INTELLECTUAL PROPERTY RIGHTS AND THE NATIONAL IVHS PROGRAM

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I. Introduction and Statement of Purpose

The national IVHS program encompasses the research, development, **testing** , procurement, integration, and operation of numerous complex and emerging technologies. Federal, state and local government funds will be expended to support long-range research and development of IVHS technologies, to sponsor operational tests of component systems, and to acquire the infrastructure components of the system. State and local governments will be principally responsible for building, operating, and maintaining surface transportation systems and managing traffic, usually with Federal assistance. The private sector will research, develop and market component IVHS technologies and services. Indeed, it is anticipated that most of the funding for research and development of IVHS products and services will originate in the private sector.

This paper (1) analyzes the extent to which current law and government procurement policy (both Federal and State) adequately protect both the intellectual property rights of developers of Intelligent Vehicle Highway Systems (IVHS) technology and the public interest in ensuring that the government obtain sufficient rights in technology developed with public funds to meet government needs and to prevent the nonuse or unreasonable use of basic technologies that enhance public safety and mobility; (2) discusses whether the IVHS program raises any special issues or concerns regarding intellectual property rights: and (3) recommends actions to address issues and concerns identified in the course of the analysis.

The objective of this analysis is to explore the extent to which legal issues surrounding the allocation of intellectual property rights to IVHS technologies may constrain, challenge, or prevent implementation of the national IVHS program. It is anticipated that the research and analysis set forth herein will be considered by the Department of Transportation (DOT) in preparing its report to Congress on non-technical constraints to IVHS, as required by the Intelligent Vehicle Highway Systems Act of 1991 (IVHS Act).'

II. Statement of Facts and Assumptions

A. IVHS Technologies

IVHS is a continually evolving collection of technologies that can be grouped into five broad functional areas which often overlap or are interrelated.2 The IVHS program objectives for each area are:

1. *Advanced Traffic Management Systems* (ATMS) are integrated, area-wide traffic signal systems and freeways surveillance and control systems which utilize advanced technologies to provide

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1/ Title VI, Part B of the Inter-modal Surface Transportation Efficiency Act (ISTEA) of 1991, p.
2/ l. 102-240 §057 Fed. 6054(d),codifiedat23U.S.C.§307,note.
Reg. 19,960 (1992).

improved surveillance methods, new integrated traffic adaptive control strategies, improved incident detection and response, and enhanced multi-jurisdictional coordination.

2. *Advanced Traveler Information Systems* (ATIS) encompass various technologies and approaches for providing a wide range of services to the traveler and/or driver (e.g., real time traffic status, congestion or incident reports, navigation and route guidance).

3. *Commercial Vehicle Operations* (CVO) focus on a wide range of commercial fleet operations including advanced approaches for electronic permitting and reporting systems for use by the motor carriers and state regulatory and licensing agencies for automatically checking and clearing vehicles with the proper credentials.

4. *Advanced Public Transportation System* (APTS) introduce innovative traveler information and communication technologies to increase the use of public and mass transportation systems and allow transit operators to improve the efficiencies of fleet operations and reduce operating costs.

5. *Advanced Vehicle Control Systems* (AVCS) involve the application of new vehicle warning and control devices, such as the use of headway monitoring and obstacle detection (proximity) devices in the near term and the development and testing of fully-automated vehicles in the longer term.3

B. The IVHS Act

Federal support for the IVHS program is authorized by the IVHS Act, which directs the Secretary of Transportation to "conduct a program to research, develop and operationally test intelligent vehicle-highway systems and promote implementation of such systems as a component of the Nation's surface transportation systems." 4 The goals of the IVHS program include: (1) the widespread implementation of IVHS to enhance the safety, efficiency and capacity of the federal highway system; (2) the attainment of air quality goals; (3) the enhancement of safety and the identification of aspects of the federal highway system that may degrade safety: (4) the development and promotion of IVHS and an IVHS industry in the United States; (5) the reduction of traffic congestion; (6) the enhancement of industrial competitiveness by establishing a significant U.S. presence in an emerging field of technology; (7) the development of a technology base for IVHS using existing national laboratory capabilities where appropriate; and (8) facilitating the transfer of transportation technology from national laboratories to the private sector.5

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4/ ISTEA, §6052(a).

5/ ISTEA, § 6052(b).

The IVHS Act directs the Secretary to develop and implement standards and protocols designed to promote the widespread use and evaluation of IVHS technology and to attempt, to the extent practical, to ensure that such standards and protocols will promote compatibility among the disparate IVHS technologies implemented throughout the states.6 The establishment of standards and protocols to which IVHS technologies should conform is critical to the timely implementation of a nationwide system. In establishing standards and protocols, attention must be paid to the competing goals of promoting compatibility and interoperability and encouraging innovation and experimentation.

The IVHS Act specifically directs the Secretary to encourage cooperation among state and local governments, the private sector and the non-profit sector, including colleges and universities, in all aspects of the IVHS program.7 The IVHS program has been identified as a potential model for public-private arrangements for the development of emerging technologies.8 The private sector's role in research and development of IVHS technologies is pivotal and will include research and development of underlying IVHS products, installation and operation of traffic surveillance and detection equipment, consulting, software supply, system integration and facilities management services, and developing and marketing databases for certain applications? It has been suggested that public/private/academic research and education partnerships focused on IVHS technologies should be formed with substantial federal support.10

Certain IVHS applications, including ATIS, could be developed as entirely private systems analogous to existing cable television and cellular telephone systems.11 Alternatively, such systems could be entirely publicly operated.12 The preferred configuration for such systems is the "partnership" model, in which a government entity (or alternately, a government franchisee) provides infrastructure components while the private sector provides value-added services, communication links, on-board devices, and other free-standing system components.13

C. National IVHS Program

The DOT's Draft National Program Plan for IVHS describes distinct phases of the IVHS program, including (1) research and development, (2) operational testing and (3) deployment phases.14 The National Program will entail significant funding for

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6/ ISTEA, § 6053(b).
7/ ISTEA, § 6053(a).
8/ Transportation Research Board, *Advanced Vehicle and Highway Technologies, Special Report 232,* at 3 (1991).
9/ IVHS America, *Strategic Plan For Intelligent Vehicle-Highway Systems in the United States,* Report No. IVHS-AMER-92-3. III-114-115 (1992) (hereinafter, "Strategic Plan").
10/ Strategic *Plan,* at III-123.
11/ *Special Report 232,* at 5.
12/ *Id.* at 5.
13/ *id.* at 5.
14/ Federal Highway Administration, *National Program Plan for Intelligent Vehicle Highway Systems,* p. II-4 (Draft, October 15, 1993) (hereinafter, "National Program").

research and development of basic IVHS technology components and of systems that will provide one or more IVHS services.15

Operational tests conducted in a highway environment under "live" transportation conditions serve as the transition between research and development and full-scale deployment of IVHS technologies.16 An operational test integrates existing technology, research and development products, institutional and regulatory arrangements to test one, and usually more, new technological, institutional, or financial elements in a "real world" test .17 Operational tests are conducted as cooperative ventures and involve a carefully crafted partnerships negotiated among federal, state, local, private and other institutions? A recent DOT Request for Participation in the IVHS field operational test program identifies specific operational tests needed to advance the national IVHS program in particular user service areas, including emergency and security services, roadside safety inspection systems, travel demand management services and driver advisory and traveler information services.19

The federal share of funding for joint operational tests from IVHS funds may not exceed 80%, and non-federal partners in operational tests are encouraged to increase their share to 50%.20 Funds provided in excess of the 20% minimum non-federal share may include the value of federally-supported projects directly associated with the operational test.21 The evaluation criteria set forth -in a recent request for participation include provisions to insure that the DOT has an adequate opportunity to perform an acceptable and unbiased evaluation of the project for federal purposes, but specifically states that "nothing in these guidelines shall preclude the non-federal partners from conducting additional evaluations for their specific needs?

The terms of an operational test will typically be defined in a Memorandum of Understanding (MOU) negotiated'between the DOT lead agency and the project partners which delineates cost-sharing arrangements and any other terms and conditions agreed among the partners.23 Generally, a cooperative agreement will be used as the contract document to transfer federal IVHS funds to a state department of transportation or local lead agency for implementation of an operational test.24 The selection criteria for proposed IVHS operational test plans include the identification of proposed agreements for sharing of technology developed under the operational test.25

In contrast to this approach, a DOT Request for Information regarding development of a system architecture for a nationwide intelligent vehicle highway

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15/ National Program, p. II-7
16/ 58 Fed. Reg. 47,310 (1993)
17/ Id.
18/ Id.
19/ 58 Fed. Reg. 47, 311-47, 314 (1993).
20/ 58 Fed. Reg. 47, 314 (1993).
21/ *Id.*
22/ 58 Fed. Reg. 47,314.
23/ *57* Fed. Reg. 14,905 (1992).
24/ *Id.*
25/ *57* Fed. Reg. 14,906 (1992).

system sets forth a different model for federal funding of an IVHS project.26 This notice states that the DOT's system architecture development program is "directed toward the initial definition of an open, national IVHS architecture."27 Moreover, the notice states that "since the architectural definition process should take place wholly in the public domain, the DOT will fund the entire effort."28 The stated goal of the system architecture development program is to result in " the design of a single open system architecture for a nationwide IVHS."29

III. Issues Presented

As noted above, the success of the IVHS program depends in large part on the willingness and ability of private entities to design and market component IVHS technologies. However, the implementation of IVHS -- or any other emerging technology with a clearly identifiable public purpose -- requires an unusual degree of cooperation between public and private entities. This is true for IVHS for at least two reasons, including the strong public policy favoring an integrated, nationwide system operating through a single set of standards and protocols, and the need to use public resources to carry out large-scale tests and demonstrations of component technologies. Notwithstanding this need for cooperation, there is an inherent tension between the fundamental profit motive of private companies and government's interest in retaining the right to use and promote technology developed with public funds.

Obviously, IVHS technology will only attract private investment if it is perceived as a potentially profitable endeavor. As in all industries dependent on technological innovation, the control of intellectual property rights to core technologies is viewed as a primary determinant of profitability. Thus, to the extent cooperative arrangements between public and private entities limit a private concern's ability to exploit its intellectual property rights, such cooperative arrangements will act as a disincentive to participate in publicly-funded IVHS projects.

Concerns over the allocation of intellectual property rights have already been voiced by participants in DOT-funded IVHS operational tests? The primary concern expressed by private developers of IVHS technologies is the potential loss of control over proprietary information and technologies, including the fear that retention of intellectual property rights by governmental entities will result in the release of these technologies into "the public domain." This concern must be considered the primary potential constraint to IVHS development related to intellectual property.

It has also been reported that private participants in DOT-funded projects have engaged in lengthy negotiations for procurement contracts, particularly over

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26/ 57 Fed. Reg. 39,054 (1992).

27/ *Id.*

28/ *Id.*

29/ *Id.*

30/ K. Syverud, Legal Constraints to the Research, Development, and Deployment of IVHS *Technology in the United States,* IVHS America Annual Meeting, 418 (1993).

intellectual property issues.[31] While the willingness of private parties to negotiate these issues is itself evidence that the primary constraint is not insuperable, the increased transaction costs associated with such negotiations should be considered a secondary potential constraint.[32]

The potential constraints posed by state and local procurement policies are less apparent given the fact that these entities appear generally to have somewhat greater flexibility than Federal agencies to acquire and dispose of intellectual property rights by contract. One limitation on this flexibility which is of consequence to private IVHS developers arises in the context of projects funded in whole or in part with Federal funds. The DOT's Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments (the "common rule") requires that state and local grantees impose the awarding agency's requirements pertaining to patents, copyrights and rights in data in contracts with subgrantees? Thus, in such circumstances, the potential constraints arising under state and local government procurement policies will mirror the constraints arising under Federal policies.

IV. Analysis

A. Forms of Intellectual Property at Issue

The intellectual property rights of primary concern to private developers of IVHS technologies are patents, copyrights and trade secrets. This section briefly describes the rights and the basic principles governing their ownership and transfer.

1. Patents

a. Eligible subject matter

An invention may be patented only if it fits within one of the statutory classes of eligible subject matter, which include: "any new and useful process, machine, manufacturer or composition of matter, or any new and useful improvement thereof."[34] The purpose of the statutory classification is to limit patent protection to applied technology or "the useful arts."[35] Theoretical or abstract discoveries are excluded from protection.[36] In addition, a patent will not be granted for the discovery of natural laws or the manifestation of these laws in physical form.[37]

31/ *Id. at 425.*

32/ Syverud identifies intellectual property issues as "manageable" legal constraints, *Id.* at 431. Moreover, it should be noted that the defense industry has adapted to the underlying principles governing the allocation of intellectual property rights in military systems designed under federal contracts.

33/ 49 C.F.R. §1&36(i)(8)-(9). For example, it has been reported that the FHWA's cooperative agreement with the State of New Jersey for implementation of the EZPASS system includes data rights and patent rights provisions consistent with standard federal contracting requirements. M. Ostrer, *Contract issues in Toll Road Agency Procurement of Intelligent Vehicle Highway Systems,* IVHS America Annual Meeting, 199,201 (1993).

34/ 35 USC. § 101.

35/ See U.S. Constitution, Article I, § 8, cl. 8.

36/ 1 D. Chisum, *Patents,* §1 .01 , at 1-5 (1993).

37/ *Diamond v. Chakarabaraty,* 447 U.S. 303,309, 100 S. Ct. 2204, 65 L.Ed.2d 144 (1960).

Computer software is eligible for patent protection, although the Patent Office and the courts have refused to grant or uphold patents for programs that embody nothing more than mathematical algorithms.[38] A computer software patent protects the actual *process* performed by a computer using the software rather than the expression of that process in computer source code or in screen displays. Thus, patent protection for any particular piece of software is distinct from -- and may be obtained in addition to -- copyright protection.[39]

The statutory conditions for patentability include "novelty." An inventor is not entitled to a patent if the invention was known or used by others in the United States or patented or described in a printed publication in the United States or any foreign country prior to the inventor's application for patent.[40] An inventor is also barred from obtaining a patent if the subject invention was in public use or on sale in the United States more than one year prior to the date of the application.[41] Thus, premature disclosure or "public use" of an otherwise patentable invention can raise an absolute bar to patentability. The holder of a patent has the exclusive right to make, use or sell the subject invention for a limited number of years.[42]

b. . Ownership and transfer

Patent law requires that the true and original inventor or inventors be named in the patent application.[43] Absent a transfer or obligation to assign rights in the application or the invention, the inventor or inventors are the presumptive owners of those rights.[44] However, patents have the attributes of personal property, and are assignable in law by an instrument in writing.[45] Thus, an inventor may contract to convey any patent rights to his or her existing or future inventions.[46]

The assignment of patents is governed by federal law and regulation, which set forth requirements for recording such assignments.[47] The express assignment of patent rights in inventions conceived or developed in the course of an inventor's employment is a common feature of employment contracts in industry and academia.[48] Even in the absence of an express provision in an employment agreement, an

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38/ *Arythmia Research Technology v. Corazonix Cop, 956* F.2d 1053, 1058-59 (Fed. Cir. 1992).

39/ *See Atari Games Corp. v. Nintendo of America, Inc., 975* F.2d 632 (Fed. Cir. 1992).

40/ *35* U.S.C. § 102(a).

41/ *35* U.S.C. § 102(b).

42/ "Functional patents" are protected for a term of 17 years, subject to the payment of specified fees (35 U.S.C. § 154); "design patents" are protected for a term of 14 years *(35 U.S.C. § 173).*

43/ *6* D. Chisum, § 22.02, at 22-23.

44/ *Id.* §22.01.

45/ *35* U.S.C. § 261.

46/ *Arachnid, Inc. v. Merit Industries, Inc. 939* F.2d 1574 (Fed. Cir. 1991); *Filmtec v. Allied-Signal, 939* F.2d 1568, 1572 (Fed. Cir.. 1991).

47/ *35* U.S.C. § 261; 37 C.F.R. §1.331-.332.

48/ *See* P. Chew, *Faculty Generated Inventions: Who Owns the Golden Egg?,* 1992 Wis. L. Rev. 259 (1992).

employer may be entitled to an employee's invention if the employee was specifically hired to exercise his Or her "inventive faculties."[49]

Licenses to use or "practice" patents or patented inventions are generally governed by state-based common law governing contracts for the sale and disposition of personal property.[50] State law yields only where it presents a serious conflict with federal patent policy.[51] A patent license may be exclusive or non-exclusive, and may permit the licensee to practice the invention in a particular "field of use." In typical commercial transactions royalty payments are paid by a licensee for the right to practice an invention. Under certain circumstances, including the absence of an express agreement between an employer and an employee, an employer may be entitled to a so-called "shop right": a non-exclusive, non-transferable, royalty-free license to practice an employee's invention.[52] The shop right is not an ownership interest, and the employer entitled to the shop right has no standing to sue for infringement.[53] A non-exclusive licensee of a patent has no property interest in the patent, nor any right to prevent the patent holder from exercising his property rights.[54]

The United States government may hold, acquire and exploit patent rights, including rights to inventions made by Federal employees and Federal contractors.[55] In general, it is the policy of the Federal government to encourage the widespread use of inventions in which the government hold patent rights through the assignment and licensing of those rights. The federal government may take a license in a patent, through the exercise of the power of eminent domain.[56] Section 1498 of Title 28 provides the sole remedy for a patentee alleging patent infringement by the Federal government.[57]

2. Copyrights

a. Eligible subject matter

A federal copyright may be obtained for "original works of authorship fixed in any tangible medium of expression."[58] A person claiming copyright must either be the author of the work in question, or have succeeded to the rights of the author.[59] Works of authorship eligible for copyright protection include sound recordings, audio visual

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49/ 6 D. Chisum, § 22.03[1], at 22-29.

50/ *Id., § 22.03[4].* at 22-49.

51/ *Powerlift, inc. v. Weatherford Nipple Up,* 871 F.2d 1082 (Fed. Cir. 1989) (state laws applicable to the license of a patent); *Mechmetals v. Telex, 709* F.2d 1287, 1293 (9th Cir. 1963) (possibility of conflict with 35 U.S.C. § 261 and resolution of congressional intent); *Farmland irrigation v. Doppimaier, 48* Cal.2d 208, 308 P.2d 732 (1957).

52/ 6 D. Chisum, § 22.03[1], at 22-9.

53/ *Kurtzan* v. *Sterling, 228* F.Supp. 696 (E.D. Pa. 1964) .

54/ *Sanofi, S.A. v. Med-Tech Veterinarian Products, Inc.,* 565 F.Supp. 931 (D. J. 1963); *Kaplan v. Cochran, 545* F.2d 1073 (7th Cir. 1976); see *a/so* Executive Order No. 10096 (1953).

56/ 28 U.S.C. § 1498.

57/ *Motorola, inc. v. United States, 729* F.2d 765 (Fed. Cir. 1964).

58/ 17 U.S.C. § 102(a).

59/ 1 M. Nimmer, D. Nimmer, *Nimmer on Copyright, §* 5.01 [A], at 5-3 (1993).

works, dramatic works, musical works, and "literary works."60 The term "literary works" encompasses all original expressions of ideas in writing, including technical papers and computer programs.61

Copyright protection does not extend to the ideas, procedures, methods of operation, systems, processes, concepts, principles, or discoveries expressed in a work of authorship, but only to the expression itself.62 The owner of a copyright has the exclusive right to reproduce the copyrighted work, to prepare derivative works based on the copyrighted work, and to distribute copies of the copyrighted work to the public by sales or transfer.63 Copyright protection extends for a period of 50 years after the death of the author.64

b. Ownershio and transfer

Initial ownership of a copyright vests in the author or authors of the subject work.65 However, ownership can be transferred in whole or in part by the initial owner by contract.66 The Copyright Act provides that title to a copyright may vest in an employer if an employee's original work of authorship can be deemed a "work made for hire."67 Work made for hire includes work that has been specifically ordered or commissioned if "the parties expressly agree in a written instrument signed by them."68

Copyright protection is not available for any work prepared by an officer or employee of the United States government as part of that person's official duties.69 However, the Federal government is not precluded from receiving and holding copyrights transferred to it by assignment, bequest, or otherwise.70

3. Trade Secrets

a. Eligible subject matter

Unlike patents and copyrights, which are creatures of federal law, trade secrets are creatures of state law. A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives the owner an opportunity to obtain an advantage over competitors who do not know or use it.71

60/ 17 U.S.C. § 102(a).
61/ 17 U.S.C. § 101.
62/ 17 U.S.C. § 102(b).
63/ 17 U.S.C.§§ 101-118, et seq
64/ 17 U.S.C. § 302(b).
65/ 17 U.S.C. § 201 (a).
66/ 17 U.S.C. § 201(a).
67/ 17 U.S.C. § 201(e).
68/ 17 U.S.C. § 101.
69/ 17 U.S.C. §§105,101.
70/ 17 U.S.C. 9105.
71/ *Restatement of Torts,* (1 st) § 757, comment b.

The owner of a trade secret is required to take reasonable precautions to preserve the secret.[72] The unprotected disclosure of a trade secret forfeits its trade secret status.[73]

b. Ownership and transfer

Trade secrets are a form of property, and may be assigned and licensed under conditions that will preserve their status as trade secrets.[74]

B. The Effect of Federal Funding on Intellectual Property Rights

Federal funding of IVHS projects entails certain restrictions on the allocation of intellectual property rights to technologies developed with such funding. The nature and extent of these restrictions depends in part on the source and purpose of the funding.

1. Grants, contracts and cooperative agreements under the IVHS Act

The IVHS Act authorizes the Secretary to use several different means to finance IVHS research, development and implementation.[75] The Secretary may make grants to state and local governments for feasibility and planning studies for IVHS development and implementation.[76] The Secretary may also make grants to non-federal entities (including state and local governments, universities and "other persons") for IVHS operational tests.[77] The Act further provides that funds authorized under § 6058 shall be available for obligation in the same manner as if such funds were apportioned under Chapter 1 of Title 23.[78] Section 133 of Title 23 permits a state to obligate federal funds apportioned for the Surface Transportation Program for a variety of purposes, including "operational improvements" (which is defined to

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72/ 1 R. Milgrim, *Milgrim on Trade Secrets, §2.04* (1993).

73/ *1 Milgrim, §2.05[1].*

74/ 1 *Milgrim,* §1.02.

75/ The distinctions among procurement contracts, grants and cooperative agreements are set forth at 31 U.S.C. Chapter 63. This chapter provides that a procurement contract will be used "as the legal instrument reflecting a relationship between the United States government" and a contractor when the principle purpose of the contract is to acquire property or services for the direct benefit or use of the United States government, or when an agency decides in a specific instance that the use of a procurement contract is appropriate. 31 U.S.C. § 6303. A grant agreement shall be used by an executive agency when the principle purpose of the relationship between the federal government and the grantee is to transfer a thing of value to the recipient "to carry out a public purpose of support or stimulation authorized by the law of the United States" and "substantial involvement is not expected between the executive agency and the state, local government, or other recipient when carrying out the activity contemplated in the agreement." 31 U.S.C. § 6304. Finally, an executive agency shall use a cooperative agreement when the principle purpose of the relationship is to transfer a thing of value to the recipient to carry out a public purpose of support or stimulation authorized by law, and substantial involvement is expected between the executive agency and the state, local government, or other recipient in carrying out the activity contemplated under the agreement. 31 U.S.C. § 6305.

76/ ISTEA, § 6055(b).

77/ ISTEA, § 6055(d).

78/ ISTEA, § 6058(e).

include improvements embodying IVHS applications) and highway and transit research and development and technology transfer programs.79

The Act also authorizes the Secretary to conduct a program to research, develop and operationally test IVHS and to promote the implementation of IVHS using authority provided under § 307 of Title 23.80 Section 307 authorizes the Secretary to engage in research, development and technology transfer activities with respect to motor carrier transportation and highway planning and development "by making grants to, and entering into contracts and cooperative agreements with" state agencies, associations, for-profit and non-profit corporations and other personsal Section 307 further authorizes the Secretary to undertake, "on a cost-shared basis, collaborative research and development with non-federal entities, including state and local governments, foreign governments, colleges and universities, corporations, institutions, partnerships, sole proprietorships, and trade associations which are incorporated or established under the laws of any state?

2. Coooerative Research and Develoomeni Aareements

Pursuant to § 307, the Secretary may enter into cooperative research and development agreements ("CRADAs") under the Stevenson-Wydler Technology Innovation Act .83

The Stevenson-Wydler Act authorizes agencies to permit their Federal laboratories to enter into CRADAs with state and local governments, public and private foundations, non-profit organizations and universities, and private corporations and persons.84 Pursuant to a CRADA, a Federal laboratory may grant a collaborating party patent licenses or assignments in any invention made in whole or in part by a laboratory employee, provided that the laboratory retains "a non-exclusive, non-transferable, irrevocable, paid-up license to practice the invention or have the invention practiced throughout the world by or on behalf of the Government or such other rights as the federal laboratory deems appropriate."85 The Federal laboratory may also waive (subject to the retention of the same license) any right of ownership the Federal government may have to any subject invention made under the CRADA by a collaborating party or employee of a collaborating party.86 The provisions of the Stevenson-Wydler Act take precedence over the general Federal patent policies set forth at 35 U.S.C. Chapter 18 to the extent that they permit or require a disposition of rights in subject inventions which is inconsistent with that chapter.87

79/ 23 U.S.C. §133(b)(l), (5); 23 U.S.C. §101(a).
80/ ISTEA, § 6052(b)(4).
81/ 23 U.S.C. § 307(a)(l)(A)-(B).
82/ 23 U.S.C. § 307(a)(2)(A).
83/ 23 U.S.C. § 307(a)(2)(8).
84/ 15 U.S.C. § 3710a(a)
85/ 15 U.S.C. § 3710a(b)(2).
86/ 15 U.S.C. § 3710a(b)(3).
87/ 35 USC. § 210(e).

3. Grants and Coooerative Agreements to State and Local Governments

Grants and cooperative agreements to state and local governments for implementation of the IVHS program are subject to DOT's Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments. 88 These regulations provide that a state or local government procuring property or services under "an award of financial assistance, including cooperative agreements" from the DOT must include in its contracts "[n]otice of awarding agency requirements and regulations pertaining to patent rights with respect to any discovery or invention which arises or is developed in the course of or under such contract" and "[a]warding agency requirements and regulations pertaining to copyrights and rights in data." 89 Thus, in general, IVHS procurements by state and local governments with DOT financial assistance are subject to the same Federal policies governing the allocation of intellectual property rights as apply to grants made directly by the DOT.

C. Potential constraints related to patents

1. Federal patent policy

Chapter 18 of Title 35 ("Patent Rights in Inventions Made with Federal Assistance") 90 sets forth Federal government policy governing rights to inventions created in the course of any "funding agreement" between a Federal agency and a contractor for the performance of experimental, developmental or research work funded in whole or in part by the Federal government.91 The term "funding agreement" encompasses any "contract, grant, or cooperative agreement" for such work and "any assignment, substitution of parties, or subcontract" for such work under a funding agreement.92

Although Chapter 18 specifically describes the requirements applicable to funding agreements with small business firms and non-profit organizations, the scope of the Chapter was expanded by the Presidential Memorandum on Government Patent Policy dated February 18, 1983 ("Patent Policy"). The Patent Policy provides that, to the extent permitted by law, all federal agencies should adopt policies with respect to the disposition of inventions made in the performance of federally-funded research and development contracts, grants or cooperative agreements that are "the same or substantially the same" as applied to small business firms and non-profit organizations under Chapter 18. The purpose of the Patent Policy, as set forth in the accompanying Fact Sheet, is to allow inventing organizations to retain title to inventions made with federal support because it is "the best incentive to obtain the risk of capital necessary to develop technological innovations."

Chapter 18 is not intended to limit the authority of Federal agencies to allow entities other than small business firms or nonprofit organizations to retain ownership

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88/ 49 U.S.C. Part 18 (the "common rule").
89/ 49 C.F.R. § 18.36(i)(8)-(9).
90/ 35 U.S.C. §200 et seq.
91/ 35 U.S.C. § 201(a)-(b).
92/ 35 U.S.C. § 201(b).

of inventions created under Federal funding agreements.93 However, "all funding agreements, including those with other than small business firms and nonprofit organizations, shall Include the requrrements established in paragraph 202(c)(4) and § 203" of the Chapter.94 Thus, *at a minimum,* any funding agreement with any entity must provide for: (1) retention by the Federal agency of a license to practice any "subject invention" arising under a funding agreement, 95 and (2) retention by the agency of "march-in rights" with respect to any invention retained by the contractor.96 Funding agreements with small business firms and nonprofit entities -- **including** universities and other institutions of higher learning -- must meet all of the requirements set forth in the Chapter.

a. Retained license

A contractor may, upon proper notice to the funding agency, elect to retain ownership of any "subject invention" arising under a funding agreement.97 The term "invention" includes any discovery that may be patentable or protectable under Title 35, and the term "subject invention" is defined as "any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement."98 Paragraph 202(c)(4) of Chapter 18 provides:

> With respect to any subject invention in which a contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practice for or on behalf of the United States any subject invention throughout the world."99

In addition, a funding agreement *may* provide for "additional rights" to be retained by the United States, including the right to assign foreign patent rights in the subject invention, as are determined by the agency to be necessary to meet the obligations of the United States under any treaty, international agreement or similar arrangement, including military agreements relating to weapons.100

b. March-in rights

§ 203 of Chapter 18 provides that, in addition to its retained license, a Federal agency under whose funding agreement a subject invention was made

> shall have the right . . . to require the contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor,

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93/ 35 U.S.C. § 210(c).
94/ Id.
95/ 35 U.S.C. § 202(c)(4).
96/ 35 U.S.C. § 203.
97/ 35 U.S.C. § 202(a).
98/ 35 U.S.C. § 201(d)-(e).
99/ 35 USC. § 202(c)(4).
100/ Id.

assignee or exclusive licensee refuses such request, to grant such license itself, if the Federal agency determines that such --

(a) action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use[101];

(b) action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees;

(c) action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

(d) action is necessary because the agreement required by § 204[102] has not been obtained or waived or because the licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to § 204.[103]

A contractor, inventor, assignee or exclusive licensee adversely affected by an agency determination to exercise march-in rights pursuant to this provision may file a petition with the United States Claims Court, which has jurisdiction to modify or reverse an agency determination.[104]

c. Additional requirements

As noted above, a nonexclusive license and march-in rights are the *minimum* rights that may be retained by a Federal agency pursuant to Chapter 18. The Chapter prescribes numerous additional requirements that must be met in funding agreements with nonprofits and small business firms, and which may be imposed in funding agreements with other entities. These include: invention disclosure procedures[105] time limits with respect to the election to retain title to a subject invention[106]; periodic reporting on the utilization of rights to retained inventions[107]; limitations on a nonprofit organization's power to assign rights to an invention without agency approval? and

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101/ 35 U.S.C. § 201 (f) defines the term "practical application" as the manufacture or practice of an invention "under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms."

102/ 35 U.S.C. § 204 provides that, with limited exceptions, a contractor may not grant an exclusive license to use or sell a subject invention within the United States unless the exclusive licensee agrees that any products embodying the invention will be manufactured substantially within the United States.

103/ 35 U.S.C. §203(a).

104/ 35 U.S.C. § 203(2).

105/ 35 U.S.C. § 202(c)(l).

106/ 35 U.S.C. § 202(c)(2).

107/ 35 U.S.C. § 202(c)(5).

108/ 35 U.S.C. § 202(c)(7).

restrictions on the power to license inventions to non-US. manufacturers.109 Failure to comply with these requirements can result in the funding agency obtaining title to subject inventions.110

Finally, Chapter 18 permits a Federal agency to prohibit a contractor from retaining title to an invention made under a funding agreement upon making an appropriate determination, including in "exceptional circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter."111

d. Implementing regulations

The regulations implementing Chapter 18 provide additional guidance on the application of the requirements described above.112 In particular, the regulations explore the right of research organizations to accept funds from a non-federal source to "supplement" federal funding and to expedite the research objectives of the government-sponsored project. While noting that "traditionally there have been no conditions imposed by the government on research performers while using private facilities which would preclude them from accepting research funding from other sources," the regulations conclude "it is clear that the ownership provisions of these regulations would remain applicable in any invention 'conceived or first actually reduced to practice in performance of the [government sponsored] project.'"113 Moreover, in such a situation, "separate accounting for the two funds used to support the project in this case is not a determining factor."114

Notwithstanding this, the regulations provide that an invention will not be subject to the ownership provisions of the regulations if it is made in the performance of a "non-government sponsored project" which "although closely related, falls outside the planned and committed activities of a government-funded project and does not diminish or distract from the performance of such activities."115 Moreover, the regulation states that the "time relationship" between the two projects and "the use of new fundamental knowledge from one in the performance of the other are not important determinants" in deciding whether an invention was made "in the performance of the federally-supported project".'116

109/ 35 U.S.C. § 204. This requirement may be waived by the Federal agency if the entity retaining title to the invention can demonstrate that reasonable but unsuccessful efforts have been made to grant licenses to entities likely to manufacture substantially in the United States or that domestic manufacture of the invention is not commercially feasible.

110/ 35 U.S.C.. § 202(c)(2)-(3).

111/ 35 U.S.C. §202(a)(ii). The exercise of this power is contingent upon the preparation of an analysis justifying the determination, and is subject to review by the Secretary of Commerce. 35 U.S.C. § 202(b)(l).

112/ 37 C.F.R. Part 401 ("Rights to Inventions Made by Non-Profit Organizations and Small Business Firms Under Government Grants, Contracts, and Cooperative Agreements").

113/ 37 C.F.R. § 401.1(a).

114/ Id.

115/ 37 C.F.R§ 401.1(a)(l).

116/ Id.

The regulations include a standard patent rights clause and variations to be included in funding agreements awarded to a small business firm or non-profit organization.[117] These clauses address each of the requirements set forth in Chapter 18, including: the relevant definitions; the agency's retention of a nonexclusive license; invention disclosure requirements; conditions under which the government may retain title; utilization reporting requirements; and the reservation of march-in rights.[118]

The standard patent rights clause provides that the contractor shall include the clause in all subcontracts, regardless of tier, for experimental, developmental or research work to be performed by a small business firm or domestic non-profit organization. However, the regulations provide that in grants and cooperative agreements (and in contracts, if not inconsistent with the Federal Acquisition Regulation) an agency may apply the standard clause to *all* subcontractors.[119]

2. Patent rights under the Federal Acquisition Regulation (FAR)

Except where otherwise provided by law or regulation, the Federal Acquisition Regulation sets forth policies and procedures for acquisition by all executive agencies of the federal government.[120] An "acquisition" is the acquiring by contract with appropriated funds of supplies or services by and for the use of the federal government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, and evaluated.[121] The term "contract" does not include grants or cooperative agreements.[122]

The patent rights provisions of the FAR are based on Chapter 18 and the Patent Policy.[123] Subpart 27.3 of the FAR contains the regulations applicable to inventions made in the performance of work under government contracts or subcontracts for the conduct of experimental, developmental or research work.[124] The regulations incorporate the definitions of "invention" and "subject invention" used in Chapter 18.[125] Subpart 27.3 also provides that all federal contractors, regardless of size, should be permitted to retain title to inventions made in whole or in part with federal funds in exchange for the retention by the government of a nonexclusive license to practice the invention and the reservation of march-in rights.[126]

117/ *37* C.F.R. § 401.3(a).
118/ *37* C. F.R. §404.14(a).
119/ *37* C.F.R. § 401.5(a).
120/ 48 C.F.R. § 1 .101 et seq. The Department of Transportation's procurement regulations incorporate the FAR's patents, data and copyrights provisions by reference. 48 C.F.R. Patt 1227.
121/ *Id.* § 2.101. The patents rights and data rights provisions at 48 C.F.R. Part 27 apply to research and development contracts subject to 48 C.F.R. Part 35. 48 C.F.R. §§ 35.011-12
122/ *id.* § 2.101.
123/ *48* C.F.R. § 27.302.
124/ *48* C.F.R. § 27.300.
125/ *48* C.F.R. § 27.301.
126/ *48* C.F.R. § 27.302.

The subpart specifies the conditions under which the FAR's standard and alternative patent rights clauses should be used in contracts for experimental, developmental or research work.[127] In particular, it calls for the standard clause at 48 C.F.R. § 52.227-l 1 when the contractor is a small business concern or nonprofit organization, and the clause at 48 C.F.R. § 52.227-12 when the contractor is other than a small business firm or non-profit organization.[128]

3. The standard patents rights clause

There is a significant body of case law interpreting the scope and effect of the standard patent rights clause in government contracts. While the vast majority of these cases discuss inventions developed under military research and procurement contracts, judicial interpretations of several fundamental terms in the standard clause are relevant to the discussion at hand?[129]

a. "Subject invention"

The starting point in any analysis of the standard patent rights clause is the definition of the term "subject invention." Inasmuch as the restrictions that may be imposed by the government on a private party's rights in an invention will extend only to "subject inventions" developed in the course of a contract, the magnitude of the potential constraints arising under Federal law depend in large part on the scope of this term. It has been held that the scope of the term in any given case "should be approached liberally by asking what the United States (acting for its taxpayers) can fairly be said to have purchased through its sponsorship of the contract project."[130]

The term "subject invention" encompasses any invention of the contractor that is either "conceived or first actually reduced to practice in the performance of work under a funding agreement."[131] The phrase "conceived or first actually reduced to practice" is derived from the patent priority rule set forth at 35 U.S.C. §102(g). The basic rule of priority is that the first person to actually or constructively reduce an invention to practice is the first inventor. However, the first person to conceive the invention will be considered the first inventor if he or she exercises reasonable diligence in reducing the invention to practice from a time just prior to when the first person to reduce to practice enters the field.[132]

b. "Conception"

The term "conception" refers to the mental formulation of a patentable invention. The idea must indicate a specific means, not just a desirable end or result, and must be sufficiently complete so as to enable a person of ordinary skill in the relevant art to

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127/ 48 C.F.R. § 27.303.

128/ 48 C.F.R. § 27.303(a)(1) (b)(l).

129/ Military procurement contracting is also subject to a separate set of regulations known as Defense Acquisition Regulation Supplement or "DFARS" at 48 C.F.R. Part 201 et seq.

130/ *Technitrol, Inc. v. United States, 440* F.2d 1362, 1372 (Ct. Cl. 1971).

131/ 35 U.S.C. § 201.

132/ 3 D. Chisum, § 10.03[1].

reduce the concept to practice.133 Thus, "conception" encompasses both the underlying idea of the invention and an operative method of making it.134 The Federal Circuit has described the conception of a patentable invention as "the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice."135

Evidence relating to the time of "conception" can be critical in determining the rights retained by the government under the standard patent rights clause. An inventor submitting proposals during the term of a government contract which revealed all the essential attributes to enable it to be reduced to practice was found to have "conceived" of the invention during the contract.136 This finding was made notwithstanding the fact that the work which actually reduced the invention to practice occurred after the initial contract had expired.137

The subsequent modification or improvement of an invention first conceived in the course of a government contract may also be considered a "subject invention" under that contract. In Filmtec Corporation v. Hydranautics138 the court addressed the government's right to an invention developed pursuant to a research contract issued under the Federal Non-Nuclear Energy, Research, and Development Act of 1974.139 The court found that the invention in question had been "conceived" in the course of the government contract, notwithstanding the fact that the device actually reduced to" practice under the contract had failed to perform to the standards stated in the patent application.140 The court found that the failure to meet these standards was not conclusive, and that while subsequent refinements completed outside the scope of the government contract may have improved the performance of the device, the underlying "invention" remained the same.141 This principle does not appear to extend to what one court called "post-contract developments which are new and not obvious." Thus, the government had no rights to an automatic reset feature conceived after the termination of a government-funded research project but incorporated into an invention conceived in the course of that contract.142

133/ 3 D. Chisum, § 10.04.

134/ *Amgen Inc. v. Chugai Pharmaceutical Co., 927* F.2d 1200, 1206 (Fed. Cir. 1991), cert. *denied,* _____ *U.S.* _____, 112 S.Ct. 1691, 116 L.Ed.2d 132 (1991).

135/ *Id.* at 1551, *citing, Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802* F.2d 1367, 1376 (Fed. Cir. 1986).

136/ *Area Them Company,* ASBCA No. 25607,82-2 BCA no. 18,166 (1985).

137/ *Id.*

138/ *982* F.2d 1546 (Fed Cir. 1992).

139/ The provisions of that Act and the contract issued pursuant to it are broader than the standard patent rights clause in that they explicitly grant the government all right, title and interest in inventions conceived or first actually reduced to practice under the course of the contract. *Id.* at 1548.

140/ *Id.* at 1552.

141/ *Id.* at 1553.

142/ *Technitrol, 440* F.2d. at 1375.

C. "First actually reduced to practice"

Actual reduction to practice occurs when an inventor constructs a product or performs a process that is within the scope of the patent claims and demonstrates the capacity of the inventive idea to achieve its intended purpose.143 Generally, an inventor must construct an embodiment of the invention and adequately test the device in order to establish that it meets its intended purpose.144

The extent of testing required to demonstrate "actual reduction to practice" has been widely litigated and may have particular significance for developers of IVHS technologies. It has been held that the first test of a invention that demonstrates its workability "beyond the probability of a failure" will constitute first actual reduction to practice.145 If this first test occurs in the course of a government-funded research project, the invention will be deemed a "subject invention."146 While it has been found that successful tests under "actual working conditions" is not an absolute requirement for demonstrating reduction to practice, laboratory or "bench tests" must adequately simulate actual conditions in order to meet the standard.147 However, as the cases described below reveal, these distinctions can be extremely subtle.

The nature and extent of the testing required to demonstrate actual reduction to practice was explored in Farrand Optical Company v. United States,148 Prior to entry into a contract with the government for the fabrication of an experimental hemisphere gun sight for an airplane, the patentee created a "brown box mock-up" of the optical invention that formed the basis of the device. 149 Although the mock-up could not be used as a gun sight, the court found that it did "embody the optical principle set forth in" the patent claims for the device. 150 The court found that the patentee's failure to test the device "under actual conditions" prior to entry into the contract was not determinative. Rather, "the essential inquiry here is whether the advance in the art represented in the invention . . . was embodied in a workable device that demonstrated it can do what it was claimed to be capable of doing."151 The court distinguished the so-called "airplane cases," which generally held that a device must be tested under actual flight conditions, finding "[t]he 'test under actual conditions' rule cannot be an absolute requirement . . . resolution of the question must depend on the particular facts of each case . . . ."152

143/ 3 D. Chisum, § 10.06.

144/ *Id., §* 10.06[2][a].

145/ *General Electric Co., v. United States, 654* F.2d 55, 60 (Ct. Cl. 1981); *Eastern Rotorcraft Corp. v. United States, 364* F.2d 429,431 (Ct. Cl. 1967).

146/ *McDonnell* Douglas *Cop, v. United States, 670* F.2d 156, 163. (Ct. Cl. 1982)

147/ *Technical Development Corp. v. United States, 202* Ct. Cl. 237, 308-l 0, (1973), cert. *denied,* 416 U.S. 983,94 S.Ct. 2384,40 L.Ed.2d 759 (1974).

148/ 325 F.2d 328 (2d Cir. 1964).

149/ *Id.* at 330-331.

150/ *Id.*

151/ *id.* at 333.

152/ *id.*

The facts considered by the courts include the availability and feasibility of alternative testing procedures. In Bendix Corporation v. United States[153] a jet aircraft fuel flow regulator was developed and successfully "bench tested" in the laboratory **prior** to plaintiff's entry into a government contract to supply the device for flight testing.[154] The government claimed that the installation and successful testing of the device in flight on a United States jet constituted the "first actual reduction to practice" because it was the only test capable of demonstrating the workability of the device.[155] In ruling against the government the court held that the "practicality of the situation must be assessed and a determination made as to whether, under the circumstances, the tests conducted were sufficiently comprehensive to demonstrate the workability of the device."[156] The court noted that at the time the contract was made the government owned all jet engines. Thus, "the only available options to private industry were to conduct bench tests, which [the inventor] did, and to use the device on a stationery gas turbine, which [the inventor] also did."[157]

The extent of testing required to demonstrate reduction to practice depends in part on the complexity of the invention. In Eastern Rotorcraft Corporation v. United States[158] the device in question was a relatively simple flexible-cable net used to secure odd-shaped cargo loads in airplanes. Although the inventor had tested the device by "securing" a small load of cargo on a wooden palette placed on the ground, the government claimed that the device was first reduced to practice after the inventor had produced (under government contract) six nets that were used with airplane cargo in flight.[159] In finding for the inventor the court focused in part on the simplicity of the device and the obviousness of its efficacy: ". . . the inquiry is not what kind of test was conducted, but whether the test conducted showed that the invention would work as intended in its contemplated use."[160]

In the case of complex inventions, the court will perform a more searching review of the evidence purporting to demonstrate reduction to practice, including the analysis of data from tests performed on the device prior to entry into a government contract.[161] In Hazeltine Corporation v. United States[162] the government claimed a license to use a patented open array antenna system incorporated into the Federal Aviation Administration's air traffic control beacon system.[163] The evidence indicated that the patentee had built and tested a model of the device prior to entering into a contract to deliver completed systems to the government. The evidence also indicated that, based on the test results, the patentee's engineers were confident that the device

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153/ *600* F.2d 1364 (Ct.Cl. 1979).
154/ *Id.* at 1370.
155/ *Id.*
156/ *Id.* at 1370.
157/ *Id.* at 1371.
158/ 349 F.2d 429 (Ct. Cl. 1967).
159/ *Id.* at 430-431.
160/ *Id.* at 431, citing, Elmore v. Schmitt, 278 F.2d 510 (CCPA 1960); Gaiser v. *Linder 253* F.2d 433 (CCPA 1958).
161/ *Technical Development Corporation v. United States, 597* F.2d 733, 747(CtCI. 1979).
162/ *820* F.2d 1190 (Fed. Cir. 1987).
163/ *Id.* at 1191.

would work under actual conditions.[164] Notwithstanding this, the court found that the patentee had failed to establish an adequate factual basis to support a conclusion that the initial tests had demonstrated the workability of the device prior to entering into the contract.[165] The court rejected the patentee's claim that changes made to the device after execution of the contract were mere "perfecting modifications," and found that the beliefs of patentee's engineers were not relevant in determining reduction to practice.

In McDonnell Douglas Corporation v. United States[166] the court addressed whether reduction to practice could be demonstrated by computer simulation. While the court found it unnecessary to answer the question in its most general form, it rejected a government contractor's claim that a computer simulation of a device performed prior to entry into a government contract constituted an adequate test. Subsequent physical tests of the device -- performed under the contract -- revealed "significant design flaws" in the device which made it incapable of meeting the essential elements of the patent claims at issue.[167]

It has been held that the filing of a patent application disclosing an invention constitutes "constructive reduction to practice" of the invention and may be considered *prima facie* evidence of "first actual reduction to practice" in the context of a government contract.[168] In order to secure the date of filing as the date of constructive reduction to practice the applicant must maintain a "continuity of prosecution" in the application.[169] An abandoned application does not constitute a constructive reduction to practice, although it may constitute evidence as to the time of conception.[170]

d. "In the performance of work under"

An invention will only be a "subject invention" if it is conceived or first actually reduced to practice "in the performance of work under" a funding agreement or other contract. In addition to inquiring *when* an invention was made the court will examine the larger relationship between the invention and the research or development work underlying the invention. The factors considered by the court include the intentions of the parties (as revealed by both intrinsic and extrinsic evidence), the nature and scope of work described in any agreement with the government, the source of funds used to support work on the invention, the personnel performing work on the project, and the physical proximity of independent research projects.

The most common test applied in determining whether an invention can be said to arise "under" a Federal research contract was set forth in Mine Safety Appliances Company v. United States,[171] which involved the rights to a crash helmet developed by researchers at the University of Southern California while the University engaged in

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164/ *Id.* at 1191-92.
165/ *Id.* at 1196.
166/ 670 F.2d 156 (Ct.Cl. 1982).
167/ *Id.* at 161.
168/ *Hazeltine Corporation v. United States, 820* F.2d at 1196, *citing In re Katz, 687* F.2d 450, *454* (CCPA *1982); Pacific Technica Corp. v. United States,* 11 Ct.Cl. 393,428 (1986).
169/ 3 D. Chisum, 10.05[4].
170/ *Id.*
171/ 364 F.2d 385 (Ct. Cl. 1966).

a contract with the Navy to research the "physiological, biochemical and anatomical affects of acceleration on the body relative to pilot position in high-speed aircraft"172 The University contended that the crash helmet had been developed under an independent, non-government-financed research program that had been purposely segregated from the Navy project.

The court cited several bases for its ruling in support of the government, including: (1) evidence revealing the intentions of the parties (including a statement in the University's research proposal to the Navy indicating that "the development of methods to protect humans against very high accelerations" would be addressed and post-contract correspondence between the University and the Navy indicating that the Navy believed the crash helmet research project was part of the Navy program173; (2) the fact that one co-inventor of the helmet was paid almost entirely from Navy research funds and was assigned full time to Navy research at the time the invention was made174; and (3) the fact that the helmet project was carried on in close physical proximity to Navy research project.175

The court found that the Navy project and the University's helmet project "could not, by their nature, be kept separate," notwithstanding the fact that the University had paid for tests of the helmet with non-government funds and that the University treated the helmet project as independent of the Navy contract."176 Rather, the court found that "there was a close and umbilical connection" between the two projects "which was not, and could not be severed."177 In particular, the court noted that the co-inventors relied heavily on information and knowledge derived from the Navy research, concluding that "without these contract-covered inquiries [into the anatomical effects of acceleration], the final invention would not have been made."178

The "close and umbilical connection" test has been further refined and clarified by the courts since Mine Safety. In Rel-Reeves, Inc. v. United States179, the court refused to grant the Navy a license in a computerized "problem check device" used in guided missile systems that had been developed by a company engaged in a series of research projects for the Navy. While there was evidence that the contractor had proposed to develop a problem check device under an earlier contract, the court noted that the scope of work for the contract in force at the time the invention was made no longer called for the contractor to address the accuracy of test results through a "problem check."180 In addition, the court found no evidence that the inventor of the device performed any work under the Navy contract in question or was paid with Navy funds.181 The court indicated that the "close and umbilical connection" test is not infinitely elastic, holding that a government agency must do more than "broadly allude"

172/ *Id.* at 388.
173/ *Id.* at 389-390.
174/ *id.* at 388.
175/ *Id.* at 389-390.
176/ *Id.* at 391.
177/ *Id.*
178/ *Id.*
179/ *534* F.2d 274 (Ct:Cl. 1976).
180/ *Id.* at 288.
181/ *Id.* at 293.

to purported connections and contacts between an invention and a government-funded project in order to retain a license in the invention.182

Similarly, in Lockheed Aircraft Corporation v. United States183 the court found insufficient evidence to support the government's claim to a license in an airborne radar system that the patentee claimed to have developed outside the scope of work performed under a Navy contract. In reaching its decision the court paid particular attention to extrinsic evidence revealing the parties' intentions at the time of the entering the contract, including correspondence and statements acknowledging the prior existence of the invention.184

The cases indicate that a "close and umbilical relationship" between an invention and a government-funded project is more likely to be found when the purpose of the project is to advance knowledge in fundamental categories of research. Technitrol. Inc. v. United States185 involved a patent disclosing a magnetic data storage device for computers. The invention arose during the performance of an Army contract with the University of Pennsylvania for research into computer systems.186 The work statement in the research contract was somewhat broad, due in part to the fact that, at the time the contract was granted, there was insufficient knowledge of computer systems to specifically identify the nature and scope of the research required.187 After examining the record the court concluded that the conception of all but one feature of the invention occurred in the performance of the EDVAC contract because all the essential elements of the invention had "crystallized" in the minds of the inventors in the course of their work under the contract.188 The court held that where the research to be conducted under a contract is not limited to the production of a specific machine or machines, the government's rights are not limited to rights in any particular device but rather it is "entitled to the crystallized ideas, improvements and inventions emerging from that process of ongoing study, inquiry and creation." 189

4. Analysis of potential constraints related to patents

Federal patent policy with respect to inventions arising under government-funded research and development, operational testing and procurement agreements will constrain the IVHS program to the extent that it dissuades private entities from participating in jointly-funded or cooperative IVHS projects. While patent licensing agreements between or among private, technology-based companies are common, even the minimum rights retained by the government under the standard patent rights clause may be perceived by private parties as a potential threat to the profitable exploitation of intellectual property rights. This perception may lead private parties to avoid unnecessary "entanglements" with government entities that may "taint" these rights.

182/ *Id.* at 291.
183/ 553 F.2d 69 (CtCl. 1977).
184/ *Id.* at 89-90.
185/ 440 F.2d 1362 (Ct. Cl. 1971).
186/ *Id.* at 1364.
187/ *id.* at 1366.
188/ *Id.* at 1370.
189/ *id.* at p. 1373, *accord, Technical Development Corporation, 597 F.2d at 746.*

Despite this perception, it appears that current Federal patent policy can accommodate the reasonable expectations of most private participants in government-funded IVHS projects. First and foremost, it must be stressed that, in general, Federal policy promotes the retention of ownership rights by private inventors working under government funding agreements. While an inventor may lose title to the government through inadvertence or neglect (e.g., the failure to timely disclose inventions or file patent applications), these consequences are best understood as extensions of long-standing background principles of patent law which encourage the thorough and timely disclosure of a new invention in exchange for a limited "monopoly" on the practice of the invention.

Moreover, notwithstanding the perceived severity of certain of the conditions and restrictions imposed under the standard patent rights clause, the discussion set forth above clearly indicates that, where appropriate, a private participant in a Federally-funded IVHS project can take affirmative steps to avoid the unintended application of these conditions and restrictions to pre-existing, independently-developed technology. These steps include:

a. Implementing an aggressive patent protection program

As discussed above, the standard patent rights clause applies only to "subject inventions" that are "conceived" or "first actually reduced to practice" in the course of a government-funded project. An aggressive in-house program that thoroughly documents the "conception" and "reduction to practice" of a company's inventions will help to prevent the inadvertent attribution of a pre-existing invention to a government-funded project.

A patent protection program should include, to the extent possible, documentation of testing under "actual conditions."[190] Moreover, wherever practical and consistent with other business objectives, a company should file patent applications for any pre-existing inventions that may be used in or tested under a government-funded project before entering into the project. The date of a filing that ripens into a patent will be considered the presumptive date of "reduction to practice" for purpose of determining "subject inventions" under the standard patent rights clause.[191]

190/ While it can be argued that certain IVHS technologies cannot be considered "workable" (and thus, reduced to practice) until they have been tested in a "live" regional transportation system, the courts appear to recognize an exception to this rule when the only available means of performing such a test are entirely within the control of government, and the inventor has demonstrated the probable workability of the invention in appropriate "bench tests".

191/ Private parties that participate in government-funded IVHS projects may have sound business reasons for declining to file, at the eariiest possible time, patent applications for inventions that may be used or tested in such projects. In such cases, the private party may wish to take precautions to avoid triggering the Patent Act's one-year limitation on the "sale" or "public use" of an invention prior to filing. See *Hobbs v. United States Atomic Energy Commission, 451* F.2d 849 (5th Cir. 1971). It has been held that a "public use,, can occur even when the knowledge that a particular device is being used is limited to a single person, and that the pertinent issue in determining whether a public use has occurred is whether the inventor places any *restrictions* on the use of the device. *Piet v. United States,* 176 F.Supp. 576 (SD. Cal. 1959), *aff'd, 283* F. 2d 693 (9th Cir. 1960).

Finally, where-consistent with project purposes, the parties to a government-funded project may express/y except from the scope of the standard patent rights clause any invention that the parties agree has been "heretofore actually reduced to practice."192

b. Defining the scope of work to be performed under a government-funded project as narrowly as possible. consistent with project goals

The participants in a government-funded project can limit the kind of the inventions that may be considered "subject inventions" under the patent rights clause by narrowly defining the scope of "work to be performed under" a project agreement. Special care should be taken to exclude from the scope of work any of the company's ongoing, independent research activities that may be related to the subject matter of the government-funded project but which are funded from non-government sources.

To the extent possible, this narrow project definition should be used in all materials relating to the project, including pre-contract proposals and post-contract correspondence and documentation. The courts have frequently relied on such "extrinsic" materials to interpret the parties' intentions with respect to any provisions in a scope of work or contract that may be deemed ambiguous.

c. Maintaining institutional "screens" between privately-funded and publicly-funded projects

A private company engaged in both government-funded and privately-funded IVHS projects can limit the reach of the patent rights clause by ensuring that the funding, personnel and other resources devoted to each project are segregated to the greatest extent practical.

d. Defining the scope of the retained license

Finally, with respect to inventions that properly fall within the scope of the term "subject invention," Federal policy encourages agencies to retain only a nonexclusive, nontransferable license to practice or have practiced any subject invention "for or on behalf of the United States." While this license expressly prohibits the government from transferring any rights in a subject invention to a private or public competitor of the inventor, the precise scope of the license is unclear. Moreover, neither the courts nor the relevant Federal administrative agencies have provided any meaningful guidance in this regard. Neither are the legislative histories of the statutes establishing the patent policy particularly helpful.

It could be argued that, given the broad mandate under the IVHS Act, a license to practice an invention "for or on behalf of the United States" would permit the Federal government to use an invention to provide certain IVHS services directly to the public. Although the IVHS program does presently call for the construction of large-scale, Federally-operated systems, this policy could change. For example, it is possible -- albeit unlikely -- that the government might choose to implement a Federally-controlled

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192/ *See Bendix v. United States, 600* F.2d at 1371-l 372.

ground-traffic control and information system patterned on the existing air traffic control system. Concern such as this could be addressed by expressly defining the term "for or on behalf of the United States" in statute, regulation, or where appropriate, in individual contracts under which a license will be retained by the government.

D. Potential constraints related to copyrights

1. Copyright in works produced under grants and cooperative agreements to state and local governments

DOT iegulations governing grants and cooperative agreements to state and local governments provide that DOT reserves

> a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for Federal Government purposes:
>
> (a) The copyright in any work developed under a grant, subgrant, or contract under a grant or subgrant ; and
>
> (b) Any rights of copyright to which a grantee, subgrantee or a contractor purchases ownership with grant support." 193

The regulations make no provision for the identification by the contractor of various "levels" of rights in technical data, as does the FAR. Rather, the scope of the Federal government's rights under this provision turn on the interpretation of the terms "developed under" and "purchase[d] . . . with grant support."

2. Copyrights under the FAR

Subpart 27.4 of the FAR sets forth Federal acquisition policy with respect to the rights retained by the government in data developed under Federal contracts (including data that is not eligible for copyright protection) and in copyrights for "works" produced under Federal contract. 194 This policy applies to all executive agencies, although the Department of Defense is exempt from certain specific provisions under the subpart.195 The Subpart notes that "the Government recognizes that its contractors may have a legitimate proprietary interest . . . in data resulting from private investment" and that " [p]rotection of such data from unauthorized use and disclosure is necessary in order to prevent the compromise of such property right or economic interest." 196 It further notes that the protection of contractors' rights in data is "necessary to

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193/ 49 C.F.R. §18.34.

194/ This policy extends to research and development contracts made pursuant to 48 C.F.R. § 35.011.

195/ 48 C.F.R. § 27.400(a).

196/ 48 C.F.R. § 27.402.

encourage qualified contractors to participate in government programs and apply innovative concepts to such programs.*197

Under Subpart 27.4 the term "data" encompasses all recorded information, including technical data, computer software programs, computer databases, and documentation relating thereto.198 Subpart 27.4 defines three basic levels of rights to data produced under government contract: "limited rights", "restricted rights" and "unlimited rights." Agencies may adopt either of two alternative definitions of "limited rights data." The broader definition includes any "data developed at private expense that embody trade secrets or are commercial or financial and confidential or privileged."199 The narrower definition excludes computer software.200 The Subpart defines "restricted computer software" as software (including minor modifications thereto) that is: (1) developed at private expense and is a trade secret: (2) is commercial or financial and confidential and privileged: or (3) is published and copyrighted.201 The term "unlimited rights" is defined as "the rights of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose, and to have or permit others to do so." 202

All Federal contracts that require data to be produced, furnished, acquired or specifically used in meeting contract performance requirements must contain terms that delineate the respective rights and obligations of the Government and contractor regarding the use, duplication and disclosure of such data.203 The Subpart states that, as a general rule, the basic rights in data clause and its five alternative clauses should be used for this purpose.204

The basic rights in data clause provides that, in general, the government acquires unlimited rights in data that is first produced in the performance of a contract.205 A contractor may, under certain conditions, claim a copyright in data first produced under the contract by obtaining the prior written approval of the agency's contracting officer.206 However, for computer software first produced in the performance of the contract the contractor agrees to grant to "the Government, and others acting in its behalf " a paid-up nonexclusive, irrevocable, worldwide license in the copyrighted software to reproduce, prepare derivative works, and perform publicly and display publicly "on behalf of the government."207

Contracting officers are authorized to modify the standard data rights clause (under specified conditions) by adopting one or more of the "Alternate" provisions at

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197/ *Id.*
198/ 48 C.F.R. § 27.401.
199/ *Id.*
200/ *Id.*
201/ *Id.*
202/ *id.*
203/ 48 C.F.R.27.403.
204/ *Id.*
205/ 48 C.F.R. § 52.227-14; 48 C.F.R. § 27.404(a).
206/ 48 C.F.R. § 52.227-l 4(c)(1)
207/ *id.*

48 C.F.R. § 52.227-14. Alternate II permits a contractor to affix a "limited rights notice" to data provided under the contract that meets the definition of "limited rights data." The limited rights notice states in pertinent part:

> These data may be reproduced and used by the government with the express limitation that they will not, without written permission of the contractor, be used for purposes of manufacture nor disclosed outside the Government; except that the Government may disclose these data outside the Government for the following purposes, if any, provided that the government makes such disclosure subject to prohibition against further use or disclosure: [list of permitted uses specified by the agency]"***

Alternate III permits the contractor to affix a "restricted rights notice" to any data meeting the definition of "restricted computer software." The restricted rights notice states that the software may only be used "with the computer or computers for which it was acquired" and for other limited, internal governmental uses.[209]

Agencies are also authorized to adopt alternatives to the standard data rights clause in contracts involving "cosponsored research and development."[210] In contracts in which the contractor's and Government's respective contributions to any work product "are not readily segregable" the agency may acquire "less than unlimited rights to any data developed and delivered under the contract."[211] Where the contributions of each party are readily segregable, the agency may treat data produced under the contract as "limited rights data" or "restricted computer software", or adopt other provisions consistent with the purposes of the contract.[212]

3. Analysis of ootential constraints related to copyrights

As noted above, the primary potential constraint on IVHS development relating to intellectual property is the perception among private entities engaged in IVHS research, development and implementation that cooperative funding arrangements involving the government will reduce or eliminate the value of the intellectual property rights to which the private party would otherwise be entitled. However, as with Federal patent policy, it appears that current policy with respect to copyrights and data rights can accommodate the reasonable expectations of private parties engaged in government-funded and jointly-funded IVHS projects.

In general, a private party may avoid losing rights to preexisting or independently-developed works eligible for copyright protection by taking the same precautions recommended above with respect to patents. With respect to projects funded under grants or cooperative agreements to state or local governments, the DOT reserves rights only those works that are actually "produced under" the funding arrangement or "purchased . . . with grant support." Thus, it appears that the relevant test for determining when the government is entitled to a license in a work is similar or

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208/ *48* C.F.R. § 52.227-14(g)(2)(a).
209/ *48* C.F.R. § 52.225-14(9)(3)(i).
210/ *48* C.F.R. 927.408.
211/ *Id.*
212/ *48* C.F.R. § 27.408(b).

identical to that used to determine whether an invention arises "in the performance of work under" a government contract. Given this, a private party seeking to avoid the improper allocation of pre-existing or independently-developed work should take the similar precautions as are taken to protect its patent rights, including: (1) registering copyrights in pre-existing works before participating in a government-funded project; (2) narrowly defining the scope of work to be performed under a government-funded project so as to exclude works prepared in course of related, non-government funded projects; and (3) segregating, to the extent practical, funding, personnel and resources engaged in related government-funded and non-government funded projects. Having taken these precautions to ensure that all such data can be shown to have been produced "at private expense," the producer will be entitled to identify the subject works as "limited rights data" or "restricted computer software" if the FAR's standard data rights clause is used in the agreement..

As to works "first produced in the performance of" Federally-supported cosponsored research and development projects the FAR gives Federal agencies greater flexibility to allocate rights in data and copyrights in a manner that is broadly consistent with project goals. Thus, it appears that, in appropriate circumstances, the DOT may agree to receive less than unlimited rights in software that is produced in the course of a research project that receives substantial Federal support. Finally, as with patent rights, it must be noted that the license reserved by the government in anything other than "unlimited rights data" is restrictive. The license obtained under 49 C.F.R. § 18.33 is expressly limited to use for "Federal Government purposes." Data subject to a limited rights notice may not be used or disclosed for any purpose "outside the Government," except as the contractor submitting the data may otherwise agree in advance. The government's license to "restricted computer software" is only somewhat broader than a standard commercial "shrink-wrap" software license.

Here again, the primary concern of private parties producing software or data subject to these licenses relates to the scope of Federal government's use. To the extent the license to any such work could be used by the Federal government to "crowd out" potential commercial sales of the work, private parties may be reluctant to enter into cooperative relationships which may result in such a license.

E. Potential constraints related to trade secrets

1. Federal law on non-disclosure of trade secrets

As noted above, the essence of a trade secret is that the information comprising the secret is not generally known and the holder has taken precautions to prevent its disclosure. Federal law protects the rights of contractors and others seeking to preserve trade secrets that may be revealed to the government in the course of a Federally-funded project by prohibiting the disclosure of such information.213

213/ Inventions or works that a creator or owner cannot (or does not wish to) patent or copyright may be protected as trade secrets. Generally, an invention or work loses its status as a "trade secret" when the mandatory public disclosures required by the Patent Act and the Copyright Act are made. It should be noted, however, that copyright

The Trade Secrets Act forbids Federal employees or agents from disclosing "in any manner or to any extent not authorized by law" any confidential information submitted to the government, including information that relates to "trade secrets, processes, operations, style of work, or apparatus." 214 Violation of the Trade Secrets Act is punishable by fine and imprisonment.215 The unauthorized disclosure of confidential information in violation of the Trade Secrets Act is an action "not in accordance with law" under the Administrative Procedures Act and may be enjoined.216 In addition, the Freedom of Information Act (FOIA) specifically excludes from a Federal agency's general obligation to make information public any "trade secrets and commercial or financial information obtained from a person and privileged and confidential." 217 It has been held that The Trade Secrets Act and trade secrets exemption under FOIA are "coextensive," and that a violation of one constitutes a violation of the other.218

In Dowty Decoto, Inc. v Department of the Navy219 the court found that the Trade Secrets Act prohibited the disclosure of confidential data and drawings provided by a subcontractor under a Navy procurement contract. Notwithstanding language in the subcontract that called for Decoto to "design, develop, manufacture, test and deliver all items as required," the court found that the government had obtained only "limited rights" in the data because the technology revealed in the data pre-dated the contract and had been "developed at a private expense." 220 The court noted that the test in such cases is "based on physical and economic reality, not [contract] language." 221 Thus, given evidence that Decoto had developed the technology to appoint of "workability" prior to receiving any funds under the subcontract, the Navy was not entitled to obtain more than "limited rights" to the data and drawings revealing the technology,222 Moreover, the cases indicate that the affixation of a "limited rights" legend is more than a mere formality. If a government agency challenges the contractor's use of a legend or notice restricting rights in data, the contractor must be prepared to present clear and convincing evidence that the notice is accurate and appropriate.223

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registration of computer software does not require that the entire source code associated with the work be submitted.

214/ 81 U.S.C Section 1905.

215/ *Id.*

216/ *Chrysler Corporation v. Brown,* 441 U.S. 281, 316-l 8, 99 S.Ct. 1705, 1724-26, 60 L.Ed.2d *208* (1979); *Conax Florida Corporation v. United States, 824* F.2d 1124, 1128 (D.C. Cir. 1987).

217/ *5* U.S.C. Section 552(b)(4).

218/ *AT&T information Systems, Inc. v General Services Administration, 627* F. Supp. 1396, 1401 (D.D.C 1986), *rev'd on other grounds,* 810 F.2d 1233 (D.C. Cir. 1987).

219/ *883* F.2d 774 (9th Cir. 1989).

220/ *Id.* at 779.

221; *Id..* at 778.

222/ *Id.* at 779.

223/ *Id.* at 1130.

2. Analysis of potential constraints related to trade secrets

While the disclosure of trade secret information to the Federal government will not, in itself, vitiate trade secret protection, the government may assert the right to disclose any information in which it claims a property right or license. For example, where the Federal government obtains "unlimited rights" to data produced and submitted pursuant to government contract, the Trade Secret Act does not prohibit the government from disclosing the data.[224] In order to avoid this eventuality, a private participant in a Federally-funded IVHS project should take steps to document the status of any pre-existing or independently-developed trade secrets prior to entering into the project.

F. Potential constraints under state law

As noted above, intellectual property rights may be held and transferred as property. It follows that a state's powers with respect to these rights derives from its inherent power to acquire, administer and dispose of property in the course of transacting state business. Although it does not appear that any state has adopted a statutory or regulatory scheme comparable to the Federal government's respecting the treatment of intellectual property rights under state contracts, the states have the power to do so.

At present, most state statutes that address intellectual property rights held by public agencies are relatively narrow in scope. Many states explicitly grant state-run institutions of higher learning the right to acquire, exploit and retain income from intellectual property rights pursuant to the policies adopted by each institution.225 In a different vein, several states have granted individual quasi-governmental state agencies (such as "economic development corporations") broad powers to obtain and exploit intellectual property rights.[226] A number of state have placed the power to secure and exploit state-owned intellectual property in specific state agencies.227 Finally, a few states expressly recognize that state and local agencies have the power to secure intellectual property rights in computer software.228

The lack of express legal authority in most states governing the disposition of intellectual property rights arising under state contracts may be interpreted as implying that most states retain the discretion to cede all such rights to a private contractor. Nevertheless, it must be noted that such an approach may afoul of general state statutory or constitutional prohibitions on wasting state property or making "gifts" of

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224/ Conax Florida Corporation v. United States, 824 F.2d 1124, 1128 (D.C. Cir. 1987).

225 / See, e.g., III. Ann. Stat. ch. 30 §105/6d; N.D. Cent. Code § 47-28-01; Ohio Rev. Code Ann. § 3345.14; Tex. Ed. Code Ann. § 51.680.

226/ See, e.g., Haw. Rev. Stat. § 206M-34; Kan. Stat. Ann. §74-8104; Mass. Ann. Laws ch. 40k § 1.

227/ See, e.g., Fla. Stat. Ann. § 286.031; Mich. Stat. Ann. § 3.407(l).

228/ See, e.g., Haw. Rev. Stat. § 206M-34(c); Minn. Stat. Ann. §13.03(5).

public funds. Predictably, there is a divergence of opinion and approach among state courts in the few cases that have touched on this question.229

Given the paucity of state statutory or decisional law in this area, a private participant in an IVHS project must take care to examine the laws and policies of the individual states or state agencies that may be able to assert a claim to any intellectual property developed in the course of the project. In general, a private participant in an IVHS project should be prepared to negotiate intellectual property rights issues with state agency participants as with any private partner. Indeed, to the extent a trend in the law and policy with respect to intellectual property rights arising under state contracts can be discerned, it appears to favor a more aggressive and "businesslike" attitude among the states.

This attitude is typified by the State of Minnesota. While existing state statutes or regulations do not require the state or its agencies to retain title or licenses to intellectual property developed under state contracts, the state typically asks for such rights in the course of contract negotiations.230 If a contractor prefers to retain title to the intellectual property at issue it can generally negotiate a royalty arrangement, license agreement or comparable arrangement whereby the state receives fair compensation for its contributions toward the creation of such rights.231 The Attorney General of Minnesota intends to draft legislation that will further define the powers of state agencies to negotiate for intellectual property rights under state contracts and will incentivize these agencies by permitting them to retain some or all of the income derived from the exploitation of these rights.232

In IVHS-related research, development or procurement arrangements that require disclosure of trade secret information to state governmental authorities a private party submitting trade secret information may preserve the confidentiality of that information pursuant to statutory and common law provisions. At least 37 states have enacted some version of the Uniform Trade Secrets Act, which provides for injunctive relief and award of damages for unauthorized disclosure of trade secrets.233 Moreover, it appears that, in general, state "freedom of information" or "public records" acts governing public access to state and municipal government records exempt trade secret information from mandatory disclosure.234

229/ Compare *California School Employees Association v. Sunnyvale Elementary School District, 36* Cal.App.3d 46, 111 CalRptr. 433 (1973) [upholding research and development contract between state agency and private company in which private party retained all intellectual property nghts arising thereunder] and *S-P Drug Co., Inc. et al v. Smith, et al, 409* N.Y.S.2d 161,96 Misc.2d 305 (1978) [striking down agreement by a state agency granting a private company the exclusive right to distribute information gathered by the state as a "bargaining away of public property without proper compensation"].

230/ Telephone interview with Minnesota Assistant Attorney General Michael Norton (November 30, 1993).

231/ *Id..*

232/ *Id.*

233/ See, e.g. Cal. Civ. Code, §§ 3426 *et seq.*

234 / See, e.g., Cal. Gov. Code § 6254; Colo. Rev. Stat. § 24-72-204; Mich. Stat. Ann. §4.1801(13)(1)(g); Minn. Stat. § 13.37; N.Y. Pub. Off. Law § 87(2)(d); Wis. Stat. §19.36 . .

V. Conclusion: Balancing Public and Private Interests

Current Federal law and policy governing the allocation and protection of intellectual property rights arising in the course of federally-sponsored or co-sponsored IVHS research, development, testing and implementation appears to accommodate the reasonable expectations and interests of private participants in such projects and the public interest in retaining rights to information and technology developed at taxpayer's expense. As in any private commercial transaction among parties in which each contributes toward the accomplishment of a common goal, the allocation of intellectual property rights among the Federal government, state governments and private participants in such ventures reflects a compromise based on competing needs and interests.

As discussed above, current law and policy are flexible enough to permit private parties to participate in Federally-sponsored projects without giving up rights in pre-existing and independently-developed technology. Moreover, where new technology is developed partially or exclusively through public financing, current law and policy permit private developers to retain commercially valuable intellectual property rights. Given the complexity and scope of the IVHS program, it is difficult to determine whether any significant revisions to current law and policy would enhance prospects for fruitful public-private cooperation. Moreover, there is a need to preserve flexibility in the allocation of intellectual property rights to specific IVHS technologies. As the DOT's recent request for information relating to IVHS system architecture makes clear, certain information relating to IVHS must remain in the "public domain" in order to assure the compatibility and interoperability of disparate IVHS applications.

Nevertheless, there is little doubt that the relative complexity of current law and policy and the ambiguity inherent in certain of the principles embodied therein may constrain IVHS development to the extent it raises concerns in the minds of potential private developers who fear that the awesome power of the Federal government may be used to strip them of valuable rights. The most effective means to reduce this constraint are education and clarification. It is recommended that the DOT adopt regulations or guidelines which explicitly describe to potential private developers of IVHS technologies:

(1) The circumstances in which the Federal government will seek rights to specific technologies developed in whole or in part with Federal assistance;

(2) The steps a private contractor may take to prevent the improper attribution of pre-existing or independently-developed technology to federally-supported projects; and

(3) The range of uses to which the Federal government may put technology in which it retains any rights.

While such regulations should provide private participants a practical, concrete framework within which they may assess the likely scope and impact of Federal

government claims on intellectual property arising under a contract, they should not prevent the DOT from exercising a degree of discretion in individual cases. For example, regulations describing the scope of retained patent licenses might set forth several classes of license which may be employed in any given contract. These might range from narrow licenses limiting the government's right to use a particular invention to perform a specific governmental function in a specific geographic location, to broader licenses permitting the government to employ an invention for more general (or for unspecified) purposes.

It may be argued that both public and private interests would be better served by liberalizing current policy to permit private contractors to retain greater rights than would now be permitted. Such a change would certainly act as an incentive for private parties to seek Federal funding to develop new IVHS technologies and applications and this would, in turn, advance the broad public purposes set forth in the IVHS Act by stimulating the rapid development of useful technologies. It may be that any sacrifice the government makes with respect to its license or ownership rights would be offset by the advancement of these broad public purposes. At this time, however, it is not clear that a wholesale change in Federal policy would be productive.

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