Legal Issues Surrounding the Use of Digital Intellectual Property on Design and Construction Projects

DETAILS

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LEGAL ISSUES SURROUNDING THE USE OF DIGITAL INTELLECTUAL PROPERTY ON DESIGN AND CONSTRUCTION PROJECTS

This report was prepared under NCHRP Project 20-6, "Legal Problems Arising Out of Highway Programs," for which the Transportation Research Board is the agency coordinating the research. The report was prepared by Larry W. Thomas, The Thomas Law Firm, Washington, DC. James B. McDaniel, TRB Counsel for Legal Research Projects, was the principal investigator and content editor.

The Problem and Its Solution

State highway departments and transportation agencies have a continuing need to keep abreast of operating practices and legal elements of specific problems in highway law. This report continues NCHRP's practice of keeping departments up-to-date on laws that will affect their operations.

Applications

The development of building information models (BIM) on construction projects has increased over the past decade, and use of BIM on highways, bridges, and complex interchanges is on the rise. Some of the beneficial uses of BIM on transportation design and construction projects include acting as a repository for project information, comparing various scenarios, evaluating impacts of changes on budgets and schedules, visualizing complex geometry, considering environmental impacts of various design options, and more. The use of BIM and the sharing of the digital model also encourage the contracting parties (i.e., owner, designer, and contractors) to work together more collaboratively and to share and jointly use the model.

However, BIM usage has created new legal challenges that were not previously present in the paper-based design and construction process. The unique legal aspects of sharing digital information and apportioning the associated risks needs to be addressed to aid agencies as they expand the use of BIM.

The digest includes: 1) a discussion of legal questions concerning who owns the model; 2) identification of who should be allowed to update the model; 3) a discussion concerning when and to whom the model should be distributed; 4) identification of interoperability issues for software developers and identification of related legal issues; 5) identification of liability various participants have for changes to or errors in the model; 6) discussions of copyright protection, nondisclosure agreements, trade secrets, and public information disclosure laws; and 7) discussion of protection of digital intellectual property through the use of disclaimers, read-only files, and digital signatures.

The objective of this digest is to develop an understanding of the previously mentioned legal issues surrounding the use of BIM on transportation design and construction projects. The information in this digest should be useful to transportation engineers, attorneys, contract administrators, construction designers, construction contractors, construction managers, contract administrators, agency data personnel, and financial officers.

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

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LEGAL ISSUES SURROUNDING THE USE OF DIGITAL INTELLECTUAL PROPERTY ON DESIGN AND CONSTRUCTION PROJECTS

By Larry W. Thomas, The Thomas Law Firm, Washington, DC

I. INTRODUCTION

One form of digital intellectual property is building information modeling (BIM), a computer process for generating and managing building or construction data during the life cycle of a project.[1] BIM is also referred to as a virtual building model (VDM) or as virtual design and construction (VDC).[2] BIM permits transportation departments to have a repository of information for a project, compare "what-if" scenarios, evaluate the effect of changes on budgets and schedules, visualize complex geometry, and assess the environmental impact of various designs. Since 2007, the United States General Services Administration (GSA) has required that all major projects that receive design funding submit a spatial program BIM.[3] However, of 28 transportation departments responding to the survey conducted for the digest, only 9 departments stated that they are using BIM[4] with the other 19 agencies stating that they were not using BIM.[5] The digest, however, is relevant to agencies other than transportation departments that are using or considering using BIM for their construction projects.

BIM uses three-dimensional (3D), real-time, dynamic building modeling software to permit designers, construction firms, and owners to collaborate throughout the course of a project's development[6] and to "make changes with a certainty that all other affected components are adjusted accordingly."[7] It may be noted that four-dimensional (4D) modeling adds a time factor to the model by displaying how the design is progressing during the construction of the project.[8] As one source notes, 4D models may be used to strengthen or defend against claims for delay by showing *actual* versus *planned* events.[9] There are references in the digest also to computer-aided design/drafting (CADD). As explained by one authority, a major difference between BIM and CADD is that BIM "includes geometry and a plethora of building information while [CADD] includes only geometry."[10] "BIM utilization…has increased due to 1) BIM tools increasing productivity in design tasks; 2) the increasing number of private and government agencies that have instituted BIM requirements; 3) the pervasive use of computer analysis and simulations models; [and] 4) the benefits of BIM as [a] lifecycle management tool."[11]

BIM is part of an integrated project delivery (IPD) method that integrates "people, systems, business structures, and practices [and] that involves tight collaboration between the owner, the architect, and the general contractor."[12] BIM results in a digital database that may be shared by an architect or designer and collaborators or other authorized users on a project.[13] Digital technology, therefore, permits the creation of digital images of copyrightable works that may be distributed to and modified by others "on a massive

[1] Brad C. Parrot & Michael Bomba, *Integrated Project Delivery and Building Information Modeling: A New Breed of Contract*, PCI JOURNAL, Fall 2010, at 147.

[2] SIDNEY M. LEVY, PROJECT MANAGEMENT IN CONSTRUCTION 463 (6th ed. 2012).

[3] Benson T. Wheatley & Travis W. Brown, *An Introduction to Building Information Modeling*, 27 CONSTR. LAW. 33 (2007).

[4] California DOT (Caltrans); Delaware DOT (DelDOT); Florida DOT (FDOT); Michigan DOT (MDOT); Minnesota DOT (MnDOT); Missouri DOT (MoDOT); Pennsylvania DOT (PennDOT); Texas DOT (TxDOT); and Wisconsin DOT (WisDOT).

[5] Alabama DOT, Arkansas DOT, Connecticut DOT, Iowa DOT, Hawaii DOT, Kansas DOT, Louisiana DOT, Maryland DOT; Montana DOT, Nebraska DOT, New Jersey DOT, North Carolina DOT, Rhode Island DOT, South Carolina DOT, South Dakota DOT, Tennessee DOT, Utah DOT, Wyoming DOT.

[6] According to the National Institute of Building Sciences, BIM

> utilizes cutting edge digital technology to establish a computable representation of all the physical and functional characteristics of a facility and its related project/life-cycle information, and is intended to be a repository of information for the facility owner/operator to use and maintain throughout the life-cycle of a facility.

Quoted in Howard W. Ashcraft, *Building Information Modeling: A Framework for Collaboration*, 28 CONSTR. LAW. 1 (2008) (internal quotation marks omitted).

[7] LEVY, *supra* note 2, at 464.

[8] *Id*. at 467.

[9] *Id*. (emphasis in original).

[10] PIERRE FULLER, A SIMPLIFIED SOFTWARE ARCHITECTURE FOR SELF-UPDATING BUILDING INFORMATION MODELS (Massachusetts Institute of Technology 2009), available at: http://dspace.mit.edu/handle/1721.1/55155.

[11] *Id*.

[12] Christina Brunka, *The Drawing is Mine! The Challenges of Copyright Protection in the Architectural World*, U. ILL. J.L. TECH. & POL'Y 169, 171–72 (2011) (*citing* American Institute of Architects California Council, *A Working Definition, Integrated Project Delivery*, available at http://ipd-ca.net/images/Integrated%20Project%20Delivery%20Definition.pdf). *See also* Parrot, *supra* note 1, at 148.

[13] LEVY, *supra* note 2, at 464.

scale."[14] Because BIM is causing changes in project development, legal relationships, and contracts and procedures,[15] the digest addresses how transportation departments and their contracting documents and procedures are responding to the new technology.

Thus, Section II discusses the applicability of the copyright laws to building information modeling and concludes that BIM models based on an original designer's drawings are copyrightable works owned by the designer, unless otherwise modified by contract.

Section III discusses whether a transportation department or another designer may own the copyright to a model.

Section IV provides an overview of the types of contractual provisions and protocols that transportation departments may want to consider including as part of their bid and contracting documents for models for construction projects, including provisions regarding collaborators' responsibility for models, their access to models, and the ownership of a collaborator's contributions to a model.[16]

Section V discusses the protection of models and collaborators particularly in connection with the potential liability of collaborators for their changes to a model on which other collaborators have relied.

Section VI explains how some departments are protecting themselves from claims by collaborators and others by using disclaimers, as well as other means, when providing a model or the electronic data needed to prepare a model.

Section VII discusses the use of digital signatures with BIM, federal and state laws and regulations applicable to digital signatures, the differing levels of security and types of digital signatures, and current practice of transportation departments regarding the use of digital signatures.

Section VIII discusses interoperability issues that departments may encounter when using BIM and what departments are doing or may do to avoid or resolve them.

Section IX considers other issues that may limit copyright protection for a model, such as when an infringer either copies a model or copies an underlying model and infringes the owner's copyright by creating a derivative model. Section IX also discusses the various elements of models that may not be copyrightable.

Section X considers whether a model also constitutes a trade secret and whether a claim for misappropriation of a model as a trade secret is preempted by the Copyright Act.

Section XI reviews cases that have dealt with the issue of whether electronic information, such as a BIM model, is subject to disclosure under public information laws, and, if so, whether a public agency may require a requestor of information to sign an end-user agreement before a model is disclosed.

Finally, Section XII discusses the transportation departments' responses to a survey conducted for the digest to the extent that the departments' responses have not been discussed previously in the digest.

II. APPLICABILITY OF THE COPYRIGHT LAWS TO BUILDING INFORMATION MODELING

A. Models as Copyrightable Works

Intellectual property law consists of patent, trademark, copyright, unfair competition, and trade secret law.[17] Copyright law is the law that applies to the protection of digital intellectual property, because "virtual space consists mainly of text and images, and therefore, by its nature, makes copyright a powerful tool for determining ownership."[18] The copyright laws recognize three types of copyrighted works in which the copyright holder may claim rights: the Section 102(a) creative work, the Section 103 compilation, and the Section 103 derivative work.[19] The digest discusses creative works and derivative works in connection with BIM.

Only an author of an original "work" as defined in the Copyright Act is entitled to copyright protection.[20] As will be seen, for purposes of the digest, the terms "work" and "model" are interchangeable for purposes of copyrightability. Copyright law balances an author's interest in receiving the benefit of a work with the public's interest in having access to the work.[21] The copyright laws derive from the United States Constitution whereby Congress has the power to grant "Authors and Inventors the exclusive right to their respective Writings and Discoveries."[22] One does not have to be professionally licensed to be the author of an original work. Registration of a copyright is not required for an author to have a copyright in a work; "copyright automatically inheres in a work the moment it is 'created,' which is to say 'when it is fixed in a copy…for the first time.'"[23]

[14] Sheldon W. Halpern, *The Digital Threat to the Normative Role of Copyright Law*, 62 OHIO ST. L.J. 569 (2001).

[15] Howard W. Ashcraft, *New Paradigms for Design Professionals—New Issues for Construction Lawyers* (Feb. 2002), available at http://www.terrarrg.com/images/pdfs/NewParadigms.pdf., hereinafter cited as "New Paradigms."

[16] *See generally* James R. Sims III & Brett I. Miller, *A Blueprint for Understanding Copyright Ownership in Architectural Works*, 20 FRANCHISE L.J. 52, 57 (2000), hereinafter cited as "Sims & Miller."

[17] Daniel C. Miller, *Determining Ownership in Virtual Worlds: Copyright and License Agreements*, 22 REV. LITIG. 435, 438 (2003), hereinafter cited as "Daniel Miller."

[18] *Id*.

[19] L. Ray Patterson & Stanley F. Birch, Jr., *A Unified Theory of Copyright*, *Chapter 6: "Copyright and Fair Use"*, 46 HOUS. L. REV. 321, 332 (2009), hereinafter cited as "Patterson & Birch."

[20] MELVILLE B. NIMMER, 1 NIMMER ON COPYRIGHT § 1-103 and § 106[A].

[21] Miller, *supra* note 17, at 444.

[22] U.S. CONST. art. I, § 1, cl. 8.

[23] NIMMER, *supra* note 20, at vol. 2 § 7.16[A][1].

However, a copyright must be registered before bringing an action for infringement.[24]

Whether a designer, for example, may hold a copyright in a BIM model depends on the originality of the designer's model, as well as on whether the model is copyrightable under one of the classifications in Section 102(a).[25] Architectural plans and drawings are copyrightable as "pictorial, graphic, [or] sculptural works"[26] and receive copyright protection as both technical drawings and as architectural works.[27] Whether a design or model based thereon is copyrightable depends on the originality of the "the selection of [the] elements and in the coordination and arrangement of those elements into a design."[28] Also copyrightable are "audiovisual works."[29] Thus, a designer's original work, including a digital model thereof, is subject to the copyright laws, or as one commentator writes: "The creator of the original plans, not the creator of the BIM model…is entitled to the copyrights in the generated model."[30]

A computer program for digital information modeling is protected under the Copyright Act as a "literary work."[31] Because of an amendment in 1980 of the Copyright Act, a definition of a "computer program" is included in the definitional section of copyrightable subject matter.[32] A computer program is protected from unauthorized copying as a literary work if the program satisfies the originality and fixation requirements of the Copyright Act.[33] Expression in a computer program is copyrightable, but the actual processes or methods embodied in a program are not.[34] An audiovisual program and the computer program that implements it are separately copyrightable.[35] An infringer may copy the audiovisuals or the underlying computer program.[36] Thus, with respect to BIM, computer programs, audiovisual works, and models derived from architectural or

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[24] *Id*. § 7.16[B][1][a]. Also, "[o]nce the plaintiff produces a copyright certificate he establishes a *prima facie* case of validity of the copyright and the burden of production shifts to the defendant to introduce evidence of invalidity." Fred Riley Home Bldg. Corp. v. Cosgrove, 883 F. Supp. 1478, 1481 (D. Kan. 1985) (*citing* Original Appalachian Artworks, Inc. v. Toy Loft, Inc., 684 F.2d 821, 826 (11th Cir. 1982)).

[25] Raghu Seshadri, *Bridging the Digital Divide: How the Implied License Doctrine Could Narrow the Copynorm—Copyright Gap*, U.C.L.A. J. L. & TECH. 3, 14 (2007) (*citing* NIMMER ON COPYRIGHT § 13.01[A]). As one authority notes:

> It is clear that copyright protects an architect's plans from direct copying to make another set of plans, but whether protection extends to the use of copyrighted plans to build a structure is less clear. Courts are divided as to whether unauthorized use, as opposed to copying, of copyrighted plans violates the architect's copyright. Furthermore, copyright protects few, if any, elements of a completed structure. Currently, any person may construct an exact duplicate of a building as long as that person has not copied the copyrighted plans without the architect's permission.

Dawn M. Larsen, *The Effect of the Berne Implementation Act of 1988 on Copyright Protection for Architectural Structures*, U. ILL. L. REV. 151 (1990).

[26] Eales v. Environmental Lifestyles, Inc., 958 F.2d 876 (9th Cir. 1992).

[27] Thomas v. Artino, 723 F. Supp. 2d 822 (D. Md. 2010), (Pointing out that the work must be registered as both). *See* Harvester, Inc. v. Rule Joy Trammell + Rubio, LLC, 716 F. Supp. 2d 428, 436 (E.D. Va. 2010) (stating that architectural drawings receive copyright protection under both 17 U.S.C. § 102(a)(5) ("pictorial, graphic, and sculptural works") and § 102(a)(8) ("architectural works").

[28] David Shipley, *The Architectural Works Copyright Protection Act at Twenty: Has Full Protection Made a Difference?* 18 J. INTELL. PROP. L. 1, 23 (2010) (*quoting* Lindal Cedar Homes, Inc. v. Ireland, 2004 U.S. Dist. LEXIS 18878, at *6 (D. Or. 2004) (noting that the AWCPA did not affect protection of plans as pictorial, graphic, or sculptural works)).

[29] 17 U.S.C. § 102(a)(6) (2009).

[30] Brunka, *supra* note 12, at 184–85 (*discussing* Meshwerks, Inc. v. Toyota Motor Sales U.S.A., 528 F.3d 1258 (10th Cir. 2008), *cert. denied*, 2009 U.S. LEXIS 727 (U.S., Jan. 21, 2009) and stating that the "translation of a car into a three-dimensional mesh frame is a derivative work, which the creator of the model does not retain rights to." *Id*. at 184).

[31] 17 U.S.C. § 101; Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1249 (3d Cir. 1983). *Cert. dismissed,* 464 U.S. 1033.

[32] M. Kramer Manuf. Co. v. Andrews, 783 F.2d 421, 432 (4th Cir. 1986) (footnote omitted); NIMMER, *supra* note 20, at vol. 1 § 2.04 [C][3], at 2-51 (stating that "[i]t is…firmly established that computer programs qualify as [a] work of authorship" subject to copyright protection); Brignoli v. Balch Hardy and Scheinman, Inc., 645 F. Supp. 1201, 1204 (1986) (stating that "[t]he great weight of authority indicates that computer programs are entitled to protection under copyright law") (*citing* Videotronics, Inc. v. Bend Electronics, 564 F. Supp. 1471, 1477 (D. Nev. 1983); Williams Electronics, Inc. v. Artic Int'l, Inc., 685 F.2d 870, 875 (3d Cir. 1982); Apple Computer, Inc. v. Formula Int'l, Inc., 562 F. Supp. 775 (C.D. Cal. 1983), *aff'd*, 725 F.2d 521 (9th Cir. 1984)).

[33] Miller, *supra* note 17, at 435, 448. Apple Computer, Inc. v. Franklin Computer Corp. 714 F.2d 1240 (3d Cir. 1983).

[34] As one source notes, "[t]he creator of an original BIM model, *i.e.* the architect, maintains both the ownership rights of the file itself and the copyrights. With respect to the former right, when utilizing BIM on a construction project to maximize efficiency of the project, many parties collaborate using this three-dimensional building program, such as architects, engineers, and consultants." Brunka, *supra* note 12, at 174 (footnotes omitted). As for processes, as another writer observes, "*[p]atent law, not copyright law, provides the traditional mode of protection for utilitarian works such as processes. Processes implemented by computer programs are patentable.* The Patent and Trademark Office has issued a large number of patents claiming processes implemented by computer programs." Steven R. Englund, *Ideas, Process, or Protected Expression?: Determining the Scope of Copyright Protection of the Structure of Computer Programs*. 88 MICH. L REV. 866 (1990) at material accompanying notes 136–138 (footnotes omitted (emphasis supplied). *See also Annot*., *Copyright Protection of Computer Programs*, 180 A.L.R. FED. 1 (2002).

[35] *M. Kramer Manuf. Co.*, 783 F.2d 421, at 441 (citation omitted).

[36] *Id.* at 445. "Copying is ordinarily, due to the lack of direct evidence, established by proof that the defendant had access to the plaintiff's work and produced a work that is substantially similar to the plaintiff's work." *Id.* (citation omitted).

engineering plans or designs are separately copyrightable.[37]

A threshold issue concerns who owns a model created by the use of BIM as well as any models that are derived from an underlying model. The answer depends on the copyright laws and the contract for the project. Except in the circumstances discussed in the digest, under the copyright laws it is the creator of a model who has exclusive rights to the model, including the right to make derivative models.[38] Of interest to transportation departments is that for the most part the default rules established by the copyright laws may be altered by license or other agreement.

B. Whether the Government May Have a Copyright in Digital Intellectual Property

1. United States Government

Under Section 105 of the Copyright Act, copyright protection is not available for any work of the United States government. Federal agencies do not have copyright protection for any work created by the government;[39] for example, the decennial census is not copyrightable.[40] However, the government may hold copyrights that are transferred to the government (including by an assignment or a bequest)[41] or when the government commissions a work prepared by an independent contractor.[42]

2. State and Local Governments

Whether a state or local agency may copyright a work is a matter of state law.[43] The Copyright Act does not preclude a government employee's work from being copyrightable by the state or its subdivisions.[44] At least 28 states claim the right to copyright, "and state copyright claims are routinely made for some categories of state data…."[45] The majority rule appears to be that, unless prohibited by state law, state and local agencies may seek copyright protection for their works, which would include a BIM program or model, including one prepared by a state agency's staff.

III. THE TRANSPORTATION DEPARTMENT OR OTHER DESIGNER AS THE OWNER OF A MODEL

A. Designers of Models for Transportation Departments

The state transportation departments' responses to the survey varied, with some departments stating that the department's designer or project engineer creates a model for a project;[46] that the departments either created their own models or used consultants for that purpose;[47] or that an independent contractor or a consultant hired by the contractor serves as the designer.[48]

The Michigan Department of Transportation (DOT) stated that although BIM is used mostly on design-build projects,[49] the department's goal is to publish (pre-bid) models at the time of project advertisement.[50] The Missouri DOT reported that although "some Department designers have created their own models the models are not shared with contractors during the bidding phase. Contractors typically have developed their own models using the contract plans."[51] The department does not engage a consultant solely for the purpose of creating a model.[52] In Wisconsin, the DOT's projects currently are limited to Automated Machine Guidance

[37] Whelan Assocs., Inc. v. Jaslow Dental Lab., Inc., 797 F.2d 1222, 1234 (3d Cir. 1986) (*citing* H.R. REP. NO. 1476, 94th Cong., 2d Sess. 54, *reprinted in* 1976 U.S.C.C.A.N. 5659, 5667); *M. Kramer Manuf. Co.*, 783 F.2d at 435 n.12.

[38] Dwight A. Larson & Kate A. Golden, *Construction Law: Entering the Brave, New World: An Introduction to Contracting for Building Information Modeling*, 34 WM. MITCHELL L. REV. 75, 104 (2007), hereinafter cited as "Larson & Golden."

[39] 17 U.S.C. §§ 101, 105 (2009).

[40] Robert Gellman, *Twin Evils: Government Copyright and Copyright-Like Controls over Government Information*, 45 SYRACUSE L. REV. 999, 1003 (1995), hereinafter cited as "Gellman."

[41] 17 U.S.C. § 105.

[42] *See* Robert A. Gorman, *Copyright Law,* 52 (2d ed. 2006), available at http://www.fjc.gov/public/pdf.nsf/lookup/copyright.pdf/$file/copyright.pdf, at 60; Schnapper v. Foley, 667 F.2d 102 (D.C. Dir. 1981), *cert. denied*, 455 U.S. 948, 102 S. Ct. 1448, 71 L. Ed. 2d 661 (1982).

[43] County of Santa Clara v. Superior Court, 89 Cal. Rptr. 3d 374, 397 (2009) (citation omitted) (stating that some state laws "explicitly recognize the authority of public officials or agencies to copyright specific public records that they have created").

[44] County of Suffolk, New York v. First American Real Estate Solutions, 261 F.3d 179, 187 (2d Cir. 2001) (citations omitted).

[45] Gellman, *supra* note 40, at 1027 (footnote omitted).

[46] Caltrans Response; DelDOT Response (stating that the department creates a roadway model for a large majority of its construction projects); MDOT (stating that there have been a few pilot projects when the department provided a 3D model to the contractor); MnDOT Response (uses MnDOT staff).

[47] Caltrans Response. FDOT reports that it has more than 10 years of experience with the electronic delivery of CADD files and plans in digital format. FDOT also states that the projects that have utilized BIM to date when surfaces were modeled or extracted have been done by in-house staff and consultant staff but that consultants currently perform about 90 percent of FDOT's designs. MoDOT (stating that a model is developed by the internal design staff or by a consultant under contract for the design as a by-product of the roadway design process); PennDOT Response (PennDOT employees or consultants).

[48] MDOT Response (stating that in the future the department will provide models).

[49] *Id*.

[50] *Id*.

[51] MoDOT Response. Texas identified "[u]niversity research through interagency agreement, [and] design/engineering consultants more minimally…." TxDOT Response.

[52] MoDOT Response.

(AMG)[53] surface models for which an independent contractor is the sole developer and user. The project designer provides information if it is available to help with the development of a model.[54]

B. Transportation Departments' Copyright in a Model

Unless prohibited by state law, under the work-for-hire rule, state and local agencies may seek copyright protection for their works, for example, when prepared by their own staff.[55] However, a model created for a transportation department by an independent contractor belongs to the independent contractor unless there is an agreement designating the work as one for hire.

Only three transportation departments reported that they own the rights in models developed for their department's projects.[56] Only the Delaware DOT stated that it had registered a copyright in a model developed for a project. The other transportation departments using BIM responded that they had not registered a copyright.[57] As the Pennsylvania Department of Transportation (PennDOT) observed, a copyright registration is not required for a copyright to be valid.[58] The position of the other departments responding to the survey is that the department owns any data or models developed for a project.[59]

Five departments said that they neither own the copyright nor otherwise own the rights in models developed for their departments' projects.[60] Caltrans' position is that models created by a contractor or a consultant are owned by the contractor or consultant.[61] In Missouri, the DOT "consider[s] the model to be additional information provided for the use of the contractor and not a legal document as part of the bid process."[62]

C. Identification of the Owner of a Model in the Contract Documents

1. The Developer of a Model as the Owner

The contract documents should address who owns the copyright in a model developed for a project. Absent a contract to the contrary, it is the party who creates a BIM model who owns the copyright.[63] Because a model may be derived from an original model, the contract documents also should specify the party having "the legal rights to reproduce, use, make derivative works, distribute, and publicly display the models…."[64] (Models and derivative rights are discussed in more detail in Section IX.A of the digest.) The GSA maintains ownership rights in all data and deliverables provided to the organization.[65] In Maryland, a public agency's rights in technical data are covered by the agency's standard special conditions that are included in the agency's contract solicitation packages.[66]

When public funds are responsible for technological discoveries that are potentially copyrightable, a transportation department may want to utilize a disclaimer of interest or ownership or other agreement to be signed by the creator of a model so that any model or later contributions to it are owned by the department.[67]

2. Ownership of a Model Under the Work-for-Hire Rule

Under the work-for-hire provision of the Copyright Act, a copyright in a work prepared by an employee within the scope of his or her employment is owned by the employer.[68] The work-for-hire doctrine does not apply when a work is created by an independent contractor. The work belongs to the independent contractor

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[53] WisDOT Response. As discussed in "Automated Machine Guidance—An Emerging Technology Whose Time Has Come?"

> Automated Machine Guidance (AMG) incorporates the use of a three-dimensional computer models to move or place materials with greater precision. Operators receive information via GPS satellite transmitters to determine how much earth to remove or when the correct level of aggregates has been obtained. In other cases, the machine controls the materials moving via computer while the operator simply drives down the roadbed.

Available at http://docs.trb.org/prp/08-2948.pdf.

[54] *Id*.

[55] 17 U.S.C. § 201(b) ("In the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author for purposes of this title, and, unless the parties have expressly agreed otherwise in a written instrument signed by them, owns all of the rights comprised in the copyright.")

[56] FDOT, PennDOT, and TxDOT.

[57] Caltrans, FDOT, MDOT, MnDOT, MoDOT, PennDOT, TxDOT, and WisDOT.

[58] PennDOT Response.

[59] FDOT Response. FDOT stated that pursuant to its Plans Preparation Manual with respect to plans bearing FDOT's "embossment in the title block," the public owns any data paid for with taxpayer funds. FDOT's opinion is that the same principle is applicable to BIM models. FDOT states that to date "there has not been an issue with 'proprietary' data that has been delivered to the FDOT as part of an Electronic Delivery…." PennDOT Response; TxDOT Response (stating that the DOT owns the rights in any models developed for its projects).

[60] Caltrans, MDOT, MnDOT, MoDOT, and WisDOT.

[61] Caltrans Response.

[62] MoDOT Response.

[63] Larson & Golden, *supra* note 38.

[64] *Id*. at 104.

[65] Wheatley & Brown, *supra* note 3, at 34.

[66] SGP–7.04 Rights in Technical Data (provided by the Maryland Transit Administration).

[67] For example, by an independent designer, engineer, project manager, team, contractor, or subcontractor for a project. For the government to use copyrighted material the government must have the copyright owner's consent. 4 PATRY ON COPYRIGHT § 10:73.

[68] 17 U.S.C. § 201(b). *See* Raphael Winick, *Copyright Protection for Architecture after the Architectural Works Copyright Protection Act of 1990*, 41 DUKE L.J. 1598, 1641 (1992) (*quoting* 17 U.S.C. § 201(b)); Sims & Miller, *supra* note 16, at 54. A written agreement between an employer and an employee is not needed for the copyright to "vest" in the employer. John G. Danielson, Inc. v. Winchester-Conant Props., Inc., 186 F. Supp. 2d 1, 11 N 1 (D. Mass. 2002), *aff'd*, 322 F.3d 26 (1st Cir. 2003).

unless there is a signed agreement designating the work as one for hire.[69] Thus, in the absence of a written agreement providing to the contrary, an independent architect, consultant, designer, engineer, or planner developing a model usually holds the copyright in any plans or model derived from the plans for a project.[70]

The foregoing rule is not affected by an owner's involvement or participation in a project, such as by furnishing ideas, preliminary drawings, sketches, or specifications for a project or by having control of a project.[71] The owner's involvement does not make the owner an author or co-author of the plans or model for a project.[72] Moreover, in the absence of a contract, an owner of a project does not acquire a copyright in any plans or a model for a project simply because the owner paid for them.[73] Of course, a transportation department may provide as part of its contract that the department either owns or is a joint owner of the copyright in any model or derivative models created for a project.[74]

3. The Joint Authorship Rule

A party who is unable to claim a copyright in a work because of the work-for-hire rule "may turn to a theory of joint authorship."[75] Under the joint authorship rule, unless otherwise provided by contract, an owner's involvement simply by virtue of its ownership of or participation in a project does not render the owner a joint author. The issue of joint authorship is important because joint authors have an undivided, equal interest in a copyright regardless of the difference in their respective contributions.[76] Each coowner may revise the work, make a derivative work, or publish an original or a revision of the work.[77]

Consultants, contractors, or subcontractors may make significant contributions to a model and consequently want to claim joint authorship of it. For there to be joint authorship, a work must be "prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole."[78] To be a joint author of a model, a transportation agency would have to establish both that it made an independently copyrightable contribution to a model and that the parties' intent was that they be coauthors of the work.[79] The intent to be joint authors is determined at the time the work was created.[80] As for contractors, they usually lack "the requisite level of control over preparation of the plans" to claim joint authorship.[81]

There are at least two approaches to determining joint ownership. One approach is to determine whether a collaborator's contribution meets the originality test of authorship of an original work. The other approach is to determine whether the mere making of a significant contribution to a work is sufficient to create joint authorship. Although the Copyright Act does not specifically require copyrightability of a collaborator's contribution,[82] the majority view is that a collaborator's contribution does not result in a joint work "unless the contribution represents original expression that could stand on its own as the subject matter of copyright."[83] In other words, a purported joint author's contribution must be original and independently copyrightable.[84] If the test for the creation of a joint work is a contribution's copyrightability, then contributions that are not copyrightable are excluded in determining joint author-

[69] Winick, *supra* note 68, at 1642 (*citing* NIMMER ON COPYRIGHT § 5.03[B]); Creative Non-Violence v. Reid, 490 U.S. 730 (1989)); Sims & Miller, *supra* note 16, at 54.

[70] Sims & Miller, *supra* note 16, at 55; Hi-Tech Video Productions, Inc. v. Capital Cities/ABC, Inc., 58 F.3d 1093 (6th Cir. 1995) (holding that a travel video produced by a production company having control of a project was not a work made for hire under the copyright statute because the assistants who worked on the project were independent contractors, not employees).

[71] Norbert F. Kugele, *How Much Does it Take?: Copyrightability as a Minimum Standard for Determining Joint Authorship*, 1991 U. ILL. L. REV. 809, 810 (1991) (*citing* Community for Creative Non-Violence v. Reid, 490 U.S. 730, 750 (1989); 17 U.S.C.A. §§ 101-914).

[72] Kugele, *supra* note 71, at 828 (*citing* Aitken, Hazen, Hoffman, Miller, P.C. v. Empire Construction Co., 542 F. Supp. 252 (D. Neb. 1982).

[73] Sims & Miller, *supra* note 16, at 53 (*citing* 17 U.S.C. §§ 201(a) and (b)).

[74] Kugele, *supra* note 71, at 837 (footnote omitted).

[75] *See* Kugele, *supra* note 71, at 809, 810 (stating that under 17 U.S.C. § 201 a joint author is a joint owner of the copyright and thus entitled to all of the privileges of copyright ownership).

[76] Sims & Miller, *supra* note 16, at 56 (*quoting* 17 U.S.C. §§ 101, 201(a)); Erickson v. Trinity Theatre, Inc., 13 F.3d 1061 (7th Cir. 1994).

[77] Weinstein v. University of Illinois, 811 F.2d 1091 (1987).

[78] Daniel Miller, *supra* note 17, at 458 (*quoting* 17 U.S.C. § 101).

[79] Daniel Miller, *supra* note 17, at 458 (*quoting* Thomson v. Larson, 147 F.3d 195, 200 (2d Cir. 1998)).

[80] Fred Riley Home Bldg. Corp. v. Cosgrove, 883 F. Supp. 1478 (D. Kan. 1975) (holding that a firm and a builder did not intend to be coauthors at the time that the builder created the alleged derivative work).

[81] Winick, *supra* note 68, at 1643.

[82] Kugele, *supra* note 71, at 821 (*quoting* 135 H.R. REP. NO. 1476*, reprinted in* 1976 U.S.C.C.A.N. at 5736).

[83] Kugele, *supra* note 71, at 819 (*quoting* Goldstein § 4.2.1.2, at 379.118).

[84] Berman v. Johnson, 518 F. Supp. 2d 791 (E.D. Va. 2007), *aff'd* 315 Fed. Appx. 461 (2009) (holding that a promoter and a filmmaker had intended to be joint authors and that the promoter's contributions to the film were independently copyrightable). *See* Kugele, *supra* note 71, at 840. Kugele argues that the copyrightability standard is only the "minimum threshold for determining intent" and that other factors should be considered, such as "the extent of the collaboration, the amount contributed in relation to the size of the entire work, and any express agreements that the parties have made between themselves." *Id*.

ship even though the contributions "were important to the final product."[85]

An alternative view is that joint authorship does not require a copyrightable contribution, but rather that joint authorship results when the authors intended that the collaboration be joint.[86]

The issue of copyright ownership should be addressed by contract because the evidence of intent to create a joint work does not have to be in writing; moreover, the author's contributions do not have to be "qualitatively or quantitatively equivalent" or "prepared in similar ways or with any day-to-day contact with the other authors."[87] It is not necessary that the parties work together for there to be a joint work as long as their contributions are sufficiently complementary "to be embodied in a single work…."[88] The quantity and quality of the contributions do bear on the ultimate question of the parties' intent.[89]

IV. CONTRACTUAL PROVISIONS AND MODELS

A. Maintaining the Separation of Collaborators' Contributions to a Model

When using BIM it is important to "keep the contract documents firmly in mind and ensure that decisions made in the modeling process are properly reflected in the contract documents."[90] A designer of a model may impose restrictions on access to and on the use or dissemination of a model by a terms-of-use, end-user, license, or other agreement or may use software controls. For example, a licensing agreement may prohibit a collaborator or other user of a model from making a model available to third parties or from using the model in a manner not authorized by a designer. However, as explained in Section IV.F, there may be an issue whether a provision in a contract or licensing agreement seeking to protect *noncopyrightable elements* of a model from unauthorized copying and use is preempted by the copyright laws.[91]

When writing about contract documents that are currently in use, one source states that no efforts have been made "to prepare contract documents that reflect the parties' responsibilities in a collaborative, electronic based environment."[92] When using BIM, one approach is for a designer to deliver two-dimensional plans to a contractor who creates a model or models for "means-and-methods" purposes.[93] A second approach is that a designer provides a digital model of the plans to a contractor who relies on the model for the contractor's means-and-methods development.[94] A third and more integrated approach is for a contractor to begin its modeling in the design phase so that the contractor may share its model with the designer.[95]

When there is simultaneous (or nearly so) modeling by designers and contractors, however, there is some concern that a contractor may inadvertently assume some of the designer's responsibilities or that a designer may assume some of the contractor's responsibilities.[96] Although collaborators' contributions could become "irreversibly blended,"[97] one source argues that "BIM can be designed to maintain the separation…."[98] The writer explains that

> [i]n a typical process, each party develops, maintains, and modifies its own model on its own server, and only downloads a copy to the "in box" in the networked file-sharing site, where only the party managing the modeling process can access it. The model manager can move models from various parties into a collaboration space where the models can be combined for viewing, conflict checking, analyzing, and problem solving. However, data is neither altered nor created in this process. Instead, if the structural engineer, for example, determines in the collaborative process that the design should be modified, the engineer will make any changes to the model on the engineer's information technology system. Other parties do the same, and updated models can then be downloaded to the sharing site for further collaborative review and analysis.

It is explained further that

> [t]he key modeling parties can and should jointly prepare a protocol to establish— in detail beyond that set forth in the project agreements—the processes to be followed by the parties in order to ensure that design decisions are made by the appropriate designers and documented in their models, drawings, and specifications. Moreover, the parties should ensure that only the appropriate contrac-

[85] Kugele, *supra* note 71, at 822 (*citing* David A. Gerber, *Joint Authorship Requirement Questioned by Courts, Experts*, NAT'L L.J., Apr. 30, 1990, at 24).

[86] Kugele, *supra* note 71, at 825 (*citing* NIMMER ON COPYRIGHT § 6.07, at 6-20 to 6-22).

[87] Winick, *supra* note 68, at 1644 (*citing* Edward B. Marks Music Corp. v. Jerry Vogel Music Co., 42 F. Supp. 859, 863–64 (S.D.N.Y. 1942), *aff'd*, 140 F.2d 266 (2d Cir. 1944); Ashton-Tate Corp. v. Ross, 916 F.2d 516, 522 (9th Cir. 1990) (joint authorship of a prior work not itself sufficient to make a developer a joint author of a derivative work); NIMMER ON COPYRIGHT § 6.03 ("The essence of joint authorship is a joint laboring in furtherance of a preconcerted design.")).

[88] Kugele, *supra* note 71, at 815.

[89] *Id*. at 831 (*quoting* Eckert v. Hurley Chicago Co., 638 F. Supp. 699, 704 (N.D. Ill. 1986) (quotation marks omitted)).

[90] Larson & Golden, *supra* note 38, at 89.

[91] Under 17 U.S.C. § 204 transfers of copyrights must be in writing. *See also* 17 U.S.C. § 205(a) (providing that "[a]ny transfer of copyright ownership or other document pertaining to a copyright may be recorded in the Copyright Office" when signed in the manner required by the section). Registration is a prerequisite to certain remedies for infringement of copyright. 17 U.S.C. § 412.

[92] Ashcraft, *supra* note 15, at 5.

[93] Larson & Golden, *supra* note 38, at 80.

[94] *Id*.

[95] *Id*. at 81, 87.

[96] *Id*. at 82.

[97] *Id*.

[98] *Id*. at 82, 85.

tors and suppliers make means-and-methods decisions and document them in their models and shop drawings.[99]

It is preferable to rely on contractual provisions to protect a copyright owner's investment rather than to rely on a later action for infringement.[100] The standard American Institute of Architecture (AIA) contract states that an architect is the author of the documents and drawings prepared for a project and that the architect retains all rights to the documents including the copyrights.[101] Furthermore, the standard contract provides that an architect's documents and drawings are not to be used by others on another project except as agreed in writing.[102] The same rights and protections, of course, could be transferred by contract to a transportation department.

B. Contractual Provisions Regarding Participants' Responsibility for Models

The contract documents should identify the model or models to be developed for the collaborative use of the team, the parties responsible for preparing the models, and the required content of the models.[103] Decisions made in the modeling process should be reflected in the contract documents, and the BIM protocol should require contract changes as the model changes.[104] More specifically:

- The contract documents should require that all parties have identical BIM-related terms in their subconsultant agreements and subcontracts.[105]
- The contract documents should identify and clarify the participants' access rights so that "their ability to view, create and modify documents" is limited appropriately.[106]
- One source suggests that a contract should specify when paper documents must be provided because "good practice suggests that paper should be used" with the electronic documents treated as drafts.[107]
- The contract should include a protocol for assuring that the agreements, designs, inputs, and changes have been carefully reviewed prior to acceptance and use; otherwise, "[g]lossy formatting can displace critical thought."[108]
- The contract should assign responsibility for the increasing number of nonlicensed professionals who are inputting information in models.
- Because software vendors are likely to require a waiver of liability, the contract documents should assign responsibility for BIM elements that are "self-modifying" or "partially self-designed."[109]
- The contract documents will need to define the type of electronic media to be used and assign responsibility for the incorporation and coordination as well as for the preservation of the design and its implementation at "major design milestones."[110]
- At least one party must be assigned the responsibility for checking for translation errors caused in part by the conversion of documents.[111]
- Because "practice standards are evolving" quickly in this field, the contract should define the standard of care and state who is responsible for errors caused by systems or software.[112]
- Responsibility must be assigned as well for coordinating and maintaining Web-based documentation.[113]
- The contract should deal with responsibility for legal issues arising from the use of a "broad-based Web site," (for example, for lost or corrupted data), and state whether users of the site are to provide "confidential damage waivers."[114]
- The contract should establish the means of authenticating participants.
- The use of digital signatures, along with the question of whether BIM software proposed to be used either provides for the use of digital signatures by multiple collaborators on a model or will interface with third-party software, should be addressed in the contract or related documents.
- It should be made clear in the contract who owns the data on the site, who controls the data, and how data are to be protected and archived.[115]
- A model manager may be designated who serves as a gatekeeper with responsibility for managing the modeling process, including, inter alia, overseeing or provid-

[99] *Id*. at 86–87 (footnotes omitted).

[100] Miller, *supra* note 17, at 470 (stating that "[a]bsolute prohibitions, whether by contract or encryption are hardly calculated to command public obedience, even with the force of law behind them" but that "the contract approach, on the other hand, seeks to protect corporate investment while tring to lower enforcement costs"). *See* SAPC, Inc. v. Lotus Development Corp., 699 F. Supp. 1009 (D. Mass. 1988), *aff'd* 921 F.2d 360, *rehearing denied* (holding that an asset purchase agreement that included tangible and intangible assets, and specifically including trademarks, copyrights, and computer programs, transferred all preexisting causes of action for copyright infringement, along with the copyrights themselves).

[101] Shipley, *supra* note 28, at *16 (*quoting* Johnson v. Jones, 149 F.3d 494, 497 (6th Cir. 1998) (*quoting* Abbreviated Form of Agreement between Owner and Architect, art. 6, § 6.1)).

[102] *Id*.

[103] Larson & Golden, *supra* note 38, at 89–91.

[104] *Id*. at 89.

[105] *Id*.

[106] Ashcraft, *supra* note 15, at 3.

[107] *Id*. at 11, 12

[108] *Id*. at 4 n.8.

[109] *Id*. at 6.

[110] *Id*.

[111] *Id*. at 8.

[112] *Id.*

[113] *Id*. at 5.

[114] *Id*. at 9.

[115] *Id*.

ing access rights, managing collaborative sessions, and recording and displaying change orders.[116]

- Because a model could be damaged to such an extent that the loss constitutes a force majeure event, the force majeure clause should define when a BIM-related loss or damage triggers the operation of the clause.
- Without adequate contract documents indemnification claims may be difficult, if not impossible, to pursue.[117]
- The contract documents should address insurance coverage for loss or damage to electronic data that may not be covered by a typical policy without a special endorsement.[118]

C. Transportation Departments' Practices Regarding Access to Models

Several transportation departments responding to the survey described their present practice in using BIM and in controlling access to models. Caltrans reported that it does not provide models. It is only the contractor's employees or consultants who develop models that collaborate on a model and revise, add to, or update it.[119] In Delaware where "[e]ach roadway model is created by the project engineer" with input from the project development and construction sections, a model is revised only by the project engineer.[120]

The Florida Department of Transportation (FDOT) reported that most of its experience has been with design-build projects when a consultant-designer produces the surface models for a contractor. In other design-bid-build projects, contractors have digitized plans into 3D models or have requested the CADD and other data so those models could be developed.[121] FDOT stated that in the "current environment" a collaborator needing a model is responsible for the model;[122] however, "FDOT is moving toward a policy of providing the currently available CADD data to contractors (design-bid-build projects), and will eventually require models be produced and delivered by designers for those projects where a logistical benefit would be realized."[123]

The Michigan DOT reported that although contractors share a model with subcontractors and suppliers, as well as with the department for purposes of inspection, "collaborators have not produced or made changes to models."[124] Minnesota's DOT stated that the department and the contractor collaborate on or share a model and that the originator or creator of a model revises or updates it.[125]

In Missouri, "[j]ust as in the design process, roadway designers in our districts work on project teams with right of way, utilities, and construction staff to prepare all aspects of the design;[126] "[m]odels are provided for the roadway only to contractors bidding on our projects;"[127] a single model of a roadway design is all that the department requires; and BIM is not used with bridges at this time.[128] Any revisions to a model are made by the creator of the model.[129]

PennDOT stated that there is no collaboration on a model between the department and a contractor, just the sharing of a model; however, "[s]uccessful contractors may add to or update a model provided at contract execution."[130] There is no collaboration between parties except for a design-build contract when a contractor has its own designer.[131] Under an upcoming policy, a contractor or bidders will be required to report model errors to the agency upon discovery of the errors.[132]

In Texas there is limited access within the department and read-only access for contractors or other groups.[133]

Finally, Wisconsin requires its contractors to share with the department their Automated Machine Guidance (AMG) surface models, but the department's staff does not use the models in construction activities.[134] The department is not presently addressing the issue of access because the contractor maintains the models throughout the project and the developer of the models is also the end user.[135] The department's response noted that when its AMG surface model delivery requirements are implemented in 2014, the DOT will be responsible for revisions to models.[136]

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[116] Larson & Golden, *supra* note 38, at 103–04.

[117] Thomas L. Rosenberg, *Building Information Modeling*, available at http://www.ralaw.com/resources/documents/Building%20Information%20Modeling%20-%20Rosenberg.pdf.

[118] Larson & Golden, *supra* note 38, at 106.

[119] Caltrans Response.

[120] DelDOT Response.

[121] FDOT Response.

[122] *Id*.

[123] *Id*.

[124] MDOT Response.

[125] MnDOT Response. On the other hand, Texas stated that models generally are developed separately from anything the consultant creates. TxDOT Response.

[126] MoDOT Response. By comparison, Texas identified the DOT, universities, consultants, and contractors as parties who collaborate on or share a model. TxDOT Response.

[127] MoDOT Response.

[128] *Id*.

[129] *Id*.

[130] PennDOT Response.

[131] *Id*.

[132] *Id*. PennDOT stated that the department's "ECMS system allows attachment of the data model, and ECMS access is restricted by user-based security. Prior to this recent ECMS enhancement, models were delivered by DVD or secure FTP site."

[133] TxDOT Response.

[134] WisDOT Response.

[135] *Id*.

[136] *Id*.

D. Ownership of a Participant's Contribution to a Model

Because many parties may contribute to a model, questions of authorship and ownership of the contributions may arise that should be addressed in the contract documents. As discussed in Section VIII.A, the copyright laws enable a copyright holder to "control the production of derivative works both directly, by permitting assertions of copyright infringement, and indirectly, by denying copyright protection for unauthorized derivative works. This indirect control effectively permits copyright owners in existing works to capture the value added by subsequent creators."[137]

A model designer's right to reproduce a model covers not only claims of verbatim reproduction of a copyrighted work but also claims for nonliteral copying. Nonliteral copying constitutes infringement if a work is substantially similar to a copyrighted work. As one article discussed later notes, determining where infringement of the reproduction right ends and infringement of the derivative work right begins can be difficult. As explained in Section IX.A.5, a collaborator could transform an original model to such an extent that the collaborator's model is protected by the copyright laws.

A contract or license may be used not only to prevent ownership of one's creative works but also *to transfer* a collaborator's or user's contribution to a model *to the owner* of the copyright in a model.[138] Therefore the owner of a copyright in a model may specify by a license or other agreement whether other parties' contributions to a model also belong to the owner of the underlying model. As discussed in Section IV.E.2, copyright owners in a model also should be aware of the risk of creating or consenting to an implied license. In any case, a license or other agreement may be used both to deny a collaborator's claim of copyright to contributions and to effect a transfer of any legal rights to the collaborator's contributions from the collaborator to the owner of the model. It should be noted, however, that it is important for a license agreement not to overstep, for example, by attempting to limit competition or extend copyright protection to works that are not copyrightable. Doing so may give rise to a claim for misuse of copyright.[139]

[137] Lydia Pallas Loren, *The Changing Nature of Derivative Works in the Face of New Technologies*, 4 J. SMALL & EMERGING BUS. L. 57, 63 (2000), hereinafter cited as "Loren," (*citing* Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1074 and n.35 (1997)).

[138] *Id.* at 463.

[139] *See* discussion in Apple, Inc. v. Psystar Corp., 658 F. 3d 1150, 1157 (9th Cir. 2011) (*citing* Lasercomb Am., Inc. v. Reynolds, 911 F.2d 970, 979 (4th Cir. 1990) (court holding that when a software manufacturer required customers to agree to a licensing agreement that barred a licensee from creating any competing software, the licensing was an "egregious" anticompetitive restraint amounting to copyright misuse); Practice Mgmt. Info. Corp. v. AMA, 121 F.3d 516, 521 (9th Cir. 1997), *amended,* 133 F.3d 1140 (9th Cir. 1998) (holding that conditioning a license to use a copyright on the licensee's promise not to use competitors' products constitutes a misuse of the copyright by the licensor).

E. Exclusive, Nonexclusive, and Implied Licenses

1. Exclusive and Nonexclusive Licenses

The use of licenses is ubiquitous in the digital age. Under the first-sale doctrine, an owner of a copy of a copyrighted work may resell the copy without restriction.[140] However, the first-sale doctrine does not apply when a "copy is transferred through 'rental, lease, loan, or otherwise, without acquiring ownership of it.' …Thus, the first-sale doctrine does not apply to a licensee."[141] Because a copyright is divisible, the recipient of an exclusive grant or license may become the owner or the licensee of a copyright to the extent the rights are assigned or otherwise dealt with in the grant or license.[142] Although the author of an original model owns the copyright, it is clear that the effect of the copyright laws may be altered by contract.[143] "[O]wnership of a copyright may be transferred in whole or in part by any means of conveyance or by operation of law…."[144] An owner of a copyright may transfer ownership of a copyright by selling it or by exclusively licensing it. Exclusive licenses, however, must be in writing.[145]

Because no transfer of copyright ownership occurs with a nonexclusive license, no writing is required and

[140] Apple, Inc. v. Psystar Corp., 658 F.3d 1150, 1155 (9th Cir. 2011) (*citing* 17 U.S.C. § 109), *cert. denied*, Psystar Corp. v. Apple Inc., 2012 U.S. LEXIS 3593 (U.S., May 14, 2012).

[141] *Apple, Inc.,* 658 F.3d at 1155 (citations omitted). *See also* Vernor v. Autodesk, Inc., 621 F.3d 1102 (9th Cir. 2010) and Marcelo Halpern, Yury Kapgan & Kathy Yu, *Vernor v. Autodesk*: *Software and the First Sale Doctrine under Copyright Law*, 23 No. 3 INTELL. PROP. & TECH. L.J. 7 (2011).

[142] 17 U.S.C. § 201(d)(2),

> Any of the exclusive rights comprised in a copyright, including any subdivision of any of the rights specified by section 106, may be transferred as provided by clause (1) and owned separately. The owner of any particular exclusive right is entitled, to the extent of that right, to all of the protection and remedies accorded to the copyright owner by this title.

[143] Miller, *supra* note 17, at 467–68,

> [C]opyright does not protect expression that does not demonstrate the minimal required level of originality, nor does it protect expression that is not fixed. Further, copyright never protects a mere idea. In licensing agreements, these restrictions do not apply. The drafter may protect more than could be protected under copyright; this is the power of the contract. Therefore, the licensing agreement may protect items and elements that would otherwise have been unprotected.

[144] Seshadri, *supra* note 25, at 21 (*quoting* 17 U.S.C. § 201 (d)(1)*; see also, In re Valley Media, Inc.,* 279 B.R. 105, 140 (Bankr. D. Del. 2002) (explaining that state law applies to the license as long as it does not conflict with federal intellectual property law).

[145] MacLean Assoc., Inc. v. Wm. M. Mercer-Meidinger-Hansen, Inc., 952 F.2d 769 (3d Cir. 1991). The reason is that an exclusive license is considered to be a transfer of ownership rights and therefore must be in writing. Imperial Residential Design, Inc. v. Palms Development Group, Inc., 29 F.3d 581, 583 (11th Cir. 1994), *opinion after remand*, 70 F.3d 96.

permission may be granted orally.[146] Under the facts of one case, it was held that an architectural firm had not orally assigned its copyright to a construction project to its former member's new employer, notwithstanding a memorandum executed more than 8 years later purporting to confirm an assignment.[147]

2. Implied Licenses

One who commissions a work may have an implied license to use the work for some "limited purposes."[148] A copyright holder in a model should be aware of the risk of creating or consenting to an implied license, the scope of which depends on the licensor's intent.[149] Such nonexclusive licenses may be granted orally or implied from conduct.[150] Only an exclusive license requires the consent of any other copyright owners.[151] There are cases finding that under the circumstances an implied license has been granted.[152] On the other hand, in an Ohio case it was held that a general contractor did not have an implied, nonexclusive license in plant design drawings made and copyrighted by an engineer as a subcontractor when there was no written contract that, inter alia, described the work.[153]

F. Whether the Copyright Act Preempts Contractual or Licensing Controls

The Copyright Act preempts some claims that otherwise could be made by a copyright holder under state law.[154] Although some courts have refused to enforce contracts that provide copyright-like protection to noncopyrightable facts or unoriginal databases in the belief that the Copyright Act preempts such contracts, the majority view appears to be that such contracts are not preempted and are enforceable.[155] As the Eleventh Circuit has observed, "courts generally read preemption clauses to leave private contracts unaffected."[156] The basis of the majority rule that private contracts are not preempted is that "[a] copyright is a right against the world," whereas "[c]ontracts…generally affect only their parties" and do not "create 'exclusive rights.'"[157]

The interpretation of contracts and licenses is determined by state law "to the extent that they do not interfere with the federal protection of intellectual

[146] Lansted Homes, Inc. v. Sherman, 305 F. Supp. 2d 976 at 983 (W.D. Wis. 2002); Seshadri, *supra* note 25, at P21 (*citing* 17 U.S.C. §§ 101, 201(d)(1), 204(a)).

[147] Barefoot Architect, Inc. v. Bunge, 632 F.3d 822 (3d Cir. 2011).

[148] Sims & Miller, *supra* note 16, at 56. *See id*. for suggested factors to consider regarding whether there is an implied license in a particular situation. *See* Effects Associates v. Cohen, 908 F.2d 555 (9th Cir. 1990) (finding a nonexclusive implied license); I.A.E., Inc. v. Shaver, 74 F.3d 768 (7th Cir. 1996) (in absence of consideration implied license may be revocable); Johnson v. Jones, 855 F. Supp. 1008 (E.D. Mich. 1995) (existence of an implied license is a question of fact).

[149] Seshadri, *supra* note 25, at 24 (*citing* Effects Assocs. v. Cohen, 908 F.2d 555, 558 (9th Cir. 1990); Lulirama Ltd., Inc. v. Axcess Broad. Servs., Inc., 128 F.3d 872, 882 (5th Cir. 1997)). *See* R. Miller Architecture, Inc. v. Edgington Enterprises, Inc., 2006 U.S. Dist. LEXIS 54635 at *1 (M.D. Fla. 2006) (alleged that Edgington entered into an unlawful scheme to misappropriate Miller's design work, but in denying a motion for a preliminary injunction, the court ruled that additional evidence was needed to determine whether there was a limit to the implied license that Miller granted to use Miller's work).

[150] Pamfiloff v. Giant Records, Inc., 794 F. Supp. 933 (N.D. Cal. 1992).

[151] Davis v. Blige, 419 F. Supp. 2d 493 (S.D.N.Y. 2005), *vacated and remanded*, 505 F.3d 90 (2d Cir. 2007), *cert. denied*, 129 S. Ct. 117, 172 L. Ed. 2d 36 (2008). The reason is that an exclusive license would have the effect of transferring the joint owners' interests to a third party.

[152] I.A.E., v. Shaver, 74 F.3d 768 (7th Cir. 1996); R. Miller Architecture, Inc. v. Edgington Enterprises, Inc., 81 U.S.P.Q. 2d 1819 (M.D. Fla. 2006); Estate of Hevia v. Portrio Corp., 602 F.3d 34, 41 (1st Cir. 2010). In Field v. Google, 412 F. Supp. 2d 1106, 1116 (D. Nev. 2006) (stating that that "[a]n implied license can be found where the copyright holder engages in conduct 'from which the other party may properly infer that the owner consents to his use'" (citations omitted)). Furthermore, consent "may be inferred based on silence where the copyright holder knows of the use and encourages it." *Id*. In a New Hampshire case it was held that an owner of copyrighted engineering and surveying plans had impliedly granted a property owner the nonexclusive license to use the plans; thus, the use of the plans by a replacement engineering firm was not infringing. Meisner Brem Corp. v. Mitchell, 313 F. Supp. 2d 13 (D. N.H. 2004).

[153] Jedson Engineering, Inc. v. Spirit Const. Services, Inc., 720 F. Supp. 2d 904 (S.D. Ohio 2010).

[154] For example, because a BIM model comes within the subject matter of copyright, a claim based on state law may be preempted if the claim being asserted is one that is equivalent to a right protected by the Copyright Act; thus, a misappropriation claim under state law is preempted by the Copyright Act. 2 PATRY ON COPYRIGHT § 3:69, at 3-221-322. Nevertheless, a designer of a noncopyrightable model (or a model with noncopyrightable elements) appears to have a proprietary interest in a model until such time as the model is released into the public domain.

[155] ProCD, Inc. v. Zeidenberg, 86 F.3d 1447 (7th Cir. 1996); Winick, *supra* note 68, at 1623–24 (*citing* NIMMER ON COPYRIGHT § 1.01[B][1]; Hardin & Choy, Inc. v. Autumn Shelter, Inc., 1988 WL 156,273 (N.D. Cal. Dec. 7, 1988) (granting summary judgment motion on copyright infringement and conversion claims because contract provision allowed purchasers of plans to transfer any rights in the plans to third parties); Whitney, Atwood, Norcross Assocs. v. Architect's Collaborative Inc., 18 U.S.P.Q. 2d 1243 (D. Mass. Jan. 4, 1991) (ambiguously worded contract provision governing copyright ownership of architectural plans precludes Rule 12(b)(7) motion to dismiss)). *See also* Chambers v. Time Warner, Inc., 123 F. Supp. 2d 198 (S.D.N.Y. 2000), *vacated* 282 F.3d 147, *decision on remand*, 2003 WL 749422 (holding that the contracts at issue effectively assigned the musicians' copyrights in digital versions of recordings to record companies)).

[156] Lipscher v. LRP Publs., Inc., 266 F.3d 1305, 1318 (11th Cir. 2001) (citation omitted).

[157] Huckshold v. HSSL, L.L.C., 344 F. Supp. 2d 1203, 1207 (E.D. Mo. 2004); National Basketball Ass'n v. Motorola, 105 F.3d 841, 850 (2d Cir. 1997).

property."[158] Thus, "employment agreements between architects and their firms, and between architects and their clients, may alter the ownership of copyrights."[159] Copyright owners must express their preferences; otherwise the copyright laws' default rules or restrictions will apply.[160] Licensing agreements or other methods may restrict the disclosure of information, state who is a qualified recipient, or deny access to digital versions of publicly available information.[161] Government agencies also are protecting their noncopyrightable data by using copyright-like controls to limit access to information developed with public funds.

V. PROTECTION OF MODELS AND COLLABORATORS

A. Liability of Participants for Changes

There are risks in the collaborative process when using BIM. A party may rely on erroneous information provided or changes made by another party in the modeling process that may not be reflected in the contract documents.[162]

The contract documents for a BIM project should address the means of authenticating collaborators; allocate the rights and responsibilities of the collaborators; identify who owns and/or controls the data on a Web site or other source; and provide for the protection and archival of data, models, and changes to models.[163] The contract documents should deal with legal issues arising out of the use of any Web site used for a model; assign responsibility for lost or corrupted data; and address whether users of the site are to provide damage waivers.[164]

With BIM, there is concern that there may be an unintended assumption of responsibility by one of the collaborators. The contract documents should delineate the collaborators' responsibilities as discussed above and should identify who is responsible for errors allegedly caused, for example, by systems or software. As discussed in Section V.A, the contract documents should state whether collaborators are warranting their inputs and changes to a model on which other collaborators may be expected to rely.

B. Recording and Archival of Changes

Important to the question of liability for changes is the maintenance of a record of who made which changes to a model and when. Transportation departments were requested to state whether they use a log and/or maintain an archive of data, models, and changes to models; to explain their archival method; and to state the period of time that the department archives such information.

Only two departments responding to the survey reported that they are archiving changes to models.[165] FDOT utilizes an "electronic plans room" called PEDDS-DB in which project electronic deliveries are stored long term. "Each delivery may be enrolled (even multiple different deliveries of the same project, which occurs for revisions, etc.). These deliveries represent the files exactly, bit-for-bit, as they were received."[166] FDOT also uses a separate Electronic Document Management System (EDMS) where facsimiles of the paper versions of plans, specifications, and other relevant documents are also enrolled. Thus, in the EDMS, files are often scans of printed paper.[167]

PennDOT said that the answer is "sometimes." "When the answer is yes, we utilize our Electronic Document Management System to archive the electronic data."[168]

Other departments using BIM are not archiving changes.[169] DelDOT stated that it had no archival method at this time—it only archives an original roadway model.[170] Michigan also stated that it is not archiving changes to models. However, the department has "archived As-Built drawings in the past and see doing the same for As-Built models in the future. The method would be to use our ProjectWise document management system. Currently As-Built drawings are kept indefinitely."[171]

Wisconsin stated that it has not developed a policy for archiving AMG surface models after project completion.

Only FDOT is using a log to keep a record of changes to a model and when and who made them.[172] Although it sometimes archives data, PennDOT stated that it was not keeping a log of changes to a model.[173]

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[158] Seshadri, *supra* note 25, at 24 (*quoting In re Valley Media, Inc*., 279 B.R. 105, 140 (Bankr. D. Del. 2002)).

[159] Winick, *supra* note 68, at 1643.

[160] Seshadri, *supra* note 25, at 3 (stating that if copyright owners fail to "express their preferences then the law automatically restricts all uses").

[161] Gellman, *supra* note 40, at 1004–05 (footnotes omitted).

[162] Larson and Golden, *supra* note 38, at 89.

[163] Ashcraft, *supra* note 15, at 12.

[164] *Id*. at 9 (identifying some of the issues that arise out of the hosting of a broad-based Web site that are not "currently discussed in contract documents"). *Id*.

[165] FDOT and PennDOT.

[166] FDOT Response.

[167] *Id*.

[168] PennDOT Response.

[169] Caltrans, DelDOT, MDOT, MnDOT, MoDOT, TxDOT, and WisDOT.

[170] DelDOT Response.

[171] MDOT Response.

[172] The Florida DOT has a "prescriptive process" for making revisions to projects that includes the current electronic delivery process, a process that would be applicable to BIM models also. FDOT Response.

[173] PennDOT Response.

VI. PROTECTING MODELS AND COLLABORATORS WITH DISCLAIMERS AND READ-ONLY FILES

A. Use of Disclaimers

Participants in a BIM project may insist on using disclaimers to limit or avoid their responsibility when another party relies on a collaborator's input or changes to a model. The use of disclaimers, however, may discourage collaboration, thereby significantly diminishing the benefits of using BIM. One solution, as discussed in the preceding section, is for the contract documents and BIM process to provide for a log and/or archive of data, models, and changes to models so that there is a record-copy, if needed, for later comparison.[174]

Transportation departments currently are relying on the use of disclaimers in BIM projects. Caltrans uses disclaimers in construction change orders when sharing electronic files with contractors after a contract is awarded.[175] TheDelaware Department of Transportation (DelDOT) stated that as explained in its "Release for Delivery of Documents in Electronic Form to A Contractor" document, the department provides electronic documents to the contractor as a convenience and that no warranties are given with respect to the documents.[176]

PennDOT uses "non-reliance disclaimers in contract language for models."[177] When model errors are discovered they must be disclosed within a certain time to minimize the risk of a construction claim.[178] Furthermore, "[t]he 2D plan sheets are the basis for contractual disputes."[179] Michigan uses disclaimers, stating that models and other electronic files are for information purposes only.[180] Minnesota stated that it manages risk by checking on the progress of grading via surveying and staking, using contract language to define the participants' roles and responsibility, and engaging in collaborative review and timely resolution of agreed discrepancies in a model.[181] Missouri stated that a model is not a legal document.[182] Texas also reported that the use of a model is for informational purposes only and is not intended to be a tool for construction or scheduling.[183]

Florida explained that data has been provided to contractors as part of the department's "letting process" using a disclaimer that must be acknowledged "on the media on which the data was shipped." Thus,

> [t]he FLORIDA DEPARTMENT OF TRANSPORTATION makes no warranty or guarantee, express, implied, or statutory, as to the accuracy, reliability, suitability, functioning, or results derived from programs or data on this FLORIDA DEPARTMENT OF TRANSPORTATION ELECTRONIC PROJECT CD. Nor shall the fact of distribution of this CD, its data and related program materials or documentation constitute any warranty or guarantee, either express or implied. The FLORIDA DEPARTMENT OF TRANSPORTATION shall have no liability or responsibility to the intended user or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by use of this FLORIDA DEPARTMENT OF TRANSPORTATION ELECTRONIC PROJECT CD and its contents or related program materials, including, but not limited to, any interruption of service, loss of business or anticipatory profits, or consequential damages. All computer program results and data require professional interpretation, and the FLORIDA DEPARTMENT OF TRANSPORTATION makes no warranty of results obtained by using the computer programs and data contained herein.[184]

B. Use of Read-Only Files and Other Means

Because of the concerns regarding the protection of data being shared with collaborators, some information provided to BIM recipients will be "read only." Recipients may not make changes on their own, but may review a model and recommend changes, which, if implemented, will be reflected in all parts of the design affected by the change or changes.[185] In Minnesota, machine control models are provided as read-only files via electronic transfer as agreed by the parties.[186]

Under the 1998 Digital Millennium Copyright Act (DMCA), copyright owners may resort to management systems known as digital rights management or automated rights management to prevent unauthorized access to or use of copyrighted works.[187] One authority notes that "because a suit under the [DMCA] is not an 'action for copyright infringement,' it would seem there is no registration pre-requisite to bringing a claim thereunder."[188]

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[174] Larson & Golden, *supra* note 38, at 97.

[175] Caltrans Response.

[176] DelDOT Response.

[177] PennDOT Response.

[178] *Id*.

[179] *Id*.

[180] MDOT Response.

[181] MnDOT Response.

[182] MoDOT Response.

[183] TxDOT Response.

[184] FDOT's disclaimer also states:

> THIS SOFTWARE, DATA AND RELATED MATERIALS ARE DISTRIBUTED "AS IS". ANY AND ALL WARRANTIES FOR MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE, EXPRESS, IMPLIED OR STATUTORY, ARE EXCLUSIVELY EXCLUDED. Portions of the programs are protected by United States Copyright Laws, Common Law Copyright and/or trade secret protection by the FLORIDA DEPARTMENT OF TRANSPORTATION, ADOBE SYSTEMS, Inc., RUSSELL LANG, MICROSOFT, Inc., and/or others. All programs and related program materials are subject to proprietary rights of the FLORIDA DEPARTMENT OF TRANSPORTATION.

[185] LEVY, *supra* note 2, at 387; Ashcraft, *supra* note 15, at 12.

[186] MnDOT Response.

[187] *See* 17 U.S.C. § 1201(a).

[188] NIMMER, *supra* note 20, at vol. 2 § 7.16[B][1][b][i].

Finally, as discussed in Section VII, the contract documents should address the use of digital signatures with BIM.

VII. USE OF DIGITAL SIGNATURES

A. Introduction

A transportation department will want to review its state's statutes and regulations applicable to digital signatures and specify in its BIM documents whether digital signatures will be used and, if so, which type. This part of the digest discusses federal and state laws that are applicable to digital signatures, including state digital signature acts, the differing levels of security of digital signatures, and current practices of transportation departments that use digital signatures at least to some extent with BIM projects.

B. Electronic Signatures in Global and National Commerce Act of 2000

An important federal law applicable to digital signatures is the Electronic Signatures in Global and National Commerce Act of 2000 (E-Sign),[189] an Act that applies to any transaction in or affecting interstate or foreign commerce. As a result of E-Sign, "a signature, contract, or other record relating to [a] transaction may not be denied legal effect…because it is in electronic form…."[190] E-Sign is voluntary;[191] moreover, the Act does not limit any requirement of a state regulatory agency that certain records must be filed with the agency or organization in accordance with "specified standards or formats."[192]

E-Sign defines an electronic signature to mean "an electronic sound, symbol, or process, attached to or logically associated with a *contract or other record* and executed or adopted by a person with the intent to sign the record."[193] E-Sign uses the term electronic to embrace the term digital, but does not otherwise define the term digital signature.[194] The Act is technology-neutral in that it does not specify a particular type of digital signature or means of authenticating one.

C. Uniform Electronic Transactions Act

State laws or regulations may modify, limit, or supersede Section 7001 of the federal E-Sign. Forty-seven states, the District of Columbia, Puerto Rico, and the Virgin Islands have adopted the Uniform Electronic Transactions Act (UETA).[195] (As of this writing, three states—Illinois, New York, and Washington—have not adopted the uniform act, but have statutes pertaining to electronic transactions.[196]) If a state adopts UETA, any exceptions made to the uniform law must be consistent with Section 7001 of E-Sign; that is, inconsistent provisions are preempted by the federal law.[197]

UETA defines the term electronic to include technology that has digital or similar capabilities.[198] UETA defines an electronic signature to mean "an electronic sound, symbol, or process attached to or logically associated with a *record* and executed or adopted by a person with the intent to sign the *record*."[199] As with E-Sign, UETA does not identify any particular type of technology that is to be used to create or authenticate a digital signature.[200] However, as UETA's Draft Comments note, a digital signature based on public key encryption technology, referred to either as public key cryptography (PKC) or as public key infrastructure (PKI), discussed in subsections D and E of this section of the digest, qualifies as an electronic signature.[201]

Likewise, under UETA the use of digital signatures is voluntary.[202] Thus, a governmental agency is not required to use or permit the use of electronic records or electronic signatures.[203] Nevertheless, if using digital signatures, a governmental agency may specify the "control processes and procedures as appropriate to ensure adequate preservation, disposition, integrity, security, confidentiality, and auditability of electronic records…."[204]

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[189] 15 U.S.C. § 7001 *et seq*.

[190] *Id*. § 7001(a)(1).

[191] E-Sign does not "require any person to agree to use or accept electronic records or electronic signatures, other than a governmental agency with respect to a record other than a contract to which it is a party." *Id*. § 7001(b)(2).

[192] *Id*. § 7004(a).

[193] *Id*. § 7006(5) (emphasis supplied).

[194] *Id*. § 7006(2).

[195] UETA was promulgated by the Uniform Law Commission, also known as the National Conference of Commissioners on Uniform State Laws. The text is available at: http://www.law.upenn.edu/. For a list of states and their respective statutes, see the Web site of the National Conference of State Legislatures (NCSL), available at: http://www.ncsl.org/issues-research/telecom/uniform-electronic-transactions-acts.aspx.

[196] Illinois, 5 ILL. COMP. STAt. 175/1-101; New York, NY CLS State Technology § 301, *et seq*.; and Washington, http://apps.leg.wa.gov/RCW/default.aspx?cite=19.34. *See* NCSL, available at http://www.ncsl.org/issues-research/telecom/uniform-electronic-transactions-acts.aspx.

[197] 15 U.S.C. § 7002(a)(1).

[198] UETA, § 2(5).

[199] *Id*. § 2(8) (emphasis supplied).

[200] Rather, UETA states that "[a]n electronic record or electronic signature is attributable to a person if it was the act of the person. The act of the person may be shown in any manner, including a showing of the efficacy of any security procedure applied to determine the person to which the electronic record or electronic signature was attributable." *Id.*

[201] UETA, Draft Comments, ¶ 7.

[202] UETA, § 5.

[203] *Id*. § 18(c).

[204] *Id*. § 18(b)(3).

D. State Digital Signature Acts

Although virtually all states have enacted a statute substantially in the form of or identical to UETA, some states additionally have enacted digital signature acts of which there are basically three categories.

The first category of state statutes authorizing digital signatures does not require the use of a particular technology and is therefore referred to as technology-neutral.[205]

A second category of state statutes specifies that a valid digital signature must meet certain security characteristics, but the statutes do not mandate a particular technology.[206] An example is California where regulations implementing California Government Code Section 16.5 provide for the use of public key cryptography as well as for a less verifiable and less secure method of digital signatures referred to as signature dynamics.[207] California's regulations specify the types of technologies that are acceptable for creating digital signatures for use by California public entities.[208] The use of digital signatures is at the parties' option.[209] Although a public entity is not required to use digital signatures, if it wishes to do so, all other parties to a transaction must agree to the use of digital signatures.[210]

A third category of digital signatures is technology-specific and may authorize or require the use of a certain type of cryptography referred to as an asymmetric cryptosystem.[211] The American Bar Association's *Digital Signature Guidelines* explain the asymmetric cryptosystem and the use of private and public keys and certificates and certification authorities to verify such digital signatures.[212] The *Guidelines* use the term digital signature rather than the term electronic signature found in E-Sign or UETA precisely because of the "information security technology" available for the creation and use of such digital signatures.[213] As explained in the *Guidelines*:

> Digital signatures are created and verified by cryptography, the branch of applied mathematics that concerns itself with transforming messages into seemingly unintelligible forms and back again. Digital signatures use what is known as public key cryptography, which employs an algorithm using two different but mathematically related keys; one for creating a digital signature or transforming data into a seemingly unintelligible form, and another key for verifying a digital signature or returning the message to its original form. Computer equipment and software utilizing two such keys are often collectively termed an asymmetric cryptosystem.[214]

For example, in Florida the term digital signature[215]

> means a type of electronic signature that transforms a message using an asymmetric cryptosystem such that a person having the initial message and the signer's public key can accurately determine:
>
> (a) Whether the transformation was created using the private key that corresponds to the signer's public key.
>
> (b) Whether the initial message has been altered since the transformation was made.
>
> A "key pair" is a private key and its corresponding public key in an asymmetric cryptosystem, under which the public key verifies a digital signature the private key creates. An "asymmetric cryptosystem" is an algorithm or series of algorithms which provide a secure key pair.[216]

Digital signatures based on cryptography use a trusted third party or "certification authority" to certify that a public key is the subject of a certificate and that a signer identified in the certificate holds the corresponding private key and that the digital signature was created by that particular subscriber.[217] In particular, the use of digital signatures provides a high degree of security when information is sent over open systems.[218] The *Guidelines* also note the importance of time-stamping with respect to digital signatures and messages, including the time of a digital signature in relation to the "operational period of a certificate…."[219]

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[205] W. Everett Lupton, *The Digital Signature: Your Identity by the Numbers*, 6 RICH. J. L. & TECH. 10 (1999), at text accompanying notes 122–124, available at http://jolt.richmond.edu/v6i2/note2.html.

[206] *Id*.

[207] CAL. CODE REGS. tit 2, § 22000, *et seq*. *See also* W. VA. CODE ANN. § 39A-3-1(3) and (4) (defining "digital mark" and "digital signature").

[208] CAL. GOV'T CODE § 16.5 (as implemented by CAL. CODE REGS. tit 2, § 22000, *et seq*.).

[209] *Id*. § 16.5(b).

[210] *See* discussion of CAL. CODE REGS., tit. 2, § 22000, *et seq*., available at: http://www.sos.ca.gov/digsig/digital-signature-faq.htm.

[211] *See* Lupton, *supra* note 205, at text accompanying notes 124–126. *See* FLA. STAT. § 668.001, *et seq*.; MINN. STAT. § 325K.001.

[212] American Bar Association, *Digital Signature Guidelines*, ABA Information Security Committee, Section of Science and Technology (Aug. 1966), hereinafter referred to as "*Digital Signature Guidelines*," available at: http://www.signelec.com/content/download/digital_signature_guidelines.pdf.

[213] *Id*. at 3.

[214] *Id*. at 9 (footnotes omitted).

> The complementary keys of an asymmetric cryptosystem for digital signatures are arbitrarily termed the private key, which is known only to the signer and used to create the digital signature, and the public key, which is ordinarily more widely known and is used by a relying party to verify the digital signature. If many people need to verify the signer's digital signatures, the public key must be available or distributed to all of them, perhaps by publication in an on-line repository or directory where it is easily accessible.

Id. at 9, 10.

[215] Part I of Florida's chapter on electronic commerce is the Electronic Signature Act of 1996, FLA. STAT. § 668.001, *et seq*., whereas Part II is the state's adoption of UETA, FLA. STAT. § 668.50, *et seq*.

[216] FLA. STAT. § 668.003(3).

[217] *Digital Signature Guidelines* at 17.

[218] *Id*. at 20.

[219] *Id*. at 64.

The *Guidelines* emphasize that "[a] message bearing a digital signature verified by the public key listed in a valid certificate is as valid, effective, and enforceable as if the message had been written on paper."[220] Similarly, California advises that PKC signatures have a greater degree of verifiability and security than dynamic or other kinds of electronic signatures and "are immediately verifiable with a third-party issued certificate."[221] On the other hand, it may be noted that in Ohio, a state agency must obtain prior approval before using digital signatures, which "require a significant infrastructure known as public key infrastructure (PKI)."[222]

E. Digital Signatures and Security Considerations

A public entity likely will want to determine the level of security that is necessary or desired when using digital signatures with BIM. In the Federal E-Sign, there is no definition of security or security procedures or the means of authenticating digital signatures.[223] UETA defines the term security procedure, but does not specify a particular technology or security procedure.[224] Rather, UETA "allows for future technological development" and permits the parties to select the procedures, if they are not otherwise mandated by state law.[225] Under UETA "[a] security procedure may be technologically very sophisticated, such as an asymmetric cryptographic system. At the other extreme the security procedure may be as simple as a telephone call to confirm the identity of the sender through another channel of communication."[226]

In deciding on the desirable level of security and type of digital signature, the California regulations provide useful guidance; for example:

- Are the documents containing signatures going to be transmitted over an "open" or a "closed" network?
- Does the signature on the document need to be verified?
- How much time and resources can be allocated to verification?
- Does the signature need to be compared to a manual signature on paper or can a digital certificate adequately provide one-stop verification?
- Will immediate verifiability reduce the potential of fraud?
- Will the documents containing digital signatures need to be reproduced for public access to the records?
- Will the documents containing digital signatures need to be utilized by another local, state, or federal agency? If so, is the technology compatible with the other agency's needs?[227]

California states that "[a]nswering these and countless other questions can help public entities identify the appropriate technology to use for each application that includes a digital signature component."[228] In Florida, each agency is responsible for "procedures to ensure adequate integrity, security, confidentiality, and auditability of business transactions conducted using electronic commerce."[229] Other states may have more detailed, mandatory requirements on choosing and using digital signatures, such as Ohio's regulations that implement Section 1306.20 of the state code.[230]

The Ohio regulations establish "an overarching security procedure" that requires state agencies to document their uses of electronic transactions; to conduct "a transaction risk assessment of each set of similar electronic transactions"; to use appropriate levels of security based on a security assessment to be made in compliance with the regulations; to establish and maintain documented security policies and procedures; and to seek a waiver from the state's Office of Information Technology when a security technology or procedure does not conform to the required level of security in the agency's transaction risk assessment.[231] The transaction risk assessment referred to above must identify the appropriate level of security by analyzing the impact of a security breach and the probability of an attempt to breach security based on a consideration of the factors set forth in the regulations.[232] Ohio requires that state agencies complete an electronic transaction report in the form required by the regulations "before acquiring or implementing electronic signatures, transactions or related technology."[233]

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[220] *Id*. at 102.

[221] *See* discussion of CAL. CODE REGS. tit. 2, § 22000, *et seq*., available at: http://www.sos.ca.gov/digsig/digital-signature-faq.htm.

[222] OHIO ADMIN. CODE § 123:3-1-01(G)(4)(a).

[223] *See* 15 U.S.C. § 7006. The federal act does define a self-regulatory organization that is authorized to adopt and administer rules. *Id*. § 7006(11).

[224] UETA § 2(14) defines a security procedure as one

> employed for the purpose of verifying that an electronic signature, record, or performance is that of a specific person or for detecting changes or errors in the information in an electronic record. The term includes a procedure that requires the use of algorithms or other codes, identifying words or numbers, encryption, or callback or other acknowledgment procedures.

[225] *Id*. § 2(11), cmt. 11.

[226] *Id*.

[227] *See* discussion of CAL. CODE REGS. tit 2, § 22000, *et seq*., available at: http://www.sos.ca.gov/digsig/digital-signature-faq.htm (section with answers to frequently asked questions).

[228] *See id*.

[229] FLA. STAT. § 668.006.

[230] *See* OHIO REV. CODE ANN. § 1306.20(a), providing that

> [s]ubject to section 1306.11 of the Revised Code, each state agency shall determine if, and the extent to which, it will send and receive electronic records and electronic signatures to and from other persons and otherwise create, generate, communicate, store, process, use, and rely upon electronic records and electronic signatures.

[231] OHIO ADMIN. CODE § 123:3-1-01(C).

[232] *Id*. § 123:3-1-01(F)(1); *see id*. § 123:3-1-01(F)(2)(a)–(j).

[233] *Id*. §§ 123:3-1-01(D)(1) and 123:3-1-01(D)(2)(a)-(f).

Finally, as the California regulations note, it is critical that the technology for digital signatures be compatible with the agency's other needs.[234] A transportation department planning to use digital signatures will want to verify whether a BIM program "handle[s] digital signature verification automatically in a standardized way."[235]

F. Transportation Departments' Use of Digital Signatures and BIM

To ascertain whether and to what extent transportation departments are using digital signatures with BIM, transportation departments that reported using BIM were asked follow-up questions regarding their use of digital signatures with BIM.[236] Several departments responded to the first question that asked if the department or its consultants or contractors are using digital signatures in connection with models, such as when collaborators on a project make changes to a model.

FDOT reported that it uses electronic signatures for files delivered to the department. The department reports that nearly 15 years ago the department developed software to implement its use of electronic signatures in a system called Professionals' Electronic Data Delivery System (PEDDS).[237] Since 2001, "projects developed for letting have been secured with PEDDS," which is used for projects developed both in-house and by consultants.[238]

The Missouri DOT reported that it is using digital signatures, but not for the actual model itself. The department uses digital signatures for its construction plans, which are a product of the BIM model created for the project. Under the department's "program delivery methodology" a project manager is in charge of the plans produced in the design process and "electronically signs and seals the plan sheets used for bidding and construction purposes."[239]

Three departments stated that their departments are not using digital signatures. The Delaware DOT stated that its department does not utilize digital signatures yet, but that the department is investigating the potential for using such technology.[240] The Michigan DOT likewise reported that the department is not using digital signatures. The department explained that the electronic model and plan-data furnished by Michigan DOT is for informational purposes; that the department "relieves itself of liability through an agreement disclosed prior to accessing the Electronic Model Data;" and that "[t]he degree to which the consultants/contractors rely on the information is left to their judgment as the paper plan set is the contract document."[241] The Minnesota DOT reported that the department does not require digital signatures as an agency standard business practice for the exchange of project-related BIM-CAD, CAD, CAD-ancillary data, or general engineering data. Minnesota DOT stated that "[t]he project records reflect requests between partners and the deliverable exchanged."[242]

The second follow-up question asked the departments to state any reasons the department is not using digital signatures in connection with models.

FDOT explained that although the Florida Department of Business and Professional Regulation allows for digital signatures, the department has not yet adopted digital signatures for several reasons including:

- FDOT has not yet developed a "no cost to the user" solution for digital signatures as it has for electronic signatures (i.e., PEDDS). Using digital signatures would be an expense for the user;
- The cost of third-party solutions (e.g., certificate authorities) varies considerably, and there have been concerns regarding the cost and duration of the signatures;
- Third-party providers have not achieved a uniform implementation, thus leaving it to the department to have to choose among competing vendors for one or more acceptable solutions;
- Some types of files cannot be signed/sealed non-destructively by digital signatures (e.g., text files, XML files, non-X509 compliant files), a limitation not present with electronic signatures implemented by PEDDS;
- There are limits on the duration that the identity of a signatory or a digital signature may be validated, a factor that often depends on how long the signatory subscribes to the certification service. There are also varying levels of identity verification by vendors, which although defined by the National Institutes of Standards and Technology (NIST) do not seem to be implemented clearly or uniformly by vendors; and
- A third party is injected into what traditionally has been a two-party transaction.[243]

[234] *See* discussion of CAL. CODE REGS. tit 2, § 22000, *et seq*., available at: http://www.sos.ca.gov/digsig/digital-signature-faq.htm (section with answers to frequently asked questions).

[235] Owen Wengerd, *Digital Signatures*, ManuSoft, available at: http://www.manusoft.com/resources/digest/digitalsig.html.

[236] The departments were asked: 1) if the department or its consultants or contractors are using digital signatures in connection with models, such as when collaborators on a project make changes to a model; 2) if not, to identify any reason or reasons for not using digital signatures; 3) if using digital signatures whether the signatures are created and verified by cryptography; and 4) if the BIM software in use provides for the use of digital signatures by collaborators, and, if not, whether it is necessary to use a third-party source for the technology to create and verify digital signatures that interface with the BIM software.

[237] FDOT email dated Aug. 3, 2012. Information about PEDDS is available at: http://www.dot.state.fl.us/ecso/downloads/software/PEDDS/default.shtm.

[238] *Id*.

[239] MoDOT email dated Aug. 3, 2012.

[240] DelDOT email dated Aug. 6, 2012.

[241] MDOT email dated Aug. 6, 2012.

[242] MnDOT email dated Aug. 7, 2012.

[243] FDOT email dated Aug. 3, 2012.

Also in regard to the second question, the Missouri DOT states that the department is using digital signatures for all of its plan-bidding documents. However, the department is not using digital signatures "to seal the model" because Missouri law does not provide for the ability to sign and seal a model at this time.[244] The state's digital signature statute

> requires these [signatures] to be applied to the same document-based products as a traditional wet signature. All BIM models provided by MoDOT are provided for bidding and construction use by the contractor. Our general specifications state that the plans are the controlling document and always take precedence.
>
> Even if our statute allowed this, we have concerns [whether] the technology is available and in place to allow secure encryption of the model while still allowing it to be utilized for automated field construction activities. Until a standard model delivery format is created and adopted throughout the industry, contractors still need the ability to convert these models into formats utilized by their proprietary field equipment.[245]

Other departments explained why they are not using digital signatures for BIM projects. The Delaware DOT states that the information that it provides to its "contracting community is delivered…'as is' and is not subject to modifications or revisions by the designer or contractor."[246] The information is provided as supplemental information for the contractor's use.[247] The Michigan DOT reports that it is "just getting into electronic signatures for contract modification in [c]onstruction; that there is no reason for digital signatures because the model is not part of the contract; but that the department possibly will use digital signatures after the department is 'more comfortable with electronic files.'"[248]

Minnesota gives several reasons the department is not using digital signatures. The department states, first, that there are cost, usage, and management issues associated with public key cryptography.[249] A second reason is that there are "[n]o adopted business standards for digital signature technology, licensing, and usage on project deliverables and/or ongoing data exchange."[250] The department also states that the relationship and communication between the department and the primary contractor or consultant negates reliance on E-Sign and "each partner is clear on what is 'current & valid' CAD-BIM data."[251] Finally, the department's "ProjectWise system allows for file versioning that creates a progressive record of exchanged/delivered content [if] questions arise as to actual content in specific versions or deliverables over the life of project. This is not widely used as few problems have arisen due to limited BIM project volume."[252]

Third, the departments using digital signatures were asked if the digital signatures are created and verified by cryptography. FDOT stated that its implementation of electronic signatures

> calculates a one-way cryptographic hash (the Fed's SHA-1) [for] each file intended to be signed/sealed. These resulting SHA-1 hash codes and the URL of the files selected are written to a holding file (called a Signature file). That Signature file itself is then processed through SHA-1, so a single resulting SHA-1 hash code can secure all of the files listed in the Signature file. That resulting hash is printed to a paper report, which in turn is signed, dated, and impression sealed. In this way, one, or many files can be signed/sealed in a single operation. FDOT's implementation of SHA-1 has been NIST certified.[253]

The Missouri DOT utilizes for the signing and sealing process Adobe Acrobat signatures that use encryption technology and PKI support.[254] However, the department reports that it maintains its own certificate authority rather than incur the expense of a third-party document certification services.[255]

Fourth, the departments were asked whether the BIM software used by the department or its consultants or contractors provides for the use of digital signatures by users or collaborators on a project, or whether it is necessary to rely on a third-party source for the technology to create and verify digital signatures that interface with BIM software.

FDOT explains that the implementation of its electronic signature process is "agnostic to the format of the files being signed/sealed. To SHA-1, a file is simply a pattern of bytes (zero's and ones)."[256] With an electronic signature "a signatory can sign/seal any file type he or she chooses without regard to [the] file format."[257] A digital signature requires

> specific file types that can consume the encoding of the signature keys and supporting data. This is one reason FDOT has yet to convert to Digital Signature, as we still have a significant delivery of data in ASCII/text formats—from text report files, XML files, input files, .csv files, etc.[258]

The department explains that its intention is to use digital signatures but that the adoption of digital signatures "depends upon the software being used, the forms the data take, and what the Department and the Florida [DBPR] say a professional of record will take responsibility for and be accountable by their signature and seal. FDOT is actively working with our Board of Engineers on these issues."[259]

[244] MoDOT email dated Aug. 3, 2012.

[245] *Id*.

[246] DelDOT email dated Aug. 6, 2012.

[247] *Id*.

[248] MDOT email dated Aug. 6, 2012.

[249] MnDOT email dated Aug. 7, 2012.

[250] *Id*.

[251] *Id*.

[252] *Id*.

[253] FDOT email dated Aug. 3, 2012.

[254] MoDOT email dated Aug. 3, 2012.

[255] *Id*.

[256] FDOT email dated Aug. 3, 2012.

[257] *Id*.

[258] *Id*.

[259] *Id*.

The Missouri DOT reports that the department uses Microstation and Geopak to create its engineering models, but that the software does not provide the necessary encryption technology for the agency's processes.[260] The department relies on Adobe Acrobat signatures for its signing and sealing process.[261] The department has "created custom software that includes versioning through our document management system that integrates the [two-] dimensional view of the model extracted from our design software into the Adobe Acrobat encryption process."[262] The project managers apply their seal with Adobe Reader.[263]

The Michigan DOT states that if it implements the use of digital signatures, most likely the department would use third-party software.[264] Although not presently using digital signatures, the Minnesota DOT observed that some BIM applications provide "an application specific signature tool" and that the department is seeking and will evaluate a preferred business method of e-signature for a variety of project-related document types.[265]

VIII. MODELS AND INTEROPERABILITY ISSUES

A. Identification of Interoperability Issues

A 2002 National Institute of Standards and Technology study concluded that the added cost to a project because of the absence of interoperability is "astonishing."[266] Interoperability refers to the ability of various entities and persons "to share electronic information seamlessly among all participants on a construction project," whereas BIM is "the computer-assisted design process whereby 3D and 4D images are developed…."[267] Interoperability is the "ability to comprehend and integrate this information across multiple software systems…so that your system can 'talk' to mine, and we can all 'talk' to the designers, contractors, subcontractors, vendors, and owners' representatives in the same electronic language."[268]

One source argues that "[t]here is little interoperability in [the] AECO (architect, engineer, contractor, owner) community today."[269]

The interoperability problem exists for several reasons. One reason is that contractors have been reluctant to embrace the new technology, partly because of the expense. Of 884,300 contractors in the United States, only 32 percent have more than four employees, and only 1 percent have more than 100 employees.[270] Profit margins are narrow—about 1.2 percent to 1.5 percent.[271] In addition to the cost of technology and training, contractors are concerned that computers will crash with a loss of work and information.[272] Another issue is that many of their subcontractors use computers only for payroll and accounting.[273] Not only are internal business practices fragmented, contractors and subcontractors also spend much of their time securing information from "disparate sources."[274]

In addition, interoperability problems exist because of "paper-based business practices, a lack of standardization, and inconsistent technology among stakeholders."[275] Moreover, government offices may require a paper format for filing and require that documents have original signatures and seals.[276] Electronic media at the site may be inefficient and not work properly.[277] All-in-all, "[t]here is no real incentive to work electronically."[278]

Another issue is that "[c]ollaboration software is not integrated with a contractor's other systems."[279] Unlike the manufacturing industry, the construction industry is unique in that its products are not the result of "an integrated design build process" that occurs in one place.[280] Furthermore, there are different versions of the same software, or the collaborators are using different software.[281]

One source maintains that absent the existence of uniform standards for BIM and interoperability, the contract documents for a BIM project should require "bidders to have interoperable software, and the ability to provide BIM modeling as part of their qualification package."[282] Moreover, the contract documents should include guidance on software and/or interoperability requirements for modeling and a file format for exchanged files so that there is a "relatively seamless flow of information…."[283]

"A lack of data standards inhibits the transfer of data" among the participants' systems and applications.[284] The industry has to "develop the specific non-graphic common language required for interoperability."[285] The development of a neutral file format

[260] MoDOT email dated Aug. 3, 2012.
[261] *Id*.
[262] *Id*.
[263] *Id*.
[264] MDOT email dated Aug. 6, 2012.
[265] MnDOT email dated Aug. 7, 2012.
[266] *See* LEVY, *supra* note 2, at 456.
[267] *Id*. at 451.
[268] *Id*. at 454.
[269] *Id*.
[270] *Id*. at 1.
[271] *Id*. at 2.
[272] *Id*. at 452.
[273] *Id*.
[274] *Id*. at 457.
[275] *Id*.
[276] *Id*. at 452
[277] *Id*.
[278] *Id*. at 454
[279] *Id*. at 457.
[280] *Id*. at 456
[281] *Id*.
[282] *Id*. at 458.
[283] *Id*.
[284] *Id*. at 457.
[285] *Id*. at 458.

provides for communication "by translating a program's native format into a neutral format to allow data exchange across multiple platforms."[286] A successful translation system has implications for copyrights and/or patents (and possibly litigation), for more effective and widespread use of BIM, and for the overall control of a project.

B. Transportation Departments' Responses Regarding Interoperability

As for whether transportation departments are experiencing any interoperability issues with the use of BIM and models for construction projects, five departments stated that they had experienced interoperability issues,[287] whereas four departments had not.[288] The California Department of Transportation (Caltrans) has used Land XML as a means of translating electronic files, but stated that Land XML is not 100 percent effective.[289] Caltrans also said that it has encountered some issues, but the issues do not necessarily involve interoperability. For example, with respect to engineers, they may choose not to interact with contractors until after a contract is awarded; are concerned that contractors will modify a model; or are concerned that providing a model may result in change orders and construction claims.[290] The department is concerned with the authentication or signing of a model electronically and with the potential liability resulting from the sharing of models.[291]

Delaware stated that it utilizes Bentley software to create its roadway models, but that the models generated by its software are not in a format that is readily readable or usable by a majority of its contractors that do not use Bentley products. Delaware's solution has been to allow for the conversions of its data to an XML format that may be converted easily by its contractors to suit their needs.[292]

MDOT uses the Bentley MicroStation format. Michigan requires all consultants to use its standard design software to ensure that construction deliverables designed in-house or by a consultant are in the same format.[293] Its contractors have been asking for CADD information and models in the Autodesk (AutoCAD) format. Michigan's policy is to provide its native formats and not to perform conversions of files into other formats. However, Michigan plans, when possible, to use XML (generic) formats to transfer data. MDOT noted that in the past, global positioning system (GPS) manufacturers have had difficulties using the XML format for automated machine guidance.[294]

Minnesota stated that it has experienced technical issues with respect to format, that the issues have been resolved through collaboration among the partners, and that there are fewer issues than before because the "applications support more standard output formats."[295] The Missouri DOT stated that it provides a model "in a neutral file format (LandXML) that gives the contractor the ability to read it in his software package of choice. Other ancillary data is provided in the department's design software format."[296]

The departments were asked about any precautions they are taking to ensure software compatibility. Four departments stated that they make efforts (e.g., in the bid documents and/or bidder qualification) to ensure that BIM software that will be used by all participants is either suitable for or compatible with a project and/or in compliance with what the department has specified.[297] Five departments reported that they have not been taking any precautions.[298]

As for the departments reporting that they are taking precautions, in Florida the DOT's CADD Manual specifies the format of the CADD data that must be delivered, a requirement that helps to assure that the data may be shared on a reasonable basis.[299] Minnesota includes contractual provisions on whether a "machine control model" is an option; on data formats and exchange; and on the designation of decision authority to resolve ultimate issues.[300] In Missouri the plan sheets in the bidding documents are the legal contract, not the model.[301] However, the DOT expects eventually to make the model a legal document.[302]

No departments responding to the survey reported requiring a work log to document progress in modifications that are transmitted on a daily basis to a protected database.

Finally, although not providing any details, only one department reported that there had been any litigation involving interoperability for any of its projects.[303] The other transportation departments using BIM did not report any claims or litigation.[304] PennDOT observed that it provides model data, which is not mandatory, with a nonreliance disclaimer; consequently, it is the

[286] *Id*. at 460 (citation omitted).

[287] Caltrans, DelDOT, MDOT, MnDOT, and MoDOT.

[288] FDOT, PennDOT, TxDOT, and WisDOT.

[289] Caltrans Response.

[290] *Id*.

[291] *Id.*

[292] DelDOT Response.

[293] MDOT Response.

[294] *Id*.

[295] MnDOT Response.

[296] MoDOT Response.

[297] FDOT, MnDOT, MoDOT, and PennDOT.

[298] Caltrans, DelDOT, MDOT, TxDOT, and WisDOT.

[299] FDOT Response.

[300] MnDOT Response.

[301] *Id*.

[302] MoDOT Response.

[303] PennDOT.

[304] Caltrans, DelDOT, FDOT, MDOT, MnDOT, TexDOT, and WisDOT.

department's opinion that "the lack of a valid model is not available as a litigation strategy."[305]

IX. BIM ISSUES THAT MAY LIMIT COPYRIGHT PROTECTION FOR A MODEL

A. Copyright in Original BIM Models and in Derivative Models

1. What Is or Is Not Protected by a Copyright Owner's Rights in a Model

Based on the departments' responses to the survey questions, it appears that the departments have not encountered the issues that are discussed in this part of the digest. However, as the use of BIM becomes more widespread, the following issues may have more salience.

With BIM, the production of a model may proceed in a number of ways, each of which may give rise to questions of authorship and copyright ownership, unless otherwise resolved in advance by contract.[306] As emphasized in this section of the digest, "[t]he parties should decide in advance which parties will be entitled to make derivative models from other parties' models and how and when record copies of models will be created and preserved."[307]

2. Rights of a Copyright Owner in a Derivative Model

It is assumed in this subsection of the digest that there is an *authorized* transformation or adaptation of any underlying plans or data to create a model for a project. The issue, thereafter, is the copyright laws' treatment of a model that is derived from the source-model for a project.

Under Section 106 of the Copyright Act, a copyright holder has certain "exclusive rights,"[308] including the rights to make copies of a protected work; to create a derivative work; to distribute copies of a protected work to the public; and to display a work publicly. A "derivative work" is defined as one that is "based upon one or more preexisting works…[that] may be recast, transformed, or adapted."[309] To be a derivative model, it has to be based upon and borrow substantially from one or more preexisting, copyrightable works.[310]

The designer of an original model, for example, a transportation department or an independent contractor, is the owner of the copyright and has the right to create a derivative model based on the source-model. Under the copyright laws, the creator of an original work has a "*de facto* monopoly" on all works derived from the original work.[311]

Thus, "[u]nderstanding the contours of infringement of the derivative work right also requires understanding how the derivative work right relates to the primary right granted to copyright owners—the right to control the reproduction of copyrighted works."[312]

If a BIM model is copied or derived entirely from an underlying model for a project, unless altered by contract, the default rule is that the author of the model (e.g., the original architect, planner, or designer) owns the copyright in the resulting model.[313] Without any additional creative work within the meaning of the copyright laws, a derivative work is but a copy of the underlying model.[314]

If the copyright holder in an underlying model creates a derivative model based on the underlying model, however, the holder's copyright in the derivative work extends only to that part of the derivative model that was original in the holder's underlying work.[315] For a derivative model to be both a derivative and to be separately copyrightable by the owner of the copyright in the underlying model, the derivative model must have borrowed substantially from the prior work.[316] For the copyright holder in the underlying model who creates a derivative model, if the new elements in the derivative model are separately copyrightable, then the derivative model is separately copyrightable by the same copyright owner.[317] The new elements in the derivative model must amount to more than a minimal or trivial contribution.[318]

A derivative model, thus, may be very similar to the underlying model. The Copyright Act's provision that a designer of an underlying model has the right to make or authorize derivative models helps to prevent "an endless series of infringement suits posing insoluble diffi-

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[305] PennDOT Response.

[306] Winick, *supra* note 68, at 1640.

[307] Larson & Golden, *supra* note 38, at 87 (footnote omitted).

[308] Under Section 106 the rights of a copyright holder include the rights

"(1) to reproduce the copyrighted work in…;

(2) to prepare derivative works based upon the copyrighted work;

(3) to distribute copies…of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending…."

[309] Ets-Hokin v. Skyy Spirits, Inc., 225 F.3d 1068 (9th Cir. 2000).

[310] M.H. Segan, Ltd. Partnership v. Hasbro, Inc., 924 F. Supp. 512 (S.D.N.Y. 1996).

[311] NIMMER, *supra* note 20, at vol. 1 § 3.03[A].

[312] Loren, *supra* note 137, at 63–64 (2000) (footnotes omitted). *See* Fred Riley Home Building Corp. v. Cosgrove, 883 F. Supp. 1478, 1482 (D. Kan. 1995) (stating that "[c]reation of a derivative work requires consent by the owner of the original copyright to the creation of a derivative copyrightable work").

[313] Brunka, *supra* note 12, at 185.

[314] Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc., 528 F.3d 1258, 1260 (10th Cir. 2008).

[315] NIMMER, *supra* note 20, at vol. 1 § 3.04[A].

[316] *Id*. § 3.01.

[317] *Id*.

[318] Moore Pub., Inc. v. Big Sky Marketing, Inc., 756 F. Supp. 1371, at 1375 (D. Idaho 1990).

culties of proof."[319] The copyright in a derivative model protects against either the copying or the infringing of the underlying model's original contribution present in a later derivative work.[320]

3. Rights in a Derivative Model Created by a Designer's Licensee

A copyright holder in an underlying model may enter into a license or other agreement with one or more collaborators on a project, whereby, for example, the designer provides a copy of the underlying model and/or controls access to it. In this situation, it is assumed that a license or other agreement does not clarify who owns the copyright in a derivative model or models; thus, the default rules under the Copyright Act apply. It is assumed further that a collaborator later claims a copyright in a derivative model that is based, of course, on the underlying model provided to the licensee. In this scenario, a derivative model is being created with the permission of the copyright owner in the underlying model, but the copyright owner has not been careful to make certain that any original contributions by way of a derivative model vest in the copyright owner of the underlying model.

Patry on Copyright warns that when a "derivative work is created with the permission of the copyright owner or is otherwise permitted by law (e.g., the use is fair use), copyright may vest in the derivative work owner."[321] As *Nimmer on Copyright* also cautions, "[t]he rights between the underlying copyright owner and derivative owner should be determined by the contract between them. Absent any such contract, Section 201(c) sets the default rules…."[322] Material taken from the underlying model is infringing if it is taken without the owner's permission.[323] By having an exclusive license to use the original model, the licensee is treated as the copyright owner of the underlying work for the purpose of exercising rights, the meaning or extent of which could be in dispute later, that have been granted to the licensee.[324]

Contributions to an underlying model created by another may be copyrightable as a derivative work, but any copyright in the derivative model would extend only to the new elements in the derivative model. The creator of the derivative model would not have any rights in preexisting material in the underlying model, which is one reason that it has been held that the copyright in a derivative work is "thin."[325]

If the agreement between the parties bars a licensee from claiming a copyright even in a licensed derivative model, the contractual provision should govern.[326] Furthermore, *Nimmer on Copyright* states that if the parties' agreement stipulates that a licensee will not claim copyright in a derivative work and the licensee violates the stipulation, then the violation may "void the license altogether, thereby rendering the making of the derivative work itself an act of copyright infringement."[327]

4. Unauthorized Copying and Infringement of an Underlying Model

In this scenario, there is no license or other agreement but a party presumably with access to an underlying model 1) copies the model and 2) makes original contributions to it in creating a derivative model.

The scenario presented, first, is a violation of the copyright holder's right in the underlying model to *reproduce* the model. As *Patry on Copyright* explains, "when a work is copied verbatim from one format to another, e.g., from a cartridge to a disk, or from a hard drive to any other file format, the reproduction right, not the derivative right, is infringed."[328]

> The reproduction right covers not only claims of verbatim reproduction of a copyrighted work, but also claims for non-literal copying. *Non-literal copying constitutes infringement if the work is substantially similar to the copyrighted work. To infringe the derivative work right, the new work must also exhibit a substantial similarity to the preexisting copyrighted work.* Thus, determining where infringement of the reproduction right ends and infringement of the derivative work right begins can be difficult.[329]

Thus, the copyright owner's right of reproduction of an underlying model may be violated without any "recasting, transformation or adaptation of the authorship of the original," i.e., without any infringement.[330]

Second, besides violating the copyright owner's right of reproduction existing in the underlying model, the unauthorized user's creation of a derivative model is an act of infringement. For example, infringement occurs when there is an unauthorized recasting, transformation, or adaptation of a two-dimensional work into a three-dimensional version;[331] "[t]he addition of an extra dimension usually necessitates creating elements not

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[319] Picket v. Prince, 207 F.3d 402, 406 (7th Cir. 2000).

[320] NIMMER, *supra* note 20, at vol. 1 § 3.04[A].

[321] 4 PATRY ON COPYRIGHT § 12:21.

[322] NIMMER, *supra* note 20, at vol. 1 § 3.04[4].

[323] NIMMER, *supra* note 20, at vol. 2 § 7.16[B][5][b]; NIMMER, *supra* note 20, at vol. 1 § 3.01.

[324] NIMMER, *supra* note 20, at vol. 1 § 3.05.

[325] Harvester, Inc. v. Rule Joy Trammell + Rubio, LLC, 716 F. Supp. 2d 428, 439, 440 (E.D. Va. 2010) (stating that "derivative works enjoy a thin layer of copyright protection, whereby only the original material contributed by the new author receives protection"); *see also* Moore Pub., Inc. v. Big Sky Marketing, Inc., 756 F. Supp. 1371 (D. Idaho 1990).

[326] NIMMER, *supra* note 20, at vol. 1 § 3.06.

[327] *Id*.

[328] 4 PATRY ON COPYRIGHT §§ 12:14.

[329] Loren, *supra* note 312, at 64 (footnotes omitted) (emphasis supplied).

[330] 4 PATRY ON COPYRIGHT § 12:16. *See Harvester, Inc.,* 716 F. Supp. 2d at 447 (stating that when there was unauthorized copying of copyrighted work (architectural drawings) the court need not reach the issue of whether the defendant "incorporated…protected expression into its own drawings").

[331] *Id*. § 12:20.

found in the original…."[332] When there is an "unauthorized incorporation" of an underlying model into a derivative one, the incorporation is copyright infringement.[333] The incorporation violates the derivative rights of the copyright owner in the underlying model.[334]

Third, it is necessary, however, to separate the original contributions to the model and the original contributions in the infringing derivative. The author of an underlying model has no rights in the original elements contributed by the infringer to make a derivative model. The reason is that the author of the underlying model is not the author of the original elements contained in the infringing model. Assuming that the contributions made by the infringer contained in the derivative model satisfy the original work of authorship test under the Copyright Act, the infringer may claim a copyright only in his or her contributions contained in the infringing model.[335] Under Section 103(a) of the Act "only the portion of a derivative…work that employs pre-existing work would be denied copyright."[336]

On the other hand, if an underlying work "pervade[s] the entire derivative work" then the derivative model would not be protected by the copyright laws.[337] Moreover, "the original copyright owner is the only party that can distribute the infringing nonseparable derivative material…."[338]

In sum, when a copyright owner's derivative rights are violated by an infringer, it is possible for the infringer to have a copyright "in the noninfringing parts of the derivative work."[339]

5. Substantial Copying Versus a Complete Transformation of an Underlying Model

When an infringer makes a derivative work, in our case a model, the infringement must involve the appropriation of the underlying model. There must be a substantial similarity between the underlying work and the infringing derivative.[340] However, the derivative, although based on an underlying model, may make so many alterations or contributions that the two models are not similar. Without substantial similarity in protectable expression between the underlying model and a derivative model there is no infringement.[341]

In sum, one who transforms a work sufficiently may be entitled to a copyright based on the creator's contribution.[342] As one commentator notes, a copyright owner's "exclusive right to prepare a derivative work does not serve as an omnibus shield against any and all misappropriation."[343]

6. Proof of Infringement

Although "a derivative work is one which 'incorporates a portion of the copyrighted work in some form,' courts interpret the statute as also requiring that an infringing work be substantially similar to the work on which it is based."[344] There are two elements that a plaintiff must prove, the first being that that an alleged infringer used "the plaintiff's material as a model, template, or even inspiration" and the second being that "the defendant's work is *substantially similar* to [the] plaintiff's work…."[345]

To prove the first element, "the plaintiff must show directly or by inference that the defendant mechanically copied the plaintiff's work...or that the defendant had the plaintiff's work in mind when he composed the alleged infringing work."[346]

To prove the second element,

> the plaintiff must show that at least some of the elements the defendant copied constitute protected subject matter, and that audiences for the two works will find these elements in the defendant's work to be similar to elements in the plaintiff's work. Mere similarity between the works

[332] *Id*.

[333] NIMMER, *supra* note 20, at vol. 1 § 3.06.

[334] *Id*. § 3.06. Brunka, *supra* note 12, argues that "alternative design(s) may constitute derivative works." With BIM it is easy to create plans that are similar; the "regularization results in…copies becoming 'substantially similar'" and closer to infringing. *Id*. at 185–87.

[335] NIMMER, *supra* note 20, at vol. 1 § 3.06.

[336] *Id*.

[337] *Id*.

[338] 4 PATRY ON COPYRIGHT § 12:22.

[339] *Id*.

[340] *Id*. § 12:13.

[341] *See id*.

[342] Halpern, *supra* note 14, at 581 (stating that "[t]he use of digital technology to reproduce or to transform visual works has resulted in the need to rethink…what kind of 'contribution' will be sufficient to give the creator of the reproduction or transformation [of a derivative work] a copyright interest in the resulting work").

[343] *Id*. at 582.

[344] Swatee L. Mehta, *Berkeley Technology Law Journal Annual Review of Law and Technology: 1. Intellectual Property: A. Copyright: 3. Derivative Works: a) Substantial Similarity Test*…., 15 BERKELEY TECH. L. J. 49, at *49 (2000), hereinafter cited as "Mehta" (*quoting* H.R. REP. NO. 94-1476, at 62 (1976) and *citing* Litchfield v. Spielberg, 736 F.2d 1352, 1357 (9th Cir. 1994) (rejecting the argument that the right to make derivative works covers any work based on a copyrighted work and holding that substantial similarity must exist before a work would be considered derivative within the meaning of 17 U.S.C. 106(2)); Ferguson v. NBC, Inc., 584 F.2d 111, 113 (5th Cir. 1978) (applying substantial similarity test); Universal Athletic Sales Co. v. Salkeld, 511 F.2d 904, 907 (3d Cir. 1975) (using substantial similarity inquiry); cf. Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930) (characterizing the test for infringement as "whether the part...taken is 'substantial'")).

[345] Seshadri, *supra* note 25, at 15 (*quoting* NIMMER § 13.01[B], at 13-9) (emphasis supplied)).

[346] Brunka, *supra* note 12, at 179 (*quoting* 17 U.S.C. § 501 (2006) (internal quotation marks omitted) and *citing* Arstein v. Porter, 154 F.2d 464 (discussing infringement); GOLDSTEIN ON COPYRIGHT § 9.1 (2005); Shine v. Childs, 382 F. Supp. 2d 602, 611 (S.D.N.Y. 2005)).

> does not imply infringement; rather, such similarity must be substantial.[347]

The term substantial similarity is defined as

> sufficient similarity of a second work to the protected work to support a reasoned inference by an ordinary observer that more probably than not the second work was copied from the copyrighted work. The dominant test for substantial similarity, as elaborated by the Second Circuit, is the "total concept and feel" test.[348]

For the defendant to prevail when a plaintiff succeeds in making a prima facie case, the defendant must disprove the plaintiff's ownership; show that the defendant was authorized by a license or other agreement to make and use a copy or that the copying amounts to fair use; or demonstrate that the works are not substantially similar.[349]

Although the use of BIM appears not to have been the subject of many cases, there has been litigation when, for example, a construction company made identical images of an architect's plans. In *Aitken, Hazen, Hoffman, Miller, P.C. v. Empire Constr. Co*., [350] the court held that the copying did not constitute fair use. In another case, a copyright holder of a floor plan for a house established that an alleged infringer had access to and had traced the copyrighted design.[351] As for computer software, the copying of a copyrighted computer software system by licensees and its employees was held to be an infringement of the copyright holder's exclusive right to prepare derivative works.[352] Also, the distribution of copyrighted software to other than qualified users violated a manufacturer's exclusive right to distribution under the Copyright Act.[353]

B. Noncopyrightable Elements of Models

1. Introduction

Although copyright protection extends to BIM and models used for transportation planning and construction, the protection is limited for several reasons. Copyright protection extends to a model that is an original work of authorship; however, certain elements of any model may not be protected by the copyright laws.

2. Ideas

Copyright protection, first, does not exist for an idea.[354] Under the doctrine of merger, when an idea merges with the expression of the underlying idea in a work, the work is not copyrightable.[355]

> The doctrine of merger…holds that "when there is essentially only one way to express an idea, the idea and its expression are inseparable and copyright is no bar to copying that expression." …The related doctrine of scenes a faire denies copyright protection to "unoriginal elements flowing from the undisputed standard and inherent characteristics" of a common idea.[356]

The purpose of the merger doctrine is to ensure that courts do not unwillingly grant protection to an idea by granting exclusive rights to only one or a few means of expressing an idea;[357] doing so "would effectively accord protection to the idea itself."[358]

It is difficult, however, to articulate the difference between an idea and the expression of the idea.[359] Although ideas may not be copyrightable, a computer program that expresses an idea by way of a computer device or machine brings the expression within the standard of communications that are copyrightable.[360] Although there are elements of a computer program that are not copyrightable as ideas, it has been held that the rule against the copyrighting of ideas does not prevent an entire computer program from being copyrightable.[361] It has been held that the processes used in developing a computer program, as compared to the expression adopted by the programmer, are not within

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[347] Brunka, *supra* note 12, at 179 (citations omitted) (internal quotation marks omitted).

[348] Brunka, *supra* note 12, at 179–80 (*quoting* CONSTRUCTION CHECKLISTS: A GUIDE TO FREQUENTLY ENCOUNTERED CONSTRUCTION ISSUES 311–12 (Fred D. Wilshusen, et al. eds., American Bar Association, 2008) (some internal quotation marks omitted); Shine v. Childs*,* 382 F. Supp. 2d 602, 613 (S.D.N.Y. 2005).

[349] Seshadri, *supra* note 25, at 18 (*quoting* NIMMER ON COPYRIGHT § 13.04).

[350] 542 F. Supp. 252, 260 (D. Neb. 1982).

[351] John Alden Homes, Inc. v. Kangas, 142 F. Supp. 2d 1338 (M.D. Fla. 2001); *see also* Forest River, Inc. v. Hearland Recreational Vehicles, LLC*,* 2010 WL 4683628 (N.D. Ind. 2010).

[352] CMAX/Cleveland, Inc. v. UCR, Inc*.,* 804 F. Supp. 337 (M.D. Ga. 1992); *see also* Tracfone Wireless, Inc. v. Access Telecom, Inc*.,* 642 F. Supp. 2d 1354 (S.D. Fla. 2009) (infringement occurred when a competitor created an unauthorized reproduction and derivative versions of copyrighted software).

[353] Microsoft Corp. v. EEE Business, Inc., 555 F. Supp. 2d 1051 (N.D. Cal. 2008).

[354] *See* Intervest Constr., Inc. v. Canterbury Estate Homes, Inc., 554 F.3d 914, 919, 921 (11th Cir. 2008).

[355] Todd Hixon, *The Architectural Works Copyright Protection Act of 1990: At Odds with the Traditional Limitations of American Copyright Law*, 37 ARIZ. L. REV. 629, 652 (1995), hereinafter cited as "Hixon." *See* Raymond M. Polakovic, *Should the Bauhaus Be in the Copyright Doghouse? Rethinking Conceptual Separability*, 64 U. COLO. L. REV. 871, 888 (1993).

[356] Maddog Software, Inc. v. Sklader, 382 F. Supp. 2d 268, 278 (M.D. N.H. 2005) (citation omitted) (footnote omitted).

[357] Control Data Systems, Inc. v. Infoware, Inc*.,* 903 F. Supp. 1316 (D. Minn. 1995). *See* John Pinheiro & Gerard LaCroix, *Protecting the "Look and Feel" of Computer Software*, 1 HIGH TECH. L.J. 411, 428 (1987).

[358] New York Mercantile Exch., Inc. v. IntercontinentalExchange, Inc., 497 F.3d 109, 117 (2d Cir. 2007) (citation omitted) (internal quotation marks omitted), *cert. denied*, 128 S. Ct. 1669, 170 L. Ed. 2d 357 (2008).

[359] Apple Computer, Inc. v. Franklin Computer Corp*.,* 714 F.2d 1240, 1253 (3d Cir. 1983) (citations omitted), *cert. dismissed,* 464 U.S. 1033, 104 S. Ct. 690, 79 L. Ed. 2d 158 (1984).

[360] M. Kramer Mfg. Co., Inc. v. Andrews, 783 F.2d 421, at 435.

[361] Brignoli v. Balch Hardy & Scheinman, Inc., 645 F. Supp. 1201, 1204 (S.D.N.Y. 1986).

the scope of copyright protection.[362] In *Apple Computer, Inc. v. Franklin Computer Corp*.,[363] the Third Circuit held that computer programs are not to be denied copyrightability on the basis of their being a "process," a "system," or a "method of operation" that is not copyrightable.[364]

No cases were located for the digest specifically involving BIM and the merger doctrine. Nevertheless, in one case it was held that the merger doctrine did not bar copyright protection for an engineer's registered design and drawings for a plant because there were numerous ways to express those ideas.[365] In another case, the merger doctrine did not bar an engineer's copyright infringement action because the defendants did not demonstrate that there was only one way to create a map and subdivide property.[366] However, in another case, the merger doctrine did constrain an architectural firm's drawings because there were factors that limited the "opportunity for originality and available ways in which to express elements" in the drawings.[367]

3. Functional, Industrial, and Utilitarian Elements

If design elements reflect the merger of aesthetic and functional considerations, artistic aspects of the work cannot be said to be conceptionally separate from the functional elements and thus the work is not copyrightable.[368] Likewise, copyright protection does not extend to utilitarian works and industrial design.[369] Copyright is available only to protect the form of an object, separate from its function, and if such separation is not possible, then copyright protection is unavailable.[370]

Although original plans, drawings and models, and architectural works are protectable under the copyright laws, highways and bridges are not protected as structures under the copyright laws. Copyright protection for transportation works may be limited also on the basis that some elements needed to design a project are not protectable.

4. Systems and Methods

Copyright protection does not extend to processes or methods of construction.[371] For example, a manufacturing process is not copyrightable.[372] A "copyright does not protect a system explained within a work, nor does it protect facts contained within a work."[373]

5. Standard Architectural Features

The copyright laws do not protect standard architectural features. However, "an original combination of standard features" may be copyrightable as long as "there is no functional necessity for the particular combination."[374] In one case it was held that a roof truss drafting program's menu and submenu command tree structure were uncopyrightable. The means by which the program undertook the task of drafting roof truss planes were said to mimic the steps that a draftsman would follow in designing roof truss planes by hand.[375]

6. Industry Practices

There may be no copyrightable expression when the expression is dictated by industry practices.[376] Technical industry concepts that are widely used are not protectable elements.[377] It has been held that if there are "external factors," such as market or industry demands, requiring that all computer programs display specific

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[362] Gates Rubber Co. v. Bando Chemical Industries, Ltd., 9 F.3d 823 (10th Cir. 1993). *See also* Woods v. Resnick, 725 F. Supp. 2d 809 (W.D. Wis. 2010) (stating that finance formulas used in a computer program in the auto financing industry, whether categorical as business logic, algorithms, or math equations, could not be copyrightable); Harbor Software Inc. v. Applied Systems, Inc., 925 F. Supp. 1042 (S.D.N.Y. 1996) (holding in part that the method of calculating cyclical statistics in a computer program designed to automate marketing services for insurance agencies was not protectable for copyright purposes as the expression of the method merged with the algorithm itself).

[363] 714 F.2d 1240 (3d Cir. 1983), *cert. denied*, 464 U.S. 1033, 104 S. Ct. 690, 79 L. Ed. 2d 158 (1984).

[364] 714 F.2d at 1250–51.

[365] Jedson Engineering, Inc. v. Spirit Const. Services, Inc., 720 F. Supp. 2d 904 (S.D. Ohio 2010).

[366] McIntosh v. Northern California Universal Enterprise Co., 670 F. Supp. 2d 1069, 1096–97 (E.D. Cal. 2009).

[367] Harvester, Inc. v. Rule Joy Trammell + Rubio, LLC*,* 716 F. Supp. 2d 428, 440 (E.D. Va. 2010) (*e.g.*, market demands, building codes and manufacturers' clearance directives, functional demands, and other factors identified in the opinion).

[368] Brandir Intern., Inc. v. Cascade Pacific Lumber Co., 834 F.2d 1142 (2d Cir. 1987). *See also* Galiano v. Harrah's Operating Co., Inc., 416 F.3d 411 (5th Cir. 2005); Chosun Intern., Inc. v. Chrisha Creations, Ltd., 413 F.3d 324 (2d Cir. 2005).

[369] *See generally* SHELDON W. HALPERN, ET. AL., FUNDAMENTALS OF UNITED STATES INTELLECTUAL PROPERTY LAW: COPYRIGHT, PATENT, AND TRADEMARK*,* § 2.4. 4 (1999).

[370] Schnadig Corp. v. Gaines Mfg. Co*.,* 620 F.2d 1166 (6th Cir. 1980).

[371] UNITED STATES COPYRIGHT OFFICE, A REPORT OF THE REGISTER OF COPYRIGHTS: COPYRIGHT IN WORKS OF ARCHITECTURE 113 (1989).

[372] Norma Ribbon & Trimming, Inc. v. Little, 51 F.3d 45 (5th Cir. 1995). *See also* Secure Services Technology, Inc. v. Time and Space Processing, Inc., 722 F. Supp. 1354 (E.D. Va. 1989) (holding that the timing in a facsimile machine was a process by which electronic signals were created, transmitted, or received was excluded from copyright protection).

[373] Kugele, *supra* note 71, at 812 (*citing* ALAN LATMAN, ET AL., COPYRIGHT FOR THE NINETIES 30 (3d ed. 1989).

[374] Sims & Miller, *supra* note 16, at 53 (*citing* 37 C.F.R. § 202.11(d)(2)).

[375] MiTek Holdings v. Arce Eng'g Co*.,* 89 F.3d 1548, at 1557 (11th Cir. 1996).

[376] Mehta, *supra* note 344, at *60 (*citing* Amy B. Cohen, *Copyright Law and the Myth of Objectivity: The Idea-Expression Dichotomy and the Inevitability of Artistic Value Judgments*, 66 IND. L.J. 175, 212 (1990)).

[377] Biosafe-One, Inc. v. Hawks, 524 F. Supp. 2d 452 (S.D.N.Y. 2007).

words on a computer screen, "the components of that program that provide such a function are not protected by copyright laws."[378]

C. The Effect of the Architectural Works Copyright Protection Act

Copyright protection extended to architectural plans[379] even prior to the enactment in 1990 of the Architectural Works Copyright Protection Act (AWCPA).[380] Because of the AWCPA, an architect has two copyrights in a completed architectural work: a copyright in the constructed building as defined in Section 102(a)(8) and a copyright in the plans and drawings under Section 102(a)(5).[381] However, "the many reported decisions show that the scope of copyright protection for architectural works is thin. As a result, the architect plaintiff will ordinarily have to prove close to verbatim copying in order to win."[382]

The AWCPA provides little additional copyright protection for planners and designers of transportation projects. According to the legislative history, although the AWCPA does not define the term building,[383] the term includes structures inhabitable by humans as well as structures used but not inhabited by humans, such as churches.[384] The legislative history is clear that "bridges and related nonhabitable three-dimensional structures" are excluded from copyright protection.[385] In drafting the AWCPA, a congressional subcommittee deleted the phrase "three dimensional structures" because in the subcommittee's view, interstate highways, cloverleafs, and pedestrian walkways do not deserve copyright protection.[386] The reason is that these are "works whose overall forms are generally dictated by engineering considerations…. [They] do not embody the creative expression of an author…[and] merely express the laws of physics and structural engineering applied in a certain context."[387]

D. Fair Use of a Model

Any copyrighted work is subject to the "fair use" doctrine. The fair use of a copyrighted work is not an infringement of copyright.[388] Without the fair use doctrine, a copyright holder would be able to control all access to a work.[389] The fair use doctrine is one originally created by the courts that was codified in the 1976 Copyright Act in 17 U.S.C. § 107.[390] There are three kinds of fair use—for creative, personal, and educational uses. Creative fair use involves the use of copyrighted material in another work in creating one's own work.[391]

In what has been referred to as a preamble, § 107 states in part that the use of a copyrighted work for purposes of criticism, comment, news reporting, teaching, scholarship, or research is a fair use and not an infringement of copyright. The foregoing uses are not "presumptive categories of fair use protection. A transformative purpose is also required."[392] As the Ninth Circuit has observed,

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[378] Cognotec Services, Ltd. v. Morgan Guar. Trust Co. of N.Y., 862 F. Supp. 45, 49 (S.D.N.Y. 1994). *See also* Maddog Software Inc. v. Sklader, 382 F. Supp. 2d 268, 272 (D. N.H. 2005) (holding that a computer program that permitted entry of data on different forms "designed to accommodate the standard practices of the industry" was not infringed because based on the needs of the industry the forms were the only possible expression of the idea).

[379] 17 U.S.C. § 102. *See* NIMMER ON COPYRIGHT § 2.08[D] n.162 (1991); Winick, *supra* note 68, at 1609 (*citing* Demetriades v. Kaufmann, 680 F. Supp. 658, 664 (S.D.N.Y. 1988)); *see generally* 1 NIMMER ON COPYRIGHT § 2.08[D] n.164.1.

[380] 17 U.S.C. § 102(8). "[P]rior to the addition of 'architectural works' to the Copyright Act, architectural plans were only protected against two-dimensional copying (e.g., photocopying)." Sims and Miller, *supra note* 16, at 53.

> [C]ertain restrictions apply to the scope of copyright protection for architectural works that do not exist in other areas of copyright. [T]he owner of a copyright in an architectural work cannot prevent "the making, distribution, or public display of pictures, paintings, photographic, or other pictorial representations of the work, if the building in which the work is embodied is located in or ordinarily visible from a public place." With respect to modifications of a building, the Copyright Act states that "the owners of a building embodying an architectural work may, without the consent of the author or copyright owner of the architectural work, make or authorize the making of alterations to such building, and destroy or authorize the destruction of such building."

Id. at 53 (*quoting* 17 U.S.C. §§ 120(a) and (b)).

[381] Winick, *supra* note 68, at 1621 (*citing* 17 U.S.C. §§ 101, 102(a)(5) (1988); H.R. REP. NO. 735, at 19, reprinted in 1990 U.S.C.C.A.N. at 6950 ("Protection for architectural plans, drawings, and models as pictorial, graphic or sculptural works under section 102(a)(5), title 17, United States Code, is unaffected by this bill.")).

[382] Shipley, *supra* note 28, at *7.

[383] 17 U.S.C. § 101.

[384] Winick, *supra* note 68, at 1613–14 (*citing* H.R. REP. NO. 735 at 20, *reprinted* in 1990 U.S.C.C.A.N. at 6951).

[385] Sims & Miller, *supra* note 16, at 54 (*citing* 37 C.F.R. § 202.11(d)(1) and (2)).

[386] Winick, *supra* note 68, at 1613 (*citing* H.R. REP. NO. 735, 101st Cong., 2d Sess. 19–20 (1990), *reprinted in* 1990 U.S.C.C.A.N. 6935, 6950-51).

[387] Winick, *supra* note 68, at 1614.

[388] 17 U.S.C. § 107.

[389] Patterson & Birch, *supra* note 19, at 339.

[390] *See* Folsom v. Marsh, 9 F. Cas. 342 (C.C.D. Mass. 1841) (holding that defendants' verbatim use in its own publication of the letters of a former author constituted an act of piracy that violated the plaintiffs' copyright in the original work from which the letters had been taken); Lawrence v. Dana, 15 F. Cas. 26, 79 (C.C.D. Mass. 1869), stating that

> the privilege of fair use accorded to a subsequent writer must be such, and such only, as will not cause substantial injury to the proprietor of the first publication; but cases frequently arise in though there is some injury, yet equity will not interpose by injunction to prevent the further use….

[391] Patterson & Birch, *supra* note 19, at 333.

[392] Frederick E. Bouchat v. Baltimore Ravens Limited Partnership, 619 F.3d 301, 309 (4th Cir. 2010).

> [t]o help determine what else might count, we ask "whether the new work merely supersedes the objects of the original creation, or instead adds something new, with a further purpose or different character, altering the first with new expression, meaning or message; [we] ask, in other words, whether and to what extent the new work is transformative." …"A 'transformative' use is one that 'employ[s] the [copyrighted work] in a different manner or for a different purpose from the original….'"[393]

Section 107 sets forth four nonexclusive factors that are to be considered when assessing whether "the use made of a work in any particular case is a fair use…." The factors include:

> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
>
> (2) the nature of the copyrighted work;
>
> (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
>
> (4) the effect of the use upon the potential market for or value of the copyrighted work.

The fair use doctrine is applicable as well to derivative works that are discussed in Section VIII.A.[394] As provided in § 107, the fair use doctrine, subject to the above four factors, also applies to unpublished works.

The fair use doctrine is an affirmative defense,[395] presents a mixed question of law and fact,[396] and is determined on a case-by-case basis.[397] Section 107, however, fails to include a clear standard for determining what is or is not a fair use. As many writers have noted, Congress provided no guidance in § 107 on how to evaluate or balance the factors.[398] In a dissenting opinion, Justice Blackman, quoting a Second Circuit opinion, once described the fair use doctrine as "the most troublesome in the whole law of copyright."[399]

Thus, the first factors in § 107 to be considered when applying the fair use doctrine are the purpose and character of the use and specifically whether the use is commercial in nature or is for a nonprofit educational purpose.[400] If a use of a copyrighted work fits within one of the favored uses under the Copyright Act, then the use is considered presumptively fair, but if the use is commercial, then there is a presumption that the use is unfair.[401] The commercial nature of a use that is claimed to be a fair use "weighs against a finding of fair use."[402] It has been held that the effect of a use on the value of a copyrighted work is "undoubtedly the single most important element of fair use."[403] Nevertheless, the fact that the use of a copyrighted work is for a commercial purpose does not necessarily defeat the fair use defense in an action for infringement of a copyright.[404]

Other factors that are considered in determining whether copying is a noninfringing, fair use include the nature of the copyrighted work, the amount of the copying of the work, and how the use affects the market for or the value of a copyrighted work.[405] If part of a work that is copied is unpublished, then the absence of publishing is an important factor but not one that is necessarily determinative of whether the copying is a fair use.[406] In one case, a telephone company copied a copyrighted database generated by licensed, network-management software so that the database could be viewed through a third-party's software to avoid repeated access to the database. The court held that the copying of the database did not constitute a fair use.[407]

Although the DMCA brought the copyright laws "into the digital age,"[408] the DMCA did not change the fair use doctrine in § 107.[409] Nevertheless, one source argues that by prohibiting circumvention of technological protection measures, the DMCA made fair use irrelevant with respect to the vast amount of protected expression stored in digital form. The DMCA gave copyright owners an absolute veto over any fair uses of their works.[410]

E. Proprietary Rights in a Model

A designer of a model should have a protectable property interest in its model until such time that the

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[393] *Frederick E. Bouchat,* 619 F.3d at 308 (citations omitted).

[394] 4 PATRY ON COPYRIGHT § 12:25**.**

[395] Harper & Row Publishers, Inc. v. Nation Enterprises, 471 U.S. 539 at 561 (1985).

[396] *Frederick E. Bouchat*, 619 F.3d at 307.

[397] Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 577 (1994).

[398] Gideon Parchomovsky & Kevin A. Goldman, *Fair Use Harbors*, 93 VA. L. REV. 1483, 1485, 1496 (2007), hereinafter cited as "Parchomovsky & Goldman" (stating that "neither the courts nor the legislature have provided a useful definition of fair use, nor have they devised a meaningful method for determining which uses are fair").

[399] Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417, 475 (1984) (Blackman, J., dissenting) (*quoting* Dellar v. Samuel Goldwyn, Inc., 104 F.2d 661, 662 (2d Cir. 1939) (per curiam)).

[400] Marcus v. Rowley, 695 F.2d 1171 (9th Cir. 1983), *disapproved,*796 F.2d 1148 (9th Cir. 1986).

[401] Robinson v. Random House, Inc., 877 F. Supp. 830 (S.D.N.Y. 1995).

[402] *Frederick E. Bouchat,* 619 F.3d at 311.

[403] *Id*. at 312 (citations omitted).

[404] Consumers Union of United States, Inc. v. General Signal Corp., 724 F.2d 1044 (2d Cir. 1983).

[405] *Id.* (*citing* 17 U.S.C. § 107).

[406] Harper & Row, Publishers, Inc. v. Nation Enterprises, 471 U.S. 539, 554, 105 S. Ct. 2218, 2227, 85 L. Ed. 2d 588, 603 (1985).

[407] Madison River Management Co. v. Business Management Software Corp., 387 F. Supp. 2d 521 (M.D. N.C. 2005).

[408] Joseph B. Baker, *Contracting to Supplement Fair Use Doctrine*, 39 U. MEM. L. REV. 757, 764 (2009), hereinafter cited as "Baker" (*quoting* S. REP. NO. 105-109, at 2 (1998).

[409] Baker, *supra* note 408, at 764.

[410] *Id*. at 765.

model is released into the public domain.[411] According to one authority, "a person having no trust or other relationship with the proprietor of a computerized database should not be immunized from sanctions against electronically or cryptographically breaking the proprietor's security arrangements and accessing the proprietor's data."[412]

X. WHETHER A MODEL IS A TRADE SECRET

Although no cases were located for the digest regarding whether models are protected as trade secrets, based on state statutes and precedents not involving models, a model may be protected as a trade secret from misappropriation and use by another party. If the claim is for copying and/or infringement, it is possible that a trade secret claim would be preempted by the Copyright Act.

According to the *Restatement (Third) of Unfair Competition*, "[a] trade secret is any information that can be used in the operation of a business or other enterprise and that is sufficiently valuable and secret to afford an actual or potential economic advantage over others."[413] Forty-five states, the District of Columbia, and the U.S. Virgin Islands have adopted some version of the Uniform Trade Secrets Act (UTSA), a model law defining rights and remedies regarding trade secrets.[414]

Pursuant to the UTSA any "information" may constitute a trade secret.[415] The UTSA defines a trade secret to mean

> information, including a formula, pattern, compilation, program device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.[416]

To preserve a trade secret the owner must be careful "to limit access to the information, and such information should only be disclosed in confidence."[417]

A claim may be available for misappropriation of trade secrets under either the UTSA[418] or at common law. Although a misappropriation of trade secrets is unlawful, "trade secret law does not create a right in the information itself."[419] Thus, an owner "has no proprietary interest in the information," and "the public at large remains free to discover and exploit the trade secret through reverse engineering…or by independent creation."[420]

As the court observed in *Sherman & Co. v. Salton Maxim Housewares, Inc.,*[421] under the Michigan statute[422] a claimant has to establish among other things whether the data in question amounts to trade secrets and whether the party against whom the claim is made has given express or implied consent to disclose or use the data.[423] In *Sherman,* because Salton alleged that, "Sherman took sales data constituting trade secrets and/or proprietary information under MCL § 445.1902(b)(ii)(A) and gave it to Salton's competitor…without Salton's consent," Salton's amended counterclaim stated a claim.[424]

Not addressed in the *Sherman* case is the question of whether the Copyright Act preempts a state claim for misappropriation of a trade secret. As one article notes, as "the line between trade secret and copyright protection becomes blurred…the possibility of preemption increases."[425] Whether there is preemption depends on whether the essence of the claim for a violation of a state's trade secrets law is merely for unauthorized copying of data or software.

In *Huckshold v. HSSL, LLC,*[426] the plaintiff had entered into an agreement to develop software for the tracking and maintenance of a customer database for the defendant HSSL.[427] Another defendant, The Miller Group, Inc., allegedly copied the software from one of HSSL's computers in violation of the agreement between the plaintiff and HSSL. The court noted that a claim for misappropriation of trade secrets is preempted when the claim is based solely on copying, because the claim would be "qualitatively equivalent" to a claim for copyright infringement.[428] On the other hand, "claims of misappropriation of trade secrets that are based upon breach of an independent duty of trust or confidence to the plaintiff are qualitatively different than claims for copyright infringement and are not preempted."[429] The

[411] Corey Field, *Corporations and Copyright in Cyberspace*, 27 DEL. J. CORP. L. 99, 129 (2002).

[412] NIMMER, *supra* note 20, at vol. 1 § 101[B][2][b] (citation omitted).

[413] *Restatement (Third) of Unfair Competition*, 39 cmt. d (1995).

[414] Lars S. Smith, *Symposium Review: RFID and Other Imbedded Technologies: Who Owns the Data?* 22 SANTA CLARA COMPUTER & HIGH TECH. L. J. 695, 722 n.138 (2006).

[415] *Uniform Trade Secrets Act* § 1(4), available at: http://euro.ecom.cmu.edu/program/law/08-732/TradeSecrets/utsa.pdf. *See also*, State of Washington, Trade Secrets Act, WASH. REV. CODE § 19.108, *et seq*., available at: http://apps.leg.wa.gov/RCW/default.aspx?cite=19.108.

[416] Uniform Trade Secrets Act § 1(4).

[417] Smith, *supra* note 414, at 724; *Restatement (Third) of Unfair Competition*, 39 cmt. g (1995).

[418] *See* Uniform Trade Secrets Act 1(2).

[419] Smith, *supra* note 414, at 729 (*citing Restatement (Third) of Unfair Competition*, 39 cmt. c (1995)).

[420] *Id.* at 730 (footnote omitted).

[421] 94 F. Supp. 2d 817 (E.D. Mich. 2000).

[422] MICH. COMP. LAWS § 445.1902(b)(ii)(A).

[423] Sherman & Co. v. Salton Maxim Housewares, Inc*.,* 94 F. Supp. 2d 817, 821, 822 (E.D. Mich. 2000).

[424] *Id.* at 822.

[425] Carole P. Sadler, *Comment: Federal Copyright Protection and State Trade Secret Protection: The Case for Partial Preemption*, 33 AM. U. L. REV. 667, 668 (1984) (footnote omitted).

[426] 344 F. Supp. 2d 1203 (E.D. Mo. 2004).

[427] *Id.* at 1205.

[428] *Id.* at 1209 (citation omitted).

[429] *Id.* (citations omitted).

court held that the plaintiff's claim for misappropriation of trade secrets was not preempted, because the plaintiff would "have to prove that the Software was a trade secret that was misappropriated by Miller from HSSL and that HSSL was under a duty to maintain the secret and limit its use. These are elements in addition to the copying required for a copyright infringement claim."[430]

Likewise, in *Therapeutic Research Faculty v. NBTY, Inc.,*[431] the court held that the alleged misappropriation by the subscriber of its username and password for the defendants' benefit was a violation of the UTSA adopted in California. Moreover, the court held that the plaintiff could prevail on its claim by showing damage because of the misappropriation or unjust enrichment.[432]

There also may be an issue of whether a state's trade secret law preempts other claims at common law. Section 7(a) of the UTSA provides that except as provided in subsection (b) it "displaces conflicting tort, restitutionary, and other law of this State providing civil remedies for misappropriation of a trade secret." However, the UTSA "does not affect: (1) contractual remedies, whether or not based upon misappropriation of a trade secret; or (2) other civil remedies that are not based upon misappropriation of a trade secret…."[433] Of course, a trade secret statute does not preclude other civil remedies for misappropriation of confidential information if the information is not a trade secret under the applicable statute.[434]

XI. DISCLOSURE OF MODELS UNDER PUBLIC INFORMATION LAWS

A. Federal FOIA Issues

The purpose of the Federal Freedom of Information Act (FOIA) is to open the administrative process to public scrutiny,[435] disclosure being the dominant objective of the Act.[436] The law provides for full disclosure by an agency unless the information sought is exempt from disclosure under one of the Act's nine exceptions.[437] In general, the statute is interpreted broadly to permit access to official information so as to create a judicially enforceable public right to government information that otherwise would not be available for inspection. The term agency as used in the Act includes any government corporation or government-controlled corporation.[438] Furthermore, "the FOIA does not authorize an agency to restrict the use of information in the hands of a recipient."[439]

When it comes to a model for a transportation project it appears that the legal basis for refusing to disclose a model is either weak or even nonexistent.[440] A requester may obtain a model and in some jurisdictions be able to reuse it commercially or otherwise, subject of course to a copyright holder's rights under the copyright laws. One source has observed that when FOIA material is produced the highest charges are imposed for records having a commercial use.[441]

B. State Public Records Disclosure Laws

1. Applicability to Models

All 50 states have enacted their own FOIA or Freedom of Information Law (FOIL) pursuant to which individuals may obtain records of state and local government agencies and departments.[442] If a model is copyrightable, state law must be consulted because how the laws "are drafted may affect the terms of a state's copyright interest or whether a state can be deemed to have placed its documents in the public domain."[443] One source suggests that by allowing the inspection of records but limiting copying, it may be possible "to apply an open records law and still preserve a copyright interest;"[444] however, such an approach may have limited utility for information that is "electronic in format."[445]

In general FOIAs and FOILs now apply to government information and data in electronic form.[446] Under New York's FOIL, for example, all agency records must be released to a requester unless they fall under one of the specific exemptions stated in the law that are similar to those in the Federal FOIA. Under New York's FOIL "any information kept, held, filed, produced or reproduced by, with or for an agency or the state legislature" constitutes a record.[447] A record may be in the form of a document, file, book, photograph, drawing,

[430] *Id.*

[431] 488 F. Supp. 2d 991, 999 (E.D. Ca. 2007) (*quoting* Fas Techs, Ltd. v. Dainippon Screen MFG., Co., Ltd., 2001 U.S. Dist. LEXIS 7503 (N.D. Cal. May 31, 2001) and *citing* Cal. Civ. Code §§ 3426.2, 3426.3).

[432] *Therapeutic Research Faculty*. 488 F. Supp. 2d at 1000 (citations omitted).

[433] Uniform Trade Secrets Act §§ 7(a) and (b).

[434] Burbank Grease Servs., LLC v. Sokolowski, 294 Wis. 2d 274, 308 (2006) 717 N.W.2d 781, 798 (*citing* WIS. STAT. § 134.90(6)(a) (emphasis supplied)).

[435] 5 U.S.C. § 552(d) (2009).

[436] *Id.*

[437] *Id*. § 552(b).

[438] § 552(f)(1) (2009).

[439] Gellman, *supra* note 40, at 1032 (*citing* Baldridge v. Shapiro, 455 U.S. 345, 350 n.4, 102 S. Ct. 1103, 1106 n.4, 71 L. Ed. 2d 199, 206 n.4 (1982) (noting that there was no provision in the FOIA for releasing information but swearing all users to secrecy)).

[440] 5 U.S.C. § 552(b) (2009).

[441] Gellman, *supra* note 40, at 1031 (*citing* 5 U.S.C. § 552(a)(4)(A)(ii)(I) (1988)).

[442] Ira Bloom, *Freedom of Information Laws in the Digital Age: The Death Knell of Informational Privacy*, 12 RICH. J. L. & TECH. 9, text at note 11 (2006).

[443] Gellman, *supra* note 40, at 1035 (*citing* John A. Kidwell, *Open Records Laws and Copyright*, 1989 WIS. L. REV. 1021, 1030 (1989)).

[444] *Id.* at 1034.

[445] *Id.* at 1035.

[446] Bloom, *supra* note 442, text at note 13.

[447] N.Y. Public Officers Law § 86(4) (2009).

computer disk, or tape.[448] However, an agency is not required to create a record if the record does not exist at the time a request is made.[449] One of the exemptions under the New York law is for records that "if disclosed, would jeopardize an agency's capacity to guarantee the security of its information technology assets, such assets encompassing both electronic information systems and infrastructures."[450]

It has been held that a municipality may not avoid liability under its state's open records law through contracts, for example, with independent contractors.[451] Thus, a municipality may not avoid disclosure because pursuant to a contract an independent contractor has custody of the city's records.[452]

In *WIREdata, Inc. v. Village of Sussex,* because the municipalities had provided the information, albeit in a format that could not be manipulated and used as WIREdata desired, the municipalities also were not liable under the open records law.[453] Furthermore, Wisconsin's Supreme Court stated that it disagreed

> with the court of appeals' statement that requesters must be given access to an authority's electronic databases to examine them, extract information from them, or copy them. …We share the DOJ's concern, as expressed in its amicus brief, that *allowing requesters such direct access to the electronic databases of an authority would pose substantial risks*. For example, confidential data that is not subject to disclosure under the open records law might be viewed or copied. Also, the authority's database might be damaged, either inadvertently or intentionally. We are satisfied that it is sufficient for the purposes of the open records law for an authority, as here, *to provide a copy of the relevant data in an appropriate format*.[454]

Thus, there is some authority that a requestor may not be entitled to records in the format of the requestor's choice. Moreover, state law must be consulted regarding whether a government or government agency may refuse to produce electronic information either because of an exemption under state law or because the statute does not require that the information be provided in such a format, possibly for security reasons.

2. Whether an End-User Agreement May Be Required Before Disclosing a Model

One issue is whether a transportation department would be able to protect a model for a project from disclosure under a FOIA or FOIL and thereafter from being used for a commercial or other purpose. First, the cases discussed below hold uniformly that even a copyrighted work must be disclosed unless disclosure is precluded by a specific exemption. Second, in the cases located for the digest, in every instance the courts required disclosure to the requesting party even if the requester had a commercial motive. Third, the cases are divided on the issue of whether a public agency may require a requester to sign a contract, e.g., an end-user agreement, to prevent further distribution or use by the requester or others.

In *Microdecisions, Inc. v. Skinner*,[455] involving geographic information systems (GIS) maps, the court held that a county's property appraiser could not require prospective commercial users of the records created in the office to sign a licensing agreement as a condition to receiving the records.[456] Although the court did not hold that the county had a copyright in the GIS maps,[457] the court did hold that under Florida law "the fact that a person seeking access to public records wishes to use them in a commercial enterprise does not alter his or her rights under Florida's public records law."[458] Even if there were a copyright in the GIS maps, the Florida public records law "overrides a governmental agency's ability to claim a copyright in its work unless the legislature has expressly authorized a public records exemption."[459]

In *County of Santa Clara v. The Superior Court of Santa Clara County,*[460] the county demanded, prior to furnishing its copyrightable GIS basemap to a requester under the California Public Records Act (CRPA), that the requester sign an end-user agreement. The court, agreeing with the Florida court's decision in *Microdecisions*, ruled that the county as part of its disclosure under the CPRA could not require a requester to sign an end-user agreement. Stating that "end user restrictions are incompatible with the purposes and operation of the CPRA,"[461] the court held that "[t]he CPRA contains no provisions either for copyrighting the GIS basemap or for conditioning its release on an end user or licensing agreement by the requester. The record thus must be disclosed as provided in the CPRA, without any such conditions or limitations."[462]

In contrast to the courts' decisions in *County of Santa Clara v. The Superior Court of Santa Clara County* and *Microdecisons, Inc*., the South Carolina Supreme Court held in *George H. Seago, III v. Horry County*[463] that an end-user agreement could be required

[448] *Id.*

[449] *Id.* § 87 (2009).

[450] *Id.* § 87(2)(i) (2009).

[451] WIREdata, Inc. v. Village of Sussex*,* 310 Wis. 2d 397, 437, 751 N.W.2d 736, 755 (2008) (Holding that because a municipality's independent contractor is not an authority within the meaning of the open records law, the independent contractor, an assessor, was not a proper recipient of an open records request.

[452] *Id.* at 441, 751 N.W.2d at 757.

[453] *Id.* at 443, 751 N.W.2d at 758.

[454] *Id.* at 447, 751 N.W.2d at 760 (emphasis supplied).

[455] 889 So. 2d 871 (Fla. 2d DCA 2004).

[456] *Id.* at 872.

[457] *See id.* at 875, n.2.

[458] *Id.* at 875.

[459] *Id.* at 876 (citations omitted).

[460] 170 Cal. App. 4th 1301, 89 Cal. Rptr. 3d 374 (Cal. App. 6th Dist. 2009), *modified*, 2009 Cal. App. LEXIS 274 (Cal. App. 6th Dist. Feb. 27, 2009).

[461] *Id.* at 1335, 89 Cal. Rptr. 3d at 399.

[462] *Id.* at 1335–36, 89 Cal. Rptr. 3d at 400.

[463] 378 S.C. 414, 663 S.E.2d 38 (2008).

by the county. The county's geographic information department had developed a digital database to combine several layers of information onto one digital photographic map of the county at a cost of $7.5 million.[464] A real estate company made a request for the digital photographic map for its Web site for the use of its customers.[465] The court agreed with the Second Circuit in *County of Suffolk, New York v. First American Real Estate Solutions,* discussed below.[466] In *George H. Seago, III,* the court held that the county could obtain copyrights and that maps could be copyrighted to the extent that they contained "original materials, research, and creative compilation."[467] Furthermore, the court held that the county could restrict the subsequent commercial distribution of the data requested by Seago pursuant to the copyright law.[468]

In *County of Suffolk, New York v. First American Real Estate Solutions*,[469] involving the county's attempt to copyright and control the redistribution of the county's official tax maps, the Second Circuit observed that "states and their subdivisions are not excluded from protection under the Act" and unless they are prohibited from doing so by a specific state law may seek to copyright databases under their control.[470] The court held, *inter alia*, that the state's FOIL did not abrogate the county's copyright in its tax maps and that the county could comply with its FOIL obligations while preserving its rights under the Copyright Act.[471]

3. Post 9/11 Security Issues and Public Access to Models

In particular since the terrorist attacks on September 11, 2001 (9/11), there has been an issue whether a public agency may refuse to disclose data because of its concerns regarding public safety and security. According to one commentator, the states and localities would be prudent to establish policies concerning information on "key infrastructure systems."[472]

Several cases have addressed the question of whether information collected by a locality should not be disclosed because disclosure would threaten a town's or county's safety or security. In *Dir., Dep't of Information Technology of the Town of Greenwich v. Freedom of Information Comm'n,*[473] the Department of Information Technology (DIT) denied a request by an individual requester for "a copy of all [geographic information system or 'GIS'] data concerning orthophotography, arc info coverages, structured query language server databases, and all documentation created to support and define coverages for the arc info data set."[474] The DIT "claimed that the data…was exempt from disclosure pursuant to General Statutes § 1-210(b)(5)(A), which provides an exemption from disclosure for trade secrets, and § 1-210(b)(20), which exempts from disclosure information that would compromise the security of an information technology system."[475]

In regard to the issue of security, Connecticut's General Statutes Section 1-210(b)(19) provided that the Freedom of Information Act did not require disclosure of:

> Records when there are reasonable grounds to believe disclosure may result in a safety risk, including the risk of harm to any person, any government-owned or leased institution or facility or any fixture or appurtenance and equipment attached to, or contained in, such institution or facility, except that such records shall be disclosed to a law enforcement agency upon the request of the law enforcement agency.[476]

The Supreme Court of Connecticut agreed with the trial court that the DIT had failed to seek a public safety determination from the commissioner of public works as required under the above provision; failed to show a potential threat to the town's residents if the requested GIS data were disclosed; failed to provide "statistical data that correlates criminal activity or potential terrorist type activity with disclosure of GIS data"; and failed to show how disclosure of the data "would compromise the security or integrity of the GIS."[477]

An attempted refusal to disclose a GIS basemap on the ground of federal homeland security law also was unsuccessful in *County of Santa Clara v. The Superior Court of Santa Clara County,*[478] *supra*. The trial court had required the county to disclose its GIS basemap to a requester, the California First Amendment Coalition (CFAC), which sought a copy under the CPRA.[479] The court stated that the case "illuminates tensions between federal homeland security provisions and our state's open public record laws."[480] One of the county's arguments was that federal law promulgated under the Homeland Security Act of 2002[481] protected the information from disclosure.[482] Although the court held that under the law the county had to disclose the information, it is worthwhile to note, first, the provisions of federal law on which the county relied, and, second, the

[464] *Id.* at 419, 663 S.E.2d at 40.

[465] *Id.* at 420, 663 S.E.2d at 41.

[466] 261 F.3d 179 (2d Cir. 2001).

[467] *George H. Seago, III*, 378 S.C. at 424, 663 S.E.2d at 43.

[468] *Id.* at 424–25, 663 S.E.2d at 43 (citation omitted).

[469] 261 F.3d 179 (2d Cir. 2001).

[470] 261 F.3d at 187.

[471] *Id.* at 195.

[472] Bloom, *supra* note 442, text at notes 102–03 (footnotes omitted).

[473] 274 Conn. 179, 874 A.2d 785 (2005).

[474] *Id.* at 182, 874 A.2d 787 (footnote omitted).

[475] *Id.* at 182–83, 874 A.2d 788 (footnotes omitted).

[476] *Id.* at 186, 874 A.2d at 790.

[477] *Id.* at 189, 191, 874 A.2d at 793.

[478] 170 Cal. App. 4th 1301, 89 Cal. Rptr. 3d 374 (6th Dist. 2009).

[479] CAL. GOV'T CODE § 6250, *et seq*.

[480] *County of Santa Clara*, 170 Cal. App. 4th at 1308, 89 Cal. Rptr. 3d at 379.

[481] 6 U.S.C. § 101 (2009), *et seq*.

[482] *County of Santa Clara*, 170 Cal. App. 4th at 1308, 89 Cal. Rptr. 3d at 379.

court's analysis in determining why federal law did not apply.

The court noted that the federal statute at issue was the Critical Infrastructure Information Act of 2002 (CII Act),[483] part of the Homeland Security Act of 2002 that established the Department of Homeland Security (DHS).[484] Within the DHS, Congress established the Office of Intelligence and Analysis and the Office of Infrastructure Protection[485] that are responsible, *inter alia*, for carrying out "comprehensive assessments of the vulnerabilities of the key resources and critical infrastructure of the United States…."[486]

> At the heart of the CII Act is the protection of critical infrastructure information (CII), statutorily defined as "information not customarily in the public domain and related to the security of critical infrastructure or protected systems." …"The CII Act authorized DHS to accept information relating to critical infrastructure from the public, owners and operators of critical infrastructure, and State, local, and tribal governmental entities, while limiting public disclosure of that sensitive information under the Freedom of Information Act…and other laws, rules, and processes."[487]

The CII Act contains provisions exempting from disclosure either under the Federal FOIA or under any state or local disclosure law of any critical infrastructure information that is submitted voluntarily to the DHS.[488] The CII Act directs DHS to establish uniform procedures for the receipt, care, and storage of such information and for the protection of the confidentiality of the information.[489] Under the regulations implementing the above statutory scheme, "protected CII" was referred to as "PCII," i.e., "CII that has been validated by DHS."[490]

The county argued that federal law preempted the CPRA, a question the court did not reach, because it held that the CII Act was inapplicable: "the County is a *submitter* of CII, not a *recipient* of PCII."[491]

> Taken as a whole, this consistent and pervasive regulatory language supports our construction of the relevant provision of the CII Act, 6 United States Code section 133(a)(1)(E)(i). As we interpret that provision, it draws a distinction between the submission of CII and the receipt of PCII. In the hands of the submitter, the nature of the information remains unchanged; in the hands of the governmental recipient, it is protected from disclosure.[492]

Thus, "the federal statute's prohibition on disclosure of protected confidential infrastructure information applies only when it has been 'provided to a State or local government or government agency….'"[493]

Although the county also asserted a public safety interest in guarding against terrorist threats,[494] the court noted that the trial court found that the dissemination of the GIS basemap had not been an overriding concern because the county had sold it to 18 purchasers.[495] The court held:

> Security may be a valid factor supporting nondisclosure. …But the "mere assertion of possible endangerment does not 'clearly outweigh' the public interest in access to these public records." …While we are sensitive to the County's security concerns, we agree with the trial court that the County failed to support nondisclosure on this ground.[496]

The Connecticut Supreme Court also rejected the public safety reason as a basis for not disclosing a GIS database.[497] In both the *Dep't of Information Technology of the Town of Greenwich* and the *County of Santa Clara* cases, it appears that disclosure was required because the statute in question was not broad enough to preclude disclosure and/or because the government failed to demonstrate that public safety or security was a creditable or verifiable reason for refusing to provide the requested data.

4. Whether a BIM Model Is a Trade Secret Not Subject to Disclosure

Very little authority was located for the digest regarding whether trade secrets are subject to disclosure under public records disclosure laws. It has been held that computer data purchased by the legislature with public funds for use in legislative redistricting constituted a trade secret owned by the vendor that prepared it and was exempt from disclosure as a public record.[498] At least one court has held that a state's Public Records Act "protects a broader range of information than just that covered under the…definition [in] the Trade Secrets Act. The Public Records Act protects from disclosure documents in the hands of a public body 'which contain trade secrets or confidential commercial or financial information….'"[499] In a 1935 case, *State ex. Rel. Cummer v. Pace,*[500] the court held that records concern-

[483] *Id.* at 1313, 89 Cal. Rptr. 3d at 382 (*citing* 6 U.S.C. §§ 131–134).

[484] *Id. (citing* 6 U.S.C. §§ 101, 111(a)).

[485] *Id.* (*citing* 6 U.S.C. § 121(a)).

[486] *Id.* (*citing* 6 U.S.C. § 121(d)(2), (5)).

[487] *Id.* at 1313, 89 Cal. Rptr. 3d at 383 (citations omitted).

[488] *Id.* at 1313–14, 89 Cal. Rptr. 3d at 383.

[489] *Id.*

[490] *Id.* at 1314–15, 89 Cal. Rptr. 3d at 384 (citation omitted).

[491] *Id.* at 1316, 89 Cal. Rptr. 3d at 385 (emphasis in original).

[492] *Id.* at 1318, 89 Cal. Rptr. 3d at 386 (citation omitted) (footnote omitted).

[493] *Id.* (citation omitted).

[494] *Id.* at 1327, 89 Cal. Rptr. 3d at 393.

[495] *Id.* at 1329, 89 Cal. Rptr. 3d at 395.

[496] *Id.* (citations omitted).

[497] Dir., Dep't of Information Technology of the Town of Greenwich v. Freedom of Information Comm'n, 274 Conn. 179, 874 A.2d 785 (2005).

[498] Brown v. Iowa Legislative Council, 490 N.W.2d 551 (Iowa 1992).

[499] Caldwell & Gregory, Inc. v. University of Southern Mississippi, 716 So. 2d 1120, 1122 (Miss. Ct. App. 1998) (citation omitted) (emphasis deleted).

[500] 121 Fla. 871, 164 So. 723 (1935). The Municipal Docks and Terminals, when acting as agents for shippers and con-

ing the operation of the municipal docks and terminals of the city and concerning, *inter alia*, the routing of property were not subject to disclosure under the law providing for inspection of public records because the disclosure of such information would violate the Interstate Commerce Commission's rules protecting trade secrets.

On the other hand, in *Dir., Dep't of Information Technology of the Town of Greenwich v. Freedom of Information Comm'n,*[501] the Supreme Court of Connecticut rejected the claim of the DIT that the disclosure of GIS data would reveal a trade secret for which the Connecticut statute provided an exemption:

> The requested GIS data in the present case, however, is readily available to the public, and, accordingly, it does not fall within the plain language of § 1-210(b)(5)(A) as a trade secret. As the trial court noted, *the GIS database is an electronic compilation* of the records of many of the town's departments. Members of the public seeking the GIS data could obtain separate portions of the data from various town departments, where that data is available for disclosure. *The requested GIS database simply is a convenient compilation of information that is already available to the public. The records therefore fail to meet the threshold test for trade secrets*.[502]

The Maryland Transit Administration's special conditions in regard to the agency's obligations under the Public Information Act provide that a contractor may "clearly identify each portion of the technical data it considers a 'trade secret' to which the public shall be denied inspection."[503] Under the special conditions, certain categories of technical data are not to be considered trade secrets.[504]

In sum, the cases hold that electronic data are not necessarily protected from disclosure when requested pursuant to a FOIA or FOIL. In two cases the courts held that although the data had to be released, the government could restrict redistribution by requiring a requester to sign an end-user agreement. Unless there is a specific exemption, data compiled by the government is not protected as a trade secret from disclosure; however, information in the possession of the government that if released would reveal a third party's trade secrets may be protected from disclosure.

XII. DISCUSSION OF THE TRANSPORTATION DEPARTMENTS' OTHER RESPONSES TO SURVEY QUESTIONS

A. State Statutes or Regulations Applicable to BIM

The states did not identify any statutes or regulations that authorize or require a transportation department to make use of BIM.[505] Caltrans has a directive mandating that certain files must be provided to bidders that will help in developing models.[506] Likewise, in Delaware notice is given to a contractor regarding the types of electronic files that will be shared with the contractor who is ultimately awarded a contract.[507] There is also a Design Guidance Memorandum for determining the projects on which electronic data will be provided.[508] FDOT noted that Chapters 334 and 337 of the Florida Statutes permit innovative contracting.[509]

The departments also did not identify any statutes or regulations in their states applicable to the retention of ownership or control of models developed with BIM.[510] PennDOT stated that ownership and control is set by the terms and conditions of the contract.[511]

B. Identification of BIM Software Used for Transportation Department Construction Projects

As for specific BIM software that has been used to design and construct projects, in California, the department's engineers use CAiCE to develop internal models; however, Caltrans is in the process of replacing CAiCE with Autocad Civil 3D.[512] Caltrans' response also stated that the creation of a 3D model is not currently a requirement of or a deliverable in its project development process, but that after Civil 3D is fully implemented it will be a requirement that 3D models are developed.[513] With the implementation of Civil 3D in 2012, the department plans to integrate models into the project delivery process. However, until all interoperability issues are addressed, the implementation will be internal only.[514]

The Delaware DOT uses the following Bentley Sys-

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signees, would receive and deliver goods and collect and remit the agreed prices and keep records thereof. *Id*. at 723–24.

[501] 274 Conn. 179, 874 A.2d 785 (2005).

[502] *Id.*, 274 Conn. at 195, 874 A.2d at 795 (emphasis supplied).

[503] MTA, SGP -7.04 Rights in Technical Data, ¶ C. Paragraph C also provides that a contractor acknowledges that its "classifications are advisory only." *Id*.

[504] *See id*., ¶ D, stating that the following categories are not exempt as trade secrets:

> 1. Technical data prepared or required to be delivered under this contract and any subcontracts hereunder for the purpose of identifying sources, part numbers, size, configurations, mating, attachment characteristics, functions characteristics and performance requirements.
>
> 2. Manual or instructional materials prepared or required to be delivered under this contract and any subcontracts hereunder, for installation, operation, maintenance, repair, replacement, overhaul and training purposes.

[505] *See, e.g.,* Caltrans Response, PennDOT Response, and MDOT Response.

[506] Caltrans Response.

[507] *See* http://www.deldot.gov/information/business/drc/pd_files/model_plans/ei-mp-09-004_model_plans_notes.pdf.

[508] *Id*.

[509] FDOT Response.

[510] *See, e.g.,* FDOT Response; MDOT Response; PennDOT.

[511] PennDOT Response.

[512] Caltrans Response.

[513] *Id*.

[514] *Id*.

tems software products to aid in the creation of roadway models: MicroStation V8i (Version 08.11.07.443), CADD software, and InRoads V8i (Version 08.11.07.536) design software.[515] In Florida, the transportation department utilizes Bentley's MicroStation GEOPAK that is capable of BIM modeling. FDOT states that it is in the process of implementing Autodesk AutoCAD Civil 3D on a few pilot projects whose designs implement "full corridor modeling."[516]

The Michigan DOT is using Bentley MicroStation and GEOPAK V8i for the creation of models.[517] Michigan stated that it has just begun using the new Roadway Designer software within GEOPAK and that the new software provides the department with the capability to create models.[518] Minnesota also identified Bentley Civil GEOPAK version V8i SS1 or higher.[519] Likewise, in Missouri, roadway design models are created in GEOPAK SS2 R2 from Bentley Systems.[520] PennDOT identified Bentley MicroStation and Inroads versions 8.5 and 8.1 and the use of LandXML format for the transfer of data.[521] Finally, the Wisconsin DOT uses AutoCAD Civil 3D to design its projects and reports also that when the AMG surface model delivery requirement takes effect projects will be designed in AutoCAD Civil 3D.[522]

C. Other Issues or Problems Experienced by the Departments Using BIM

As for any other issues or problems that the departments have experienced in connection with the use of BIM and models, Caltrans stated that software compatibility between different entities has been an issue when exchanging electronic files.[523] On the other hand, Delaware has not experienced any major issues with the CADD or design software when developing roadway models.[524]

Florida reports some problems with the necessary learning curve and training, "the expense of having more sophisticated software and hardware…, the additional effort needed to gain proficiency using that software, the acceptance by the designer, and how…the customer (Contractor) take[s] advantage of the technology and the resulting data…."[525]

MDOT stated that it is slowly beginning to provide models to contractors:

> We are in our infancy but understand the value of providing electronic information. The best examples of BIM are a result of Design Build and other innovative contracting methods. It takes time to change processes and procedures. For instance we have just rolled out the software which is capable of creating models. The designs which incorporate the software may take several years before they are ready for letting to construction.[526]

In Michigan, pilot projects have revealed the need to perform independent quality assurance of the models prior to publishing them to contractors.[527] Furthermore, the transportation department is

> setting up processes to have a surveyor perform a review of the model and project control. We also need to further define the models based on the type of project. In some cases a 50% complete model may be acceptable for construction which would require less designer effort. [For] other types of jobs intersections, driveways, ramps, etc. may need to be precisely modeled to build the job which would require a 100% complete model with increased design time. The other issue that will need resolving is when the contractor discovers a bust in the model. If this happens is it the [department's] responsibility to correct the model in a reasonable timeframe. In our process the model is provided as information only with letting plans being the controlling document. Theoretically the same bust should be inherent in the planset so [that] the Agency would correct the model. If the bust was not inherent in the planset it would be left up to the contractor to correct the model.[528]

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[515] DelDOT Response. For example, MicroStation V8i is described by Bentley as

> the world's leading information modeling environment explicitly for the architecture, engineering, construction, and operation of all infrastructure types including utility systems, roads and rail, bridges, buildings, communications networks, water and wastewater networks, process plants, mining, and more. MicroStation can be used either as a software application or as a technology platform.

Bentley, available at http://www.bentley.com/en-US/Products/MicroStation/. InRoads V8i is described as a system that "provides complete drafting capabilities, powerful mapping tools, and design automation for civil transportation professionals. InRoads Suite features constraint-driven, 3D parametric modeling with an innovative approach to designing civil components in a total-project context." Bentley, available at: http://www.bentley.com/en-US/Products/InRoads+Suite/.

[516] FDOT Response. The manufacturer states:

> AutoCAD® Civil 3D® software is a Building Information Modeling (BIM) solution for civil engineering design and documentation. Civil 3D is built for civil engineers, drafters, designers, and technicians working on transportation, land development, and water projects. Stay coordinated and explore design options, analyze project performance, and deliver more consistent, higher-quality documentation—all within a familiar AutoCAD® software environment.

See AutoCAD Civil 3D, available at http://usa.autodesk.com/civil-3d/.

[517] MDOT Response.

[518] *Id*.

[519] MnDOT Response.

[520] MoDOT Response. TxDOT identified Autodesk, NavisWorks, compiler of 3D models from AutoCAD (Microstation), and Primavera schedule P3, P6.

[521] PennDOT Response.

[522] WisDOT Response.

[523] Caltrans Response.

[524] DelDOT Response.

[525] FDOT Response. FDOT is not in "the vanguard of 3D design and the delivery of BIM models but has an extensive experience with Electronic Delivery of CADD data, 2D Electronic Plans and Specifications, and Electronic Signing and Sealing." The department intends to pursue BIM technology for more efficient, less costly projects.

[526] MDOT Response.

[527] *Id*.

[528] *Id*.

Minnesota said that "software issues processing-resolving vertical surfaces and integration of intersecting roadways" have been problematic.[529] Minnesota also identified as issues the "[g]eneral formats acceptable/readable on different grading equipment (Topcon, Trimble, etc.)" and "[s]atellite coverage impact on accuracy."[530] In Missouri, the

> [a]bility to create 3D models from our design software is in its infancy. Many issues exist with the software that [is] still being enhanced. We concentrate the model on the main line alignment and side roads at this time but hope to improve our model ability to deal with more complex roadway geometry elements in the future.[531]

PennDOT reported that compatibility issues between consultant platforms (AutoCADD) and departmental standards are sometimes an issue.[532] Texas noted that the usefulness of modeling is dictated by the level of detail contained in a contractor's schedule and that timeliness has been an issue.[533]

D. BIM Specifications in Bid Documents and Contracts

Of the nine departments using BIM, only four (Minnesota, Missouri, Pennsylvania, and Wisconsin) stated that they have bidding information, specifications, contract and/or other documents regarding or requiring the use of BIM and access to and use of BIM and models for their construction projects.[534] However, Caltrans advises that its construction department is currently working on a directive that would provide specifications and bidding information for the use of automated machine guidance in its construction projects.[535]

Minnesota stated that special provisions are used to govern the use of machine control. The Missouri DOT said that it has been providing raw data to contractors for about 5 years to permit the contractors to create a model of the main line and side roads of a project and that beginning in 2012, the department has changed its "delivery requirements for designers to actually create the model as a part of the bid package for any projects that have significant earthwork."[536] Missouri DOT provided a link to its Electronic Design Data Delivery.[537] PennDOT provided a link to its Engineering and Construction Management System (ECMS).[538] Wisconsin noted that its specifications for using AMG processes in subgrade construction are found at Section 650.3.3.3 of its standard specifications for Highway Construction.[539]

XIII. CONCLUSION

The Copyright Act is applicable to BIM models as copyrightable works under the Act. Architectural plans and drawings are copyrightable as pictorial, graphic, and sculptural works and as architectural works. A designer's original plan or design, including a digital model thereof, is subject to the copyright laws. Furthermore, a computer program for digital information modeling is protected under the Copyright Act. An audiovisual program and the computer program that implements it are separately copyrightable. Thus, with respect to BIM, computer programs, audiovisual works, and models derived from plans and designs are separately copyrightable.

The transportation departments responding to the survey did not identify any statutes or regulations that authorize or require a transportation department to make use of BIM. Of the nine departments using BIM, only four stated that they have bidding information, specifications, contract and/or other documents regarding or requiring the use of BIM, and access to and use of BIM and models for their construction projects.

For some departments, the department's designer or project engineer creates a model for a project, whereas other departments use contractors or consultants for that purpose. Unless prohibited by state law, under the work-for-hire rule, state and local agencies may seek copyright protection for their works, for example, when prepared by their own staff. However, unless there is an agreement designating the work as one for hire, a model created for a transportation department by an independent contractor belongs to the independent contractor. A designer of a model may impose restrictions on access to and on the use or dissemination of a model by a terms-of-use, end-user, license, or other agreement or may use software controls. A contract or license may be used not only to prevent ownership of one's creative works but also to transfer a collaborator's or user's contribution to a model to the owner of the copyright in a model.

Except in the circumstances discussed in the digest, under the copyright laws, it is the creator of an original design and any model based thereon who has exclusive rights to the model, including the right to make derivative models. Nevertheless, the contract documents should address who owns the copyright in a model developed for a project. Because a model may be derived from an original or underlying model, the contract documents also should specify the party having the legal rights to reproduce, use, make derivative works, distribute, and publicly display a model or models. A transportation department may want to utilize a dis-

[529] MnDOT Response.

[530] *Id*.

[531] MoDOT Response.

[532] PennDOT Response.

[533] TxDOT Response.

[534] The transportation departments in California, Florida, Michigan, and Texas stated that they did not have such information or documents.

[535] Caltrans Response.

[536] MoDOT Response.

[537] *See* http://epg.modot.mo.gov/index.php?title=237.14_Electronic_Design_Data_Delivery (visited Aug. 5, 2012).

[538] *See* http:/www.dot14.state.pa.us/ECMS/ (visited Aug. 5, 2012).

[539] *See* http://roadwaystandards.dot.wi.gov/standards/stndspec/ss-06-50.pdf#ss650 (visited Aug. 5, 2012).

claimer of interest or ownership or other agreement to provide that department is the owner of any model or later contributions to it.

Under the joint authorship rule, unless otherwise provided by contract, an owner's involvement simply by virtue of its ownership of or participation in a project does not render the owner a joint author. The issue of joint authorship is important because joint authors have an undivided, equal interest in a copyright regardless of the difference in their respective contributions. Evidence of intent to create a joint work does not have to be in writing. Because consultants, contractors, or subcontractors may make significant contributions to a model and thereafter want to claim joint authorship of it, the issue of whether there is joint authorship or ownership should be addressed by contract.

The contract documents should identify the model or models to be developed for the collaborative use of the team, the parties responsible for preparing the models, and the required content of the models. Decisions made in the modeling process should be reflected in the contract documents, and the BIM-protocol should require contract changes as the model changes.

The contract documents should address the means of authenticating collaborators; allocate the rights and responsibilities of the collaborators; identify who owns and/or controls the data on a Web site or other source; and provide for the protection and archival of data, models, and changes to models. The contract documents should delineate the collaborators' responsibilities and should identify who is responsible for errors allegedly caused, for example, by systems or software. The contract documents should state whether collaborators are warranting their inputs and changes to a model on which other collaborators may be expected to rely.

Participants in a BIM project may insist on using disclaimers to limit or avoid their responsibility when another party relies on a collaborator's input or changes to a model. The use of disclaimers, however, may discourage collaboration, thereby significantly diminishing the benefits of using BIM. One solution is for the contract documents and BIM process to provide for a log and/or archive of data, models, and changes to models so that there is a record-copy, if needed, for later comparison.

Transportation departments may use digital signatures to identify and authenticate each collaborator's contribution or change. Because the use of digital signatures is voluntary, the contract should address whether and to what extent the parties and collaborators on a project must use digital signatures. The level of security varies according to the type of digital signature used, with PKC/PKI signatures being the most secure. A department will want to verify whether digital signatures may be used with the BIM software designated for the project.

Users of BIM may encounter interoperability problems. The contract documents for a BIM project should require bidders to have interoperable software and the ability to provide BIM modeling as part of their qualification package. Moreover, the contract documents should include guidance on software and/or interoperability requirements for modeling and a file format for exchanged files so that there is a relatively seamless flow of information.

Although no cases were located for the digest regarding whether models are protected as trade secrets, it appears that a model may be protected as a trade secret from misappropriation and use by another party. However, if a claim really is one for copying or infringement of a model, it is possible that the trade secret claim would be preempted by the Copyright Act.

In regard to disclosure laws applicable to public records, such as a FOIA or FOIL, in general the acts now apply to government information and data in electronic form. The cases located for the digest uniformly hold that even a copyrighted work must be disclosed unless disclosure is precluded by a specific exemption. In two cases the courts held that although the data had to be released, the government could restrict redistribution by requiring a requester to sign an end-user agreement. Unless there is a specific exemption, data compiled by the government is not protected as a trade secret from disclosure; however, information in the possession of the government that if released would reveal a third party's trade secret may be protected from disclosure.

APPENDIX A: LIST OF AGENCIES RESPONDING TO THE SURVEY

Alabama Department of Transportation
Arkansas State Highway and Transportation Department
California Department of Transportation
Connecticut Department of Transportation
Delaware Department of Transportation
Florida Department of Transportation
Hawaii Department of Transportation
Idaho Department of Transportation
Iowa Department of Transportation
Kansas Department of Transportation
Louisiana Department of Transportation and Development
Maine Department of Transportation
Maryland Department of Transportation
Michigan Department of Transportation
Minnesota Department of Transportation
Mississippi Department of Transportation
Missouri Department of Transportation
Montana Department of Transportation
Nebraska Department of Roads
New Jersey Department of Transportation
North Carolina Department of Transportation
Pennsylvania Department of Transportation
Rhode Island Department of Transportation
South Carolina Department of Transportation
South Dakota Department of Transportation
Tennessee Department of Transportation
Texas Department of Transportation
Utah Department of Transportation
Wisconsin Department of Transportation
Wyoming Department of Transportation

APPENDIX B: SURVEY QUESTIONS

NCHRP 20-6, Study Topic 18-03, Legal Issues Surrounding the Use of Digital Intellectual Property on Design and Construction Projects

Agency Name: _____

Name of Employee: _____

Job Title: _____

Contact telephone/cell phone number: _____/ _____

Email address: _____

How many years have you been with the agency? ____

NOTES

a. For the purposes of the survey, building information modeling (BIM) means a computer process for generating and managing a digital model for a construction project that is used and shared by all parties participating in the project.

b. Whenever possible, please provide an Internet link to any contracts or other documents identified in your responses.

c. If necessary, please feel free to use additional paper when responding.

******

1. Is your agency using or has it previously used BIM for any transportation construction projects?
Yes ___ No ___

If your answer is "yes", please answer the following questions.

2. With respect to your agency, please explain in general terms:

(a) who develops a BIM model for a project;

_____

_____

(b) whether the BIM designer is the department and/or an independent contractor or consultant;

_____

_____

(c) who the parties are that collaborate on or share a model;

_____

_____

(d) whether collaborators develop their own models or add to, revise and/or update a model developed and provided by the architect or designer for a project.

_____

_____

3. Please identify any statutes or regulations that authorize or require your agency:

(a) to make use of BIM;

_____

_____

(b) to retain ownership or control of models developed with BIM.

_____

_____

4. Please identify:

(a) any specific BIM software (e.g., name, version, vendor) that has been used to design and construct your projects;

_____

_____

(b) any issues or problems that your agency has experienced in connection with the use of BIM and models.

_____

_____

5. Does your agency have bidding information, specifications, contract and/or other documents regarding or requiring the use of BIM and/or access to and use of BIM and models for your agency's construction projects?

Yes ___ No ___

If your answer is yes, please provide a copy or an Internet link.

_____

_____

6. Does your agency own the copyright in or otherwise own the rights in models developed for your agency's projects?

Yes ___ No ___

If your answer is yes, please provide a copy of or an Internet link for any contract and/or other documents regarding ownership of the copyright(s) and/or the model(s).

_____

_____

7. Has your agency or any participant in your agency's projects registered a copyright in a model developed for a project?

Yes ___ No ___

If your answer is yes, please provide a copy of one such registration or an Internet link.

_____

_____

8. Please explain how access to a model is controlled (*e.g.*, terms-of-use, end-user, license, read-only file, digital signature, non-disclosure or other agreement) and provide a copy of or an Internet link for any relevant contract or other documents regarding access.

_____

_____

9. Interoperability has been defined as the ability of various entities and different technology to share and exchange electronic information. Has your agency experienced any interoperability issues, including legal issues, with the use of BIM and models for transportation construction projects?

Yes ___ No ___

If your answer is yes, please identify and explain whether and how the issues were resolved.

_____

_____

10. Does your agency take any precautions (*e.g.*, in the bid documents and/or bidder qualification) to assure that BIM software that will be used by all participants is either suitable or compatible for the project and/or in compliance with what your agency has specified for the project?

Yes ___ No ___

If your answer is "yes", please explain.

_____

_____

11. If there are other means and methods your agency uses to avoid or resolve interoperability issues, please explain.

_____

_____

12. Does your agency archive changes to a model for a project to preserve a record-copy?

Yes ___ No ___

If your answer is "yes",

(a) please explain the archival method and state the period of time that your agency archives such information for a BIM project;

_____

_____

(b) if a log or other separate record is maintained of changes to a model and when and who made them, please explain.

_____

_____

13. Based on your agency's experience, please explain any other issues that have arisen in connection with the use of BIM for a project (e.g., force majeure, complete or partial loss of a model or data, indemnity, insurance or other issues, problems or situations) and provide a copy of or an Internet link for any relevant contract or other documents.

_____

_____

14. Please explain how issues of risk and liability have been handled and/or apportioned in connection with participants' sharing of information on a BIM project? For example, are disclaimers used or required by participants when they input data or otherwise share a model, or are other participants entitled to rely on the completeness and accuracy of a participant's inputs?

_____

_____

15. Has there been any litigation involving BIM and/or interoperability for any of your agency's projects?
Yes ___ No ___

If your answer is yes, please provide citations to any cases or opinions filed in connection therewith.

_____

_____

16. To the extent not already provided in your responses, please identify the BIM software, interoperability technology, and formats that are being used by your department, designers, engineers, contractors, and other participants for transportation design and construction projects and provide a copy of any relevant contract or other documents.

_____

_____

17. Please include with your responses any additional comments you wish to make regarding your agency's knowledge of and experience with BIM and/or interoperability.

_____

_____

18. Please identify someone at your agency who could be interviewed and provide additional information concerning your agency's experience with BIM, models, and interoperability and related issues in connection with the agency's construction projects.

Name: _____

Title: _____

Telephone number: _____

E-mail address: _____

****

Please return your completed survey <u>preferably via e-mail</u> to:

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