail Transportation (392)	Transportation and Warehousing (48-49)
27. Motor Freight	Truck Transportation (394)	Transportation and Warehousing (48-49)
28. Other Transportation	Air Transportation (391) Water Transportation (393)	Transportation and Warehousing (48-49)
	Pipeline Transportation (396)	
Utilities		
29. Communications	Telecommunications (422)	Information (51)
30. Electric, Gas, Sanitary Service	Power Generation and Supply (30) Natural Gas Distribution (31)	Utilities (22)
	Water, Sewage, and Other Systems (32)	
Wholesale Trade		
31. Machinery and Equipment	Wholesale Trade (390)	Wholesale Trade (42)
32. Other Wholesale Trade	Wholesale Trade (390)	Wholesale Trade (42)
Retail Trade		
33. Gasoline Service Stations	Gasoline Stations (407)	Retail Trade (44-45)
34. Eating and Drinking Places	Food Services and Drinking Places (481)	Accommodation and Food Services (72)

Table 1.6: Correspondence of Contractor Survey, IMPLAN® and NAICS Sector Definitions (cont'd)

35. Other Retail Trade	Miscellaneous Store Retailers (411)	Retail Trade (44-45)
Finance, Insurance, Real Estate		
36. Banking	Monetary Authorities and Deposit Credit Institutions (430)	Finance and Insurance (52)
37. Other Financial Institutions	Monetary Authorities and Deposit Credit Institutions (430)	Finance and Insurance (52)
38. Insurance and Real Estate	Insurance Carriers (427)	Finance and Insurance (52)
Services		
39. Lodging Services	Hotels and Motels, Including Casino Hotels (479)	Accommodation and Food services (72)
40. Personal Services	Dry Cleaning and Laundry Services (489)	Other Services (Except Public Admin) (81)
41. Business Services	Legal Services (437) Accounting and Bookkeeping Services (438)	Professional, Scientific, and Technical Services (54)
	Architectural and Engineering Services (439)	
	Office Administrative Services (452)	
	Business Support Services (455)	
42. Medical-Health Services	Office of Physicians and Dentists (465) Other Ambulatory Healthcare Services (466)	Healthcare and Social Assistance (62)
	Hospitals (467)	
43. Other Services	Other Support Services (459)	Administrative and Support and Waste Management and Remediation Services (50)

Chapter 2 - THE SAMPLE OF KANSAS CTP K-JURISDICTION HIGHWAY CONSTRUCTION PROJECTS

The objectives of this study are achieved by adapting an input-output model for Kansas developed by IMPLAN® to reflect five sectors corresponding to the five highway improvement types. The input-output data of these five sectors is obtained by surveying highway contractors who obtained Kansas CTP (K-jurisdiction) highway construction contracts during the period January 1, 2004 to December 31, 2007. The total value of the survey contracts is \$1,416,330,019 which was 71.4% of the value of the sample contracts let during the 2004-2007 period (\$1,982,269,124), and 27% of the total value of K-jurisdiction contracts for the 10 year CTP (\$5,236,968,645). In this chapter we analyze the purchases of goods, services, and materials by highway contractors for each of the five highway improvement types for the sample contracts. We also develop the output, value added (income), and employment multipliers that are used to measure the economic impacts of the K-jurisdiction highway construction projects of the CTP.

2.1 Analysis of Contractor Survey Expenditures by Highway Improvement Type

Table 2.1 contains the contractor spending for Category 1 construction projects in the 2004-2007 period. The total value of the expenditures is \$266.7 million of which 83.3% was spent in Kansas (\$222.1 million). When the expenditures in Kansas are expanded for the July 1999 to July 2009 period of the CTP, the result is direct expenditure of \$1,045,226,437. An examination of Column 2 of the table indicates that the principal supplying industries for Category 1 are Non-Metallic Minerals (11.4% of total expenditures), Petroleum and Coal Products (20.2%), Construction and Industrial

Machinery (4.9%), and Motor Freight (6.6%). Thus the four supply ing industries collectively account for 42.2% of total survey expenditures for Category 1.

Table 2.1: Contractor Spending by Type for Category 1 Construction Projects, 2004-2007

Survey Industry Categories	Survey Total	Spent in Kansas	Projected Total Spent in Kansas
Agricultural			
Agricultural Services	\$5,401,826.82	\$3,673,573.44	\$24,952,517.18
Mining			
Non-Metallic Minerals	\$30,310,365.79	\$24,674,391.45	\$167,599,256.44
Other Mining	\$59.20	\$59.20	\$402.11
Construction			
Construction Maintenance & Repair	\$4,668,541.24	\$4,149,147.12	\$28,182,821.58
Heavy Construction	\$92,119.20	\$55,156.20	\$374,645.03
Special Trade Construction	\$5,047.00	\$5,047.00	\$34,281.43
Manufacturing			
Paper & Allied Products	\$500.00	\$500.00	\$3,396.22
Printing & Publishing	\$759.30	\$759.30	\$5,157.50
Industrial Chemicals	\$163,592.00	\$0.00	\$0.00
Agricultural Chemicals	\$0.00	\$0.00	\$0.00
Other Chemicals	\$3,521,802.00	\$0.00	\$0.00
Petroleum & Coal Products	\$53,979,189.73	\$39,037,562.54	\$265,160,195.29
Rubber & Plastic Products	\$3,032,568.88	\$774,965.88	\$5,263,907.14
Cement & Concrete	\$47,571.84	\$47,571.84	\$323,128.74
Other Stone, Clay, & Glass Products	\$819,333.00	\$1,837.00	\$12,477.71
Primary Metal	\$88,481.20	\$1,594.20	\$10,828.50
Fabricated Metal	\$608,843.13	\$605,086.23	\$4,110,010.27
Other Fabricated Structural Metal	\$386,564.80	\$84,347.80	\$572,927.14
Farm Machinery & Equipment	\$0.00	\$0.00	\$0.00
Construction & Industrial Machinery	\$10,680,122.43	\$8,985,388.03	\$61,032,684.69
Electrical Machinery	\$21,834.80	\$21,834.80	\$148,311.51
Other Machinery	\$0.00	\$0.00	\$0.00
Motor Vehicles & Equipment	\$40,000.00	\$40,000.00	\$271,697.49
Other Transport Equipment	\$0.00	\$0.00	\$0.00
Other Manufacturing	\$44,485.30	\$44,485.30	\$302,163.61
Transportation			
Railroad Transportation	\$95,410.00	\$0.00	\$0.00
Motor Freight	\$17,692,605.46	\$15,630,806.30	\$106,171,271.52

Table 2.1: Contractor Spending by Type for Category 1 Construction Projects, 2004-2007 (cont'd)

Other Transportation	\$114,475.00	\$57,237.50	\$388,782.13
Utilities			
Communications	\$135,419.97	\$115,156.33	\$782,192.15
Electric, Gas, Sanitary Service	\$160,775.23	\$160,360.37	\$1,089,237.76
Wholesale Trade			
Machinery & Equipment	\$144,053.40	\$87,106.40	\$591,664.76
Other Wholesale Trade	\$8,007.00	\$8,007.00	\$54,387.05
Retail Trade			
Gasoline Service Stations	\$4,612,952.62	\$4,376,929.21	\$29,730,017.17
Eating & Drinking Places	\$532,175.29	\$532,175.29	\$3,614,767.28
Other Retail Trade	\$1,766,316.18	\$1,660,216.61	\$11,276,917.20
Finance, Insurance, Real Estate			
Banking	\$497,207.03	\$428,127.23	\$2,908,027.36
Other Financial Institutions	\$0.00	\$0.00	
Insurance & Real Estate	\$3,043,832.81	\$2,364,350.14	\$16,059,700.04
Services			
Lodging Services	\$2,157,027.59	\$2,148,009.45	\$14,590,219.45
Personal Services	\$10,776.00	\$8,447.85	\$57,381.49
Business Services	\$2,418,575.07	\$1,323,110.07	\$8,987,142.17
Medical & Health Services	\$11,587.20	\$11,587.20	\$78,705.33
Other Services	\$1,471,372.93	\$1,243,914.83	\$8,449,213.47
Payroll, Taxes, Other			
Wages Salaries	\$23,310,953.79	\$21,308,020.79	\$144,733,394.86
Federal Taxes	\$3,687,456.51	\$0.00	\$0.00
State Taxes	\$2,803,093.51	\$2,803,093.51	\$19,039,836.84
Local Taxes	\$424,858.23	\$424,858.23	\$2,885,822.90
Depreciated/Retained Earnings	\$16,986,089.33	\$16,986,089.33	\$115,376,946.50
Subcontractors	\$70,722,590.40	\$68,244,755.20	
TOTAL EXPENDITURE	\$266,721,218.21	\$222,125,666.17	\$1,045,226,437.00

Contractor expenditure by survey industry category for Category 2 construction projects (2004-2007) is in Table 2.2. An examination of the data reveals that the value of the contracts in the survey was \$747.3 million of which 83.8% was spent in Kansas (\$626.2 million). After expanding the amount spent in Kansas to the entire 10 year period of the CTP, the result is direct expenditure of \$2.18 billion. Column 2 of the table indicates that the major supplying sectors for Category 2 are Non-Metallic Minerals, Petroleum and Coal Products, Cement and Concrete, Motor Freight, and Fabricated Metal. These five sectors as a group account for 26.4% (\$197 million) of total survey expenditures for Category 2.

Table 2.3 contains contractor expenditure by survey industry category for Category 3-4 construction projects in the 2004-2007 period. The value of Category 3-4 contracts in the survey is \$141.65 million of which 69% was spent in Kansas (\$97.7 million). When the expenditures in Kansas are expanded to the 10 year CTP period the resulting direct expenditure is \$421.1 million. The major supplying sector for Category 3-4 is Fabricated Metal accounting for 17.1% of the total survey expenditures. The corresponding percentage for Cement and Concrete is 6.1%. Thus, these two supplying sectors collectively account for 23.2% of total survey expenditures for Category 3-4.

Contractor expenditure by survey industry category for Category 5 construction projects (2004-2007) is in Table 2.4. Total survey expenditures are \$181.5 million of which 75.2% is spent in Kansas (\$136.5 million). After expansion of the expenditures in Kansas during the 2004-2007 period to the full 10 year CTP era the result is \$354.9 million. The major supplying industries for Category 5 are Fabricated Metal (7.7% of total expenditures), Non-Metallic Minerals (4.9%), Motor Freight (4.6%), and Cement

and Concrete (4.9%). Thus the four sectors jointly account for 22.1% (\$40.1 million) of total survey expenditures for Category 5.

Table 2.2: Contractor Spending by Type for Category 2 Construction Projects, 2004-2007

Survey Industry Categories	Survey Total	Spent in Kansas	Projected Total Spent in Kansas
Agricultural			
Agricultural Services	\$1,096,551.00	\$1,096,551.00	\$6,774,717.91
Mining			
Non-Metallic Minerals	\$44,763,615.89	\$36,048,107.31	\$222,712,635.91
Other Mining	\$3,256.00	\$3,256.00	\$20,116.24
Construction			
Construction Maintenance & Repair	\$10,316,081.23	\$7,501,950.24	\$46,348,597.71
Heavy Construction	\$17,471,165.76	\$11,805,085.32	\$75,939,205.65
Special Trade Construction	\$3,387,191.00	\$1,996,002.40	\$12,331,713.91
Manufacturing			
Paper & Allied Products	\$43,599.00	\$41,643.50	\$257,282.12
Printing & Publishing	\$16,287.00	\$8,143.50	\$50,312.22
Industrial Chemicals	\$84,999.20	\$12,869.00	\$79,507.33
Agricultural Chemicals	\$3,922.00	\$3,922.00	\$24,230.92
Other Chemicals	\$2,178,228.96	\$18,066.00	\$111,615.47
Petroleum & Coal Products	\$42,572,596.63	\$28,464,589.44	\$175,860,100.77
Rubber & Plastic Products	\$1,526,920.70	\$1,272,611.27	\$7,862,456.25
Cement & Concrete	\$41,294,118.71	\$31,891,032.51	\$197,029,368.69
Other Stone, Clay, & Glass Products	\$2,396,994.00	\$104,786.96	\$647,395.39
Primary Metal	\$13,255.00	\$12,750.93	\$78,777.87
Fabricated Metal	\$27,710,751.92	\$4,615,069.08	\$28,512,849.57
Other Fabricated Structural Metal	\$122,616.82	\$55,251.76	\$341,356.96
Farm Machinery & Equipment	\$0.00	\$0.00	\$0.00
Construction & Industrial Machinery	\$8,775,423.49	\$6,872,709.92	\$42,461,638.32
Electrical Machinery	\$1,480,024.00	\$1,186,276.40	\$7,332,149.02
Other Machinery	\$88.00	\$88.00	\$543.68
Motor Vehicles & Equipment	\$0.00	\$0.00	\$0.00
Other Transport Equipment	\$2,778.77	\$2,778.77	\$17,169.23
Other Manufacturing	\$639,902.00	\$327,054.27	\$2,020,608.64
Transportation			
Railroad Transportation	\$0.00	\$0.00	\$0.00

Table 2.2: Contractor Spending by Type for Category 2 Construction Projects, 2004-2007 (cont'd)

Motor Freight	\$40,694,764.34	\$28,770,892.04	\$177,752,494.62
Other Transportation	\$3,768.00	\$3,768.00	\$23,279.48
Utilities			
Communications	\$480,137.91	\$206,523.98	\$1,288,304.81
Electric, Gas, Sanitary Service	\$363,408.29	\$329,243.69	\$2,034,133.53
Wholesale Trade			
Machinery & Equipment	\$361,165.00	\$300,745.19	\$1,858,065.72
Other Wholesale Trade	\$843,097.00	\$491,780.92	\$3,038,323.81
Retail Trade			
Gasoline Service Stations	\$15,359,012.50	\$14,006,849.92	\$86,537,200.44
Eating & Drinking Places	\$514,521.12	\$512,351.12	\$3,165,416.18
Other Retail Trade	\$3,711,187.46	\$2,435,255.45	\$15,045,315.56
Finance, Insurance, Real Estate			
Banking	\$39,950.34	\$26,669.34	\$164,766.57
Other Financial Institutions	\$69,012.00	\$69,012.00	\$426,370.35
Insurance & Real Estate	\$4,654,631.71	\$4,131,471.60	\$25,525,084.22
Services			
Lodging Services	\$3,537,463.59	\$3,435,722.43	\$21,226,603.27
Personal Services	\$969,180.00	\$620,183.35	\$3,831,620.48
Business Services	\$1,695,242.17	\$538,654.32	\$3,327,916.29
Medical & Health Services	\$5,661.00	\$5,661.00	\$34,974.82
Other Services	\$226,425.06	\$220,423.36	\$1,361,820.54
Payroll, Taxes, Other			
Wages Salaries	\$100,124,585.22	\$98,346,112.47	\$607,602,536.06
Federal Taxes	\$11,860,222.44	\$0.00	\$0.00
State Taxes	\$7,011,625.43	\$7,011,625.43	\$43,319,269.49
Local Taxes	\$830,648.15	\$830,648.15	\$5,131,914.42
Depreciated/Retained Earnings	\$56,551,452.13	\$56,551,452.13	\$349,386,523.52
Subcontractors	\$291,444,875.50	\$274,016,067.85	\$0.00
TOTAL EXPENDITURE	\$747,252,403.47	\$626,201,679.30	\$2,178,896,284.00

Table 2.3: Contractor Spending by Type for Category 3-4 Construction Projects, 2004-2007

Survey Industry Categories	Survey Total	Spent in Kansas	Projected Total Spent in Kansas
Agricultural			
Agricultural Services	\$40,093.00	\$39,857.32	\$286,534.46
Mining			
Non-Metallic Minerals	\$2,125,623.75	\$1,684,385.86	\$12,109,058.05
Other Mining	\$118,111.00	\$118,111.00	\$849,100.54
Construction			
Construction Maintenance & Repair	\$1,404,282.37	\$1,057,720.19	\$7,603,955.54
Heavy Construction	\$2,681,521.00	\$1,182,322.68	\$8,499,723.42
Special Trade Construction	\$1,847,678.00	\$1,629,983.42	\$11,717,958.62
Manufacturing			
Paper & Allied Products	\$935.00	\$404.00	\$2,904.36
Printing & Publishing	\$3,289.00	\$1,644.50	\$11,822.32
Industrial Chemicals	\$131,525.00	\$47,321.92	\$340,197.51
Agricultural Chemicals	\$643.00	\$643.00	\$4,622.53
Other Chemicals	\$38,769.00	\$31,652.88	\$227,552.71
Petroleum & Coal Products	\$1,439,357.78	\$534,162.18	\$3,840,094.47
Rubber & Plastic Products	\$209,966.50	\$92,611.32	\$665,783.19
Cement & Concrete	\$8,702,169.89	\$8,127,631.30	\$58,429,580.35
Other Stone, Clay, & Glass Products	\$11,071.00	\$11,071.00	\$79,589.47
Primary Metal	\$363,939.00	\$5,936.00	\$42,673.93
Fabricated Metal	\$24,233,920.69	\$5,487,638.87	\$39,450,662.12
Other Fabricated Structural Metal	\$428,673.00	\$179,486.92	\$1,290,332.30
Farm Machinery & Equipment	\$0.00	\$0.00	\$0.00
Construction & Industrial Machinery	\$1,403,555.46	\$1,257,384.43	\$9,039,342.69
Electrical Machinery	\$77,813.00	\$77,053.12	\$553,935.25
Other Machinery	\$0.00	\$0.00	\$0.00
Motor Vehicles & Equipment	\$69.00	\$69.00	\$496.04
Other Transport Equipment	\$0.00	\$0.00	\$0.00
Other Manufacturing	\$526,214.65	\$319,365.36	\$2,295,919.08
Transportation			
Railroad Transportation	\$838,075.00	\$838,075.00	\$6,024,925.19
Motor Freight	\$983,723.81	\$494,918.66	\$3,557,972.62
Other Transportation	\$26,770.52	\$26,750.48	\$192,309.32
Utilities			
Communications	\$140,369.96	\$76,387.67	\$549,151.31
Electric, Gas, Sanitary Service	\$166,165.45	\$166,066.95	\$1,193,856.10

Table 2.3: Contractor Spending by Type for Category 3-4 Construction Projects, 2004-2007 (cont'd)

Wholesale Trade			
Machinery & Equipment	\$65,874.00	\$45,638.46	\$328,095.11
Other Wholesale Trade	\$748,620.50	\$133,904.29	\$962,638.58
Retail Trade			
Gasoline Service Stations	\$1,262,846.27	\$1,201,206.95	\$8,635,482.52
Eating & Drinking Places	\$254,958.29	\$252,132.29	\$1,812,580.24
Other Retail Trade	\$856,753.14	\$849,903.24	\$6,109,958.47
Finance, Insurance, Real Estate			
Banking	\$130,019.00	\$130,019.00	\$313,577.20
Other Financial Institutions	\$11,417.00	\$11,417.00	\$82,076.87
Insurance & Real Estate	\$1,876,666.20	\$1,213,965.05	\$8,727,200.59
Services			
Lodging Services	\$715,480.15	\$715,480.15	\$5,143,590.23
Personal Services	\$828.00	\$828.00	\$5,952.50
Business Services	\$249,810.00	\$87,624.54	\$629,933.24
Medical & Health Services	\$19,707.74	\$19,707.74	\$141,679.02
Other Services	\$16,328.17	\$10,690.17	\$76,851.69
Payroll, Taxes, Other			
Wages Salaries	\$18,691,070.46	\$16,122,876.21	\$115,907,434.34
Federal Taxes	\$1,215,785.92	\$0.00	\$0.00
State Taxes	\$673,841.29	\$673,841.29	\$4,844,248.26
Local Taxes	\$259,596.41	\$259,596.14	\$1,866,239.84
Depreciated/Retained Earnings	\$16,273,740.90	\$13,439,343.08	\$96,615,501.80
Subcontractors	\$50,388,233.04	\$39,029,518.75	\$0.00
TOTAL EXPENDITURE	\$141,655,891.30	\$97,686,347.65	\$421,063,094.00

Table 2.4: Contractor Spending by Type for Category 5 Construction Projects, 2004-2007

Survey Industry Categories	Survey Total	Spent in Kansas	Projected Total Spent in Kansas
Agricultural			
Agricultural Services	\$957,569.00	\$957,569.00	\$5,076,196.91
Mining			
Non-Metallic Minerals	\$8,933,610.78	\$6,713,865.53	\$35,591,068.06
Other Mining	\$0.00	\$0.00	\$0.00
Construction			
Construction Maintenance & Repair	\$601,724.72	\$311,900.49	\$1,653,424.76
Heavy Construction	\$1,451,908.91	\$1,347,916.89	\$7,145,481.47
Special Trade Construction	\$493,165.00	\$178,673.20	\$947,169.70
Manufacturing			
Paper & Allied Products	\$0.00	\$0.00	\$0.00
Printing & Publishing	\$0.00	\$0.00	\$0.00
Industrial Chemicals	\$1,157.00	\$1,157.00	\$6,133.41
Agricultural Chemicals	\$7,907.00	\$7,907.00	\$41,916.03
Other Chemicals	\$45,097.00	\$15,339.00	\$81,314.02
Petroleum & Coal Products	\$1,174,443.08	\$931,283.99	\$4,936,856.68
Rubber & Plastic Products	\$422,761.40	\$122,106.36	\$647,301.58
Cement & Concrete	\$8,836,095.59	\$6,849,069.83	\$36,307,803.53
Other Stone, Clay, & Glass Products	\$155,925.14	\$9,680.14	\$51,315.69
Primary Metal	\$25,894.44	\$24,552.19	\$130,154.32
Fabricated Metal	\$13,951,345.40	\$2,140,836.96	\$11,348,853.16
Other Fabricated Structural Metal	\$94,218.75	\$48,769.71	\$258,534.52
Farm Machinery & Equipment	\$0.00	\$0.00	\$0.00
Construction & Industrial Machinery	\$1,156,615.48	\$484,138.54	\$2,566,480.93
Electrical Machinery	\$1,186,364.00	\$581,788.30	\$3,084,134.89
Other Machinery	\$0.00	\$0.00	\$0.00
Motor Vehicles & Equipment	\$0.00	\$0.00	\$0.00
Other Transport Equipment	\$0.00	\$0.00	\$0.00
Other Manufacturing	\$941,346.54	\$441,803.79	\$2,342,058.92
Transportation			
Railroad Transportation	\$0.00	\$0.00	\$0.00
Motor Freight	\$8,408,843.40	\$2,602,389.45	\$13,795,602.52
Other Transportation	\$0.00	\$0.00	\$0.00
Utilities			
Communications	\$18,063.09	\$5,561.09	\$29,480.06
Electric, Gas, Sanitary Service	\$338,011.44	\$292,030.24	\$1,548,090.01

Table 2.4: Contractor Spending by Type for Category 5 Construction Projects, 2004-2007 (cont'd)

Wholesale Trade			
Machinery & Equipment	\$761,257.00	\$639,455.88	\$3,389,838.19
Other Wholesale Trade	\$28,102.15	\$28,102.15	\$148,973.12
Retail Trade			
Gasoline Service Stations	\$223,076.32	\$180,312.27	\$955,858.62
Eating & Drinking Places	\$25,076.04	\$25,076.04	\$132,931.33
Other Retail Trade	\$239,980.89	\$216,087.01	\$1,145,505.12
Finance, Insurance, Real Estate			
Banking	\$19,828.00	\$0.00	\$0.00
Other Financial Institutions	\$133,154.56	\$0.00	\$0.00
Insurance & Real Estate	\$1,519,629.14	\$892,044.31	\$4,728,842.07
Services			
Lodging Services	\$138,394.01	\$137,205.57	\$727,344.44
Personal Services	\$23,891.00	\$18,951.55	\$100,464.60
Business Services	\$103,615.00	\$28,541.76	\$151,303.58
Medical & Health Services	\$0.00	\$0.00	\$0.00
Other Services	\$260,422.74	\$253,667.89	\$1,344,726.21
Payroll, Taxes, Other			
Wages Salaries	\$30,285,149.45	\$29,145,904.73	\$154,506,204.38
Federal Taxes	\$3,185,627.49	\$0.00	\$0.00
State Taxes	\$1,847,153.37	\$1,847,153.37	\$9,791,998.50
Local Taxes	\$41,155.87	\$41,155.87	\$218,172.58
Depreciated/Retained Earnings	\$9,507,312.81	\$9,426,165.81	\$49,969,322.10
Subcontractors	\$83,968,797.66	\$69,598,980.96	\$0.00
TOTAL EXPENDITURE	\$181,513,762.66	\$136,547,143.85	\$354,900,856.00

Table 2.5 displays contractor spending for Category 6 construction projects (2004-2007). The total value of Category 6 survey expenditures is \$79.2 million of which \$68.8 million (86.9%) was spent in Kansas. Expansion of the direct expenditures in Kansas in the 2004-2007 period to the 10 year CTP era results in direct spending of \$138.1 million. Category 6 includes a diverse set of projects and the result is relatively little concentration of expenditures in a few supplying industries. The principal supplying industries for Category 6 projects are Fabricated Metal, Cement and Concrete, Non-Metallic Minerals, Motor Freight, and Petroleum and Coal Products which collectively account for only 17% (\$13.5 million) of total survey expenditures of Category 6.

For the five categories of construction projects as a group the following five supplying industries were the most significant.

<u>Supplying Sector</u>	<u>Percent of Total Survey Expenditures</u>
Petroleum and Coal Products	18.3%
Non-Metallic Minerals	17.1%
Fabricated Metal	13.0%
Motor Freight	12.6%
Cement and Concrete	11.4%
Total of Five Sectors	72.4%

Substantial variation exists in the input purchase patterns of the five highway improvement types. For example, Petroleum and Coal Products accounts for 20.2% of total survey expenditures of Category 1, but only 1% of Category 3-4. Fabricated Metal is 17.1% of total survey expenditures for Category 3-4 but less than 1% of Category 1. Cement and Concrete plays almost no role in the input purchase pattern of Category 1 projects, but accounts for 6.1% of total survey expenditures for Category 3-4.

Table 2.5: Contractor Spending by Type for Category 6 Construction Projects, 2004-2007

Survey Industry Categories	Survey Total	Spent in Kansas	Projected Total Spent in Kansas
Agricultural			
Agricultural Services	\$1,587.00	\$1,587.00	\$8,234.41
Mining			
Non-Metallic Minerals	\$2,471,304.79	\$2,426,850.48	\$12,592,111.83
Other Mining	\$0.00	\$0.00	\$0.00
Construction			
Construction Maintenance & Repair	\$1,023,175.35	\$683,440.60	\$3,546,143.65
Heavy Construction	\$115,756.50	\$48,034.83	\$249,236.57
Special Trade Construction	\$74,280.00	\$67,594.80	\$350,726.71
Manufacturing			
Paper & Allied Products	\$0.00	\$0.00	\$0.00
Printing & Publishing	\$0.00	\$0.00	\$0.00
Industrial Chemicals	\$0.00	\$0.00	\$0.00
Agricultural Chemicals	\$0.00	\$0.00	\$0.00
Other Chemicals	\$191,745.00	\$2,109.20	\$10,943.90
Petroleum & Coal Products	\$1,449,088.67	\$1,428,150.46	\$7,410,192.92
Rubber & Plastic Products	\$67,669.67	\$900.68	\$4,673.31
Cement & Concrete	\$3,834,611.19	\$3,510,135.57	\$18,212,914.23
Other Stone, Clay, & Glass Products	\$206,756.00	\$0.00	\$0.00
Primary Metal	\$0.00	\$0.00	\$0.00
Fabricated Metal	\$4,209,770.59	\$95,172.20	\$493,816.58
Other Fabricated Structural Metal	\$19,412.51	\$370.78	\$1,923.85
Farm Machinery & Equipment	\$0.00	\$0.00	\$0.00
Construction & Industrial Machinery	\$181,270.28	\$64,306.84	\$333,666.57
Electrical Machinery	\$0.00	\$0.00	\$0.00
Other Machinery	\$0.00	\$0.00	\$0.00
Motor Vehicles & Equipment	\$0.00	\$0.00	\$0.00
Other Transport Equipment	\$0.00	\$0.00	\$0.00
Other Manufacturing	\$0.00	\$0.00	\$0.00
Transportation			
Railroad Transportation	\$0.00	\$0.00	\$0.00
Motor Freight	\$1,602,528.00	\$958,377.84	\$4,972,700.63
Other Transportation	\$0.00	\$0.00	\$0.00
Utilities			
Communications	\$44,091.22	\$3,016.19	\$15,650.00
Electric, Gas, Sanitary Service	\$5,740.66	\$5,740.66	\$29,786.36

Wholesale Trade			
Machinery & Equipment	\$0.00	\$0.00	\$0.00
Other Wholesale Trade	\$16,338.00	\$0.00	\$0.00
Retail Trade			
Gasoline Service Stations	\$1,151,982.00	\$551,812.03	\$2,863,167.25
Eating & Drinking Places	\$1,259.42	\$1,259.42	\$6,534.71
Other Retail Trade	\$790,186.00	\$278,318.45	\$1,444,100.92
Finance, Insurance, Real Estate			
Banking	\$0.00	\$0.00	\$0.00
Other Financial Institutions	\$0.00	\$0.00	\$0.00
Insurance & Real Estate	\$97,855.50	\$96,965.50	\$503,121.40
Services			
Lodging Services	\$158,304.42	\$151,129.75	\$784,161.51
Personal Services	\$371,736.00	\$265,844.48	\$1,379,377.72
Business Services	\$275,378.00	\$41,182.65	\$213,682.94
Medical & Health Services	\$0.00	\$0.00	\$0.00
Other Services	\$0.00	\$0.00	\$0.00
Payroll, Taxes, Other			
Wages Salaries	\$12,223,770.25	\$11,944,225.55	\$61,974,573.72
Federal Taxes	\$2,428,858.75	\$0.00	\$0.00
State Taxes	\$599,016.00	\$599,016.00	\$3,108,092.78
Local Taxes	\$80,672.77	\$80,672.77	\$418,853.90
Depreciated/Retained Earnings	\$3,311,019.46	\$3,311,019.46	\$17,179,767.64
Subcontractors	\$42,181,579.00	\$42,181,579.00	\$0.00
TOTAL EXPENDITURE			
	\$79,186,743.00	\$68,798,813.16	\$138,107,886.00

2.2 Conversion of Contractor Survey Expenditures by Type to IMPLAN® Expenditures by Highway Improvement Type

The survey data obtained from contractors for 43 sectors was allocated to IMPLAN® industry sectors. The national production function of Highway, Street, Bridge, and Tunnel Construction is used for this purpose. A production function can be thought of as a production recipe. It shows all of the inputs by amount needed to produce one dollar's worth of that industry sector's output. In this case, the output is Kansas highway construction.

The first step is to match contractor survey and IMPLAN® industry sectors. For example, contractors reported spending for Non-Metallic Minerals such as sand and gravel. In the IMPLAN® system, Non-Metallic Minerals is represented by two sectors, Stone Mining and Quarrying, and Sand-Gravel-Clay- and Refractory Mining. To determine how much each IMPLAN® sector gets, we examine the national production function and observe that Stone Mining gets 77% of Non-Metallic Minerals spending while Sand-Gravel-Clay- and Refractory Mining gets 23%. Conversely, there is a direct correspondence between Agriculture Services and Agriculture and Forestry Support Activities. So, the IMPLAN® sector for Agriculture and Forestry Support Activities gets 100% of spending reported by the contractors for Agriculture Services. In this way, the inter-industry input patterns for Kansas closely approximate input patterns at the national level. Input sectors not present in the Kansas model were dropped and the spending was allocated to the most closely allied industry that did exist in the Kansas model.

We retained contractor-reported spending for wages and retained earnings. To compute the allocation of wages and salaries to the various industry sectors, we used the consumption expenditure pattern of households in the \$75,000 to \$100,000 total household income range. For retained earnings, the allocation to the various industry sectors was based on the expenditure pattern of households in the \$100,000 to \$150,000 total household income range. For purposes of computing indirect economic activity associated with this income, we assumed an 80% disposable income (after taxes) factor and thus estimated household consumption. In this way we convert the highway contractor survey expenditure in Kansas to expenditure by IMPLAN® sector. The IMPLAN® expenditure patterns within Kansas are displayed in Table 2.6. The total in-state (Kansas) spending for each highway improvement category is the Kansas direct output used to calculate the Kansas output (production) impacts.

2.3 Multipliers

Having estimated Kansas direct output and value added, the output and value added impacts are obtained by multiplying the direct Kansas output and value added for each highway improvement type by their respective multipliers.

The Kansas IMPLAN® input-output model doesn't measure employment within the Kansas highway construction industry, so it has to be estimated manually. To estimate Kansas direct construction employment, we use total state output and employment in the Kansas highway construction sector. In 2006, Kansas highway construction output totaled \$840,275,000 and highway construction employment was 8,100 workers. Thus each one million dollars in highway construction output was associated with 9.64 workers ($8,100/840.275$). Multiplying Kansas total construction

spending by highway improvement type for the 10 year CTP era by 9.64 yields an estimate of direct employment in highway construction companies. The results are in Table 2.7.

It should be noted that the 2006 9.64 employment coefficient reflects highway construction productivity that was much higher than in the past. According to the Federal Highway Administration, a million dollars of highway construction spending resulted in 36% more jobs in 1997 than 2007. In 1990, the employment coefficient was 25. The impact of inflation on the costs of labor and highway construction may be a cause for some of the disparity in these coefficients. These results were derived using prevailing costs of highway construction and labor; however, spending during the CTP occurred over the course of a decade. Thus the impact of inflation on costs may have compressed the reported employment coefficient. None of this changes the fundamental economic impact of highway construction, but it suggests that job impact studies conducted many years apart can show substantially different findings.

Table 2.6: IMPLAN® In-State Direct Expenditure Patterns by Construction Category

IMPLAN® Sectors	Category 1	Category 2	Categories 3-4	Category 5	Category 6
Agricultural					
Agriculture support activities	\$24,952,517	\$6,774,718	\$286,534	\$5,076,197	\$8,234
Mining					
Stone mining and quarrying	\$128,464,830	\$170,709,235	\$9,281,593	\$27,280,554	\$9,651,854
Sand-gravel-clay-mining	\$39,134,426	\$52,003,400	\$2,827,465	\$8,310,514	\$2,940,258
Other nonmetallic minerals	\$402	\$20,116	\$849,101	\$0	\$0
Construction					
Commercial machinery repair	\$28,182,822	\$46,348,598	\$7,603,956	\$1,653,425	\$3,546,144
Highway-construction	\$374,645	\$75,939,206	\$8,499,723	\$7,145,481	\$249,237
Water-sewer-and pipeline	\$34,281	\$12,331,714	\$11,717,959	\$947,170	\$350,727
Manufacturing					
Paper and paperboard mills	\$1,357	\$102,784	\$1,160	\$0	\$0
Paperboard container	\$1,351	\$102,347	\$1,155	\$0	\$0
Coated paper and packaging	\$605	\$45,822	\$517	\$0	\$0
Coated and uncoated paper bag	\$84	\$6,329	\$71	\$0	\$0
Commercial printing	\$5,158	\$50,312	\$11,822	\$0	\$0
Other basic organic chemicals	\$0	\$79,507	\$340,198	\$6,133	\$0
Nitrogenous fertilizer	\$0	\$6,046	\$1,153	\$10,458	\$0
Phosphatic fertilizer	\$0	\$18,185	\$3,469	\$31,458	\$0
Paint and coating	\$0	\$88,288	\$179,994	\$64,319	\$8,657
Adhesive manufacturing	\$0	\$18,338	\$37,387	\$13,360	\$1,798
Soap and other detergent	\$0	\$1,953	\$3,982	\$1,423	\$192
Polish and other sanitation	\$0	\$3,036	\$6,189	\$2,212	\$298
Asphalt paving	\$216,741,944	\$143,748,046	\$3,138,893	\$4,035,387	\$6,057,092
Asphalt shingle and coating	\$48,418,252	\$32,112,054	\$701,201	\$901,470	\$1,353,101
Plastics pipe- fittings-	\$2,291,379	\$3,422,527	\$289,815	\$281,770	\$2,034
Plastics plumbing fixtures	\$2,667,222	\$3,983,907	\$337,352	\$327,988	\$2,368
Tire manufacturing	\$281,619	\$420,641	\$35,619	\$34,631	\$250

Table 2.6: IMPLAN® In-State Direct Expenditure Patterns by Construction Category (cont'd)

Gasket-packing and sealing	\$23,688	\$35,381	\$2,996	\$2,913	\$21
Cement manufacturing	\$11,503	\$7,014,246	\$2,080,093	\$1,292,558	\$648,380
Ready-mix concrete	\$206,479	\$125,901,767	\$37,336,502	\$23,200,686	\$11,638,052
Concrete pipe	\$26,012	\$15,860,864	\$4,703,581	\$2,922,778	\$1,466,140
Other concrete product	\$79,134	\$48,252,492	\$14,309,404	\$8,891,781	\$4,460,343
Abrasive products	\$424	\$22,011	\$2,706	\$1,745	\$0
Cut stone and stone products	\$190	\$9,840	\$1,210	\$780	\$0
Misc. nonmetallic minerals	\$11,864	\$615,544	\$75,674	\$48,791	\$0
Iron and steel mills	\$10,829	\$78,778	\$42,674	\$130,154	\$0
Iron- steel pipe and tube	\$4,061,101	\$28,173,547	\$38,981,199	\$11,213,802	\$487,940
Steel wire drawing	\$48,909	\$339,303	\$469,463	\$135,051	\$5,876
Fabricated structural metals	\$315,225	\$187,815	\$709,941	\$142,246	\$1,059
Plate work manufacturing	\$100,049	\$59,874	\$226,324	\$45,347	\$337
Sheet metal work	\$157,211	\$93,668	\$354,067	\$70,942	\$528
Farm machinery and equipment	\$0	\$0	\$0	\$0	\$0
Construction machinery	\$48,331,783	\$33,625,371	\$7,158,255	\$2,032,396	\$264,231
Overhead cranes	\$12,700,902	\$8,836,267	\$1,881,087	\$534,085	\$69,436
Electric power and transformer	\$14,001	\$692,155	\$52,291	\$291,142	\$0
Motor and generators	\$43,040	\$2,127,790	\$160,752	\$895,016	\$0
Switchgear apparatus	\$65,331	\$3,229,812	\$244,008	\$1,358,561	\$0
Storage battery	\$16,092	\$795,538	\$60,102	\$334,629	\$0
Miscellaneous electrical	\$9,848	\$486,855	\$36,781	\$204,787	\$0
Other machines	\$0	\$78	\$0	\$0	\$0
Metal cutting machine tools	\$0	\$78	\$0	\$0	\$0
Metal forming machine tool	\$0	\$78	\$0	\$0	\$0
Special tool- die- jig-	\$0	\$78	\$0	\$0	\$0
Cutting tool and machine tool	\$0	\$78	\$0	\$0	\$0
Rolling mill and metal working	\$0	\$78	\$0	\$0	\$0
Other engine equipment	\$0	\$78	\$0	\$0	\$0

Table 2.6: IMPLAN® In-State Direct Expenditure Patterns by Construction Category (cont'd)

Motor vehicle parts	\$271,697	\$0	\$496	\$0	\$0
All other transportation	\$0	\$17,169	\$0	\$0	\$0
Wood preservation	\$120,986	\$809,052	\$919,286	\$937,760	\$0
Cut stock-resawing and planning	\$11,452	\$76,581	\$87,015	\$88,764	\$0
Wood container and pallet	\$169,725	\$1,134,976	\$1,289,618	\$1,315,534	\$0
Transportation					
Rail transportation	\$0	\$0	\$6,024,925	\$0	\$0
Truck transportation	\$106,171,272	\$177,752,495	\$3,557,973	\$13,795,603	\$4,972,701
Air transportation	\$388,782	\$23,279	\$192,309	\$0	\$0
Utilities					
Telecommunications	\$782,192	\$1,288,305	\$549,151	\$29,480	\$15,650
Power generation and supply	\$547,233	\$1,021,949	\$599,793	\$777,760	\$14,965
Natural gas distribution	\$471,204	\$879,966	\$516,462	\$669,704	\$12,886
Water-sewage and other systems	\$70,800	\$132,219	\$77,601	\$100,626	\$1,936
Wholesale Trade					
Wholesale Trade	\$646,052	\$4,896,390	\$1,290,734	\$3,538,811	\$0
Retail Trade					
Gasoline Stations	\$29,790,017	\$86,537,200	\$8,635,483	\$955,859	\$2,863,167
Food services and drinking places	\$3,614,767	\$3,165,416	\$1,812,580	\$132,931	\$6,535
Miscellaneous store retailers	\$11,276,917	\$15,045,316	\$6,109,958	\$1,145,505	\$1,444,101
Finance, Insurance, Real Estate					
Monetary authorities	\$2,908,027	\$591,137	\$395,654	\$0	\$0
Insurance carriers	\$16,059,700	\$25,525,084	\$8,727,201	\$4,728,842	\$503,121
Services					
Hotels and motels	\$14,590,219	\$21,226,603	\$5,143,590	\$727,344	\$784,162
Dry-cleaning and laundry	\$57,381	\$3,831,620	\$5,953	\$100,465	\$1,379,378
Legal services	\$126,719	\$46,924	\$8,882	\$2,133	\$3,013
Accounting and bookkeeping	\$324,436	\$120,138	\$22,741	\$5,462	\$7,714

Table 2.6: IMPLAN® In-State Direct Expenditure Patterns by Construction Category (cont'd)

Architectural and engineering	\$8,127,073	\$3,009,435	\$569,649	\$136,824	\$193,233
Office administrative services	\$334,322	\$123,798	\$23,434	\$5,628	\$7,949
Business support services	\$74,593	\$27,622	\$5,228	\$1,256	\$1,774
Offices of health professionals	\$26,235	\$11,658	\$47,226	\$0	\$0
Other ambulatory health care	\$26,235	\$11,658	\$47,226	\$0	\$0
Hospitals	\$26,235	\$11,658	\$47,226	\$0	\$0
Other support services	\$8,449,213	\$1,361,821	\$76,852	\$1,344,726	\$0
Payroll, Taxes, Other					
Household Income - \$75-\$100k	\$144,733,395	\$607,602,536	\$115,907,434	\$154,506,204	\$61,974,574
Federal Non-Military	\$0	\$0	\$0	\$0	\$0
State & Local Non-Education	\$21,925,660	\$48,451,184	\$6,710,488	\$10,010,171	\$3,526,677
Household Income - \$100-\$150k	\$115,376,947	\$349,386,524	\$96,615,502	\$49,969,322	\$17,179,768
Total In-state Spending	\$1,045,226,437	\$2,178,896,284	\$421,063,094	\$354,900,856	\$138,107,886

Table 2.7: Estimated Direct Construction Contractor Employment

Highway Improvement Type	Value of CTP Contracts (Millions of \$)	Direct Employment per \$1 million	Direct Employment
1	\$1,240.9	9.64	11,962
2	\$2,684.8	9.64	25,881
3-4	\$638.9	9.64	6,158
5	\$503.2	9.64	4,850
6	\$169.2	9.64	1,631
Total	\$5,236.9	9.64	50,483

Table 2.8: Output, Value Added, and Employment Multipliers by Highway Improvement Category

Highway Improvement Type	Output Multiplier	Value Added Multiplier	Employment Multiplier
1	1.74047	1.78454	1.90737
2	1.60446	1.68217	1.89845
3-4	1.50128	1.64579	1.69373
5	1.52279	1.62144	1.76020
6	1.54372	1.63245	1.89454
Total	1.61929	1.69779	1.86215

The output, value added, and employment multipliers for the five highway construction categories are displayed in Table 2.8.

Chapter 3 - THE ECONOMIC IMPACT OF THE KANSAS COMPREHENSIVE TRANSPORTATION PROGRAM

3.1 Direct Wages and Salaries

This study examines the economic impacts of Kansas CTP (K-jurisdiction) highway construction contracts which have a total value of \$5,236 million. An estimated total of \$891.2 million in wages and salaries (including employer paid benefits) are attributable to these contracts, 17% of the total contract value (891,193,206/5,236,968,645). The wages, salaries, and benefits paid by highway improvement type are as follows:

<u>Highway Improvement Type</u>	<u>Direct Wages, Salaries, and Benefits</u>	<u>Percent of Contract Value</u>
Resurfacing	\$213,009,956	17.2%
Restoration and Rehabilitation Reconstruction and Minor Widening	\$480,863,433	17.9%
New Bridges and Bridge Replacement Major and Minor Bridge Rehabilitation	\$87,874,766	13.8%
New Construction; Relocation; Major Widening	\$79,390,316	15.8%
Safety/Traffic Operations/Traffic Systems Management; Environmentally Related; Physical Maintenance/Traffic Services	\$30,054,735	17.8%
Total	\$891,193,206	17.0%

The above data reveals that the percent of total contract value attributable to wages, salaries, and benefits varies only slightly by highway improvement type from a low of 13.8% to a high of 17.9%.

It should be noted that these are good paying jobs. The highway contractor firms that received large CTP contracts supplied the wages, salaries, and benefits paid to their employees as well as employee hours worked. The hours worked and wages and

salaries were classified by highway improvement category. The following are average wages, salaries, and benefits per hour for the six highway construction types.

<u>Highway Improvement Type</u>	<u>Wages, Salaries, and Benefits Per Hour</u>
Resurfacing	\$23.99
Restoration and Rehabilitation; Reconstruction and Minor Widening	\$29.67
New Bridges and Bridge Replacement	\$21.61
Major and Minor Bridge Rehabilitation	\$22.76
New Construction; Relocation; Major Widening	\$34.25
Safety/Traffic Operations/Traffic Systems Management; Environmentally Related; Physical Maintenance/Traffic Services	\$34.69
Average Total	\$28.63

The above data indicates wide variation in the average wages, salaries, and benefits per hour among the highway improvement categories, ranging from a low of \$21.61 (Category 4) to a high of \$34.69 per hour (Category 6). The average for all six categories as a group was \$28.63 per hour.

3.2 Output, Value Added, and Employment Impacts

As noted above the relatively small amount of Category 4 (Major and Minor Bridge Rehabilitation) contract value in returned contractor surveys resulted in combining Category 4 with Category 3 (New Bridges and Bridge Replacement). The combined category is referred to as Category 3-4.

Table 3.1 displays the output impact (contribution) of the CTP. The output impact or contribution to Kansas production is the increase in Kansas output as a result of the CTP. The output impact consists of three parts, the direct, indirect, and induced impacts. The direct impact is the CTP induced output within the highway construction

industry, while the indirect impact is the CTP induced output of industries that supply the construction industry with materials, goods, and services. The induced impact is the additional output in various consumer markets produced by the increase in consumer spending of people both directly and indirectly employed by CTP projects.

Examination of Column 3 in Table 3.1 indicates that the percentage of CTP contract value spent outside the state of Kansas ranged from a low of 15.77% (Category 1) to a high of 34.09% (Category 3-4). The corresponding percentage for the entire CTP is 20.98%. Column 4 of Table 3.1 indicates that \$4.1 billion of the \$5.2 billion total CTP contract value was spent in Kansas (79%). Column 5 contains the In-State (Kansas) output multipliers which range from a low of 1.50128 (Category 3-4) to a high of 1.74047 (Category 1). The output impact (contribution to state output) is in the last column of Table 3.1, and is obtained by multiplying the value of CTP contracts spent in Kansas by In-State output multipliers. Since Categories 1 and 2 have the greatest CTP contract value, they also have the greatest output impact. Together they account for 79.3% of the output impact with Category 2 alone accounting for 52.2% of total output impact. Thus the \$4.1 billion of total CTP contract value generated \$6.7 billion in Kansas output (includes the \$4.1 billion direct impact).

Table 3.1: Kansas CTP Output Impact by Highway Improvement Type

(1) Highway Improvement Type	(2) Value of CTP Contracts	(3) Proportion of Contracts Spent Outside Kansas	(4) Value of Contracts Spent in Kansas	(5) In-State Output Multiplier	(6) Output Impact
1	\$1,240,934,211	15.77%	\$1,045,226,437	1.74047	\$1,819,192,241
2	\$2,684,791,829	18.84%	\$2,178,896,284	1.60446	\$3,495,973,173
3-4	\$638,865,242	34.09%	\$421,063,094	1.50128	\$632,136,472
5	\$503,152,560	29.46%	\$354,900,856	1.52279	\$540,441,136
6	\$169,224,802	18.39%	\$138,107,886	1.54372	\$213,200,167
Total	\$5,236,968,645	20.98%	\$4,138,194,557	1.61929	\$6,700,943,189

Column (6) is the product of Columns (4) and (5), although not exactly due to rounding of the multiplier.

All data reported in dollars are measured in 2009 dollars

Table 3.2 displays the value added (income) impact of the CTP. Value added is analogous to gross state product and is perhaps the best single measure of the economic impact of the Kansas CTP.

Column 3 of Table 3.2 contains direct value added of CTP contracts which total \$1.83 billion and range from a low of \$61.1 million (Category 6) to a high of \$973.5 million (Category 2). Column 4 displays the value added multipliers that range from a low of 1.62144 (Category 5) to a high of 1.78454 (Category 1). The last column shows the total value added impact for each highway improvement type, which was obtained by multiplying the direct value added by the multipliers. The impacts range from a low of \$99.7 million (Category 6) to a high of \$1.64 billion (Category 2), which was 52.7% of the total value added impact of \$3.11 billion (includes the \$1.83 billion direct impact). Thus the total value added impact (\$3.11 billion) is about 70% higher than the direct value added (\$1.83 billion).

Table 3.3 displays the employment impact of the CTP. Column 4 of the table contains the direct employment impact of the CTP (the CTP induced employment within the construction industry itself). The direct employment ranges from 1,631 (Category 6) to 25,881 (Category 2). Column 5 displays the employment multipliers which range from 1.69373 to 1.90737. The total employment impact is obtained by multiplying the direct employment by the employment multipliers. Category 6 has the smallest employment impact (3,090) and Category 2 has the largest (49,134). The total employment generated by the CTP is 94,007 (includes 50,483 of direct employment).

The output, value added, and employment impacts by NAICS industry are in Table 3.4.

Table 3.2: Kansas CTP Value Added Impact by Highway Improvement Type

(1) Highway Improvement Type	(2) Value of CTP Contracts	(3) Direct Value Added	(4) Value Added Multiplier	(5) Value Added Impact
1	\$1,240,934,211	\$463,875,286	1.78454	\$827,808,555
2	\$2,684,791,829	\$973,537,493	1.68217	\$1,637,661,853
3-4	\$638,865,242	\$174,278,818	1.64579	\$286,828,010
5	\$503,152,560	\$157,080,456	1.62144	\$254,696,910
6	\$169,224,802	\$61,054,547	1.63245	\$99,668,973
Total	\$5,236,968,645	\$1,829,826,600	1.69779	\$3,106,664,301

Column (5) is the product of Columns (3) and (4), although not exactly due to rounding of the multiplier.

Data measured in dollars is reported in 2009 dollars

Table 3.3: Kansas CTP Employment Impact by Highway Improvement Type

(1) Highway Improvement Type	(2) Value of CTP Contracts	(3) Indirect Employment	(4) Direct Employment	(5) Employment Multiplier	(6) Total Employment Impact
1	\$1,240,934,211	10,854	11,962	1.90737	22,816
2	\$2,684,791,829	23,254	25,881	1.89845	49,134
3-4	\$638,865,242	4,271	6,158	1.69373	10,430
5	\$503,152,560	3,687	4,850	1.76020	8,537
6	\$169,224,802	1,459	1,631	1.89454	3,090
Total	\$5,236,968,645	43,525	50,483	1.86215	94,007

Column (6) is the product of Columns (4) and (5).

**Table 3.4: Summary of Economic Impacts by Type of Total CTP (K-jurisdiction)
Construction Spending**

Industry	Total Output Impact	Total Employment Impact	Total Value Added Impact
Ag, Forestry, Fish & Hunting	\$60,086,699	1,192	\$34,234,735
Mining	\$635,786,958	2,803	\$371,249,25 2
Utilities	\$93,538,972	179	\$60,547,666
Initial Highway Construction Employment ¹	\$0	50,483	\$0
Construction	\$149,720,720	1,343	\$71,308,479
Manufacturing	\$1,746,875,320	3,341	\$457,588,359
Wholesale Trade	\$216,772,852	1,252	\$146,146,96 7
Transportation & Warehousing	\$522,544,284	4,069	\$248,760,747
Retail Trade	\$498,544,742	8,218	\$330,282,29 4
Information	\$90,199,900	279	\$40,481,333
Finance & Insurance	\$350,293,488	1,868	\$172,083,715
Real Estate & Rental	\$149,977,463	1,099	\$96,396,573
Professional-Scientific & Technical Services	\$149,802,814	1,250	\$75,243,388
Management of Companies	\$52,580,507	264	\$29,391,201
Administrative & Waste Services	\$74,368,800	1,199	\$44,013,271
Educational Services	\$35,706,281	707	\$18,530,262
Health & Social Services	\$411,414,027	4,964	\$242,536,827
Arts-Entertainment & Recreation	\$28,720,774	816	\$13,294,587
Accommodation & Food Services	\$198,918,571	3,570	\$101,764,896
Other Services	\$225,182,023	3,265	\$111,158,73 6
Government & non-NAICS	\$516,594,744	1,849	\$441,651,020
Institutions	\$493,303,254	0	\$0
Total	\$6,700,943,193	94,007	\$3,106,664,301

¹ While the initial construction employment is reported independently, the associated output and income are reflected in other industry sectors

Output and Value Added are expressed in 2009 dollars.

Chapter 4 - CONCLUSION

The Kansas Comprehensive Transportation Program (CTP) was established by KSA 68-2314a and the first contracts were awarded in July 1999. When the final contracts were let in July 2009 the state of Kansas had invested \$5.24 billion dollars in K-jurisdiction highway construction projects in the 10 year CTP era. This study measured the economic impact of the \$5.24 billion investment. This was achieved through an analysis of a sample of these K-jurisdiction highway projects which has a total contract value of \$1.98 billion. The contractor sample data was linked to the Kansas IMPLAN® input-output model which was used to calculate the output, value added, and employment impacts of the CTP. The principal conclusions of the study are as follows.

1. The economic impact of the Kansas CTP (K-jurisdiction) highway construction contracts as measured by output is \$6.7 billion distributed by highway improvement type as follows:

Highway Improvement Type	Value of CTP Contracts (Millions of Dollars)	In-State Direct Output (Millions of Dollars)	In-State Output Multiplier	Output Impact (Millions of Dollars)
1	\$1,240.9	\$1,045.2	1.74047	\$1,819.2
2	\$2,684.8	\$2,178.9	1.60446	\$3,495.0
3-4	\$638.9	\$421.1	1.50128	\$632.1
5	\$503.2	\$354.9	1.52279	\$540.4
6	\$169.2	\$138.1	1.54372	\$213.2
Total	\$5,237.0	\$4,138.2	1.61929	\$6,700.9

The output impact for each highway improvement type is obtained by multiplying In-State Direct Output by the In-State output multiplier. All dollar figures are in 2009 dollars.

2. The economic impact of the Kansas CTP (K -jurisdiction) highway construction contracts as measured by value added (income) is \$3.1 billion distributed by highway improvement type as follows:

Highway Improvement Type	Value of CTP Contracts (Millions of Dollars)	Direct Value Added (Millions of Dollars)	Value Added Multiplier	Value Added Impact (Millions of Dollars)
1	\$1,240.9	\$463.8	1.78454	\$827.8
2	\$2,684.8	\$973.5	1.68217	\$1,637.7
3-4	\$638.9	\$174.3	1.64579	\$286.8
5	\$503.2	\$157.1	1.62144	\$254.7
6	\$169.2	\$61.1	1.63245	\$99.7
Total	\$5,237.0	\$1,829.8	1.69779	\$3,106.7

The value added (income) impact for each highway improvement type is calculated by multiplying the Direct Value Added by the Value Added multiplier. All dollar figures are measured in 2009 dollars.

3. The economic impact of the Kansas CTP (K -jurisdiction) highway construction contracts as measured by employment is 94,007 jobs distributed by highway improvement type as follows:

Highway Improvement Type	Indirect Employment	Direct Employment	Employment Multiplier	Total Employment Impact
1	10,854	11,962	1.90737	22,816
2	23,254	25,881	1.89845	49,134
3-4	4,271	6,158	1.69373	10,430
5	3,687	4,850	1.76020	8,537
6	1,459	1,631	1.89454	3,090
Total	43,525	50,483	1.86215	94,007

The employment impact for each highway improvement type is calculated by multiplying Direct Employment by the employment multiplier.

4. The output, value added, and employment multipliers for the five highway improvement types are as follows:

Highway Improvement Type	Output Multiplier	Value Added Multiplier	Employment Multiplier
1	1.74047	1.78454	1.90737
2	1.60446	1.68217	1.89845
3-4	1.50128	1.64579	1.69373
5	1.52279	1.62144	1.76020
6	1.54372	1.63245	1.89454
Total	1.61929	1.69779	1.86215

5. Direct wages, salaries, and benefits account for 17% of the total value of the Kansas CTP (K-jurisdiction) highway construction contracts. The percent of contract value attributable to wages, salaries, and benefits varies only slightly by highway improvement type ranging from a low of 13.8% for Category 3-4 to a high of 17.9% for Category 2.
6. The \$5.24 billion in CTP (K-jurisdiction) highway construction contracts let by KDOT provided jobs for 50,483 construction workers (direct employment). These are good paying jobs within an average wage per hour of \$28.63 according to the highway contractor survey.
7. The principal supplying industries for the various highway improvement types are as follows:

Category 1	Category 2	Category 3-4	Category 5	Category 6
Petroleum and Coal Products	Non-Metallic Minerals	Fabricated Metal	Fabricated Metal	Fabricated Metal
Non-Metallic Minerals	Petroleum and Coal Products	Cement and Concrete	Non-Metallic Minerals	Cement and Concrete
Motor Freight	Cement and Concrete	Non-Metallic Minerals	Cement and Concrete	Non-Metallic Minerals
Construction and Industrial Machinery	Motor Freight		Motor Freight	Motor Freight
	Fabricated Metal			

8. There is substantial variation in the input supplying industries (cost structure) of the five highway improvement types.

Although the economic impacts measured in this study are considerable, it should be noted that highway investment yields many other benefits to highway users that are beyond the scope of this project. For example highway improvements that reduce congestion and improve pavement quality can result in reductions in vehicle operating costs such as maintenance, fuel, tires, and depreciation. These improvements can also reduce average travel times and result in lower highway accident costs. Further research is needed to quantify these highway user benefits.

The study did not examine the economic impacts of other aspects of the Kansas CTP such as preliminary engineering by consultants which includes surveys, environmental clearances, permits, and preparation of design plans. Also omitted is the impact of utility adjustments which provide for payment of funds to affected utility companies to move utilities on KDOT right of way. The research project does not measure the impact of right-of-way acquisitions which involve payments to property owners to obtain land for construction of new bridges or pavements. Resources devoted

to construction engineering which includes surveys for bridge and pavement construction, inspection of construction materials, and other project administration activities were not measured. Finally, the study omits the as let costs for construction projects of jurisdictions off the state highway system. Further research is needed to quantify these impacts.

**APPENDIX A - FEDERAL HIGHWAY ADMINISTRATION
DEFINITIONS OF HIGHWAY IMPROVEMENT TYPES**

NEW CONSTRUCTION - Construction of a new facility that will not replace or relocate an existing facility. A new facility will provide: (1) a facility where none existed, or (2) an additional and alternate facility to an existing facility that will remain open and continue to serve through traffic.

RELOCATION - Construction of a facility on a new location that replaces an existing route. The new facility carries all the through traffic with the previous facility closed or retained as a land-service road only.

RECONSTRUCTION - Construction on approximate alignment of an existing route where the old pavement structure is substantially removed and replaced. Such reconstruction may be to the existing number of lanes or may include widening to provide additional through lanes, or utilizing or adding, or revising interchanges, replacing other highway elements such as grade separation to replace an existing grade intersection or otherwise improving the existing facility without changing the basic character of the facility.

MAJOR WIDENING - The addition of lanes or dualization of an existing facility where the existing pavement is salvaged. Also included, where necessary, is the resurfacing of existing pavement and other incidental improvements such as drainage and shoulder improvements.

MINOR WIDENING - Widening the lanes and/or shoulders of an existing facility without adding through lanes. In many cases, the improvement will include resurfacing the existing pavement and other incidental improvements such as shoulder and drainage improvements.

RESTORATION AND REHABILITATION - Work required to return an existing pavement (including shoulders) to a condition of adequate structural support or to a condition adequate for placement of an additional stage of construction. There may be some upgrading of unsafe features or other incidental work in conjunction with restoration and rehabilitation. Typical improvements would include replacing spalled or malfunctioning joints; substantial pavement stabilization prior to resurfacing; grinding/grooving of rigid pavements; replacing deteriorated materials; reworking or strengthening bases or subbases, and adding underdrains.

RESURFACING - Placement of additional surface material over the existing roadway to improve serviceability or to provide additional strength. There may be some upgrading of unsafe features and other incidental work in conjunction with resurfacing. Where surfacing is constructed by separate project as a final state of construction, the type of improvement should be the same as that of the preceding state -- new route, relocation, reconstruction, minor widening, etc.

NEW BRIDGE - Construction of a new bridge which does not replace or relocate an existing bridge.

BRIDGE REPLACEMENT - The total replacement of a structurally inadequate or functionally obsolete bridge with a new structure constructed in the same general traffic corridor to current geometric construction standards. A bridge removed and not replaced or replaced with a lesser facility is considered a bridge replacement. Incidental roadway approach work is included.

MAJOR BRIDGE REHABILITATION - The major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects. Bridge

deck replacement (both partial and complete) and the widening of bridges to specified standards are included. Construction of a dual structure to alleviate a capacity deficiency is also included.

MINOR BRIDGE REHABILITATION - Work required to correct minor structure and safety defects or deficiencies, such as deck patching, deck resurfacing, deck protective systems, upgrading railings, curbs and gutters, and other minor bridge work.

SAFETY/TRAFFIC OPERATIONS/TSM (Traffic System Management) - A project or a significant portion of a project that provides features or devices to enhance safety; or a traffic operation improvement which is designed to reduce traffic congestion and to facilitate the flow of traffic, both people and vehicles, on existing systems, or to conserve motor fuels; or which is designed to reduce vehicle use or to improve transit service.

ENVIRONMENTALLY RELATED - The category includes improvements that do not provide any increase in the level of service, in the condition of the facility, or in safety features. Typical improvements, which fall in this category, would be noise barriers, beautification and other environmentally related features not built as a part of the above identified improvement types.

PHYSICAL MAINTENANCE - Includes maintenance of condition for roads and structures.

TRAFFIC SERVICES - Includes snow removal and the maintenance of traffic control devices.

**APPENDIX B - HIGHWAY CONTRACTOR SURVEY FORMS
FOR PURCHASE - COST INFORMATION AND TOTAL
LABOR HOURS**

HIGHWAY ECONOMIC IMPACT PROJECT

PQ1

PRIME CONTRACT SURVEY

KDOT Contractor No.: SAMPLE

Person answering questionnaire _____

We request your purchase and cost information on the highway projects listed below.

These contracts deal only with:

<u>KDOT Contract Numbers</u>	<u>Route</u>	<u>Number</u>	<u>KDOT Project Let Date</u>	<u>Final Contract Amount (if avail.)</u>	<u>Total Labor Hours</u>
92000001	K-490	K 1000-01	10/20/04	_____	_____
93000001	U-220	K 2000-01	8/28/06	_____	_____
			TOTALS	_____	_____

HIGHWAY ECONOMIC IMPACT PROJECT
SUBCONTRACT SURVEY

SQ1

KDOT Contractor No.: SAMPLE

Person answering questionnaire _____

We request your purchase and cost information on the highway projects listed below.

These contracts deal only with:

KDOT Contract Numbers	Route	KDOT Project Number	Let Date	Final Contract Amount (if avail.)	Total Labor Hours
92000001	K-490	K 1000-01	7/19/06	_____	_____
93000001	U-220	K 2000-01	4/20/05	_____	_____
			TOTALS	_____	_____

APPENDIX C - NAICS INDUSTRY DEFINITIONS

Sector 11--Agriculture, Forestry, Fishing, and Hunting

The Agriculture, Forestry, Fishing, and Hunting sector comprises establishments primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals from a farm, ranch, or their natural habitats.

Sector 21--Mining, Quarrying, and Oil and Gas Extraction

The Mining, Quarrying, and Oil and Gas Extraction sector comprises establishments that extract naturally occurring mineral solids, such as coal and ores; liquid minerals, such as crude petroleum; and gases, such as natural gas. The term mining is used in the broad sense to include quarrying, well operations, beneficiating (e.g., crushing, screening, washing, and flotation), and other preparation customarily performed at the mine site, or as a part of mining activity.

Sector 22--Utilities

The Utilities sector comprises establishments engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply, and sewage removal. Within this sector, the specific activities associated with the utility services provided vary by utility: electric power includes generation, transmission, and distribution; natural gas includes distribution; steam supply includes provision and/or distribution; water supply includes treatment and distribution; and sewage removal includes collection, treatment, and disposal of waste through sewer systems and sewage treatment facilities.

Sector 23--Construction

The construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems). Establishments primarily engaged in the preparation of sites for new construction, and establishments primarily engaged in subdividing land for sale as building sites also are included in this sector.

Sector 31-33--Manufacturing

The Manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembling of component parts of manufactured products is considered manufacturing, except in cases where the activity is appropriately classified in Sector 23, Construction.

Sector 42--Wholesale Trade

The Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing.

Sector 44-45--Retail Trade

The Retail Trade sector comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.

Sector 48-49--Transportation and Warehousing

The Transportation and Warehousing sector includes industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation. Establishments in these industries use transportation equipment or transportation related facilities as a productive asset. The type of equipment depends on the mode of transportation. The modes of transportation are air, rail, water, road, and pipeline.

Sector 51--Information

The Information sector comprises establishments engaged in the following processes: (a) producing and distributing information and cultural products, (b) providing the means to transmit or distribute these products as well as data or communications, and (c) processing data.

Sector 52--Finance and Insurance

The Finance and Insurance sector comprises establishments primarily engaged in financial transactions (transactions involving the creation, liquidation, or change in ownership of financial assets) and/or in facilitating financial transactions.

Sector 53--Real Estate and Rental and Leasing

The Real Estate and Rental and Leasing sector comprises establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services. The major portion of this sector comprises establishments that rent, lease, or otherwise allow the use of their own assets by others. The assets may be tangible, as is the case of real estate and equipment, or intangible, as is the case with patents and trademarks.

Sector 54--Professional, Scientific, and Technical Services

The Professional, Scientific, and Technical Services sector comprises establishments that specialize in performing professional, scientific, and technical activities for others. These activities require a high degree of expertise and training. The establishments in this sector specialize according to expertise and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: legal advice and representation; accounting, bookkeeping, and payroll services; architectural, engineering, and specialized design services; computer services; consulting services; research services; advertising services; photographic services; translation and interpretation services; veterinary services; and other professional, scientific, and technical services.

Sector 55--Management of Companies and Enterprises

The Management of Companies and Enterprises sector comprises (1) establishments that hold the securities of (or other equity interest in) companies and enterprises for the purpose of owning a controlling interest or influencing management decisions or (2) establishments (except government establishment) that administer, oversee, and manage establishments of the company or enterprise and that normally undertake the strategic or organizational planning and decision making role of the company or enterprise. Establishments that administer, oversee, and manage may hold the securities of the company or enterprise.

Sector 56--Administrative and Support and Waste Management and Remediation Services

The Administrative and Support and Waste Management and Remediation Services sector comprises establishments performing routine support activities for the day-to-day operations of other organizations. These essential activities are often undertaken in-house by establishments in many sectors of the economy. The establishments in this sector specialize in one or more of these support activities and provide these services to clients in a variety of industries and, in some cases, to households. Activities performed include: office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services.

Sector 61--Education Services

The Education Services sector comprises establishments that provide instruction and training in a wide variety of subjects. This instruction and training is provided by specialized establishments, such as schools, colleges, universities, and training centers. These establishments may be privately owned and operated for profit or not for profit, or they may be publicly owned and operated. They may also offer food and/or accommodation services to their students.

Sector 62--Health Care and Social Assistance

The Health Care and Social Assistance sector comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance because it is sometimes difficult to distinguish between the boundaries of these two activities. The industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry.

Sector 71--Arts, Entertainment, and Recreation

The Arts, Entertainment, and Recreation sector includes a wide range of establishments that operate facilities or provide services to meet varied cultural, entertainment, and recreational interests of their patrons. This sector comprises (1) establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) establishments that preserve the exhibit objects and sites of historical, cultural, or educational interest; and (3) establishments that operate facilities or provide services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure-time interests.

Sector 72--Accommodation and Food Services

The Accommodation and Food Services sector comprises establishments providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption. The sector includes both accommodation and food services establishments because the two activities are often combined as the same establishment.

Sector 81--Other Services (except Public Administration)

The Other Services (except Public Administration) sector comprises establishments engaged in providing services not specifically provided for elsewhere in the classification system. Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, and providing dry-cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

Sector 92--Public Administration

The Public Administration sector consists of establishments of federal, state, and local government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area. These agencies also set policy, create laws, adjudicate civil and criminal legal cases, provide for public safety and for national defense. In general, government establishments in the Public Administration sector oversee governmental programs and activities that are not performed by private establishments.

K - TRAN

KANSAS TRANSPORTATION RESEARCH
AND
NEW - DEVELOPMENTS PROGRAM



A COOPERATIVE TRANSPORTATION RESEARCH PROGRAM BETWEEN:

KANSAS DEPARTMENT OF TRANSPORTATION



THE UNIVERSITY OF KANSAS



KANSAS STATE UNIVERSITY

