Exports and American Information and Communications Technology Companies and Workers

March 18, 2014

TECHNOLOGY CEO COUNCIL

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About The Trade Partnership

The Trade Partnership, a Washington, DC-based economics research and consulting firm, prepared this report. Since its founding in 1991, The Trade Partnership has provided policy makers with detailed assessments of the likely impacts of trade initiatives on U.S. and foreign economies. In addition, the firm estimates exports of goods and services for every U.S. state and all 435 Congressional districts as parts of its *CDxports* database. *CDxports* provided the foundation for the analysis in this report. Information about this database can be found at http://tradepartnership.com/site/data.

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Executive Summary

The information and communications technology (ICT) industries are a vital part of the American economy, employing 4.2 million U.S. workers in 2012. Every sector of the economy relies on ICT hardware, software and services to some degree. In addition, over 70 percent of ICT spending occurs outside of the United States. Access to global markets enables American ICT companies to make substantial investments in research, capital spending, and worker training in the United States; increase productivity across sectors by developing innovative products and processes; and generate new ideas, firms, and jobs that maintain the pre-eminence of the U.S. ICT industries. Thus, growth of ICT exports is an essential element in the success of efforts to expand business opportunities for American workers and employers generally.

In 2012, U.S. ICT exports exceeded $270 billion, or more than $1 out of every $8 in total U.S. exports. They include $201 billion of domestically manufactured goods like Intel or Micron semiconductors; $72 billion of ICT services such as consulting services provided by companies like IBM and Xerox; data and computer processing services like those provided by EMC; and royalties collected by U.S. companies for software purchased by customers around the world.

This study explores the importance of ICT exports to states and congressional districts across the United States. All 50 states and 435 congressional districts – plus the District of Columbia – export ICT hardware, software and services. The foreign markets are many, and varied.

Trade agreements have played a key role in opening foreign markets to ICT exports. Current U.S. free trade agreement (FTA) partners bought 38 percent of total U.S. ICT exports in 2012. Countries with which the United States is currently negotiating new FTAs – e.g., Japan, the European Union and others – would bring that share to 67 percent. Clearly, U.S. ICT companies and workers have a large stake in the outcome of FTA negotiations that will set high bars for trade and investment practices and policies and maintain open markets in the high-growth economies of the future.

Multilateral efforts to reduce barriers to exports of ICT hardware, software and services have also benefited U.S. exporters. China's entry into the World Trade Organization, for example, opened a large and growing market to U.S. exporters beginning in 2001. New WTO agreements, like the second phase of the Information Technology Agreement and the Trade in Services Agreement, promise additional opportunities for international growth to U.S. ICT companies and workers.

ICT Contributions to the U.S. Economy and Jobs

The ICT sector has a major impact on the U.S. economy. In 2012, the ICT sector employed 4.2 million workers and contributed nearly $1 trillion to the national gross domestic product (GDP).

- ICT companies and jobs are present in every U.S. state.
- Overall, ICT sectors contributed to 7.4 percent of U.S. GDP in 2012.
- ICT sectors accounted for 3.8 percent of total employment in that year.

The importance of the ICT sector varies greatly among states:

- ICT sectors contribute 10 percent or more to state output for seven states: **Oregon**, with the greatest share at 28 percent; **Colorado** and **Washington**, 13 percent each; **Massachusetts** and **Virginia**, 12 percent each; **California**, 11 percent, and **Idaho**, 10 percent.
- ICT jobs represent 5 percent or more of total jobs in nine states: **Virginia**, 7 percent; **Massachusetts**, **Washington** and **Colorado**, 6 percent each; and **Colorado**, **California**, **Maryland**, **New Hampshire**, **Utah** and **Oregon**, each 5 percent.

ICT Output and Employment by State, 2012

State	GDP from ICT Sector ($M)	Share of Total GDP	Workers in ICT Sector	Share of Total Workers
U.S. Total	$990,137.6	7.4%	4,195,997	3.8%
Alabama	7,108.0	4.7%	42,047	2.8%
Alaska	1,230.3	3.3%	5,717	2.3%
Arizona	16,793.9	7.3%	87,088	4.3%
Arkansas	3,349.3	3.7%	19,178	2.0%
California	184,608.7	10.6%	683,429	5.9%
Colorado	30,936.0	13.1%	113,794	6.0%
Connecticut	12,059.0	5.8%	49,959	3.6%
Delaware	1,914.3	3.2%	10,426	2.9%
District of Columbia	7,605.2	10.6%	27,008	5.5%
Florida	38,748.3	5.8%	197,195	3.2%
Georgia	31,926.6	8.6%	134,657	4.1%
Hawaii	1,864.5	3.4%	8,782	1.8%
Idaho	4,862.0	10.3%	19,669	3.9%
Illinois	33,986.5	5.5%	156,448	3.2%
Indiana	8,963.5	3.4%	52,096	2.1%
Iowa	5,181.2	4.1%	36,900	3.0%
Kansas	7,845.3	7.0%	35,358	3.2%
Kentucky	5,997.7	4.2%	32,962	2.2%
Louisiana	3,859.3	1.8%	20.975	1.3%
Maine	1,568.7	3.4%	9,567	1.9%
Maryland	24,425.4	9.5%	114,068	5.5%
Massachusetts	44,047.9	12.1%	178,210	6.3%
Michigan	14,689.2	4.2%	88.043	2.6%
Minnesota	19,020.0	7.4%	103.881	4.5%
Mississippi	2,394.7	3.0%	12,732	1.5%
Missouri	16,191.1	7.3%	64,734	2.9%
Montana	1,097.0	3.4%	7,761	2.3%
Nebraska	3,752.7	4.8%	23,391	3.0%
Nevada	2,952.5	2.5%	14,827	1.5%
New Hampshire	5,740.7	9.9%	29,463	5.5%
New Jersey	34,658.2	7.7%	138,484	4.2%
New Mexico	5,969.3	9.4%	19,566	3.2%
New York	64,325.9	6.0%	242,684	3.3%
North Carolina	22,921.7	5.9%	116,615	3.6%
North Dakota	1,194.6	3.2%	8,030	2.4%
Ohio	19,649.0	4.4%	124,128	2.8%
Oklahoma	4,676.6	3.6%	26,865	2.1%
Oregon	47,935.7	27.7%	69,200	5.2%
Pennsylvania	31,555.0	5.9%	136,253	2.7%
Rhode Island	3,100.2	7.0%	16,948	4.3%
South Carolina	5,440.5	3.7%	32,156	2.1%
South Dakota	1,090.9	3.3%	7,167	2.2%
Tennessee	9,103.0	3.7%	38,494	1.7%
Texas	86,285.4	7.0%	340,420	3.8%
Utah	8,098.7	7.1%	53,130	5.2%
Vermont	2,045.0	8.9%	12,236	4.9%
Virginia	42,509.1	11.7%	210,912	7.0%
Washington	41,183.9	13.1%	144,824	6.2%
West Virginia	1,583.0	2.8%	9,372	1.6%
Wisconsin	11,616.4	5.1%	65,640	2.8%
Wyoming	476.3	1.5%	2,511	1.2%

Source: The Trade Partnership from Moody's Analytics data

U.S. ICT Exports

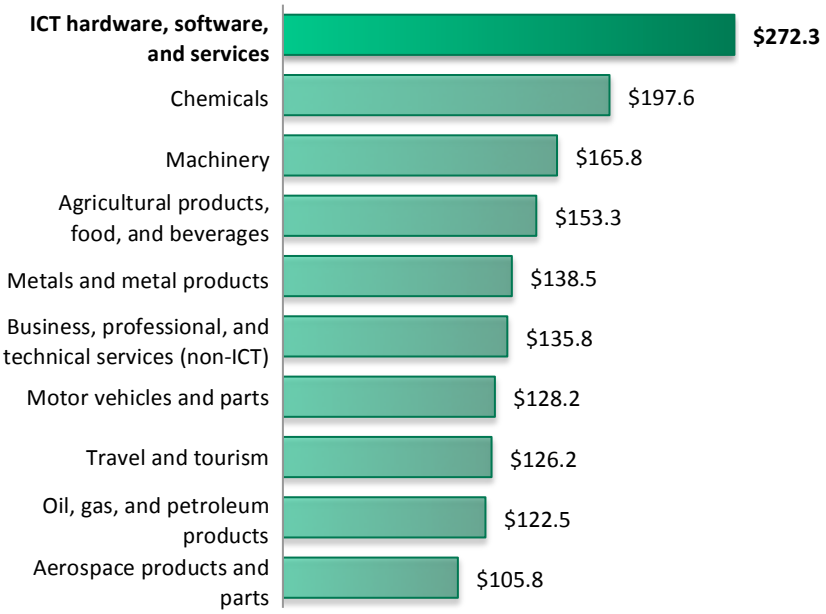
At $272 billion, **ICT hardware, software and services were the largest U.S. export sector in 2012:**

- ICT exports accounted for $1 in every $8 of 2012 U.S. goods and services exports.
- ICT exports exceeded those from the next largest sector – chemicals – by $75 billion.
- ICT exports exceeded those of a combined "transportation" sector consisting of motor vehicles and aerospace products by $38 billion.

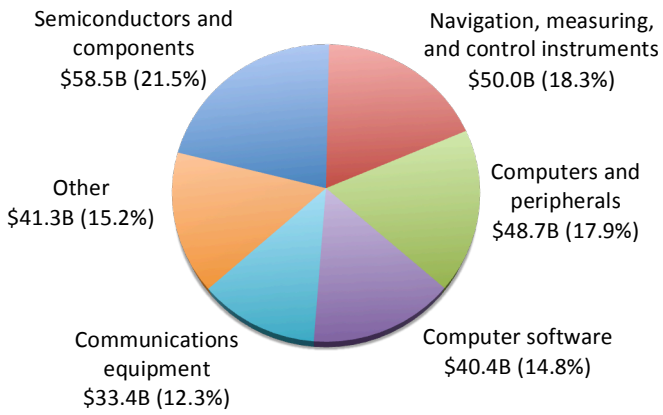
U.S. ICT exports are varied, yet dominated by goods exports, which totaled $201 billion in 2012. Semiconductors and components were the top ICT goods export, followed by navigational, measuring and control instruments, and computers.

ICT services exports totaled $72 billion in 2012. Computer software was the leading ICT services export and was the only services category to rank among the top five ICT exports overall.

Top U.S. Exports by Sector, 2012 ($B)



Top U.S. ICT Exports by Type, 2012



Source: U.S. Census Bureau.

Defining ICT Industries

This report defines ICT industries as computers and peripheral equipment manufacturers (North American Industry Classification System, NAICS, sector 3341); communications equipment manufacturers (NAICS 3342); audio and video equipment manufacturers (NAICS 3343); semiconductors and electronic components manufacturers (NAICS 3344); navigational, measuring, electromedical, and control instrument manufacturers (NAICS 3345); software publishers (NAICS 5112); telecommunications services providers (NAICS 5171, NAICS 5172, NAICS 5174, NAICS 5179); computer systems design and related services providers (NAICS 5182, NAICS 5415), and databases and information services providers (NAICS 5191). See Appendix A for a more detailed listing of the sectors that are included in each category.

Although export data are published separately for pre-packaged software (a good) and royalties from software (a service), for simplicity the two categories are combined into one "computer software" or "software" services category in this report. Further, while wholesalers are responsible for exports of many goods, like semiconductors, those sales are captured in the manufacturing categories listed above.

U.S. ICT Export Markets

The **European Union** was the largest export market for U.S. ICT hardware, software, and services in 2012 at $56.0 billion.

Among individual countries, **Mexico** was the top market for ICT exports, followed by **Canada**, **China**, and **Japan**.

The prominence of the NAFTA partners as the top export markets for computers and semiconductors demonstrates the integrated nature of North American ICT hardware manufacturing.

The United States has or is negotiating free trade agreements (FTA) with four of its top five ICT export markets.

ICT exports to **current U.S. FTA partners** totaled $104.5 billion in 2012, about 38 percent of total U.S. ICT exports.

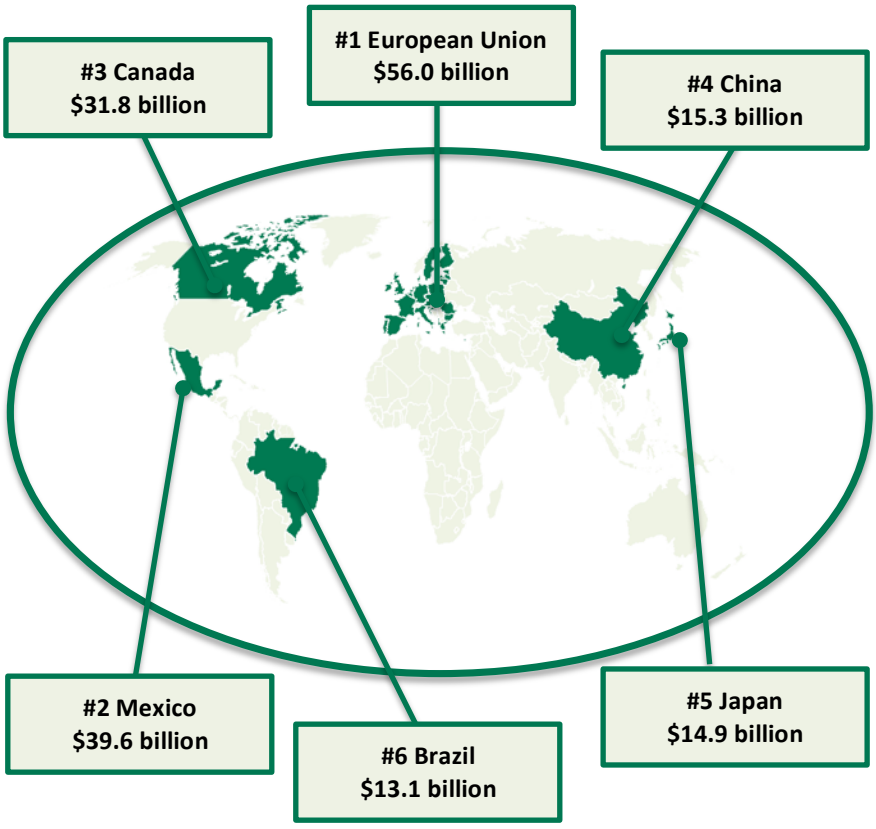
The 11 other countries negotiating the **Trans-Pacific Partnership (TPP) agreement** with the United States accounted for 40 percent of total U.S. ICT exports in 2012.

The European Union, with which the United States is negotiating the **Transatlantic Trade and Investment Partnership (T-TIP)**, accounted for 21 percent of U.S. ICT exports.

A T-TIP agreement could reduce barriers for U.S. ICT exports to the European Union, the top market for numerous hardware, software, and services catogories.

Pending FTAs have the potential to raise the share of U.S. ICT exports covered by trade agreements from 38 percent to 67 percent.

Top U.S. ICT Export Markets, 2012



Top ICT Export Markets by Type, 2012 ($B)

Export	Market	Value
Computers and peripherals	Mexico	$14.4B
Computer software	European Union	$13.5B
Navigational, measuring, and control instruments	European Union	$12.7B
Semiconductors and components	Mexico	$11.7B
Communications equipment	European Union	$5.9B
Computer and data processing services	European Union	$4.7B
Telecommunications services	Brazil	$3.7B
Audio and visual equipment	Canada	$2.9B
Database and information services	European Union	$2.9B

Source: U.S. Census Bureau

The United States has, or is negotiating, FTAs with four of its top five markets for ICT hardware, software and services.

U.S. ICT Export Growth

ICT exports are growing. Total ICT hardware, software, and services exports increased by more than $50 billion between 2006 and 2012.

ICT services exports fueled that increase, growing at an average annual rate of 10 percent, up by $31 billion between 2006 and 2012.

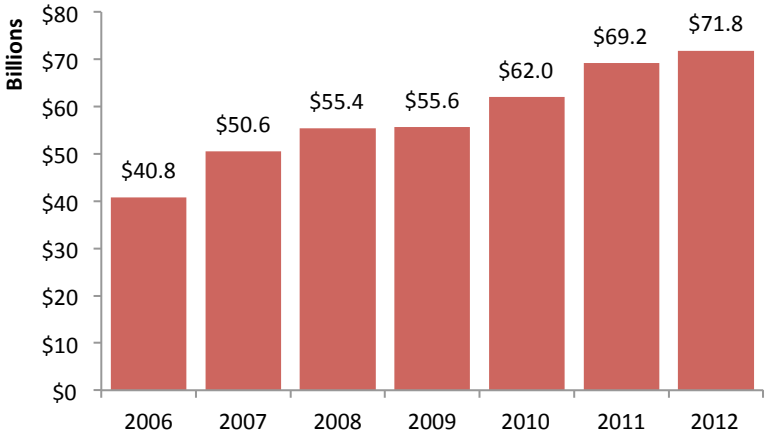
Computer software (including services) contributed the largest value increase of any ICT sector over the last six years, from $23.6 billion to $40.4 billion.

Telecommunications, and computer and data processing services experienced the largest increases in the rate of growth, in each case with exports nearly doubling.

ICT hardware, software, and services exports to FTA partner **Chile** have increased by 13.5 percent per year to $2.4 billion.

ICT hardware exports – software and services data are not available – to the United States' other South American FTA partners have also grown rapidly. Exports to **Colombia** grew by 16.5 percent annually from 2006 to 2012, while exports to **Peru** increased by 15.5 percent per year.

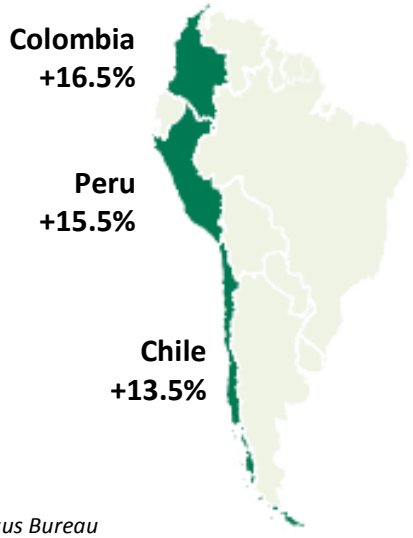
U.S. ICT Services Exports ($B)



ICT Services Export Growth by Type, 2006-2012

Export	2006 Value	2012 Value	Percent Change
Computer software	$23.6B	$40.4B	71.4%
Telecommunications services	$7.1B	$14.0B	97.2%
Computer and data processing services	$5.7B	$11.3B	96.9%
Database and information services	$4.3B	$6.0B	39.2%

Annual Export Growth to South American FTA Partners, 2002-2006



Source: U.S. Census Bureau

Following years of strong growth, ICT software and services' share of total ICT exports increased from 18 percent to 26 percent.

U.S. ICT Export Growth

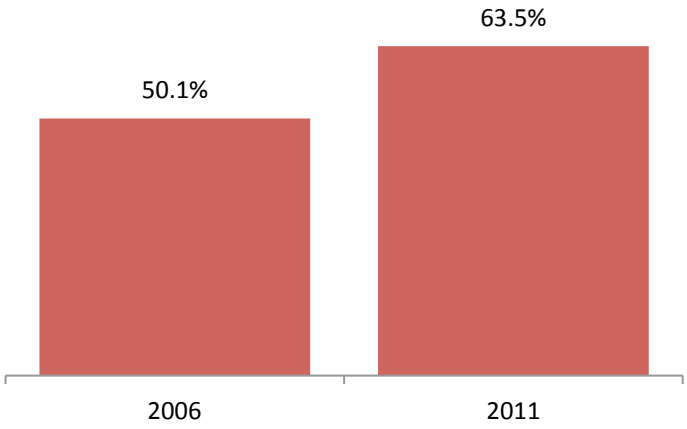
U.S. ICT hardware exports have grown by over $20 billion since 2006, reaching $200.5 billion in 2012.

Foreign markets are of growing importance to U.S. ICT hardware manufacturers. From 2006 to 2011 (the latest year available), exports as a share of ICT hardware shipments jumped from 50 percent to 64 percent.

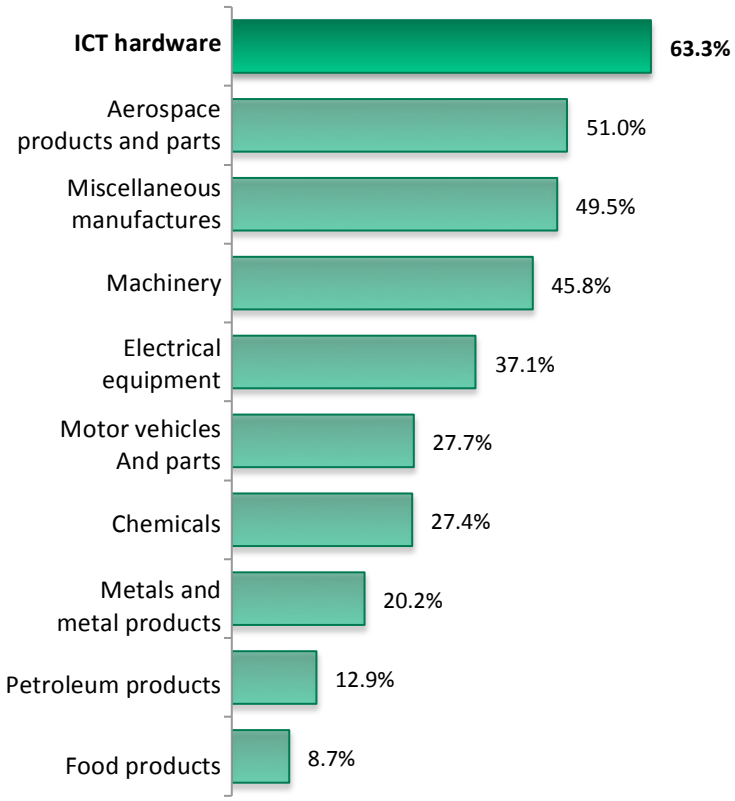
Exports represented over 60 percent of all ICT hardware shipments, more than any other major manufacturing industry.

U.S. ICT hardware shipments are more than twice as likely to be exported than motor vehicles and parts or chemicals shipments and more than three times as likely as metals and metal products shipments.

Exports as a Share of U.S. ICT Hardware Shipments, 2006 vs. 2011



Exports as a Share of U.S. Shipments in 2011, by Industry



Source: The Trade Partnership from U.S. Census Bureau data

ICT hardware manufacturers are more reliant on foreign markets any other industry.

Top State ICT Exporters

California, **Texas**, **Washington** and **Florida** are the leading ICT exporters thanks to strong high-tech hubs, but they are not the only ones that benefit from ICT exports:

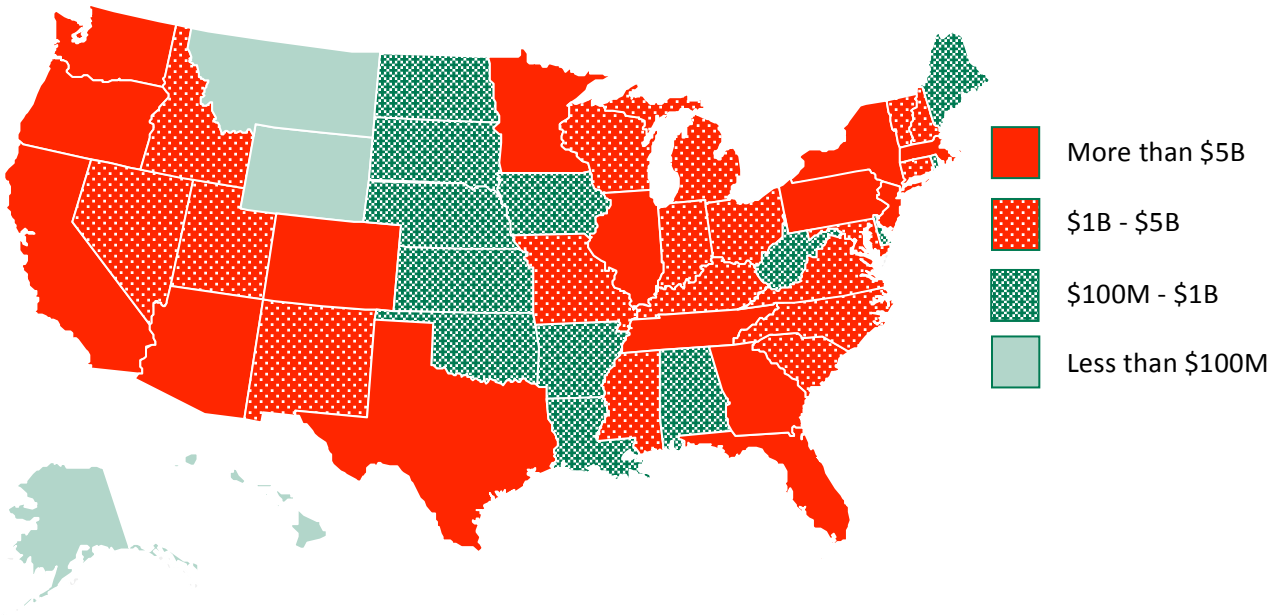
- 15 states exported at least $5 billion in ICT hardware, software, and services in 2012.
- 18 states had ICT exports between $1 billion and $5 billion in 2012.
- **Vermont** led the nation in ICT exports per ICT worker in 2012 at $230,811, followed by Idaho at $147,496.

ICT Exports and Employment by State, 2012

State	Exports	Exports per ICT Worker
California	$62.0B	$90,737
Texas	$47.9B	$140,594
Washington	$16.4B	$113,538
Florida	$16.4B	$82,917
Massachusetts	$12.9B	$72,442
New York	$10.6B	$43,660
Illinois	$7.5B	$48,116
Oregon	$7.5B	$108,296
New Jersey	$5.7B	$40,831
Georgia	$5.6B	$41,831
Colorado	$5.4B	$47,743
Arizona	$5.3B	$60,322
Minnesota	$5.2B	$49,869
Pennsylvania	$5.1B	$37,548
Tennessee	$5.0B	$130,321

Source: Bureau of the Census.

State ICT Exports to World, 2012



Source: The Trade Partnership from U.S. Census Bureau data

Thirty-three states exported at least $1 billion of ICT hardware, software and services in 2012.

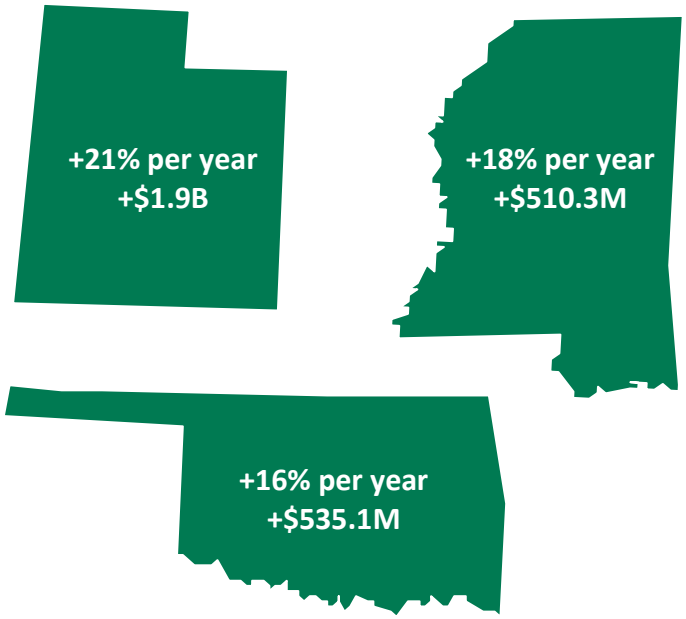
Top State ICT Exporters

A number of other states have seen rapid ICT export growth over the last six years:

- **Utah**'s ICT exports have nearly tripled since 2006 thanks to a large number of semiconductor manufacturers in the State, including Intel, Micron Technology and National Semiconductor Corp. Semiconductor exports increased from $12 million to $434 million to Taiwan alone between 2006 and 2012.

- **Mississippi**'s exports nearly doubled between 2006 and 2012. Increased computer and peripheral product exports accounted for about 60 percent of total export growth. About half of all exports go to NAFTA countries.

- **Oklahoma**'s exports more than doubled between 2006 and 2012. Exports to FTA-partner Singapore of computers and peripherals increased 10-fold during that period. HP and other leading manufacturers are located in the State.



Twenty-three states saw exports of ICT hardware, software and services increase by more than $500 million from 2006 to 2012.

Fastest Growing State ICT Hardware, Software and Services Exporters, 2006 - 2012

State	2012 ICT Exports per Worker	2006 Exports ($M)	2012 Exports ($M)	Average Annual Growth Rate
Utah	$56,595	$1,120.9	$3,006.9	21.0%
Mississippi	$81,627	$529.0	$1,039.3	18.4%
Oklahoma	$35,087	$407.5	$942.6	16.4%
Nevada	$98,621	$698.9	$1,462.3	13.5%
District of Columbia	$33,895	$520.3	$915.4	11.2%
Washington	$113,538	$9,281.0	$16,443.1	10.3%
South Carolina	$56,533	$1,250.2	$1,817.9	9.5%
Maryland	$25,135	$1,737.2	$2,867.2	9.0%
Pennsylvania	$37,548	$3,206.2	$5,116.0	8.7%
New Hampshire	$56,304	$1,130.8	$1,658.9	8.6%

Source: The Trade Partnership from U.S. Census Bureau data

The companies noted in this report have a presence in the state or district mentioned. They may or may not be the companies responsible for the exports from that state or district. Even if the companies mentioned are not exporting the product noted, their presence likely fuels economic activity by other, smaller companies that are responsible for the exports from that state or district. Most companies exporting from the United States are small- to medium-sized companies.

Top Congressional District Exporters

Like the states, the mix of congressional district ICT exporters is diverse:

- Sixty-two districts exported at least $1 billion in ICT hardware, software and services in 2012.
- Eighty-three additional districts had ICT exports between $500 million and $1 billion in 2012.

California's 17th District tops the list by a wide margin and accounted for 6.1 percent of total U.S. ICT exports in 2012. Among all districts, the 17th ranked:

- first in exports of computers and semiconductors;
- second in exports of computer and data processing services, A/V equipment, and communications equipment, and
- among the top five in exports of navigational, measuring and control instruments, database and information services, and computer software.

The 17th District's prominence is not surprising given that it represents the heart of Silicon Valley and is home to some of the leading technology companies: Intel, Apple, Advanced Micro Devices, Applied Materials, and Yahoo, to name a few.

Districts with $1 Billion in ICT Exports, 2012

District	Exports	District	Exports
CA-17	$16.6B	TX-9	$1.5B
CA-18	$6.9B	TX-2	$1.4B
TX-3	$5.6B	CA-46	$1.4B
OR-1	$5.3B	TX-35	$1.3B
WA-9	$4.8B	TX-33	$1.3B
TX-32	$4.8B	CA-15	$1.3B
TX-10	$4.7B	CA-48	$1.3B
FL-8	$4.3B	NY-12	$1.3B
WA-7	$4.0B	TX-7	$1.3B
TX-24	$3.8B	UT-3	$1.3B
CA-19	$3.7B	TX-4	$1.2B
WA-1	$3.7B	MN-3	$1.2B
CA-14	$3.6B	NV-2	$1.2B
MA-5	$3.2B	MA-4	$1.2B
MA-3	$3.1B	TX-30	$1.2B
CA-52	$3.0B	FL-22	$1.2B
MA-6	$2.9B	MN-1	$1.2B
TX-25	$2.9B	ID-1	$1.2B
VT-At Large	$2.8B	WI-2	$1.2B
CA-45	$2.7B	CA-50	$1.1B
TX-17	$2.6B	CA-26	$1.1B
FL-13	$2.5B	IL-8	$1.1B
AZ-9	$2.2B	TX-18	$1.1B
CO-2	$2.1B	AZ-6	$1.1B
TX-21	$2.1B	TN-6	$1.1B
CA-12	$1.7B	NJ-3	$1.1B
TX-5	$1.7B	TX-1	$1.1B
ID-2	$1.7B	CA-39	$1.0B
CA-49	$1.7B	NY-25	$1.0B
WA-8	$1.7B	NC-4	$1.0B
GA-6	$1.6B	NH-2	$1.0B

Source: The Trade Partnership from U.S. Census Bureau data

Sixty-two congressional districts exported at least $1 billion of ICT hardware, software and services in 2012.

Top Congressional District Exporters

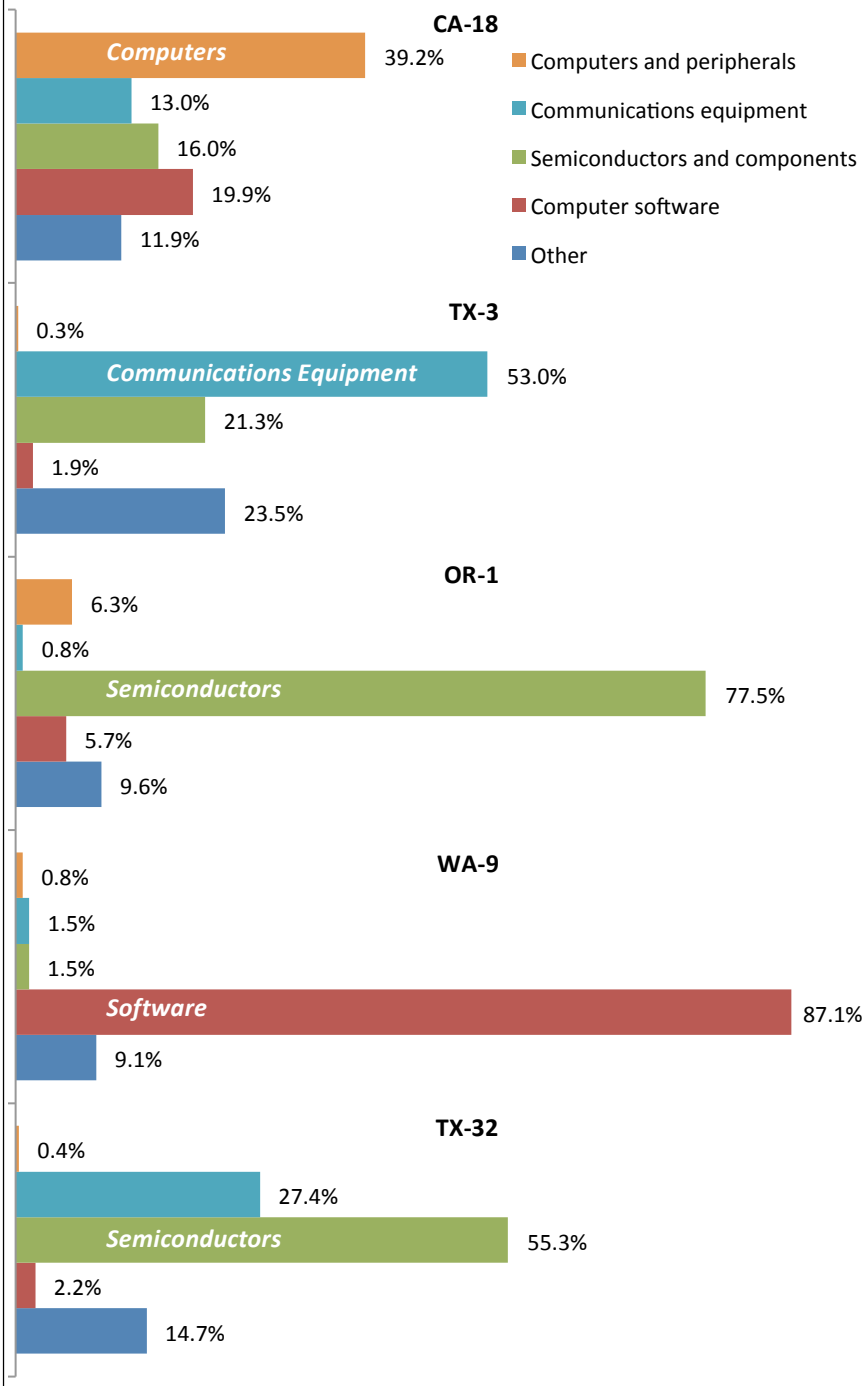
Just to the west, **California's 18th District** ranked second among all districts with ICT exports of $6.9 billion in 2012. The home of Stanford University, the District has its own "who's who" of tech companies, including Hewlett Packard, Google, LinkedIn, Netflix, Symantec, Intuit, and VMWare.

The 18th District ranked among the top 10 district exporters in seven (of 10) ICT sectors, including second in computers, third in optical media, and fourth in computer and data processing services.

In the other top exporting districts, one ICT export sector typically dominates:

- **Texas' 3rd District** ranked third among all districts with $5.7 billion in ICT exports in 2012. Home to Avaya, Alcatel USA, Xtera Communications and many others, more than half of the District's exports was communications equipment.
- **Oregon's 1st District** ranked fourth with $5.3 billion in ICT exports. More than three quarters of the District's exports were semiconductors, undoubtedly helped by Intel's Hillsboro campus – its largest in the world.
- **Washington's 9th District** ranked fifth with $4.8 billion in ICT exports, the vast majority of which was software.
- **Texas' 32nd District** ranked sixth with $4.8 billion in ICT exports. Semiconductors accounted for more than half of the District's ICT exports.

ICT Exports by Type from Top Districts, 2012



Source: The Trade Partnership from U.S. Census Bureau data

The types of ICT hardware, software and services exported by the top congressional districts vary greatly.

Top Congressional District Exporters

Many congressional districts experienced rapid ICT export growth from 2006 to 2012.

- **Texas' 8th District** saw ICT exports increase every year – and by more than $500 million – between 2006 and 2012. Computers and communications equipment exports each increased by more than $180 million and Mexico was the leading destination for both products.

In all, 25 districts saw ICT exports increase every year from 2006 to 2012 and 63 districts increased ICT exports by more than $250 million.

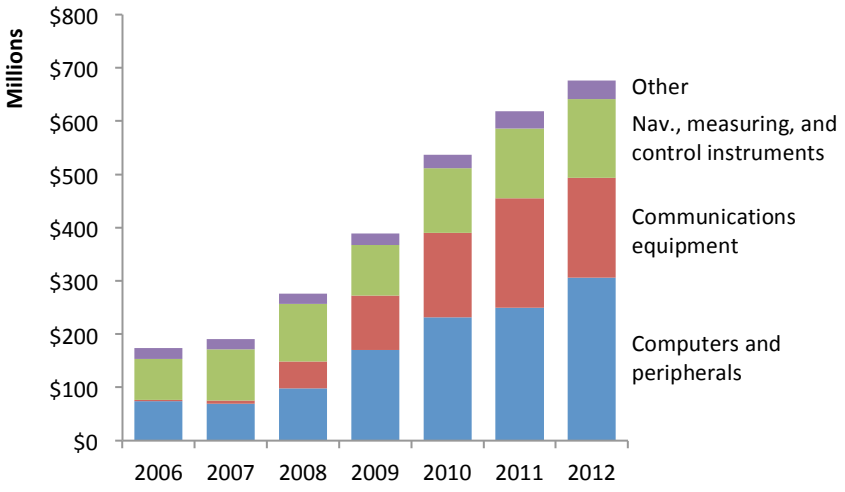
- **Utah's 1st District** was one of the fastest growing ICT exporters, with exports increasing 36 percent annually. Exports of semiconductors to Taiwan alone jumped from $3 million to $124 million.

- **Kentucky's 3rd District**, in and around Louisville and home to a Samsung Electronics of America facility, increased ICT exports by 27 percent per year. Communications equipment exports grew nearly sixfold and Italy was one of the fastest growing markets.

- **Mississippi's 1st District** saw ICT exports increase by 21 percent per year. Exports of computer equipment jumped more than fivefold to $233 million.

- **Indiana's 3rd District**, in the northeastern part of the State, increased ICT exports by 17 percent per year to nearly $460 million in 2012. Communications equipment exports accounted for 80 percent of the growth.

ICT Exports from Texas' 8th District, 2006-2012



Top 10 Districts Whose ICT Exports Grew Each Year, 2006-2012

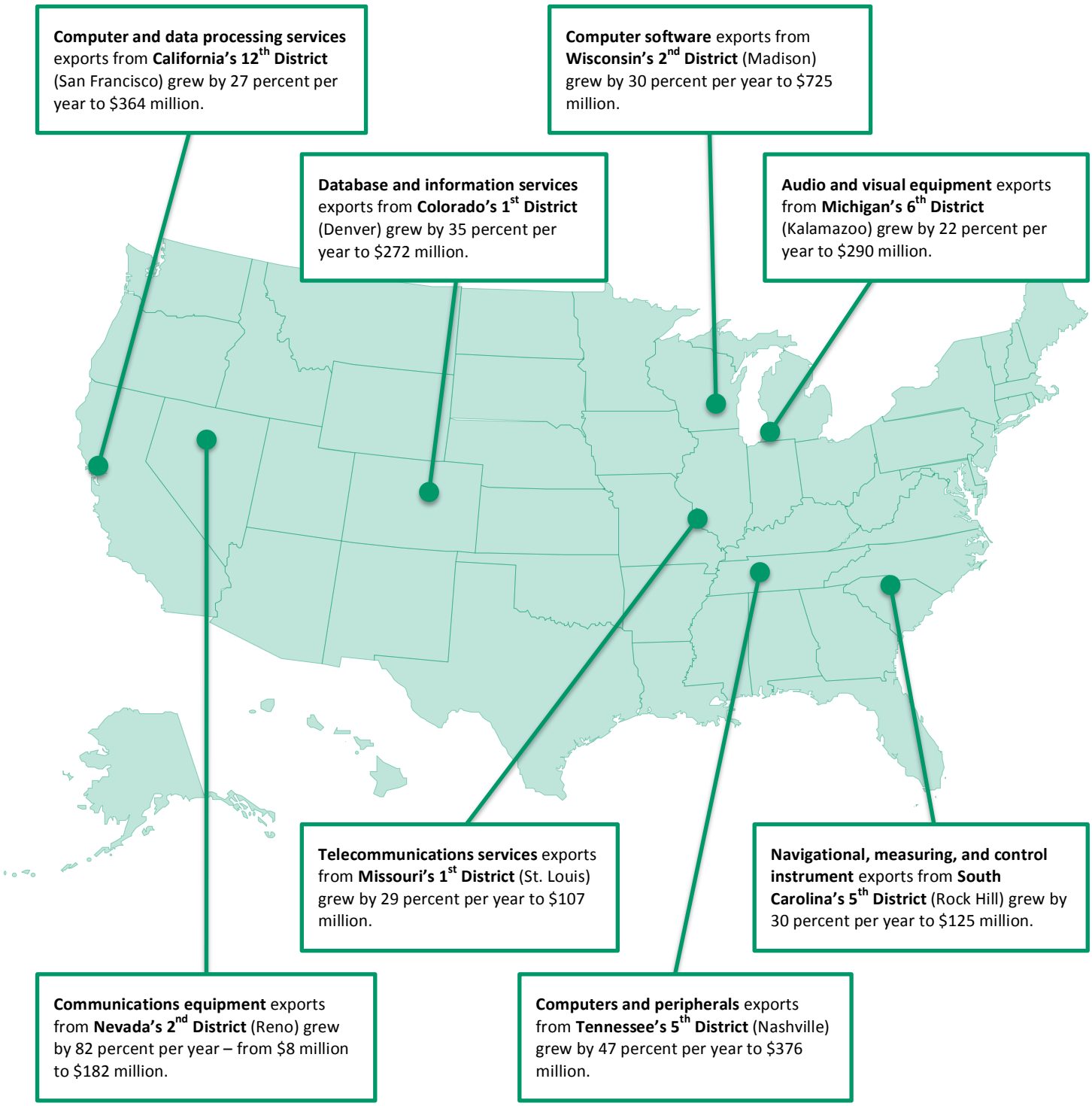
District	2012 Exports	Percent Growth
TX-8	$676.5M	287.8%
CA-12	$1,714.8M	181.8%
NJ-10	$145.8M	157.7%
NV-1	$91.3M	150.2%
NJ-8	$156.5M	127.0%
CO-6	$874.0M	121.5%
MD-8	$474.7M	117.6%
GA-5	$716.7M	110.9%
NY-15	$37.2M	102.0%
GA-6	$1,557.1M	100.7%

Source: The Trade Partnership from U.S. Census Bureau data

Twenty-five districts saw ICT exports grow every year from 2006 to 2012 despite the turbulent world economy.

Top Congressional District Exporters

Export Growth from Leading Districts by Type, 2006-2012



Source: The Trade Partnership from U.S. Census Bureau data

Semiconductor Exports: Big Value in Micro Chips

The leading U.S. congressional districts exporting semiconductors are **California's 17th District** and **Oregon's 1st District**. One likely reason Oregon's 1st District ranks so high? Hillsboro is the location for Intel's largest fabrication facility.

Intel fuels exports from other districts as well. **Arizona's 9th District**, the home to Intel's Chandler facility, ranked sixth in semiconductor exports among all districts.

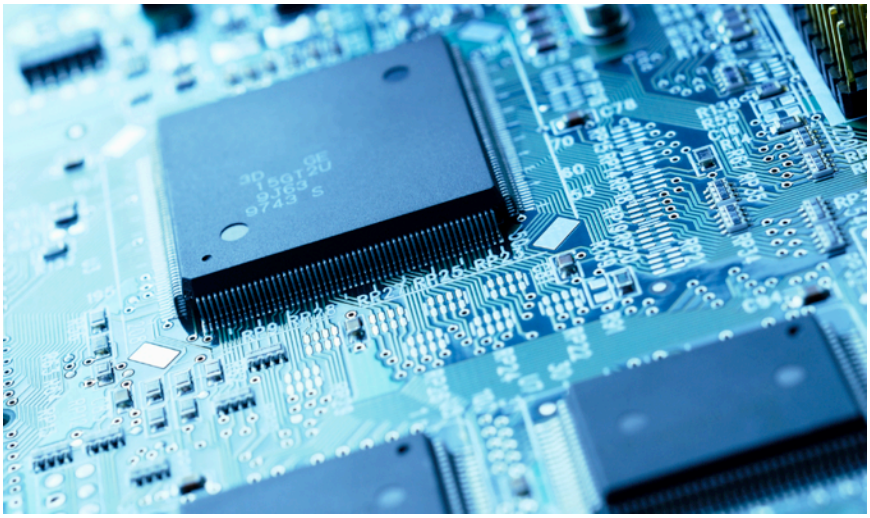
Texas' 3rd District, home to Texas Instruments' Richardson fabrication plant, is one of the fastest growing semiconductor district exporters. Exports have increased by 83 percent since 2009.

Uniquely among the ICT hardware, software and services sectors, two small states are among the top exporters of semiconductors. **Vermont** ranked fifth and **Idaho** ranked sixth for semiconductor exports in 2012 on the strength of single companies with a presence there.

Vermont is the home of IBM's development and manufacturing facility in Essex Junction, one of the top employers in the State. Semiconductors accounted for 92 percent of Vermont's ICT exports in 2012.

Micron, founded in Boise in 1978, is the dominant semiconductor manufacturer in Idaho. Semiconductors accounted for 86 percent of Idaho's ICT exports in 2012.

New Mexico also ranked among the top 10 semiconductor exporters at $1.4 billion, about 83 percent of total ICT exports.



Semiconductor Exports from Texas' 3rd District, 2006-2012

Top State Semiconductor Exporters, 2012

State	Sector Exports	Share of State ICT Exports
Texas	$14.0B	29.3%
California	$11.0B	17.7%
Oregon	$4.8B	64.5%
Arizona	$3.0B	56.2%
Vermont	$2.6B	92.2%
Idaho	$2.5B	86.4%
Massachusetts	$2.0B	15.4%
Florida	$1.5B	9.2%
New Mexico	$1.4B	83.0%
Illinois	$1.2B	16.4%

Source: The Trade Partnership from U.S. Census Bureau data

Semiconductor exports are often driven by the presence of single large, local company.

Electronic Instruments Exports: FTAs Prescribed

The leading congressional district exporters of electronic instruments are as diverse as the sector, which includes manufacturers of electromedical, laboratory, navigational, and other high-tech equipment.

Medical equipment was the largest electronic instrument export in 2012, followed by laboratory equipment and testing equipment.

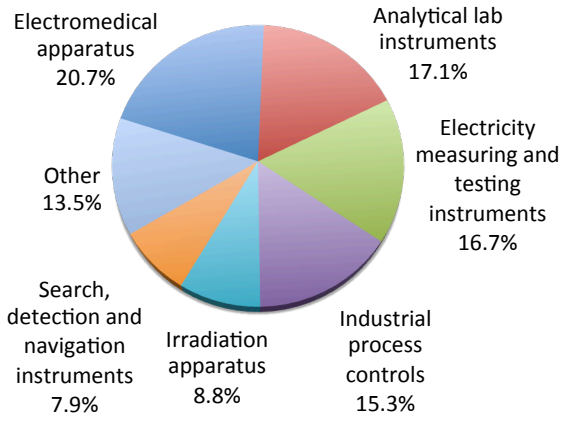
Texas' 3rd District was the leading exporter in 2012 at $1.2 billion. The District is home to multiple search and detection manufacturers, including the McKinney headquarters for Raytheon's Space and Airborne Systems.

Massachusetts' 6th and **3rd Districts** ranked second and third at $1.1 billion and $944 million, respectively. In addition to companies that make search and detection systems like Raytheon, the 6th District, just north of Boston, also includes major testing equipment manufacturers like Sensitech and Thermo Fisher Scientifc.

California's 17th District and **Colorado's 2nd District**, which includes Boulder, ranked fourth and fifth. These electronic instruments were the top export for **Wisconsin's 5th District**, which ranked seventh among all district exporters and is home to GE Healthcare.

More than two-thirds all of electronic instrument exports went to current or prospective FTA partners in 2012. This included nearly $18 billion in exports to TPP and TTIP countries that are not covered by FTAs.

Electronic Instrument Exports by Type, 2012



Leading Export Markets by Value, 2012

Country	Exports	FTA Status
European Union	$12.7B	Negotiating
Canada	$6.1B	Implemented
China	$5.1B	n/a
Japan	$4.1B	Negotiating
Mexico	$3.4B	Implemented
South Korea	$1.6B	Implemented
Singapore	$1.5B	Implemented
Brazil	$1.5B	n/a
Australia	$1.3B	Implemented
India	$1.0B	n/a

Source: The Trade Partnership from U.S. Census Bureau data

The United States exported nearly $18 billion of electronic instruments to prospective FTA partners in 2012.

Computer Hardware Exports: California Takes the Lead, Again

For computers and peripherals, the leading exporters once again hail from the San Jose area. California was the leading state exporter, while **California's 17th** and **18th Districts** ranked first and second and includes the presence of manufacturers like Hewlett-Packard and Apple. The Districts' combined exports of $9.1 billion accounted for nearly 20 percent of U.S. computer exports.

Florida's 8th District, located east of Orlando, is also an important computer exporter. The District ranked third among district exporters at $2.2 billion in 2012. While known as the "Space Coast" because of NASA operations at the Kennedy Space Center, the District accounts for about half of Florida's computer employment. Its leading export market is Brazil.

Texas' 10th District, in and around Austin, ranked fourth with an estimated $2.1 billion in computer exports in 2012. The 10th District is home to IBM's Austin facility, but IBM is far from alone in the Austin area: Apple has operations in the neighboring **17th District**, which ranked sixth in computer exports in 2012, and Dell is based just north of Austin.

Computer exports from **New Jersey's 3rd District**, which stretches from the Philadelphia suburbs to the Atlantic Ocean, more than tripled from $156 million in 2006 to $516 million in 2012. Exports to the United Arab Emirates alone increased from $2 million to $80 million. Companies located in the 3rd District include HP and Seagate Technology.

Top State Computer Exporters, 2012

State	Sector Exports	Share of State ICT Exports
California	$13.3B	21.5%
Texas	$12.8B	26.8%
Florida	$5.0B	30.5%
Tennessee	$2.2B	44.0%
New York	$1.8B	16.8%
New Jersey	$1.1B	19.9%
Minnesota	$1.1B	20.7%
Massachusetts	$1.0B	8.0%
Oregon	$916.6M	12.2%
Illinois	$870.0M	11.6%

Computer Export Growth from New Jersey's 3rd District, 2006-2012

Source: The Trade Partnership from U.S. Census Bureau data

California's 17th and 18th Congressional Districts accounted for 20 percent of total U.S. computer exports in 2012.

Computer Software Exports: Washington Is a Powerhouse

Software exports are more important for **Washington** than any other state. The State exported an estimated $11.5 billion in computer software in 2012: 70 percent of its total ICT exports. The European Union is largest market for these exports.

Of course, the big software company in Washington is Microsoft. Its 40,000 workers in the Puget Sound area work with Microsoft subsidiaries in more than 110 countries around the world.

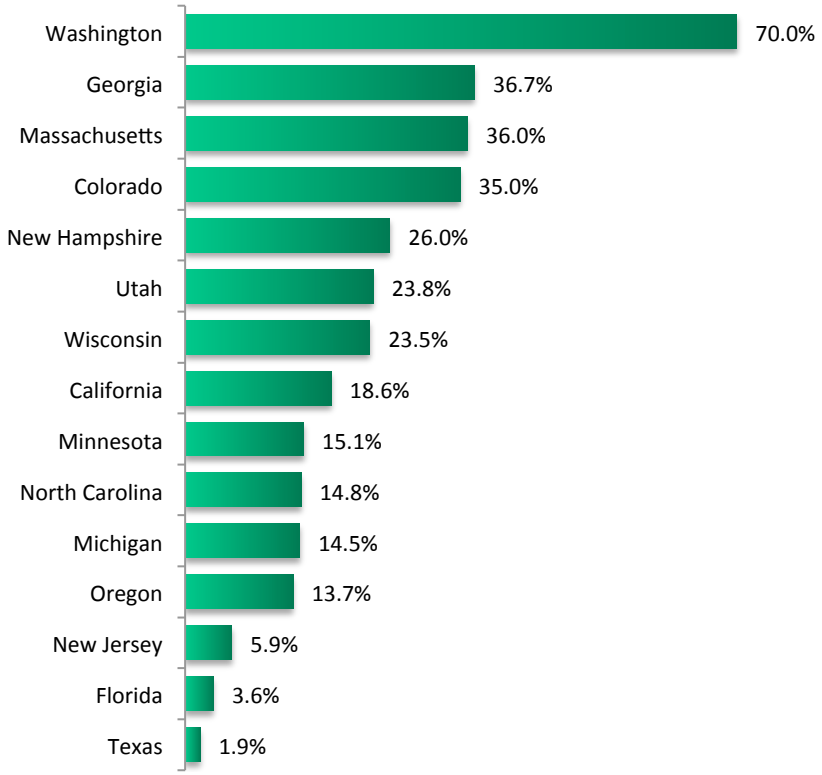
Among the top 15 state exporters of computer software by value, which account for nearly all U.S. software exports, **Georgia** ranked second at nearly 37 percent, followed by **Massachusetts** at 36 percent. For none of the other top states did software exports account for even half as much as in Washington.

Even though its total value of software exports – $160 million – does not place it among the leading 15 state exporters of software in 2012, those exports still matter importantly to **North Dakota**. Software represented 68 percent of the State's total ICT exports.

In addition to several Seattle districts, computer software accounted for more than 60 percent of all ICT exports for several other congressional districts, including:

- **Oregon's 3rd District** (77 percent),
- **California's 14th District** (67 percent),
- **Georgia's 6th District** (66 percent),
- **Wisconsin's 2nd District** (63 percent), and
- **Massachusetts' 8th District** (61 percent).

Software Exports as a Share of ICT Exports for Top 15 States, 2012



Source: The Trade Partnership from U.S. Census Bureau data

Computer software exports represented more than half of all ICT exports for Washington and North Dakota in 2012.

Communications Equipment Exports: Don't Mess with Texas

Texas has been the leading communications equipment exporter every year since 2006. Texas' communications equipment exports totaled $8.9 billion in 2012, up from $6.0 billion in 2006.

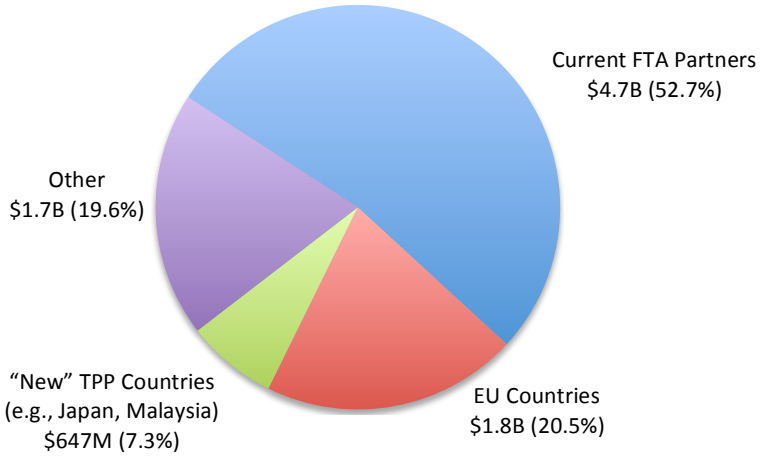
Texas' 3rd District, just north of Dallas, was the top district exporter. The District contains major facilities for manufacturers like Ericsson, Alcatel-Lucent, Samsung Telecommunications and others.

Mexico was the 3rd District's leading export destination for communications equipment at just over $1 billion, followed by the Netherlands, Canada, and Japan. Each of these countries is either a current or prospective FTA partner. In fact, current and prospective FTA countries accounted for 80 percent of Texas' communications equipment exports in 2012.

Texas' 32nd and **24th Districts**, which border the 3rd District to the south and west, are also among the top U.S. district exporters of communications equipment. The area where the three districts meet, near Richardson, is known as "Telecom Corridor" and contains major operations for AT&T, Verizon, Cisco, Rockwell Collins and Fujitsu.

Among the top five exporting states, **Florida** had the highest share of communications equipment exports at 30 percent. For **Florida's 20th District**, home to one of Motorola Solutions' major U.S. facilities, communications equipment accounted for more than two-thirds of total ICT exports.

Top Markets for Texas Communications Exports, 2012



Top State Communications Equipment Exporters, 2012

State	Sector Exports	Share of State ICT Exports
Texas	$8.9B	18.6%
California	$8.2B	13.2%
Florida	$4.9B	29.7%
New York	$1.4B	13.1%
Illinois	$1.3B	17.6%

Source: The Trade Partnership from U.S. Census Bureau data

More than 80 percent of Texas' communications equipment exports went to current or prospective FTA countries in 2012.

Telecommunications Services Exports: Big Bucks for Big Data

Telecommunications services are a small, but growing U.S. export that includes fees paid for Internet backbone, router, and broadband access services. Between 2006 and 2012, U.S. exports rose every year, reaching $14 billion.

The top state telecommunications exporters included:

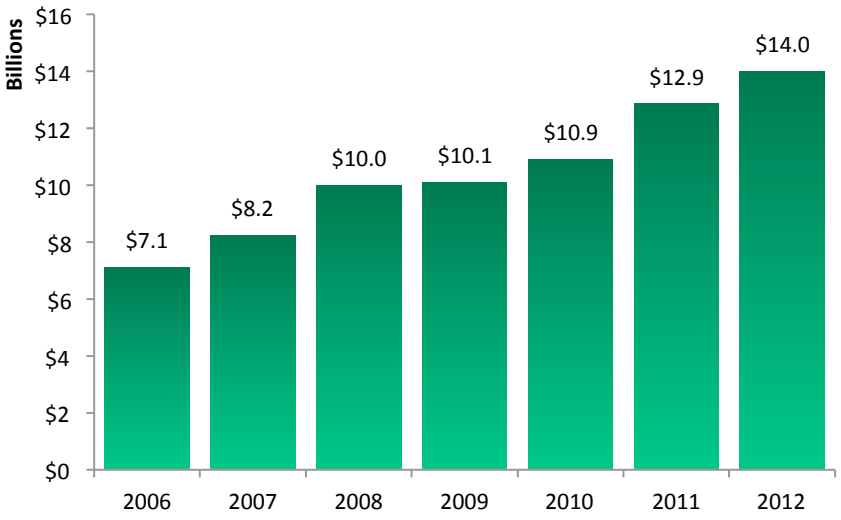
- **California** ($2.8 billion),
- **New York** ($2.0 billion),
- **Texas** ($1.0 billion),
- **Florida** ($868.6 million), and
- **Georgia** ($713.6 million).

The top congressional district exporters are concentrated in major cities. **New York's 12th** and **10th Districts**, which represent parts of Manhattan, ranked first and second at $529.4 million and $351.4 million in 2012, respectively. **Georgia's 5th** and **6th District**s, in and around Atlanta, ranked third and fourth with combined exports of $595.6 million.

Colorado's 6th District, just outside of Denver, ranked fifth at $263.1 million. The Denver area is home to several Fortune 500 telecommunications firms including DISH Network and Liberty Global.

Kansas' 3rd District, the home to Sprint Nextel, ranked sixth in telecommunications exports at $167.0 million in 2012.

U.S. Telecommunications Services Exports, 2006-2012



Source: U.S. Census Bureau

U.S. exports of telecommunications services nearly doubled between 2006 and 2012.

Computer and Data Processing: Virginia Is For Servers

Computer and data processing from **Virginia** are growing rapidly. At $1.1 billion in 2012, these services accounted for nearly a quarter of Virginia's ICT exports, about six times the U.S. average.

Northern Virginia – and the "Dulles Technology Corridor" in particular – is the data hub for the East Coast. Running from Tysons Corner to Ashburn, the Corridor lies within parts of **Virginia's 11th**, **8th**, and **10th** Congressional Districts.

With combined exports of nearly $1 billion, the Districts rank first, fifth, and seventh among all district exporters, respectively. **Washington, DC**, just to the east, ranks ninth, extending the corridor further.

The importance of the Dulles Corridor for East Coast data processing continues to grow. In 2013, Wikipedia transitioned its main technical operations from Tampa to Ashburn, and Amazon is opening two massive new data centers in the area.

This "corridor" effect for computer and data processing exports is not just found in Virginia: the West Coast's data processing corridor runs north from San Jose to San Francisco, including parts of **California's 17th**, **18th**, **14th**, and **12th** Districts.

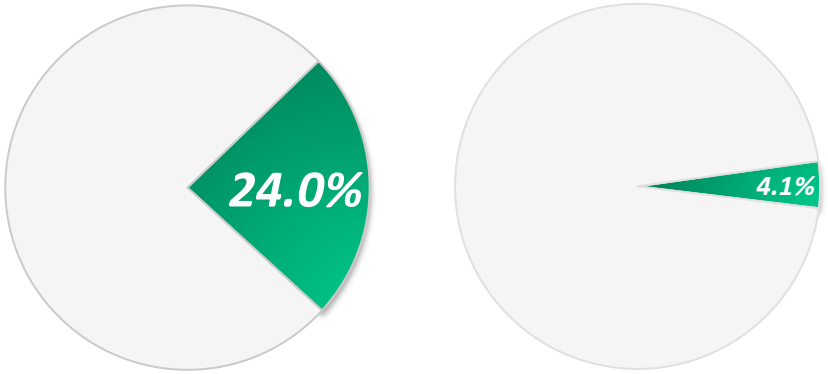
Each of these Districts ranked among the top 10 congressional districts exporters. With a combined value of $1.3 billion, they helped make California the largest state exporter.

New York, **Texas**, and **New Jersey** also rank among the top five states.

Top State Computer and Data Processing Services Exporters, 2012

State	Sector Exports	Share of State ICT Exports
California	$2.4B	3.9%
Virginia	$1.1B	24.0%
New York	$836M	7.9%
Texas	$724M	1.5%
New Jersey	$602M	10.7%

Computer and Data Processing Services Exports, 2012



Source: The Trade Partnership from U.S. Census Bureau data

Computer and data processing services accounted for 24 percent of Virginia's ICT exports, nearly six times the national average.

Audio and Video Equipment Exports: NAFTA Partners Matter

The United States exported nearly $10 billion in audio and video equipment in 2012, with about 58 percent of those going to either Canada or Mexico.

The top state exporters, which accounted for about 60 percent of total audio and video equipment exports, were:

- **Texas** ($2.7 billion),
- **California** ($2.3 billion), and
- **Florida** ($1.0 billion).

From 2006 to 2012, audio and video equipment exports from **Kentucky** tripled to $305 million, while exports from **Michigan** and **Ohio** doubled to $416 million and $244 million, respectively.

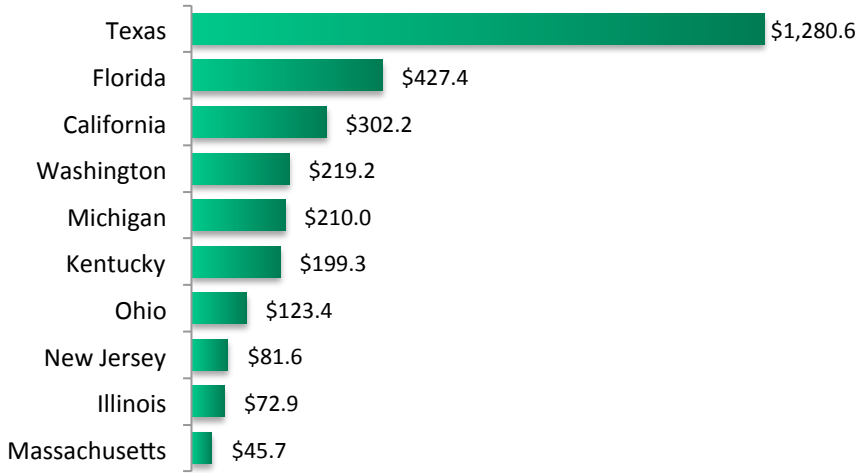
California's 52nd District, near San Diego, was the top congressional district exporter in 2012 at $461.6 million. The District includes the U.S. headquarters of Sony Electronics, and audio and video equipment accounted for more than 15 percent of the Districts total ICT exports.

While California's 52nd District was the largest exporter, audio and visual equipment accounted for a much larger share of total ICT exports from several other districts.

For **Texas' 16th District**, which represents El Paso, audio and video equipment accounted for nearly 80 percent of total ICT exports in 2012.

For **Michigan's 6th District**, more than half of all exports were audio and video equipment.

Audio and Video Export Growth by State, 2006-2012



Top District Audio and Video Equipment Exporters, 2012

State	Sector Exports	Share of State ICT Exports
CA-52	$461.6M	15.5%
TX-16	$415.8M	79.2%
FL-8	$302.1M	6.9%
MI-6	$290.0M	50.9%
TX-32	$283.9M	5.9%

Source: The Trade Partnership from U.S. Census Bureau data

Texas' audio and video equipment exports increased by $1.3 billion, more than the next four states combined.

Database and Information Services Exports: New FTAs Matter

Database and information services exports were the smallest of the ICT export sectors at $6.0 billion in 2012. **New York** was the top state exporter, followed by **California**.

The European Union is the leading market for U.S. database and information services exports. In 2012, the EU accounted for nearly half of these U.S. exports.

The TPP countries with which the United States does not have current FTAs, including Japan, Malaysia, and New Zealand, accounted for 9 percent of exports.

The importance of these markets for U.S. database and information services highlights the need for strong cross-border data flow provisions in both the TTIP and TPP negotiations.

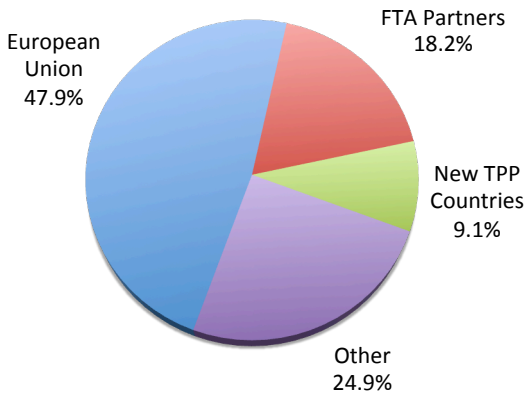
The top state exporters in 2012 were:

- **New York** ($978.8 million),
- **California** ($910.2 million),
- **Washington** ($532.9 million),
- **Colorado** ($509.6 million), and
- **Virginia** ($377.6 million).

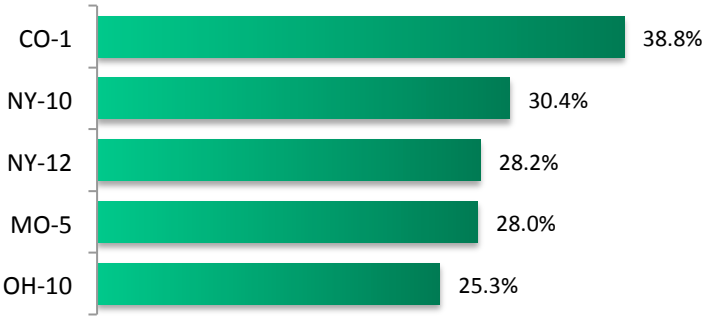
While database and information services account for just 2.2 percent of total U.S. ICT exports, the share is much higher for top districts like **Colorado's 1st District**, where they accounted for nearly 40 percent of State ICT exports.

Database and information services accounted more than a quarter of total state ICT exports for **New York's 10th** and **12th Districts**, **Missouri's 5th District**, and **Ohio's 10th District.**

Top Markets for U.S. Database and Information Services Exports, 2012



Sector's Share of Total State ICT Exports, 2012



Source: The Trade Partnership from U.S. Census Bureau data

Prospective FTA partners accounted for 57 percent of U.S. database and information services exports in 2012.

Leading Export Markets: Trans-Pacific Partnership Countries

The United States is negotiating the **Trans-Pacific Partnership** (TPP) trade agreement with 11 other countries. The participants, which include a mix of current FTA partners like Mexico and Canada as well as new countries like Japan and Malaysia, are important markets for U.S. ICT exports. TPP is expected to include digital trade provisions that are vital to the growth of U.S. ICT exports, including cloud computing.

In 2012, ICT exports to TPP countries exceeded $109 billion and accounted for about 40 percent of total U.S. ICT exports. A fifth of those are to countries not covered by current FTAs. The top exports to these markets vary:

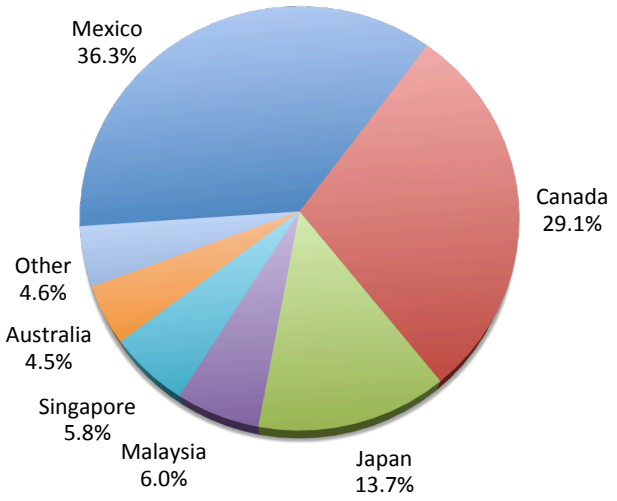
- Computers are the top exports to Mexico, Canada, Chile, and Peru.
- Software is the top export to Japan.
- Navigational, measuring, and control instruments are the top export to Australia, New Zealand, and Brunei.

Texas and **California** accounted for half of all exports to TPP countries in 2012 at $29.7 billion and $24.6 billion, respectively.

Despite the recession, **Maryland**'s ICT exports to TPP countries have increased every year since 2006 and reached $987 million in 2012. No other state saw exports increase every year.

California's 17th District was the leading ICT exporter to six TPP countries. Exports from both **Texas' 8th District** and **Maryland's 8th District** grew every year to $441 million and $157 million, respectively.

U.S. ICT Exports to TPP Countries in 2012, by Country



Leading District Exporters to Select TPP Countries, 2012

Country	District	Exports
Mexico	CA-17	$3.2B
Canada	CA-17	$2.1B
Japan	CA-17	$1.0B
Singapore	CA-17	$432.6M
Chile	FL-8	$266.5M
Peru	FL-8	$257.7M
Australia	CA-17	$246.2M
New Zealand	CA-17	$27.6M
Brunei	TX-3	$1.3M

Source: The Trade Partnership from U.S. Census Bureau data

TPP countries purchased about 40 percent of total U.S. ICT hardware, software and services exports in 2012.

Leading Export Markets: European Union

The United States is also negotiating the Transatlantic Trade and Investment Partnership (T-TIP) agreement with the European Union. The EU is a major market for U.S. ICT exports, particularly in services.

In 2012, U.S. ICT exports to the EU totaled $56.0 billion, or nearly 21 percent of all U.S. ICT exports. The EU's share of services and software exports, including database and information services, computer data and processing services, and computer software, was much higher. This highlights the need for T-TIP to include provisions to ensure cross-border data flows.

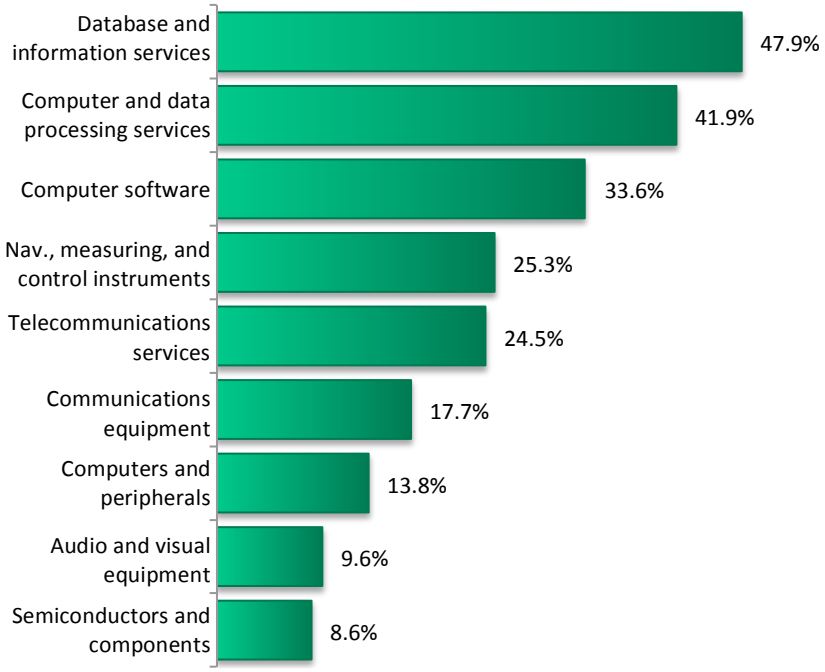
The leading state exporters in 2012 were **California**, **Texas**, **Washington**, **Massachusetts**, and **New York**. Communications equipment was the leading export from Texas, while navigational, measuring, and control instruments were the top export from New York. Computer software was the top export from the other three states.

California's 17th District was the leading exporter to the EU at $2.7 billion, and computers were its top export.

Exports from **Nevada's 2nd District** to the EU increased by 20 percent per year, led by a $100 million increase in exports of communications equipment.

Tennessee's 6th District, in the central part of the State, is one of the fastest growing ICT exporters to the EU. Its exports increased 17 percent per year from $76 million in 2006 to $190 million in 2012, led by a six-fold increase in computers.

EU Share of U.S. ICT Exports by Type, 2012



Top State Exporters to the EU, 2012

State	Exports	Share of State ICT Exports
California	$12.9B	20.8%
Texas	$5.4B	11.2%
Washington	$5.2B	31.8%
Massachusetts	$4.0B	30.8%
New York	$3.1B	29.3%

Source: The Trade Partnership from U.S. Census Bureau data

The European Union is a key market for U.S. ICT exports, in particular U.S. software and computer services exports.

Leading Export Markets: Brazil

Brazil is one of the fastest growing markets for U.S. ICT exports. From 2006 to 2012, U.S. ICT exports to Brazil increased by 128 percent. Telecommunications services were the top export, accounting for 28 percent of total U.S. ICT exports to Brazil in 2012.

Florida was the leading state exporter to Brazil each year from 2006 to 2009. But by 2012, **California** surged ahead with $3.3 billion in ICT exports to Brazil, nearly exceeding the next three states – **Florida** ($1.7 billion), **Texas** ($1.2 billion), and **Washington** ($835 million) – combined. **New York** ranked fifth at $746 million.

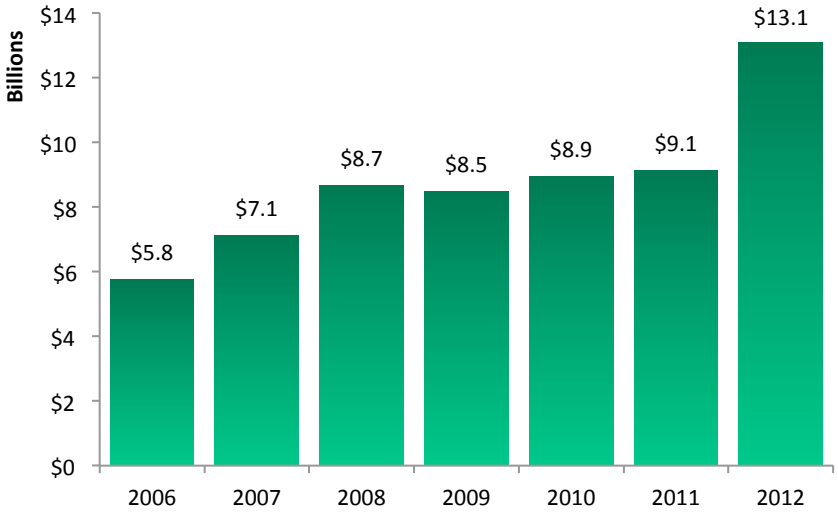
Export growth to Brazil has been widespread:

- A big jump in computer exports increased **South Carolina**'s ICT exports to Brazil by $163 million from 2011 to 2012 alone.
- **Ohio** exports increased four-fold to $189 million, with navigational, measuring, and control instruments accounting for 37 percent of the growth.

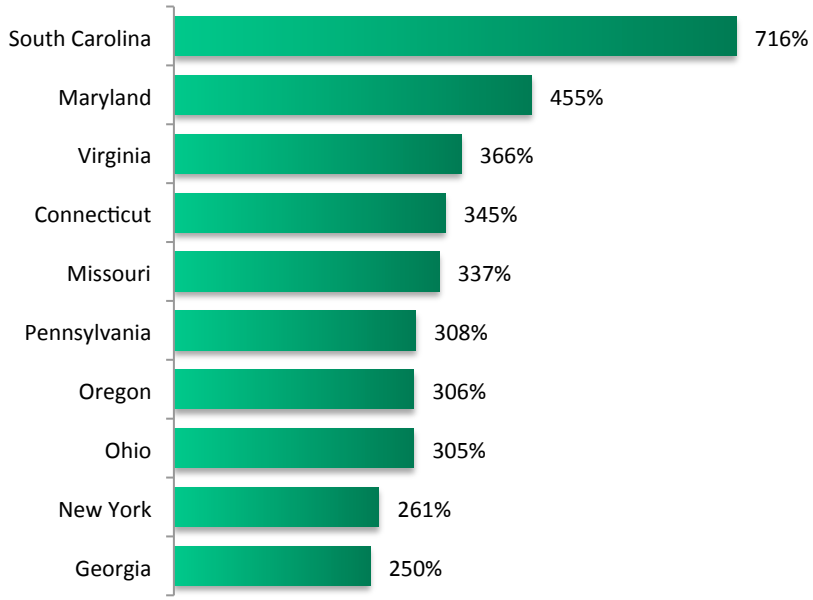
This rapid growth filtered down to the district level as well:

- Exports from **Oregon's 5th District** grew from $3 million to $36 million, led by computer exports.
- Increased communications equipment and computer exports from **Virginia's 9th District**, in the southwest corner of the State, led ICT exports to grow from $3 million to $38 million.

U.S. ICT Exports to Brazil, 2006-2012



ICT Export Growth to Brazil by State, 2006-2012



Source: The Trade Partnership from U.S. Census Bureau data

ICT export growth to Brazil has been widespread, with many states and districts experiencing triple-digit growth from 2006 to 2012.

Leading Export Markets: China

U.S. companies exported $15.3 billion in ICT hardware, software and services to China in 2012. Navigational, measuring, and control instruments were the top export, accounting for a third of all U.S. ICT exports to China. Despite nearly doubling between 2006 and 2012, software and computer services exports still account for just under 10 percent of ICT exports to China.

California ICT exports to China ($4.3 billion) exceeded the combined exports of the next four states:

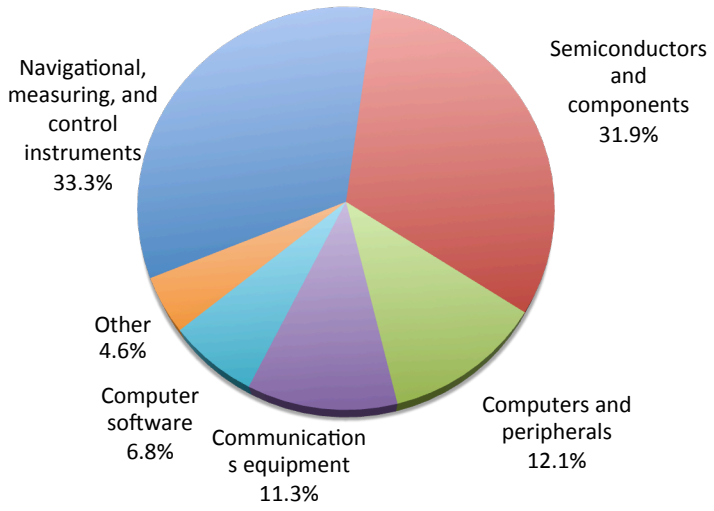
- **Texas** ($1.5 billion),
- **Oregon** ($1.1 billion),
- **Washington** ($835 million), and
- **Massachusetts** ($779 million).

Nevada was one of the fastest growing ICT exporters to China, increasing nearly five-fold from 2006 to 2012. Semiconductor and computer exports each increased by about $60 million.

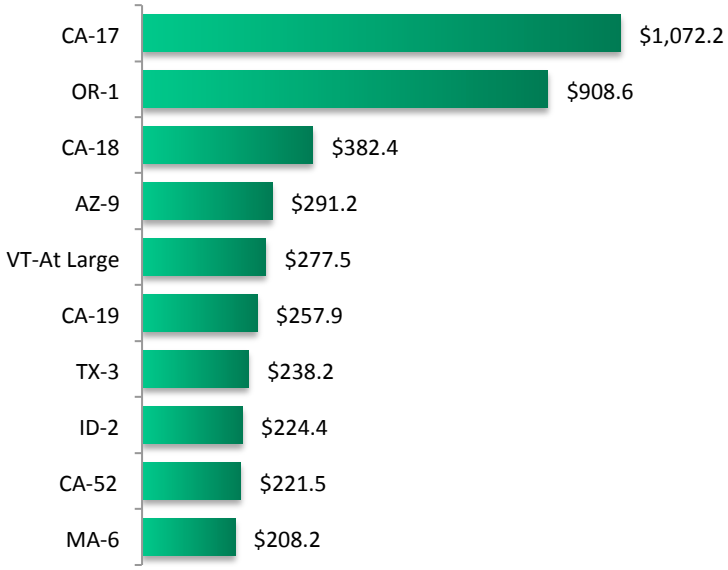
Pennsylvania's exports to China nearly tripled to $409 million, led by growth in computer exports.

The continued importance of hardware exports to China is reflected by the list of the top 10 exporting districts. While **California's 18th District** had the highest share of ICT services exports to China, that share still only amounted to 12 percent of the State's ICT exports; the rest was ICT hardware.

U.S. ICT Exports to China by Type, 2012



Top Congressional District ICT Exporters to China, 2012



Source: The Trade Partnership from U.S. Census Bureau data

Hardware accounted for more than 90 percent of the $15.3 billion in U.S. ICT exports to China in 2012.

Leading Export Markets: India

The United States exported $3.0 billion in ICT hardware, software and services to India in 2012. Like China, most exports to India are hardware. As a group, hardware accounted for 72 percent of U.S. ICT exports to India in 2012, led by navigational, measuring, and control instuments.

Although small in contrast to equipment, India is a growth market for ICT services sectors:

- Computer and data processing services exports increased by 138 percent to $193 million in 2012.
- Telecommunications services exports increased 123 percent to $267 million.
- Database and information services exports increased by 111 percent to $120 million.

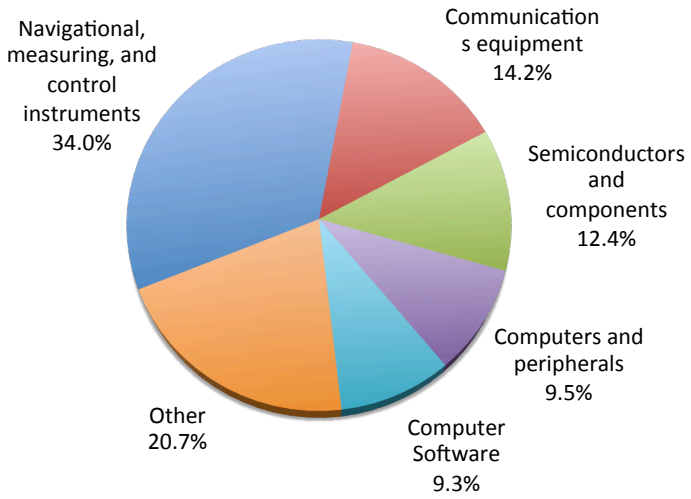
California, **Texas**, **Massachusetts**, **Ohio**, and **New York** were the leading ICT state exporters to India. More than 20 percent of Ohio's semiconductor exports in 2012 went to India.

ICT exports to India from each of the top five states – and a number of others – have grown by at least $20 million since 2006.

Four of the top five district ICT exporters to India are in **California**. The **17th**, **18th**, and **19th Districts** are in the Bay Area, whereas the **52nd District** is near San Diego.

Exports to India increased from a number of small districts. **Tennessee's 4th**, **Idaho's 2nd**, **Delaware's At-Large**, and **Nevada's 2nd District** all saw exports to India nearly triple from 2006 to 2012.

ICT Exports to India by Type, 2012



ICT Export Growth to India by State, 2006-2012

Source: The Trade Partnership from U.S. Census Bureau data

Numerous states have experienced strong ICT export growth to India.

Conclusion

ICT hardware, software and services exports matter to communities large and small across the United States. Those exports support innovation, R&D, local production and employment in every U.S. state and congressional district.

Growth in export markets – and access to those markets – is key to continued competitiveness of these important sectors of the U.S. economy. Trade agreements ensure that U.S. exporters have access to the enormous number of consumers around the globe that value U.S. ICT hardware, software and services.

The Trade in Services Agreement (TISA), currently under discussion at the World Trade Organization, would address barriers to U.S. ICT services exports maintained by each of more than 20 U.S. trading partners currently participating in those talks.

Bilaterally and regionally, free trade agreements have the potential to accomplish similar gains for U.S. ICT goods and services exports. FTAs – most notably those under negotiation now with 11 countries in the Trans-Pacific region and with the European Union – will boost to two-thirds the share of U.S. ICT exports benefiting from high trade agreement standards.

In addition to lowering foreign barriers to exports, these agreements lock in those gains, preventing the imposition of new barriers to U.S. ICT exports in the future. By setting high standards for trade, and locking in those standards, trade agreements ensure that U.S. ICT companies will have access to growing markets for their goods and services for years to come.

These agreements matter, and the benefits to U.S. companies and workers will span the United States.

Index of States Profiled in the Report

Index of Congressional Districts Profiled in the Report

Appendix A
ICT Industry Definitions

Goods

NAICS 3341 -Computer and peripheral equipment
Includes manufacturers of computers, computer storage devices, and computer terminals and other computer peripheral equipment.

NAICS 3342 - Communications equipment
Includes manufacturers of telephone apparatus, radio and television broadcasting and wireless communications equipment, and other communications equipment.

NAICS 3343 - Audio/video equipment

NAICS 3344 – Semiconductor and other electronic components
Includes manufacturers of bare printed circuit boards; capacitor, resistor, coil, transformer, and other inductors; electronic connectors; printed circuit assembly, and other electronic components.

NAICS 3345 – Navigational, measuring, electromedical and control instruments
Includes manufacturers of electromedical and electrotherapeutic apparatus; search, detection, navigation, guidance, aeronautical, and nautical systems and instruments; automatic environmental controls for residential, commercial and appliance use; instruments and related products; totalizing fluid meters and counting devices; instruments for measuring and testing electricity and electrical signals; analytical laboratory instruments; irradiation apparatus, and other measuring and controlling devices.

Services

NAICS 5112 – Software publishers

NAICS 5171 – Telecommunications services
Wired telecommunications carriers.

NAICS 5182/5415 – Computer systems design and related services
Data processing, hosting and related services; custom computer programming; computer systems design; computer facilities management, and other computer related services.

NAICS 5191 – Database and information services
News syndicates, libraries and archives, internet publishing and broadcasting and web search portals, all other information services.