



**Considerations on the Use of Federal Statistical Data
to Assess the Economics of
DHS' 17 Critical Infrastructure Sectors**

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Background

Identifying the economic value of critical infrastructure sectors for the U.S. economy is increasingly important since those indicators provide a baseline for planning everything from security training programs for employees, to cost-benefit analyses of sector-wide protection measures, to estimates of time and resources needed for recovery and reconstitution.

Currently, 17 sectors have been designated in the Patriot Act and elsewhere as critical infrastructure sectors and key assets (CI/KR), and those sectors are the basis for federal planning such as the National Infrastructure Protection Plan and the National Response Plan.¹

The statistical challenge beyond these broad designations is determining the scale and scope of those sectors. How many businesses make up the sector, where are they located, how many people are employed, what is the economic value generated? However, no methodology exists so far to match the officially designated 17 critical infrastructure and key resource sectors to detailed business, revenue, and labor statistics available for traditional industry sectors as defined by the North American Industry Classification System (NAICS). Thus, there is little use of the large amounts of Census and survey data, in particular the Economic Census (EC) for estimating the economic impact of critical infrastructure protection, disaster response and recovery.

For example, data on which business establishments provide truly critical infrastructure services, which establishments are affected by a disaster, to what extent are they affected, and how long does it take for them to resume normal business operations provide important parameters for decision-makers on allocating resources both before and after a disaster. There is broad consensus on the lack of such accurate and timely information on the status of critical infrastructures in the U.S., and the subsequent need for better data.² Such data would help clarify assumptions about the true size and criticality of CI/KR: Not every single business establishment within one of the 17 designated CI/KR sectors is critical in and of itself. Likewise,

¹ (U.S. Department of Homeland Security, 2006a), (U.S. Department of Homeland Security, 2006b), (Bush, 2003);

² See e.g. (McCarthy et al., 2005); (Cheng, Stough, & Kocornik-Mina, 2006); (Zimmerman & Restrepo, 2006); (Jarmin & Miranda, 2007)

not every business establishment within a disaster zone can be assumed to be shut down permanently, or even temporarily. In addition, widely used estimates such as that 85% of critical infrastructures are privately owned and operated have not been substantiated statistically either.

Identifying and matching the critical portions of regional and national infrastructure sectors, subsectors, and businesses with federal statistical data sources such as Census, and vice versa, promises to provide a much-needed focus for economic research on CIP. The following paper discusses the conceptual and methodological challenges for such research, outlines a possible approach, and attempts an initial quantification of certain economic parameters for a selected number of CI/KR sectors.

Approach

To illustrate the type of research effort involved, and type of outcome that can be expected when using federal statistical data sources for estimating critical infrastructure sectors, we decided to describe the process of arriving at aggregate numbers for three categories in fourteen selected CI/KR sectors. The research team decided to match sectors and categories based on expert knowledge of some of the 17 sectors and common knowledge of the other sectors on the one hand, and general familiarity of the NAICS categories on the other hand. Several tables were designed that matched NAICS codes to CI-KR sector definitions. The tables illustrate the different possibilities of arriving at aggregate numbers, and provide some sample results.

The three statistical categories from the EC are:

1. Number of establishments
2. Number of paid employees³
3. Value⁴

³ The number of establishments is not identical to the number of employers. The Census Bureau reports establishments, which is an economic unit (or government installation), such as a farm, factory, store or agency that usually is at a single physical location. Thus, the number of establishments (or installations) is larger than the number of employers (or government agencies).

⁴ The output value is not identical with the GDP. The Census Bureau reports either the value of sales or of shipments, or receipts, revenue, or business done; depending on the predominant activity in the subsector. These measures of output are used to calculate the value added. The value added is computed by subtracting costs, such as

The fourteen CI/KR sectors are:⁵

1. Banking and Finance
2. Chemical and Hazardous Materials
3. Commercial Assets
4. Dams
5. Energy
6. Healthcare and Public Health
7. IT (combined with Telecom in the analysis)
8. Telecom (combined with IT in the analysis)
9. Nuclear Facilities
10. Transportation
11. Water
12. Postal and Shipping
13. Emergency Services
14. Food and Agriculture

The definitions and data used for this analysis are primarily based on four sources:⁶

Economic Census

The Economic Census (EC) is conducted and published by the U.S. Census Bureau.⁷ The EC dataset contains information from the 2002 Economic Census Geographic Area Series and Subject Series reports. The following data are readily available:

- Number of Establishments

labor compensation, supplies and materials used, and capital costs, from output. The value added is then used to compute the gross domestic product (GDP). Thus, the output value is higher than the GDP. The GDP (Gross Domestic Product) is defined by the Bureau of Economic Analysis as the market value of goods and services produced by labor and property in the United States. In 2005, the GDP was 12.45 trillion US\$. The combined output value reported in the Economic Census, that is not yet including government and agriculture output, was 21.36 trillion US\$ alone.

⁵ The EC reports private sector activity according to the North American Industry Classification System (NAICS). The Defense Industrial Base, Monuments and Icons, and Government Facilities sectors were not categorized given the limitations of the 2002 EC data, and the Information Technology and Communications Sector were merged to meet the time objectives of the preliminary assessment.

⁶ For those sectors not covered by the EC (Agriculture, Forestry, Fishing, and Hunting; Rail Transport; Postal; and Public Administration), employment data from other sources were substituted. Those sources are the U.S. Department of Agriculture (USDA) for Food and Ag sector, the U.S. Bureau of Justice Statistics (BJS), the U.S. Fire Administration (USFA) for the Emergency Services Sector, and the Railroad Sector Coordinating Council for the freight portion within the Transportation sector. See U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics (<http://www.ojp.usdoj.gov/bjs/lawenf.htm>); U.S. Fire Administration (<http://www.usfa.dhs.gov/statistics/>)

⁷ U.S. Census Bureau, Summary Statistics by 2002 NAICS: <http://www.census.gov/econ/census02/data/us/US000.HTM>

- Value of Shipments
- Annual payroll
- Paid employees

Labor Statistics

The National Industry-Specific Occupational Employment and Wage Estimates is a survey conducted and published by the Bureau of Labor Statistics (BLS) of the U.S. Department of Labor.⁸ The May 2005 BLS dataset contains national industry-specific occupational employment and wage estimates that are calculated with data collected from employers of all sizes, in metropolitan and non-metropolitan areas in every State and the District of Columbia. The following data are readily available:

- Employment Estimates
- Wage Estimates

Industry Classification

Both datasets use the 2002 North American Industry Classification System (NAICS). NAICS was first adopted in the United States, Canada, and Mexico in 1997, and replaces the Standard Industry Classification (SIC) codes. There are 20 NAICS sectors (two-digit codes) that are subdivided into 100 sub-sectors (three-digit codes), 317 industry groups (four-digit codes), and 1179 industries (six-digit codes).

DHS Sector Definitions

The sector definitions are based on the description of critical infrastructures and key assets found in the June 2006 “*National Infrastructure Protection Plan*” published by the U.S. Department of Homeland Security, and the February 2003 “*National Strategy for The Physical Protection of Critical Infrastructures and Key Assets*” published by the White House. There are 17 sectors and key assets.

⁸ U.S. Department of Labor, National Industry-Specific Occupational Employment and Wage Estimates: <http://www.bls.gov/oes/current/oesrei.htm>

Methodological Issues

Even when estimating rough orders of magnitude only, a number of methodological issues arise and need to be addressed as they determine if and how aggregate numbers can be used, and whether more in-depth study could produce meaningful results.

Data Categories

Typically, the biggest problem in comparing aggregate data is consistency. Over time and between different data sets, the criteria for inclusion and exclusion of certain source data in a certain category may change, or an entire category may be added or deleted. This makes any analysis based on a combination of categories and data from different sources highly subjective.

Even in this initial outline of the process using rough orders of magnitude, these issues impact the usefulness of the aggregate numbers. Any follow-up analysis needs to start with a much more detailed listing of CI-KR sector definitions. Then, a thorough and in-depth understanding of each 6-digit NAICS category needs to be developed, before a decision can be made which one matches a particular sector or sub-sector. Further, decision rules need to be developed in case of uncertainty whether a category matches at all, as well as in case of NAICS categories that apply to more than one sector, or only apply partially. Finally, even when a match is established, not all the activity conducted under a 6-digit NAICS category may be conducted in support of CI/KR. This may be particularly true in sectors such as the Defense Industrial Base and Commercial Facilities.

Data Limitations

Every data set has limitations, including:

- Scale
- Scope
- Timeliness
- Completeness
- Level of Detail

For example, the Economic Census is conducted every 5 years. The latest census was conducted in 2002, but the final reports and analyses have only been issued in 2005. Some series are updated at an aggregate level through annual or monthly estimates.

The economic census does not include the Agriculture, Forestry, Fishing, and Hunting sector and the Public Administration sector. A number of individual industries, such as religious organizations, also are not covered. Further, government-owned establishments in covered industries, such as a government-operated trade school, are also not included, with the exception of government-operated hospitals and liquor stores, which are included. Rail transport and postal are not covered, either.

It also excludes establishments of firms with no paid employees. These “non-employers”, typically self-employed individuals or partnerships operating businesses that they have not chosen to incorporate, are available separately in Non-employer Statistics. This means only the 7 million establishments with paid employees are included, but not the 17 million much smaller businesses without paid employees (non-employers).

Exceptions and exclusions such as these impact the meaningfulness of the aggregate numbers for any particular purpose. For example, if the main interest were in paid employment, they are more useful than if the main interest were in the contribution of a certain sector to the economy.

Data Availability

Not every data set is readily available, for reasons including:

- Access
- Cost and Time
- Confidentiality

In this very narrowly defined task of defining rough orders of magnitude based on readily available data, these issues did not arise. However, any follow-up analysis will have to refer to numerous other data sets for cross-checking; some of which may not be readily available for reasons cited above.

Selection Criteria

Given incomplete knowledge of what exactly is considered part of certain DHS sector, and what exactly comprises a certain NAICS category, we decided to take a conservative approach and excluded NAICS categories that did not appear to be central to the CI-KR sector. Primarily, this resulted in excluding large parts of the construction, manufacturing, service, and retail industry from sectors such as transportation and energy. Exceptions are the “Chemical” sector which is largely a manufacturing sector, and the “Banking and Finance” sector, which is largely a service sector.

Given the fact that some NAICS codes could be counted in more than one sector, and would likely be claimed by representatives from both sectors as well, we decided to note those discrepancies and offer alternative aggregation. An in-depth study would have to devise a consistent methodology for deciding such issues.

Given the absence of detailed i.e. sector-specific data in the NAICS categories of Public Administration (92), and Business/ professional/ labor/ political & similar Organizations (8139), they could not be included. Thus, any CI-KR sector that would consider “Regulatory, Oversight, and Industry Organizations” as a functional sub-sector, is incomplete in this respect.

Thus, there is a clear selection bias and subjectivity of judgment. Certain sectors, especially the ones that include a high proportion of supporting services, are likely underreported. However, other sectors might be over-reported, such as transportation, which was not divided up by kind of goods transported.

The emphasis at the time of establishing CI-KR sectors was to identify key components of the national infrastructure, but these were only looked upon as a potential target. If the sectors are also to be considered assets for response and recovery, and as systems, then a review of each NAIC code takes on a different perspective. In an all-hazards environment, there are additional factors to consider.

Remediation

One possibility to remediate certain data limitations and selection biases could be to use alternate data sources (industry associations, other department statistics, etc.) to compare and contrast with the numbers that have been matched to one or another sector. This way, matches can be confirmed with a higher degree of certainty. However, given the inconsistency and variety of definitions, any gaps in one data set cannot be simply be filled with numbers from a completely different source. If different sources are used, they need to be clearly distinguished and noted.

For example, the establishments and employees in “Food and Agriculture” sector could be estimated using the Agriculture Census and NOAA fisheries data. One data element that is available is irrigation (by state). It is possible to identify locations of aqueducts providing water to certain parts of the country where certain crops u, v, x, y and z were grown in what amounts. Another data element to be included could be “commercial fisheries landings at U.S. ports.

Another possibility would be to align the CI-KR sector definitions more closely with the NAICS classifications, which are widely employed in econometric analyses in public agencies, private associations, and academic institutions. For this, CI-KR sector experts and representatives would need to crosscheck the NAICS classification with their understanding of their sector. In case of overlap with other sectors, a mechanisms needs to be found for achieving consensus.

Summary of Findings

Based on the methodology outlined above, and the limitations associated with it, the following spreadsheets are examples of the results that can be expected. It needs to be stressed that these numbers only give an impression of the magnitude of the CI sector when viewed in NAICS terms. The size and complexity of the U.S. economy as represented in the NAICS, as well as the very general and at times overlapping definition of the CI-KR sectors prevent a straight-forward matching of datasets and definitions.

We have provided two categories of numbers at “Low“ and “Higher” resolution to illuminate how even slight modifications in the selection criteria can quickly impact the overall numbers. Certain codes seemed immediately evident for individual CI/KR sectors. The “immediately

evident” codes were considered “Low Resolution”. As additional Sector codes were added, or modified based on a higher granularity of review, then they were captured in the “Higher Resolution” summary. Higher resolutions were achieved in this limited time for only four sectors, but even at this “higher” resolution, it is still far from definitive.

In addition, those numbers do not include the public administration sector (federal, state, and local government) or the agriculture sector, as well as a number of other sub-sectors (see data source discussion above).

Sector Summary

Summary By Sector - Low Resolution Analysis

CI-KR Sector	Analysis	Establishments	Value*	Paid employees
Banking and Finance	low resolution	440,268	2,803,854,868	6,578,817
Chemical and HazMat	low resolution	11,647	319,867,510	603,350
Commercial Assets	low resolution	543,691	621,012,427	6,047,223
Dams	low resolution	371	2,728,525	6,360
Energy	low resolution	145,264	1,296,133,395	2,064,226
Healthcare and Public H	low resolution	704,526	1,207,299,734	15,052,255
IT and Telecom	low resolution	79,461	566,477,914	2,285,569
Nuclear Facilities	low resolution	73	12,032,379	31,347
Transportation	low resolution	171,769	305,580,535	2,501,296
Water	low resolution	5,270	6,718,219	40,325
Postal and Shipping	low resolution	-	-	1,364,670
Emergency Services	multiple sources	48,184	-	1,101,668
Food and Ag	Multiple sources	2,357,412	1,779,660,309	
Total CI/KR		4,507,936	8,921,365,815	37,677,106
ALL INDUSTRIES	2002 EC	6,891,382	21,362,013,726	108,991,968
CI/KR as % of Private Sector Output Value		65%	42%	35%

Summary By Sector - Higher Resolution Analysis

<u>CI-KR Sector</u>	<u>Analysis</u>	<u>Establishments</u>	<u>Value*</u>	<u>Paid employees</u>
Banking and Finance		440,268	2,803,854,868	6,578,817
Chemical and HazMat		11,647	319,867,510	603,350
Commercial Assets	higher resolution	523,465	938,139,202	6,758,626
Dams		371	2,728,525	6,360
Energy		145,264	1,296,133,395	2,064,226
Healthcare and Public H	higher resolution	808,041	1,974,590,712	16,885,977
IT and Telecom	higher resolution	207,076	1,132,384,275	4,901,542
Nuclear Facilities		73	12,032,379	31,347
Transportation	higher resolution	158,649	333,441,712	2,393,769
Water		5,270	6,718,219	40,325
Postal and Shipping		-	-	1,364,670
Emergency Services	multiple sources	48,184	-	1,101,668
Food and Ag	multiple sources	2,357,412	1,779,660,309	
Total CI/KR		4,705,720	10,599,551,106	42,730,677
ALL INDUSTRIES	2002 EC	6,891,382	21,362,013,726	108,991,968
CI/KR as % of Private Sector Output Value		68%	50%	39%

*** In (000's)

Conclusion

This preliminary analysis of methodological issues and compilation of initial estimates illustrates the promises and pitfalls of using federal statistical data sources for estimating the economic and employment value of the 17 U.S. critical infrastructure sectors as currently defined in federal legislation. The results indicate that using aggregate averages, it could be argued that the 17 CI/KR account for roughly 50% of the U.S. economy in terms of number of establishments, value, and paid employees.

For more accurate estimates, it is expected that it will take a team of three researchers with expertise in Census data sets and definitions as well as other data sources an initial 6 months to (a) devise a standard methodology, (b) find and disaggregate available data sources, and (c) combine those sources to approximately match the DHS CI-KR definitions. After this data mining phase, another 6 month coordination phase would be necessary to allow stakeholders

from government and industry to discuss ambiguities in sector definitions and decide on the final inclusion and exclusion of categories, and recalculate the estimates.

In the long term, as both CI-KR sector definitions and data sources change, an expert staff should be tasked to constantly or periodically review, revise, and update the estimates with newly available data. Longitudinal series such as the Economic Census are typically updated quarterly or annually, and conducted anew every five or ten years.

Despite these challenges, we believe a continuation and expansion of this effort is indispensable for a more effective and efficient allocation of resources for critical infrastructure protection and post-disaster recovery and reconstitution.

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Appendix: Individual Sectors

BANKING AND FINANCE SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
Low Resolution		440,268	2,803,854,868	6,578,817	Incls all banks, insurance agents, etc.	2002 EC
52	Finance & insurance	440,268	2,803,854,868	6,578,817		2002 EC
521	Monetary authorities - central bank	47	28,909,454	22,367		2002 EC
522	Credit intermediation & related activities	196,451	1,055,713,787	3,299,521	all banks, mortgage brokers, etc.	2002 EC
523	Securities intermediation & related activities	72,338	316,275,155	832,144		2002 EC
524	Insurance carriers & related activities	169,520	1,380,082,817	2,406,089	all insurance agents, etc.	2002 EC
525	Funds, trusts, & other financial vehicles (part)	1,912	22,873,655	18,696		2002 EC
5614501	Consumer credit reporting agencies	878	3,299,927	18,813		2002 EC
5614502	Mercantile reporting agencies	231	1,290,685	7,144		2002 EC
42511	Business to business electronic markets	95	2,764,616	1,412		2002 EC
42512	Wholesale trade agents & brokers	32,320	480,395,239	247,185		2002 EC
551111	Offices of bank holding companies	1,874	10,659,040	25,750		2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration			9,439,900	no sector-specific detail	2005 BLS
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

CHEMICAL SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
Low resolution		11,647	319,867,510	603,350		2002 EC
3251	Basic chemical mfg	2,377	109,710,377	179,263		2002 EC
3252	Resin, syn rubber, & artificial syn fibers & filaments mfg	949	60,223,140	100,244		2002 EC
3253	Pesticide, fertilizer, & other agricultural chemical mfg	963	19,316,550	31,315		2002 EC
3255	Paint, coating, & adhesive mfg	2,018	27,368,398	67,544		2002 EC
3256	Soap, cleaning compound, & toilet preparation mfg	2,402	64,030,042	115,745		2002 EC
3259	Other chemical product & preparation mfg	2,938	39,219,003	109,239		2002 EC
3254	Pharmaceutical & medicine mfg	1,829	140,557,276	248,947	in Health	2002 EC
332993	Ammunition (except small arms) mfg	54	1,190,077	6,925		2002 EC
562211	Hazardous waste treatment & disposal	701	3,642,301	22,032	no sector-specific detail	2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration			9,439,900	no sector-specific detail	2005 BLS
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

COMMERCIAL FACILITIES						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
	LOW RESOLUTION	543,691	621,012,427	6,047,223		2002 EC
531	Real estate	256,086	223,563,114	1,304,841		2002 EC
532	Rental & leasing services	64,344	95,107,151	616,859		2002 EC
61	Educational services	49,319	30,690,707	430,164		2002 EC
71	Arts, entertainment, & recreation	110,313	141,904,109	1,848,674		2002 EC
711	Performing arts, spectator sports, & related industries	37,735	58,285,681	422,533		2002 EC
712	Museums, historical sites, & similar institutions	6,663	8,607,959	123,098		2002 EC
713	Amusement, gambling, & recreation industries	65,915	75,010,469	1,303,043		2002 EC
721	Accommodation	60,949	128,098,210	1,813,326		2002 EC
51912	Libraries & archives	2,680	1,649,136	33,359		
	HIGHER RESOLUTION	523,465	938,139,202	6,758,626		2002 EC
531	Real estate	256,086	223,563,114	1,304,841		2002 EC
532	Rental & leasing services	64,344	95,107,151	616,859		2002 EC
61	Educational services	49,319	30,690,707	430,164		2002 EC
71	Arts, entertainment, & recreation	110,313	141,904,109	1,848,674		2002 EC
711	Performing arts, spectator sports, & related industries	37,735	58,285,681	422,533		2002 EC
712	Museums, historical sites, & similar institutions	6,663	8,607,959	123,098		2002 EC
713	Amusement, gambling, & recreation industries	65,915	75,010,469	1,303,043		2002 EC
721	Accommodation	60,949	128,098,210	1,813,326		2002 EC
452	General merchandise stores	40,723	445,224,985	2,524,729		2002 EC
4521	Department stores	9,355	220,742,882	1,430,768		2002 EC
4529	Other general merchandise stores	31,368	224,482,103	1,093,961		
51912	Libraries & archives	2,680	1,649,136	33,359		2002 EC
NOT INCLUDED.						
23	Construction	710,307	1,196,555,587	7,193,069		2002 EC
313	Textile mills	3,932	45,652,142	269,064		2002 EC
314	Textile product mills	7,304	32,273,047	183,333		2002 EC
315	Apparel mfg	13,038	44,521,126	343,450		2002 EC
322	Paper mfg	5,520	153,766,022	491,436		2002 EC
323	Printing & related support activities	37,538	95,726,203	715,777		2002 EC
332	Fabricated metal product mfg	62,219	247,059,502	1,574,827		2002 EC
3332	Industrial machinery mfg	4,381	29,881,801	158,302		2002 EC
3333	Commercial & service industry machinery mfg	2,399	21,171,601	102,432		2002 EC
3334	Ventilation, heating, AC, & commercial refrigeration equip mfg	1,848	31,933,185	156,752		2002 EC
3335	Metalworking machinery mfg	9,162	25,442,220	191,746		2002 EC
3336	Engine, turbine, & power transmission equipment mfg	923	38,463,675	97,313		2002 EC
3339	Other general purpose machinery mfg	6,616	57,305,728	296,165		2002 EC
335	Electrical equipment, appliance, & component mfg	6,499	102,879,191	494,370		2002 EC
337	Furniture & related product mfg	22,523	75,964,713	595,915		2002 EC
3399	Other miscellaneous mfg	20,409	64,165,772	428,911		2002 EC
425	Wholesale electronic markets and agents and brokers	32,415	483,159,855	248,597		2002 EC
441	Motor vehicle & parts dealers	125,139	801,740,162	1,845,496		2002 EC
442	Furniture & home furnishings stores	65,204	91,814,210	535,029		2002 EC
443	Electronics & appliance stores	46,779	82,228,017	391,015		2002 EC
444	Building material & garden equipment & supplies dealers	88,314	246,560,851	1,160,016		2002 EC
445	Food & beverage stores	148,804	456,942,288	2,838,653	in Food and Ag	2002 EC
446	Health & personal care stores	81,797	177,947,091	1,024,429	in Healthcare	2002 EC

ENERGY SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
various	low resolution	145,264	1,296,133,395	2,064,226		2002 EC
221112	Fossil fuel electric power generation.	1,245	56,048,361	72,159		2002 EC
221119	Other electric power generation.	308	8,622,413	12,919		2002 EC
22112	Electric power transmission, control, & distribution.	7,397	245,596,693	412,890		2002 EC
221121	Electric bulk power transmission & control.	72	1,588,135	2,874		2002 EC
221122	Electric power distribution.	7,325	244,008,558	410,016		2002 EC
2212	Natural gas distribution.	2,376	66,515,186	85,447		2002 EC
324110	Petroleum refineries.	203	193,547,214	61,585		2002 EC
325110	Petrochemical mfg.	56	21,084,070	9,380	also in Chemical	2002 EC
42471011	Petroleum bulk stations (exc LP).	3,579	41,567,670	47,530		2002 EC
42471012	Petroleum bulk terminals (exc LP).	1,082	165,471,978	20,139		2002 EC
4247102	LP bulk stations & terminals.	175	2,941,705	2,495		2002 EC
447	Gasoline stations.	121,446	249,141,412	926,792	not in Commercial	2002 EC
NOT INCLUDED						
22133	Steam & air-conditioning supply.	63	645,268	1,597		2002 EC
333132	Oil & gas field machinery & equipment mfg.	540	5,578,895	27,821		2002 EC
4861	Pipeline transportation of crude oil.	252	3,401,854	6,508	in Transportation	2002 EC
4862	Pipeline transportation of natural gas.	1,431	14,797,371	23,677	in Transportation	2002 EC
48691	Pipeline transportation of refined petroleum products.	468	3,413,782	6,149	in Transportation	2002 EC
8139	Business/professional/labor/political & similar organizations.	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration.			9,439,900	no sector-specific detail	2005 BLS
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

DAMS, LOCKS, LEVEES SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
various	Low Resolution	371	2,728,525	6,360	excludes locks, levees, etc.	2002 EC
221111	Hydroelectric power generation.	371	2,728,525	6,360	excludes locks, levees, etc.	2002 EC
NOT INCLUDED						
8139	Business/professional/labor/political & similar organizations.	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration.			9,439,900	no sector-specific detail	2005 BLS
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

HEALTHCARE AND PUBLIC HEALTH						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
	LOW RESOLUTION	704,526	1,207,299,734	15,052,255		2002 EC
62	Health care & social assistance	704,526	1,207,299,734	15,052,255		2002 EC
621	Ambulatory health care services	489,021	488,618,528	4,924,908	parts could be in Emergency Services	2002 EC
622	Hospitals	6,411	500,112,841	5,174,262		2002 EC
623	Nursing & residential care facilities	69,342	127,113,566	2,830,582		2002 EC
624	Social assistance	139,752	91,454,799	2,122,503	parts could be in Emergency Services	2002 EC
	HIGHER RESOLUTION	808,041	1,974,590,712	16,885,977		2002 EC
62	Health care & social assistance	704,526	1,207,299,734	15,052,255		2002 EC
621	Ambulatory health care services	489,021	488,618,528	4,924,908	parts could be in Emergency Services	2002 EC
622	Hospitals	6,411	500,112,841	5,174,262		2002 EC
623	Nursing & residential care facilities	69,342	127,113,566	2,830,582		2002 EC
624	Social assistance	139,752	91,454,799	2,122,503	parts could be in Emergency Services	2002 EC
3254	Pharmaceutical & medicine mfg	1,829	140,557,276	248,947	could also be Chemical	2002 EC
32541	Pharmaceutical & medicine mfg	1,829	140,557,276	248,947		2002 EC
325411	Medicinal & botanical mfg	368	12,242,919	20,605		2002 EC
325412	Pharmaceutical preparation mfg	904	112,245,666	176,650		2002 EC
325413	In-vitro diagnostic substance mfg	237	7,699,051	27,155		2002 EC
325414	Biological product (except diagnostic) mfg	320	8,369,640	24,537		2002 EC
3391	Medical equipment & supplies mfg	12,160	61,928,760	326,490		2002 EC
33911	Medical equipment & supplies mfg	12,160	61,928,760	326,490		2002 EC
339111	Laboratory apparatus & furniture mfg	428	4,604,554	24,467		2002 EC
339112	Surgical & medical instrument mfg	1,347	21,936,894	103,237		2002 EC
339113	Surgical appliance & supplies mfg	1,852	24,156,006	108,526		2002 EC
339114	Dental equipment & supplies mfg	874	3,218,670	17,097		2002 EC
339115	Ophthalmic goods mfg	563	4,650,640	23,696		2002 EC
339116	Dental laboratories	7,096	3,361,996	49,467		2002 EC
4242	Drugs & druggists' sundries merchant wholesalers	7,729	386,857,851	233,856		2002 EC
4242101	General-line drugs merchant wholesalers	3,873	184,687,648	79,660		2002 EC
4242102	Specialty-line drugs merchant wholesalers	3,856	202,170,203	154,196		2002 EC
446	Health & personal care stores	81,797	177,947,091	1,024,429		2002 EC
44611	Pharmacies & drug stores	40,234	153,748,566	783,392		2002 EC
4461102	Proprietary stores	1,113	1,020,545	8,617		2002 EC
44613	Optical goods stores	13,037	6,649,362	70,175		2002 EC
44619	Other health & personal care stores	17,730	11,267,727	95,026		2002 EC
446191	Food (health) supplement stores	9,526	4,654,310	46,897		2002 EC
446199	All other health & personal care stores	8,204	6,613,417	48,129		2002 EC
NOT INCLUDED						
5417	Scientific research & development services	15,334	64,481,193	618,088	no sector-specific detail	2002 EC
562211	Hazardous waste treatment & disposal	701	3,642,301	22,032	no sector-specific detail	2002 EC
611	Educational services	49,319	30,690,707	430,164	no sector-specific detail	2002 EC
8131	Religious Organizations (not covered)	X	X	X		N/A
8132	Grantmaking & giving services	14,626	46,275,707	136,555	no sector-specific detail	2002 EC
8134	Civic & social organizations	31,658	14,679,408	320,504	no sector-specific detail	2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration			9,439,900	no sector-specific detail	2005 BLS

* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)

IT AND COMMUNICATIONS SECTORS (MERGED)						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
	LOW RESOLUTION	79,461	566,477,914	2,285,569		2002 EC
515	Broadcasting (except Internet)	9,540	73,962,118	291,361		2002 EC
516	Internet publishing & broadcasting	2,057	6,363,468	40,021		2002 EC
517	Telecommunications	49,275	411,644,543	1,440,141		2002 EC
518	Internet service providers, web search portals, & data proce	18,589	74,507,785	514,046		2002 EC
	HIGHER RESOLUTION	207,076	1,132,384,275	4,901,542		2002 EC
237130	Power and communication system construction	5,995	34,078,125	246,669	also in Energy	2002 EC
334	Computer & electronic product mfg.	15,910	358,414,047	1,262,063		2002 EC
515	Broadcasting (except Internet)	9,540	73,962,118	291,361		2002 EC
516	Internet publishing & broadcasting	2,057	6,363,468	40,021		2002 EC
517	Telecommunications	49,275	411,644,543	1,440,141		2002 EC
518	Internet service providers, web search portals, & data proce	18,589	74,507,785	514,046		2002 EC
5415	Computer systems design & related services	105,710	173,414,189	1,107,241	all software programmers etc.	2002 EC
NOT INCLUDED						
5417	Scientific research & development services	15,334	64,481,193	618,088	no sector-specific detail	2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration			9,439,900	no sector-specific detail	2005 BLS
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

NUCLEAR SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
	LOW RESOLUTION	73	12,032,379	31,347	excludes research, military etc. reactors	2002 EC
221113	Nuclear electric power generation	73	12,032,379	31,347	excludes research and military reactors	2002 EC
	HIGHER RESOLUTION	701	3,642,301	22,032		
562211	Hazardous waste treatment & disposal	701	3,642,301	22,032	no sector-specific detail	2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration			9,439,900	no sector-specific detail	2005 BLS
NOT INCLUDED						
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

TRANSPORTATION SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
	LOW RESOLUTION	171,769	305,580,535	2,501,296		2002 EC
481	Air transportation	3,847	19,734,965	99,144		2002 EC
482	Rail Transportation (not covered in the Economic Census)	X	X	X		2002 EC
483	Water transportation	1,890	23,331,333	66,153		2002 EC
484	Truck transportation	112,642	164,218,769	1,435,210		2002 EC
485	Transit & ground passenger transportation	17,260	18,849,918	398,383		2002 EC
486	Pipeline transportation	2,188	22,031,419	36,790	not in Energy	2002 EC
488	Support activities for transportation	33,942	57,414,131	465,616		2002 EC
	HIGHER RESOLUTION	158,649	333,441,712	2,393,769		2002 EC
481	Air transportation	3,847	19,734,965	99,144		2002 EC
	Rail Transportation (freight only)	556	40,517,000	176,899		Rail SCC
483	Water transportation	1,890	23,331,333	66,153		2002 EC
484	Truck transportation	112,642	164,218,769	1,435,210		2002 EC
4851	Urban transit systems	1,025	2,808,395	53,644		2002 EC
485111	Mixed mode transit systems	47	D	(1000-2499)	data withheld	2002 EC
485112	Commuter rail systems	18	D	(2500-4999)	data withheld	2002 EC
485113	Bus & motor vehicle transit systems	916	2,271,609	47,352		2002 EC
485119	Other urban transit systems	44	D	(500-999)	data withheld	2002 EC
4852	Interurban & rural bus transportation	508	1,530,944	19,103		2002 EC
485991	Special needs transportation	2,051	1,854,756	41,210		2002 EC
486	Pipeline transportation	2,188	22,031,419	36,790		2002 EC
4861	Pipeline transportation of crude oil	252	3,401,854	6,508		2002 EC
4862	Pipeline transportation of natural gas	1,431	14,797,371	23,677		2002 EC
4869	Other pipeline transportation	505	3,832,194	6,605		2002 EC
48691	Pipeline transportation of refined petroleum products	468	3,413,782	6,149		2002 EC
48699	All other pipeline transportation	37	418,412	456		2002 EC
488	Support activities for transportation	33,942	57,414,131	465,616		2002 EC
NOT INCLUDED						
2373	Highway, street, and bridge construction	11,348	81,412,178	410,822		2002 EC
487	Scenic & sightseeing transportation	2,523	1,858,979	22,516		2002 EC
336	Transportation equipment mfg.	12,639	636,758,285	1,676,198		2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration			9,439,900	no sector-specific detail	2005 BLS

* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)

WATER SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
	LOW RESOLUTION	5,270	6,718,219	40,325		2002 EC
22131	Water supply & irrigation systems	4,603	5,886,302	34,682		2002 EC
22132	Sewage treatment facilities	667	831,917	5,643		2002 EC
NOT INCLUDED						
22133	Steam & air-conditioning supply	63	645,268	1,597	could be Energy	
237110	Water and sewer system construction	12,395	32,481,745	198,622		2002 EC
48699	All other pipeline transportation	37	418,412	456	in Transportation	2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
92	Public Administration			9,439,900	no sector-specific detail	2005 BLS

* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)

POSTAL AND SHIPPING SECTOR						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
	LOW RESOLUTION			1,364,670		2005 BLS
491000	Postal Service			799,570		2005 BLS
492000	Couriers and Messengers			565,100		2005 BLS
NOT INCLUDED						
481112	Scheduled freight air transportation	377	3,234,578	22,889	in Transportation	2002 EC
481212	Nonscheduled chartered freight air transportation	245	1,164,511	4,449	in Transportation	2002 EC
481112	Scheduled freight air transportation	377	3,234,578	22,889	in Transportation	2002 EC
481212	Nonscheduled chartered freight air transportation	245	1,164,511	4,449	in Transportation	2002 EC
4841	General freight trucking	59,011	110,239,101	989,192	in Transportation	2002 EC
4842	Specialized freight trucking	53,631	53,979,668	446,018	in Transportation	2002 EC
561431	Private mail centers	4,578	1,957,293	20,049	different data source	2002 EC
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

EMERGENCY SERVICES SECTOR						
	Description	Departments	Officers		Note	Source
		48,184	1,101,668			multiple
SECTOR INFORMATION NOT PROVIDED IN 2002 EC						
		Agencies	FT Sworn Officers			
Police	All State and local	17,784	708,022			
	Local police	12,666	440,920			2000 BJS
	Sheriff	3,070	164,711			2000 BJS
	Primary State	49	56,348			2000 BJS
	Special jurisdiction	1,376	43,413			2000 BJS
	Texas constable	623	2,630			2000 BJS
	Federal*		88,496			2000 BJS
		Fire Departments	Firefighters			
Fire	Fire Departments	30,400				2004 USFA
	Fire Stations	51,450				2004 USFA
	Career Firefighters		305,150			2004 USFA
	Volunteer Firefighters		1,100,750		not included in total	2004 USFA
NOT INCLUDED						
NAICS	Description	Establishments	Value*	Paid employees	Note	Source
485991	Special needs transportation	2,051	1,854,756	41,210	in Transportation	2002 EC
562211	Hazardous waste treatment & disposal	701	3,642,301	22,032	no sector-specific detail	2002 EC
62191	Ambulance services	3,921	6,524,645	111,770	in Health	2002 EC
62423	Emergency & other relief services	1,807	5,095,609	23,171	in Health	2002 EC
8131	Religious Organizations (not covered)	X	X	X		N/A
8132	Grantmaking & giving services	14,626	46,275,707	136,555	no sector-specific detail	2002 EC
8134	Civic & social organizations	31,658	14,679,408	320,504	no sector-specific detail	2002 EC
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail	2002 EC
* Value of sales, shipments, receipts, revenue, or business done (in 1,000 US\$)						

Food and Agriculture Sector					
NAICS	Description	Businesses	Value*	Workers	Note
	LOW RESOLUTION	2,357,412	1,779,660,309	8,225,088	
				Primary Occupation Operators	
				1,224,246	
		Farms	Market Value Production	Hired Workers	
		2,128,982		1,172,500	
111	Crop Production		95,151,954		
112	Animal Production		105,494,401		
		Processing Plants	Market Value Landings	Employees Processing	
42446	Fisheries	3,315	3,723,328	65,336	
				Employment	
115100	Support Activities for Crop Production	X	X	277,650	
115200	Support Activities for Animal Production	X	X	26,610	
				Paid employees	
311	Food mfg.	27,915	458,786,540	1,506,932	
312	Beverage & tobacco product mfg.	3,025	105,714,263	160,305	
445	Food & beverage stores.	148,804	456,942,288	2,838,653	
4244	Grocery & related product merchant wholesalers	35,650	511,438,047	761,492	
333111	Farm machinery & equipment mfg.	1,215	14,695,197	53,088	
333294	Food product machinery mfg.	554	2,945,593	16,397	
4238201	Farm machinery & equip merchant wholesalers - farm dealers	6,016	21,098,205	65,738	
49312	Refrigerated warehousing & storage	1,231	2,907,653	45,234	
49313	Farm product warehousing & storage	705	762,840	10,907	
	Codes Not Included (for example)				
54138	Testing laboratories	5,955	8,770,541	93,596	no sector-specific detail
722	Food services & drinking places	504,641	321,400,508	8,307,625	
8139	Business/professional/labor/political & similar organizations	46,761	43,509,350	331,851	no sector-specific detail
113	Forestry and Logging			65,050	