

Appendix B. Summary of Technology Transfer Legislation

This appendix provides a compendium of relevant technology transfer legislation, listed in chronological order. Table B.1 relates the legislation to federally funded R&D.

The Morrill Land-Grant Act of 1862

- Promoted education and innovation in science and technology by forming a system of publicly supported research universities.

National Aeronautics and Space Act of 1958 (PL 85-568)

- Granted NASA broad discretion in the performance of its functions.
- Authorized the NASA Administrator to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate, with any agency or instrumentality of the United States, or with any State, Territory, or possession, or with any political subdivision thereof, or with any person, firm, association, corporation, or educational institution.
- Permitted the Administrator to engage in international cooperative programs pursuant to NASA's mission.

The Freedom of Information Act (1966) (PL 104-231) [5 USC 552]

- Provided a vehicle to inform the public about federal government activities.
- Gave citizens the right to request agency records and have them available promptly.

Stevenson-Wydler Technology Innovation Act of 1980 (PL 96-480) [15 USC 3701–3714]

- Focused on dissemination of information.
- Required Federal Laboratories to take an active role in technical cooperation.
- Established Offices of Research and Technology Application at major federal laboratories.
- Established the Center for the Utilization of Federal Technology (in the National Technical Information Service).

Bayh-Dole Act of 1980 (PL 96-517)

- Permitted universities, not-for-profits, and small businesses to obtain title to inventions developed with governmental support.
- Provided early on intellectual property rights protection of invention descriptions from public dissemination and Freedom of Information Act (FOIA).
- Allowed government-owned, government-operated (GOGO) laboratories to grant exclusive licenses to patents.

Small Business Innovation Development Act of 1982 (PL 97-219)

- Required agencies to provide special funds for small-business R&D connected to the agencies' missions.
- Established the Small Business Innovation Research Program (SBIR).

Cooperative Research Act of 1984 (PL 98-462)

- Eliminated the treble-damage aspect of antitrust concerns of companies wishing to pool research resources and engage in joint precompetitive R&D.
- Resulted in consortia, e.g., the Semiconductor Research Corporation (SRC) and Microelectronics and Computer Technology Corporation (MCC), among others.

Trademark Clarification Act of 1984 (PL 98-620)

- Permitted decisions to be made at the laboratory level in government-owned, contractor-operated (GOCO) laboratories as to awarding licenses for patents.
- Permitted contractors to receive patent royalties for use in R&D or awards, or for education.
- Permitted private companies, regardless of size, to obtain exclusive licenses.
- Permitted laboratories run by universities and nonprofit institutions to retain title to inventions, within limitations.

Japanese Technical Literature Act of 1986 (PL 99-382)

- Improved the availability of Japanese science and engineering literature in the United States.

Federal Technology Transfer Act of 1986 (PL 99-502)

- Made technology transfer a responsibility of all federal laboratory scientists and engineers.
- Mandated that technology transfer responsibility be considered in employee performance evaluations.
- Established a principle of royalty sharing for federal inventors (15 percent minimum) and set up a reward system for other innovators.
- Legislated a charter for the Federal Laboratory Consortium for Technology Transfer and provided a funding mechanism for that organization to carry out its work.
- Provided specific requirements, incentives and authorities for the Federal Laboratories.
- Empowered each agency to give the director of GOCO laboratories authority to enter into cooperative R&D agreements and negotiate licensing agreements with streamlined headquarters review.
- Allowed laboratories to make advance agreements with large and small companies on title and license to inventions resulting from Cooperative R&D Agreements (CRADAs) with government laboratories.
- Allowed directors of GOGO laboratories to negotiate licensing agreements for inventions made at their laboratories.
- Provided for exchanging GOGO laboratory personnel, services, and equipment with their research partners.
- Made it possible to grant and waive rights to GOGO laboratory inventions and intellectual property.
- Allowed current and former federal employees to participate in commercial development, to the extent that there is no conflict of interest.

Malcolm Baldrige National Quality Improvement Act of 1987 (PL 100-107)

- Established categories and criteria for the Malcolm Baldrige National Industry Award.

Executive Orders 12591 and 12618 (1987): Facilitating Access to Science and Technology

- Promoted the commercialization of science and technology.

Omnibus Trade and Competitiveness Act of 1988 (PL 100-148)

- Placed emphasis on the need for public/private cooperation in assuring full use of results and resources.
- Established centers for transferring manufacturing technology.

- Established Industrial Extension Services within states and an information clearinghouse on successful state and local technology programs.
- Changed the name of the National Bureau of Standards to the National Institute of Standards and Technology and broadened its technology transfer role.
- Extended royalty payment requirements to nongovernment employees of federal laboratories.
- Authorized Training Technology Transfer centers administered by the Department of Education.

National Institute of Standards and Technology Authorization Act for FY 1989 (PL 100-519)

- Established a Technology Administration within the Department of Commerce.
- Permitted contractual consideration for rights to intellectual property, other than patents, in cooperative research and development agreements.
- Included software development contributors eligible for awards.
- Clarified the rights of guest worker inventors regarding royalties.

Water Resources Development Act of 1988 (PL 100-676)

- Authorized Army Corps of Engineers laboratories and research centers to enter into cooperative research and development agreements.
- Allowed the Corps to fund up to 50 percent of the cost of the cooperative project.

National Competitiveness Technology Transfer Act of 1989 (PL 101-189)

- Granted GOCO federal laboratories the opportunity to enter into CRADAs and other activities with universities and private industry, under essentially the same terms as stated under the Federal Technology Transfer Act of 1986.
- Allowed information and innovations, brought into and created through cooperative agreements, to be protected from disclosure.
- Provided a technology transfer mission for the nuclear weapons laboratories.

Defense Authorization Act for FY 1991 (PL 101-510)

- Established model programs for national defense laboratories to demonstrate successful relationships among federal government, state and local governments, and small businesses.

- Provided for a federal laboratory to enter into a contract or memorandum of understanding with a partnership intermediary to perform services related to cooperative or joint activities with small businesses.
- Provided for the development and implementation of a National Defense Manufacturing Technology Plan.

Intermodal Surface Transportation Efficiency Act of 1991 (PL 102-240)

- Authorized the Department of Transportation to provide not more than 50 percent of the cost of CRADAs for highway research and development.
- Encouraged innovative solutions to highway problems and stimulated the marketing of new technologies on a cost-shared basis of more than 50 percent if there is substantial public interest or benefit.

American Technology Preeminence Act of 1991 (PL 102-245)

- Extended Federal Laboratory Consortium (FLC) mandate, removed FLC responsibility for conducting a grant program, and required the inclusion of the results of an independent annual audit in the FLC Annual Report to Congress and the President.
- Included intellectual property as potential contributions under CRADAs.
- Required the Secretary of Commerce to report on the advisability of authoring a new form of CRADA that permits federal contributions of funds.
- Allowed laboratory directors to give excess equipment to educational institutions and nonprofit organizations as a gift.

Small Business Technology Transfer (STTR) Act of 1992 (PL 102-564)

- Established a three-year pilot program—Small Business Technology Transfer (STTR)—at the Department of Defense (DoD), Department of Energy (DOE), Department of Health and Human Services (HHS), the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF).
- Directed the Small Business Administration (SBA) to oversee and coordinate the implementation of the STTR Program.
- Designed the STTR to be similar to the Small Business Innovation Research (SBIR) program.
- Required each of the five agencies listed above to fund cooperative R&D projects involving a small company and a researcher at a university, federally funded research and development center, or nonprofit research center.

National Department of Defense Authorization Act for 1993 (PL 102-25)

- Facilitated and encouraged technology transfer to small businesses.

National Defense Authorization Act for Fiscal Year 1993 (PL 102-484)

- Established the DoD Office of Technology Transition.
- Extended the streamlining of small-business technology transfer procedures for non-federal laboratory contractors.
- Directed the DOE to issue guidelines to facilitate technology transfer to small businesses.
- Extended the potential for CRADAs to some DoD-funded Federally Funded Research and Development Centers (FFRDCs) not owned by the government.

National Defense Authorization Act for Fiscal Year 1994 (PL 103-160)

- Broadened the definition of a laboratory to include the weapons production facilities of the DOE.

National Technology Transfer and Advancement Act of 1995 (PL 104-113)

- Gave CRADA partners sufficient intellectual property rights to justify prompt commercialization of inventions resulting from a CRADA.
- Authorized CRADA partners the right to an exclusive or nonexclusive license resulting from a CRADA.

Technology Transfer Commercialization Act of 2000 (PL 106-404)

- Improved the ability of federal agencies to license federally owned inventions by reforming technology training authorities under the Bayh-Dole Act.
- Permitted laboratories to bring already existing government inventions into a CRADA.

Table B.1

PERFORMERS of FEDERAL R&D	B-D						DOD	HHS	NASA	DOE	NSF	USDA	DOC	Other	TOTAL 2002 (estimated obligations in 1,000's)
	USBPPA	TCA	EO	S-W	SA	AEA/FNERA									
TOTAL Conduct of Federal R&D by All Performers							34,235,264	23,815,897	7,259,400	6,321,757	3,017,080	1,805,885	1,111,554	3,078,614	80,645,451
Federal laboratory															
Operated by USG (intramural)				X	X	X	7,898,700	4,133,700	1,841,900	510,100	20,300	1,268,200	911,300	1,701,000	18,285,200
Operated by university/college (i.e., GOCO FFRDC)		X					272,400	67,000	1,199,700	2,481,800	167,600	0	100	25,200	4,213,800
Operated by non-profit (i.e., GOCO FFRDC)		X					400,500	42,500	5,100	549,800	5,300	0	100	115,600	1,118,900
Operated by industrial firm (i.e., GOCO FFRDC)		X					212,100	270,400	200	895,000	0	0	0	19,700	1,397,400
Universities & Colleges	X						1,615,300	13,528,600	845,100	643,600	2,506,200	500,900	109,100	450,100	20,198,900
Non-profit/non-educational	X						258,000	3,806,900	444,400	49,600	163,900	16,300	10,000	341,800	5,090,900
Industry/business¹							23,473,800	1,710,300	2,900,700	1,078,800	130,300	14,100	74,200	432,800	29,815,000
Large business (est.)			X				19,436,306	371,135	2,201,631	569,606	16,418	592	41,849	319,437	22,956,975
Small business (est.)	X						4,037,494	1,339,165	699,069	509,194	113,882	13,508	32,351	113,363	6,858,025
Other															
State/Local U.S. government				X			2,900	167,100	8,100	11,500	10,200	3,000	6,500	60,000	269,300
Foreign government				na			101,700	89,400	41,300	1,500	13,300	3,400	200	5,300	256,100
Bayh-Dole Act (B-D) (35 USC 200 et. seq.)			77%				26,232,100	19,425,700	5,395,200	5,698,600	2,973,300	531,300	193,500	1,385,200	61,834,900
University and Small Business Patent Procedures Act (USBPPA)			40%				5,910,794	18,674,665	1,988,569	1,202,394	2,783,982	530,708	151,451	905,263	32,147,825
Trademark Clarification Act (TCA)²			8%				885,000	379,900	1,205,000	3,926,600	172,900	0	200	160,500	6,730,100
E.O. 12591 (EO)			28%				19,436,306	371,135	2,201,631	569,606	16,418	592	41,849	319,437	22,956,975
Stevenson-Wydler (S-W) (15 USC 3700, et. seq.)³			20%				7,901,600	4,300,800	8,100	11,500	30,500	1,271,200	917,800	1,761,000	16,202,500
Space Act (SA) (42 USC 2457)⁴			2%				na	na	1,841,900	na	na	na	na	na	1,841,900
Atomic Energy Act (AEA) (42 USC 2182) and Federal Nonnuclear Energy Research Act (FNERA) (42 USC 5908)⁵			1%				na	na	na	510,100	na	na	na	na	510,100
Basic Research			Too early for TT				1,363,205	12,969,005	2,548,050	2,339,169	2,799,076	848,751	53,351	478,684	23,399,291
Major Systems Development			Off limits for TT				25,246,972	0	0	0	0	0	0	0	25,246,972
Applied Research and Non-Major Systems Development			Prime Candidates for TT				7,625,087	10,846,892	4,711,350	3,982,588	218,004	957,134	1,058,203	2,599,930	31,999,188
Life Sciences			30%				406,149	7,718,402	150,301	44,909	15,911	600,023	188,969	542,042	9,666,706
Engineering			16%				2,010,441	236,673	1,258,802	857,352	125,367	35,361	145,558	337,135	5,006,689
Mathematics and computer sciences			5%				699,457	94,600	45,310	711,931	19,970	10,745	76,547	31,782	1,690,342
Environmental Science			5%				128,729	238,543	308,224	56,388	2,009	6,987	384,324	463,383	1,588,587
Physical Sciences			4%				161,156	375,403	90,316	485,377	23,688	37,861	82,867	52,575	1,309,253
Psychology			3%				40,322	899,644	13,259	0	25	275	0	76,920	1,030,445
Social sciences			3%				26,782	260,755	0	0	15,160	113,252	27,767	472,257	915,973
Other Applied Research n.e.c.			2%				183,988	342,459	6,713	9,100	15,874	2,395	60,848	98,245	719,622
Development, Non-Major Systems			31%				3,968,064	680,413	2,838,425	1,817,531	0	150,235	91,323	525,580	10,071,571
All amounts are from "Federal Funds for Research and Development: Fiscal Years 2000, 2001, and 2002, Volume 50 (NSF 02-321).															
¹ The percent of each agency's R&D contracts that were awarded to Small Businesses were determined using RaDiUS. Since the government-wide percent is 25%, this amount was used to determine "Other."															
² In implementing the TCA requirements, DOE has effectively adopted, via the provisions of FFRDC M&O contracts, the language of Stevenson-Wydler.															
³ The technology transfer activities of all federal intramural R&D is governed by Stevenson-Wydler, while their patenting and licensing activities are governed by Bayh-Dole. Stevenson-Wydler was amended by the Federal Technology Transfer Act of 1986 which allowed laboratories to license their inventions, and after sharing 15% with the employee inventor, keep all the remaining royalties.															
⁴ The Space Act governs the intramural technology transfer activities of NASA only.															
⁵ The Atomic Energy Act and the Federal Nonnuclear Energy Research Act govern the intramural technology transfer activities of DOE only.															