

# BOARD FOR PROFESSIONAL & OCCUPATIONAL REGULATION



## STUDY OF THE NEED TO REGULATE PHOTOGRAMMETRY

*Virginia*

**DPOR**  
DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION

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## **TABLE OF CONTENTS**

Background.....	1
Statutory Authority.....	2
The Criteria.....	4
Application of the Criteria.....	5
Alternatives to Professional and Occupational Regulation.....	6
Methodology.....	7
Analysis .....	7
Other Issues .....	21
Conclusion & Recommendation .....	24

## Background

The dictionary defines “photogrammetry” as “the process of making maps or scale drawings by aerial or other photography; the process of making precise measurements by the use of photography.” After studying the issue of photogrammetry relative to the practice of land surveying for several years, and after the introduction and non-passage of House Bill 1129 in the 2002 legislative session, the Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects (APELSCIDLA Board) voted, at its meeting on December 11, 2002, to request that the Board for Professional and Occupational Regulation consider conducting a study of the profession of photogrammetry pursuant to § 54.1-310.A.6 of the *Code of Virginia*.

The APELSCIDLA Board is authorized by statute (see Chapter 4 of Title 54.1 of the *Code of Virginia*) to regulate the practice of land surveying in Virginia. Section 54.1-400 of the *Code of Virginia* defines a “land surveyor” and the “practice of land surveying” as:

### “§ 54.1-400. Definitions.

“As used in this chapter unless the context requires a different meaning: ...

“‘Land surveyor’ means a person who, by reason of his knowledge of the several sciences and of the principles of land surveying, and of the planning and design of land developments acquired by practical experience and formal education, is qualified to engage in the practice of land surveying, and whose competence has been attested by the Board through licensure as a land surveyor.

“The ‘practice of land surveying’ includes surveying of areas for a determination or correction, a description, the establishment or reestablishment of internal and external land boundaries, or the determination of topography, contours or location of physical improvements, and also includes the planning of land and subdivisions thereof. The term ‘planning of land and subdivisions thereof’ shall include, but not be limited to, the preparation of incidental plans and profiles for roads, streets and sidewalks, grading, drainage on the surface, culverts and erosion control measures, with reference to existing state or local standards. ....”

At its meeting on March 3, 2003, the Board for Professional and Occupational Regulation agreed to conduct the study.

## Statutory Authority

Section 54.1-310 of the *Code of Virginia (Code)* provides the statutory authority for the Board for Professional and Occupational Regulation (the Board) to study and make recommendations to the General Assembly on the need to regulate professions or occupations and, if so, the degree of regulation that should be imposed.

The Board has the authority to advise the Governor and the Director on matters relating to the regulation of professions and occupations. In addition, the General Assembly may request that the Board conduct a study. The General Assembly is the body empowered to make the final determination of the need for regulation of a professional or occupation. The General Assembly has the authority to enact legislation specifying the profession to be regulated, the degree of regulation to be imposed, and the organizational structure to be used to manage the regulatory program (e.g., board, advisory committee, registry).

The Commonwealth's philosophy on the regulation of professions and occupations is that: ***The occupational property rights of the individual may be abridged only to the degree necessary to protect the public.*** This tenet is clearly stipulated in statute and serves as the Board's overarching philosophy in its approach to all its reviews of professions or occupations:

**. . . the right of every person to engage in any lawful profession, trade or occupation of his choice is clearly protected by both the Constitution of the United States and the Constitution of the Commonwealth of Virginia. The Commonwealth cannot abridge such rights except as a reasonable exercise of its police powers when it is clearly found that such abridgement is necessary for the preservation of the health, safety and welfare of the public. (Code of Virginia § 54.1-100)**

Further statutory guidance is provided in the same *Code* section which states that the following conditions must be met before the state may impose regulation on a profession or occupation:

1. The unregulated practice of a profession or occupation can harm or endanger the health, safety or welfare of the public, and the potential for harm is recognizable and not remote or dependent upon tenuous argument;
2. The practice of the profession or occupation has inherent qualities peculiar to it that distinguish it from ordinary work or labor;
3. The practice of the profession or occupation requires specialized skill or training and the public needs, and will benefit by, assurances of initial and continuing professional and occupational ability; and
4. The public is not effectively protected by other means.

Pursuant to § 54.1-311 of the *Code*, when the Board recommends that a particular profession or occupation be regulated, or that a different degree of regulation should be imposed on a regulated profession or occupation, it shall consider the following degrees of regulation in order:

1. Private civil actions and criminal prosecutions. – Whenever existing common law and statutory causes of civil action or criminal prohibitions are not sufficient to eradicate existing harm or prevent potential harm, the Board may first consider the recommendation of statutory change to provide more strict causes for civil action and criminal prosecution.
2. Inspection and injunction. – Whenever current inspection and injunction procedures are not sufficient to eradicate existing harm, the Board may promulgate regulations consistent with the intent of this chapter to provide more adequate inspection procedures and to specify procedures whereby the appropriate regulatory board may enjoin an activity which is detrimental to the public well-being. The Board may recommend to the appropriate agency of the Commonwealth that such procedures be strengthened or it may recommend statutory changes in order to grant the appropriate state agency the power to provide sufficient inspection and injunction procedures.
3. Registration – Whenever it is necessary to determine the impact of the operation of a profession or occupation on the public, the Board may implement a system of registration.
4. Certification – When the public requires a substantial basis for relying on the professional services of a practitioner, the Board may implement a system of certification.
5. Licensing – Whenever adequate regulation cannot be achieved by means other than licensing, the Board may establish licensing procedures for any particular profession or occupation.

Pursuant to § 54.1-311.B. of the *Code*, in determining the proper degree of regulation, if any, the Board shall determine the following:

1. Whether the practitioner, if unregulated, performs a service for individuals involving a hazard to the public health, safety or welfare.
2. The opinion of a substantial portion of the people who do not practice the particular profession, trade or occupation on the need for regulation.

3. The number of states which have regulatory provisions similar to those proposed.
4. Whether there is sufficient demand for the service for which there is no regulated substitute and this service is required by a substantial portion of the population.
5. Whether the profession or occupation requires high standards of public responsibility, character and performance of each individual engaged in the profession or occupation, as evidenced by established and published codes of ethics.
6. Whether the profession or occupation requires such skill that the public generally is not qualified to select a competent practitioner without some assurance that he has met minimum qualifications.
7. Whether the professional or occupational associations do not adequately protect the public from incompetent, unscrupulous or irresponsible members of the profession or occupation.
8. Whether current laws which pertain to public health, safety and welfare generally are ineffective or inadequate.
9. Whether the characteristics of the profession or occupation make it impractical or impossible to prohibit those practices of the profession or occupation which are detrimental to the public health, safety and welfare.
10. Whether the practitioner performs a service for others which may have a detrimental effect on third parties relying on the expert knowledge of the practitioner.

## **The Criteria**

Based on the principles of professional and occupational regulation established by the General Assembly, the Board has adopted the following criteria to guide evaluations of the need for regulation. (Specific questions for each criteria are contained in the Appendix.)

- 1. Risk for Harm to the Consumer** - The unregulated practice of the profession or occupation will harm or endanger the public health, safety or welfare. The harm is recognizable and not remote or dependent on tenuous argument. The harm results from: (a) practices inherent in the occupation, (b) characteristics of the clients served, (c) the

setting or supervisory arrangements for the delivery of services, or (d) from any combination of these factors.

2. **Specialized Skills and Training** - The practice of the profession or occupation requires specialized education and training, and the public needs assurance of competence.
3. **Autonomous Practice** - The functions and responsibilities of the practitioner require independent judgment and the members of the occupational group practice autonomously.
4. **Scope of Practice** - The scope of practice is distinguishable from other licensed, certified and registered professions and occupations.
5. **Economic Impact** - The economic costs to the public of regulating the occupational group are justified. These costs result from restriction of the supply of practitioners, and the cost of operation of regulatory boards and agencies.
6. **Alternatives to Regulation** - There are no alternatives to State regulation of the profession or occupation which adequately protect the public. Inspections and injunctions, disclosure requirements, and the strengthening of consumer protection laws and regulations are examples of methods of addressing the risk for public harm that do not require regulation of the occupation or profession.
7. **Least Restrictive Regulation** - When it is determined that the State regulation of the occupation or profession is necessary, the least restrictive level of occupational regulation consistent with public protection will be recommended to the Governor, the General Assembly and the Director of the Department of Professional and Occupational Regulation.

## **Application of the Criteria**

In the process of evaluating the need for regulation, the criteria are applied differently, depending upon the level of regulation which appears most appropriate for the occupational group. The following outline delineates the characteristics of licensure, certification, and registration and specifies the criteria applicable to each level.

**Registration.** Registration requires only that an individual file his name, location, and possibly background information with the State. No entry standard is typically established for a registration program.

RISK: Low potential, but consumers need to know that redress is possible.

SKILL & TRAINING: Variable, but can be differentiated for ordinary work and labor.

AUTONOMY: Variable.

APPLICATION OF CRITERIA: Criteria 4, 5 and 6 must be met.

**Certification.** Certification by the state is also known as "title protection." No scope of practice is reserved to a particular group, but only those individuals who meet certification standards (defined in terms of education and minimum competencies which can be measured) may title or call themselves by the protected title.

RISK: Moderate potential, attributable to the nature of the practice, consumer vulnerability, or practice setting and level of supervision.

SKILL & TRAINING: Specialized; can be differentiated from ordinary work. Candidate must complete specific education or experience requirements.

AUTONOMY: Variable; some independent decision-making; majority of practice actions directed or supervised by others.

SCOPE OF PRACTICE: Definable in enforceable legal terms.

APPLICATION OF CRITERIA: Criteria 1-6 must be met.

**Licensure.** Licensure confers a monopoly upon a specific profession whose practice is well defined. It is the most restrictive level of occupational regulation. It generally involves the delineation in statute of a scope of practice which is reserved to a select group based upon their possession of unique, identifiable, minimal competencies for safe practice. In this sense, state licensure typically endows a particular occupation or profession with a monopoly in a specified scope of practice.

RISK: High potential, attributable to the nature of the practice.

SKILL & TRAINING: Highly specialized education required.

AUTONOMY: Practices independently with a high degree of autonomy; little or no direct supervision.

SCOPE OF PRACTICE: Definable in enforceable legal terms.

APPLICATION OF THE CRITERIA: Criteria 1 - 6 must be met.

## **Alternatives to Professional and Occupational Regulation**

When a risk or potential risk has been demonstrated but it is not substantiated that licensure, certification, or registration are appropriate remedies, other alternatives may be warranted. These alternatives should always be considered as less restrictive means of addressing the need to adequately protect the public health, safety, and welfare than restricting the occupational property rights of individuals.



Inspections and injunctions, disclosure requirements, and the strengthening of consumer protection laws and regulations are examples of methods for protecting the public that do not require the regulation of specific occupations or professions.

## **Methodology**

The Board utilized its *Guidelines for the Evaluation of the Need to Regulate Professions and Occupations* as well as the following *Photogrammetry Study Methodology* adopted by the Board at its meeting on June 2, 2003:

- Research the laws in other jurisdictions.
- Review the work done by the Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects on this issue.
- Obtain information regarding the regulation of photogrammetry from the National Council of Examiners for Engineer and Surveyors and other available sources.
- Contact the Virginia Geographic Information Network to obtain information on the effect of regulation of photogrammetry on localities.
- Determine whether photogrammetry is a profession/occupation separate from land surveying, a specialty of land surveying, or a tool that is used by land surveyors.

A sixty day public comment period was held from August 11, 2003, through October 10, 2003, with public hearings conducted in Roanoke, Chesapeake, Richmond, and Arlington during the public comment period.

## **Analysis**

Due to the complex issues involved in this study, as well as the existing definition of the “practice of land surveying” as contained in § 54.1-400 of the *Code of Virginia*, the exact study criteria contained in the *Guidelines for the Evaluation of the Need to Regulate Professions and Occupations* were not followed; however, the principles embodied in the *Guidelines* and the criteria contained in §§ 54.1-100 and 54.1-311.B of the *Code of Virginia* were utilized in analyzing the need for regulation and the *Photogrammetry Study Methodology* adopted by the Board at its meeting on June 2, 2003, were utilized. The definition of the “practice of land

surveying” as contained in § 54.1-400 of the *Code of Virginia* includes the “... surveying of areas for ... the determination of topography, contours or location of physical improvements, and also includes the planning of land and subdivisions thereof ...” regardless of the tool that is used to accomplish such determination. Therefore, under the current definition in the *Code*, the determination of topography, contours or the location of physical improvements is the practice of land surveying, regardless of the means utilized to achieve such determination, is the practice of land surveying.

The following is a summary of the results obtained by utilizing the *Photogrammetry Study Methodology*.

- *Research the laws in other jurisdictions:*

A survey was sent to the 54 other jurisdictions that are members of National Council of Examiners for Engineering and Surveying (NCEES). Responses were received from 32 jurisdictions for a response rate of 59.3%. Of the 32 that responded, 7 regulate the practice of photogrammetry (22% of those that responded).

- *Review the work done by the Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects (APELSCIDLA Board) on this issue:*

**June 8, 2000, APELSCIDLA Board meeting** – presentation by representatives of the Virginia Association of Surveyors (VAS) regarding possible legislation to amend the definition of the “practice of land surveying” in § 54.1-400 of the *Code of Virginia* to update and conform to current practice and the NCEES model law (change would include the regulation of photogrammetrists). A motion was made to state that the Board has no objection to VAS continuing its study of a proposed change to the definition of “practice of land surveying” as contained in the *Code of Virginia* but does not endorse any specific legislation; the motion passed unanimously.

**September 13, 2000, APELSCIDLA Board meeting** – presentation by representatives of VAS regarding their proposed legislation to amend the definition of the “practice of land surveying” in § 54.1-400 of the *Code of Virginia* to update and conform to current practice and the NCEES model law (change would include the regulation of photogrammetrists). A motion was made to endorse the VAS proposal with amendments which passed with a majority vote.

**December 15, 2000, APELSCIDLA Board meeting** – letter from Joe Coppedge, President of VAS, received stating that VAS membership had voted not to go forward with the proposed legislative change to the definition of “the practice of land surveying.” A motion was made to form a committee to study changes to the Board’s regulations regarding a grandfather clause for photogrammetrists which passed unanimously.

**March 16, 2001, APELSCIDLA Board Photogrammetry Committee meeting** – all committee members present. Committee members agreed to work further revising the draft regulations on photogrammetry based on the comments by the Committee members.

**April 11, 2001, APELSCIDLA Board meeting** – report from committee meeting provided – draft proposal was revised and another committee meeting scheduled to further consider the proposal.

**April 20, 2001, APELSCIDLA Board Photogrammetry Committee meeting** – three of five committee members present. Committee members present agreed to work further on revising draft regulations and agreed to meet again.

**May 22, 2001, APELSCIDLA Board Photogrammetry Committee meeting** – four of five committee members present. A motion was made to present draft regulations to the APELSCIDLA Board regarding photogrammetrists – the motion failed on a 2 to 2 vote. A second motion was made to recommend to full Board a study by BPOR and APELSCIDLA Board to clarify the definition of the practice of land surveying contained in § 54.1-400 of the *Code of Virginia* – the motion failed on a 2 to 2 vote. Decision made to report to Board that committee members were unable to reach consensus and let Board decide course of action.

**June 6, 2001, APELSCIDLA Board meeting** – report from Photogrammetry Committee meeting that the committee was unable to reach a consensus. Motion made to continue to work on drafting regulations for photogrammetry instead of requesting a BPOR study – the motion passed with a majority vote. A second motion was made to endorse a grandfather clause for a limited time and have special indication on licenses issued under the grandfather clause – the motion unanimously passed.

**July 17, 2001, APELSCIDLA Board Photogrammetry Committee meeting** – three of five committee members present – committee unanimously adopted draft wording for the regulation of photogrammetry for presentation to full Board.

**September 12, 2001, APELSCIDLA Board meeting** – unanimous vote to adopt the draft regulations regarding photogrammetry as amended. Board adopted final regulations unanimously including wording for the regulation of photogrammetry.

**November 19, 2001, APELSCIDLA Board meeting** – unanimous vote to remove photogrammetry regulations from final regulations based on the following advice from legal counsel:

“ ... ”

“The APELSCIDLA Board is a creature of statute, and as such its authority to act is limited to the boundaries of its enabling statute. The powers of the Board, as with all the other professional and occupational boards, are set forth in Chapter 2 of § 54.1 of the Virginia Code (Powers and duties of regulatory boards). Specifically, § 54.1-201(3) empowers the Board to ‘certify or license qualified applicants as practitioners of the particular profession or occupation regulated by such board.’ This constitutes a general grant of power by the General Assembly to license those over whom the Board is granted authority. The limits of that grant of authority are clearly delineated in a subsequent chapter, § 54.1-400, *et. seq.*”

“The Definition section of –400 is instructive regarding the Board’s authority. In this section ‘land surveyor’ is defined as ‘a person who, by reason of his knowledge of the several sciences and of the principles of land surveying, and of the planning and design of land developments acquired by practical experience and formal education, is qualified to engage in the practice of land surveying.’”

“This section defines the profession to be regulated by the Board – land surveyors. It clearly defines who composes this group – those *qualified* by education and experience in the *several sciences* of land surveying, including planning and design. The Board is not authorized to license those not meeting the requirements of the definition by education and experience. The Board is only authorized to license those who actually *qualify*, which includes successful completion of the land surveyor examination under § 54.1-405. ....”

“Going back to the Definition section of –400, the practice of land surveying ‘includes surveying of areas for a determination or correction, a description, the establishment or reestablishment of internal and external land boundaries, or the determination of topography, contours or location of physical improvements, and also includes the planning of land and subdivisions thereof.’ Qualification in these areas is required for licensure, and under § 54.1-406(A) no individual may engage in this practice without a license. Finally, sections 407 and 408 of § 54.1, covering corner monumentation and subdivision planning, only contemplate licensed land surveyors. Every section in Chapter 4 relating to surveying clearly relates only to the traditional practice of land surveying. Virginia Code § 54.1-400, *et. seq.* makes no provision for any other type of licensure in this profession other than land surveyor. ....”

“... the Virginia Code currently authorizes the Board to license only those qualified by education and experience in the traditional practice of land surveying. While it is true that not every licensed surveyor has extensive experience in all aspects of ‘the several sciences’ of this profession, they nonetheless are required to pass the land surveyor examination ....”

“....”

“... the General Assembly has not provided the APELSCIDLA Board the requisite authority to sublicense other recognized professions in this area of practice, or to allow various types of licensure for occupations collateral to land surveying. ....”

**September 10, 2003, APELSCIDLA Board meeting** – majority vote to adopt the following resolution:

Resolution stating the Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers, and Landscape Architects position on the licensure of photogrammetrists.

Whereas, this board must first and foremost provide for the protection of the health, safety, and welfare of the citizens of the Commonwealth and

Whereas, Section 54.1-400 of the Code of Virginia states “The practice of land surveying includes surveying of areas for a determination or correction, a description, ..the determination of topography, contours or location of physical improvements...”and

Whereas land surveyors having historically provided these services as a licensed activity have conditioned the citizens to expect this to be a licensed activity.

Whereas, photogrammetrists are currently providing “the determination of topography, contours, or location of physical improvements” without being licensed.

Be it resolved, that this board believes that the use of photogrammetric tools and sciences to determine topography, contours or locate physical improvements is land surveying and that, since land surveyors have historically provided these services as a licensed activity, the protection of the health, safety, and welfare of citizens of the Commonwealth is at risk.

Whereas, Section 54.1-401 of the Code of Virginia states “The following shall be exempted from the provisions of this chapter: 1. Practice of professional engineering and land surveying by a licensed architect when such practice is incidental to what may be properly considered an architectural undertaking. 2. Practice of architecture and land surveying by a licensed professional engineer when such practice is incidental to an engineering project.”

Be it resolved, that this board believes professional engineers and architects can determine topography, contours or locate physical improvements when such work is incidental to an engineering or architecture project respectively regardless of the tools or sciences involved.

Whereas, this board presently promulgates and enforces regulations for licensed architects, professional engineers, and land surveyors as well as certification of interior designers and landscape architects such that the professional is required to practice only in the areas of their discipline (particular expertise) and not in all aspects of that profession and

Whereas, this board has historically had minimal violations of professionals working outside of their discipline.

Be it resolved, that this board believes that photogrammetrists should be licensed as a discipline (particular expertise) of land surveying without separate title designation, since it is consistent with the existing licensing structure and as such provides the least confusion and greatest protection for the citizens of the Commonwealth.

- *Obtain information regarding the regulation of photogrammetry from the National Council of Examiners for Engineering and Surveying (NCEES) and other available sources.*

Starting in the 1990's, the National Council of Examiners for Engineering and Surveying (NCEES) amended its model law for land surveying to include photogrammetry. In the later 1990's NCEES formed a working group of professional associations/societies to study the issue of a revised definition of “the practice of land surveying.” This group was headed by Jim Plasker of the American Society for Photogrammetry and Remote Sensing (ASPRS) and developed a new definition of “the practice of land surveying” which included photogrammetry. At its annual meeting in August 2001, NCEES established an NCEES committee to review this information and prepare its own report. The NCEES report recommended that photogrammetry is the practice of land surveying. This information was presented to the NCEES membership

at the annual meeting in August 2002 and the results of the report of the committee were distributed to other committees to make the necessary changes to various NCEES documents. At its 82<sup>nd</sup> Annual Meeting held on August 13 -16, 2003, in Baltimore, Maryland, the membership of the NCEES adopted changes to its model law regarding the practice of land surveying which included a revised definition of the practice of land surveying which included photogrammetry as well as provisions for a grandfather clause for practicing photogrammetrists who meet certain requirements. While the information from NCEES is informative, it is not as relevant here in Virginia as the *Code* has since 1984 required those individuals who determine topography, contours, and the location of physical improvements to be licensed as land surveyors. Further, Virginia has not adopted the NCEES Model Law.

- *Contact the Virginia Geographic Information Network (VGIN) to obtain information on the effect of regulation of photogrammetry on localities.*

A Notice of Comment and Study of the Need to Regulate Photogrammetry was sent to VGIN and members of the GIS community attended the public hearings and participated in the public comment period.

During the 2002 General Assembly session, Delegate Preston Bryant introduced House Bill 1129 which would have codified the grandfather and licensure provisions for “Land Surveyor Photogrammetrists” that the APELSCIDLA Board attempted to adopt via regulations but were later told that they did not have proper statutory authority (see summary of action taken by the APELSCIDLA Board on November 19, 2001). After meeting resistance from VGIN and the GIS staff of some localities, the bill was left in committee and, as a result, failed to pass and did not become law.

- *Determine whether photogrammetry is a profession/occupation separate from the land surveying, a specialty of land surveying, or a tool that is used by land surveyors.*

As noted earlier, “land surveyor” and the “practice of land surveying” are defined in the *Code of Virginia* as follows:

**“§ 54.1-400. Definitions.**

“As used in this chapter unless the context requires a different meaning:

...

“‘Land surveyor’ means a person who, by reason of his knowledge of the several sciences and of the principles of land surveying, and of the planning and design of land developments acquired by practical experience and formal education, is qualified to engage in the practice of land surveying, and whose competence has been attested by the Board through licensure as a land surveyor.

“The ‘practice of land surveying’ includes surveying of areas for a determination or correction, a description, the establishment or reestablishment of internal and external land boundaries, or *the determination of topography, contours or location of physical improvements, and also includes the planning of land and subdivisions thereof* [emphasis added]. The term ‘planning of land and subdivisions thereof’ shall include, but not be limited to, the preparation of incidental plans and profiles for roads, streets and sidewalks, grading, drainage on the surface, culverts and erosion control measures, with reference to existing state or local standards. ....”

Photogrammetry is a highly specialized tool that can be used to determine topography, contours or the location of physical improvements and is a tool that can assist with the planning of land and subdivisions thereof. Photogrammetrists are highly specialized in their field and land surveyors, while knowledgeable in the determination of topography, contours and the location of physical improvements using traditional survey methods and not necessarily skilled in the use of photogrammetric tools, have a broader set of skills including boundary determination, grading, drainage and erosion control measures. Therefore, while they appear to be two separate professions, there is some overlap between the two, especially in the areas of the determination of topography, contours or the location of physical improvements and, to a lesser extent, the planning of land and subdivisions thereof. As noted earlier (from the November 19, 2001, APELSCIDLA Board meeting as shown on pages 10 and 11 of this report), in Virginia, anyone who wishes to be licensed to engage in the “practice of land surveying” must be competent in all parts of the definition contained in § 54.1-400 of the *Code of Virginia* and the APELSCIDLA Board does not have the authority to sub-regulate this profession - “... the General Assembly has not provided the APELSCIDLA Board the requisite authority to sublicense other recognized professions in this area of practice, or to allow various types of licensure for occupations collateral to land surveying. ....”



- A sixty day public comment period was held from August 11, 2003, through October 10, 2003, with public hearings conducted in Roanoke, Chesapeake, Richmond, and Arlington. The originally scheduled public hearing set for Richmond on September 22 was disrupted by Hurricane Isabel and another public hearing in Richmond was scheduled and held on October 7.

A Notice of Comment was sent to members of the land surveying community, the photogrammetric community, and the GIS community in Virginia who had participated in the review of this matter by the APELSCIDLA Board as well as the deliberations on House Bill 1129 of the 2002 General Assembly session. Some of the parties that were sent the Notice included: Virginia Association of Surveyors (VAS), American Society for Photogrammetry and Remote Sensing (ASPRS), American Congress on Surveying and Mapping (ACSM), Management Association for Private Photogrammetric Surveyors (MAPPS), Virginia Department of Transportation (VDOT), Virginia Association for Mapping and Land Information Systems (VAMLIS), and the Virginia Geographic Information Network (VGIN, which is part of the Virginia Information Technologies Agency, or VITA).

The following chart provides detail on the number of attendees at each of the five public hearings:

<u>Location</u>	<u>Date</u>	<u># of Attendees</u>	<u># of Speakers</u>
Roanoke	August 19	6	5
Chesapeake	August 28	14	11
Richmond	September 22	8	3
Arlington	October 1	26	9
Richmond	October 7	21	9
Gross Totals (total number of attendees and speakers at each hearing)		75	37
Net Totals (total number of attendees and speakers at each hearing after eliminating those individuals who attended and/or spoke at more than one hearing)		63	34

During the public comment period, we received written comments from approximately 30 parties (please note that some individuals submitted more than one comment and some individuals submitted written comment in addition to providing testimony at public hearings). The written comments and the testimony received at the public hearings can be categorized as follows:

<b>Source</b>	<b>Comment Summary</b>
State and local GIS community	Opposes regulation/licensure of photogrammetrists
Virginia Land Surveyor community	Supports regulation/licensure of photogrammetrists with a separate and distinct limited license (not as Land Surveyors).
Virginia Land Surveyor and Photogrammetric community	Supports regulation/licensure of photogrammetrists as Land Surveyors

Subsequent to the public hearings, individuals requested the opportunity to provide further input. As a result, the following individuals met with Department staff:

- Judy Napier, VITA
- William Shinar, VGIN/VITA
- David Muane, ASPRS Potomac Region
- Karen Schuckman, Vice-President, ASPRS
- John Simmers, VDOT
- Michael Zmuda, VDOT
- Wilmer Sirine, land surveyor

All individuals expressed a willingness to work together to develop legislation. There was a consensus that any legislation should include all remote sensing technologies rather than be confined solely to photogrammetry, thereby creating a law that will accommodate future technologies as they are developed.

Bill Sirine, who spoke at the Richmond public hearing and also submitted written comment, indicated that he is aware of a locality that suffered a significant financial loss from its reliance on faulty photogrammetric work. He noted that because “photogrammetry has evolved from a planning tool to a design tool” it has the potential to “cause extreme harm to the health and safety of the Commonwealth of Virginia.”

The following is a summary of the results obtained by utilizing the principles contained in the *Guidelines for the Evaluation of the Need to Regulate Professions and Occupations*:

Pursuant to § 54.1-311.B. of the *Code*, in determining the proper degree of regulation, if any, the Board shall determine the following:

1. *Whether the practitioner, if unregulated, performs a service for individuals involving a hazard to the public health, safety or welfare.*

The practice of photogrammetry can be used to determine topography, contours or the location of physical improvements, and is a tool that can

assist with the planning of land and subdivisions thereof. Localities often rely on photogrammetric work for planning purposes. Although no evidence of harm to individual consumers was provided, two of the commenters relayed information regarding a locality that incurred a significant financial loss due to its reliance on faulty work prepared by a photogrammetrist. Also, one commenter referenced a situation where a redesign of roads and drainage and sewer systems was required in a private development due to reliance on faulty photogrammetric work. The costs incurred in these situations are ultimately passed on to the consumer. In addition, the Federal Emergency Management Agency (FEMA) and the Federal Aviation Administration (FAA) use photogrammetry to determine vertical and horizontal placement of towers.

2. *The opinion of a substantial portion of the people who do not practice the particular profession, trade or occupation on the need for regulation.*

As noted earlier in the report, the written comments and the testimony received at the public hearings can be categorized as follows:

<b>Source</b>	<b>Comment Summary</b>
State and local GIS community	Opposes regulation/licensure of photogrammetrists
Virginia Land Surveyor community	Supports regulation/licensure of photogrammetrists with a separate and distinct limited license (not as Land Surveyors).
Virginia Land Surveyor and Photogrammetric community	Supports regulation/licensure of photogrammetrists as Land Surveyors

Land surveyors are linked to the photogrammetric community as they provide similar services and photogrammetrists provide work products to land surveyors who, in turn, use them to provide a final product to their customers. Land surveyors believed that photogrammetrists should be licensed and the state and local GIS community believed that the regulation of photogrammetry to determine topography, contours or the location of physical improvements is not needed and they saw no benefit from the implementation of a regulatory program for photogrammetrists.

3. *The number of states which have regulatory provisions similar to those proposed.*

As noted earlier in the report, a survey was sent to the 54 other jurisdictions that are members of National Council of Examiners for Engineering and Surveying (NCEES). Of the 54 surveys mailed, responses were received from 32 jurisdictions for a response rate of 59.3%. Of the 32 that responded, 7 regulate the practice of photogrammetry (22% of those that responded).

4. *Whether there is sufficient demand for the service for which there is no regulated substitute and this service is required by a substantial portion of the population.*

There are different ways to determine topography, contours or the location of physical improvements and land surveyors can provide this function using traditional surveying methods. However, the use of photogrammetry and other remote sensing technology is increasing and will continue to increase as new technologies are developed. Faulty work by photogrammetrists has the potential to be harmful to the public as others rely on base mapping done by photogrammetrists for construction and planning purposes and for the design of roads and drainage and sewer systems.

5. *Whether the profession or occupation requires high standards of public responsibility, character and performance of each individual engaged in the profession or occupation, as evidenced by established and published codes of ethics.*

Both the American Society for Photogrammetry and Remote Sensing (ASPRS) and the Management Association for Private Photogrammetric Surveyors (MAPPS) have an established *Code of Ethics*.

6. *Whether the profession or occupation requires such skill that the public generally is not qualified to select a competent practitioner without some assurance that he has met minimum qualifications.*

There has been no evidence discovered that shows that users of photogrammetric services have not been able to select a competent practitioner. From the public comment received, it appears that land surveyors, professional engineers, state and local governments, and businesses are the primary users of photogrammetric services.

7. *Whether the professional or occupational associations do not adequately protect the public from incompetent, unscrupulous or irresponsible members of the profession or occupation.*

As noted earlier, it appears that land surveyors, professional engineers, state and local governments, and businesses are the primary users of photogrammetric services. Although no evidence of harm to individual consumers was provided, two of the commenters relayed information regarding a locality that incurred a significant financial loss due to its reliance on faulty work prepared by a photogrammetrist. Also, one commenter referenced a situation where a redesign of roads and drainage and sewer systems was required in a private development due to reliance on faulty photogrammetric work. The costs incurred in these situations are ultimately passed on to the consumer.

8. *Whether current laws which pertain to public health, safety and welfare generally are ineffective or inadequate.*

As noted above, no evidence of harm to individual consumers was found during the course of this study that shows that current laws which pertain to public health, safety and welfare are ineffective or inadequate. However, two localities suffered a financial loss from reliance on faulty photogrammetric work, thus potential harm to the public exists from reliance on base mapping done by photogrammetrists for construction and planning purposes. In addition, developers relying on faulty photogrammetric work may incur substantial costs to redesign roads and drainage and sewer systems, which are ultimately passed on to the consumer.

9. *Whether the characteristics of the profession or occupation make it impractical or impossible to prohibit those practices of the profession or occupation which are detrimental to the public health, safety and welfare.*

There are different ways to determine topography, contours or the location of physical improvements. Further, as technology evolves in the future, new remote sensing tools will be developed that can also be used to determine topography, contours or the location of physical improvements. Therefore, any regulation should include all remote sensing technologies, not simply photogrammetry.

10. *Whether the practitioner performs a service for others which may have a detrimental effect on third parties relying on the expert knowledge of the practitioner.*

As noted earlier in the report, photogrammetrists provide work products to land surveyors and professional engineers who, in turn, use them to provide a final product to their customers. While some land surveyors and professional engineers incorporate the work product of the photogrammetrists into their own final work product and apply their professional seal and signature, the work must be performed under the direction and supervision of the land surveyor or professional engineer while under the land surveyors' or professional engineers' contract or while employed by the same firm as the land surveyor or professional engineer (see APELSCIDLA Board Regulation 18 VAC 10-20-760). In these instances, while the land surveyor or professional engineer may perform quality control work on a sample of the photogrammetrists work product, it is not practical that they verify the entire photogrammetric work product which does increase the risk that third parties relying on the expert knowledge of photogrammetrists may be harmed by relying on such knowledge.

Pursuant to § 54.1-100 of the *Code*, in determining whether regulation of a profession is warranted for the exclusive purpose of protecting the public interest, the Board shall determine whether the following are true:

1. *The unregulated practice of a profession or occupation can harm or endanger the health, safety or welfare of the public, and the potential for harm is recognizable and not remote or dependent upon tenuous argument;*

During the course of the study, no evidence of harm to individual consumers was found, however two localities and one developer suffered a financial loss from reliance on faulty photogrammetric work. This potential harm to the public from reliance on base mapping done by photogrammetrists for construction and planning purposes is recognizable. As remote sensing technologies continue to be developed the use of such technologies increase the potential harm to the public will increase.

2. *The practice of the profession or occupation has inherent qualities peculiar to it that distinguish it from ordinary work or labor;*

The use of photogrammetric tools to determine topography, contours or the location of physical improvements requires highly specialized and very technical skills and equipment which distinguish it from ordinary work or labor.

3. *The practice of the profession or occupation requires specialized skill or training and the public needs, and will benefit by, assurances of initial and continuing professional and occupational ability; and*

The use of photogrammetric tools to determine topography, contours or the location of physical improvements requires highly specialized and very technical skills and equipment. The public will benefit by an assurance of competence because of its reliance on base mapping done by photogrammetrists for construction and planning purposes.

4. *The public is not effectively protected by other means.*

As noted earlier in this report, the state and local GIS community is the group that was heard from during the study that do not practice the particular profession, trade or occupation; their opinion on the need for regulation is that the use of photogrammetry to determine topography, contours or the location of physical improvements is that it is not needed and they saw no benefit from the implementation of a regulatory program for photogrammetrists.

### **Other Issues**

Examination – currently, there are three examinations (two national – the NCEES Fundamentals of Land Surveying Examination, FLS, and the NCEES Principles and Practice of Land Surveying Examination, PLS - and one state specific – Virginia Portion Land Surveyor Examination) that need to be passed in order for an individual to become licensed as a land surveyor. The FLS examination does not appear to be a barrier for photogrammetrists; however, the PLS does appear to be problematic for photogrammetrists as its tests in areas which photogrammetrists are not minimally competent such as boundary law, and the performance of land based surveys. It has been suggested by the photogrammetric community that they be grandfathered in until such time as the PLS is modified to include appropriate subject areas for the measurement of competency in remote sensing topics. NCEES Examination Policy (EP) 12 states:

**EP 12 Adoption of a New Depth Module for the PLS Examination**

A. No depth module shall be added to the Principles and Practice of Land Surveying examination unless and until no fewer than ten Member Boards collectively request the module. Requests shall include proof of need, estimates of usage, and impact on protection of the public health, safety, and welfare.

B. A depth module must address a distinct PLS practice area included within statutory coverage of the ten requesting jurisdictions.

C. Member Boards shall be notified one year in advance of the addition of any depth module to the Principles and Practice of Land Surveying examination.

As of October 8, 2003, per Jerry Carter (the Director of Corporate Affairs/Senior Assistant to the Executive Director of NCEES), five jurisdictions (Florida, Maryland, South Dakota, Virginia and Washington) had requested that NCEES prepare a Geomatics Depth Module for the PLS examination. Therefore, there is no request at this time to modify the NCEES PLS examination which meets the requirements of NCEES EP 12 so NCEES is not developing such an examination at this time.

Grandfathering – the photogrammetrists noted during the course of the public comment period that if it is decided that they should be regulated, that they should be allowed a grandfather period. As noted earlier in the report, the current definition of the “practice of land surveying” as contained in § 54.1-400 of the Code of Virginia has been substantially in place since 1984. Grandfather provisions are implemented when a profession that was previously not regulated becomes regulated so as to not place an undue burden on existing, long standing practitioners. In this case, the requirement for licensure as a land surveyor for the determination of topography, contours, and the location of physical improvements has been in place since 1984; it is not a new requirement.

Professional Engineer and Medical Doctor Model of Regulation – during the public comment period, it was pointed out by members of the photogrammetric community that professional engineers and medical doctors specialize and practice in one area, yet are licensed as generalists and are expected to remain in their area of competence and not practice outside those areas. Therefore, they argued, that they should be licensed as “land surveyors” even though they are minimally competent to perform only certain aspects of the “practice of surveying” as defined in § 54.1-400 of the *Code of Virginia*.

The education structure and testing methodologies for these professions are established to educate and examine in a specific discipline of their respective professions while the education and testing systems for land surveyors is more general in nature and not specialized. In addition, the definition of the “practice of engineering” in the *Code of Virginia* is focused on skills, independent of the area of specialization, while the definition of the “practice of land surveying” contained in the *Code* is focused on outcomes/products which, as noted earlier, a land surveyor in Virginia must be minimally competent to develop. Further, the Board for Barbers and Cosmetology, which has the authority to sub-regulate within its professions (see § 54.1-706 of the *Code of Virginia*) ascribes different licensure titles to those licenses which authorize an individual to practice only a subpart of the occupation. Further, as noted earlier, the APELSCIDLA Board does not have the statutory authority to sub-regulate its professions.



Code Issues (definition in § 54.1-400) – as previously noted, at its meeting on November 19, 2001, the APELSCIDLA Board received legal advice which stated:

“... the Virginia Code currently authorizes the Board to license only those qualified by education and experience in the traditional practice of land surveying. While it is true that not every licensed surveyor has extensive experience in all aspects of ‘the several sciences’ of this profession, they nonetheless are required to pass the land surveyor examination ....”

“ .... ”

“... the General Assembly has not provided the APELSCIDLA Board the requisite authority to sublicense other recognized professions in this area of practice, or to allow various types of licensure for occupations collateral to land surveying. ....”

Procurement Issues – while not germane to this study, the issue of procurement of photogrammetric services by state and/or local governmental bodies was raised as an issue (whether it was considered a professional service or not). The benefits of acquiring professional services via competitive negotiation were expressed as well as concern over the potential of increased cost of services incurred by using competitive negotiation instead of bidding were expressed. While the cost issue could not be evaluated, it should be noted that non-professional services can also be obtained via competitive negotiation “when it is not practicable or fiscally advantageous to use competitive sealed bidding.” Therefore, the benefits of competitive negotiation can be utilized in the procurement of non-professional services in certain situations (see Chapter 7 of the *Department of General Services Agency Procurement and Surplus Property Manual*).

Sealing of Photogrammetric Work by Land Surveyors – during the public comment period, concern was expressed that land surveyors who contracted for photogrammetric work, to incorporate into their final land surveying product, could not seal such work as they were not competent in the practice of photogrammetry. However, such work could be performed under the direction and supervision of the land surveyor or professional engineer while under the land surveyors’ or professional engineers’ contract or while employed by the same firm as the land surveyor or professional engineer and, as a result, incorporated into the final land surveying product and sealed by the land surveyor (see APELSCIDLA Board Regulation 18 VAC 10-20-760).

## **Conclusion & Recommendations**

The definition of the “practice of land surveying” in the *Code of Virginia* requires that the determination of topography, contours or the location of physical improvements, regardless of the tool utilized to make such determinations, be performed by a regulated professional (a land surveyor). Further, the use of photogrammetric tools to determine topography, contours or the location of physical improvements has the potential to be harmful to the public as others rely on base mapping done by photogrammetrists for construction and planning purposes. The risk of harm will increase as remote sensing technology advances and continues to evolve from a planning tool to a design tool.

In developing a regulatory system for photogrammetrists and users of other remote sensing technologies to determine topography, contours or the location of physical improvements, the questions raised in the **Other Issues** section of this report must be resolved in coming to a workable solution. Therefore, it is recommended that all parties related to the remote sensing industry in Virginia be involved in developing a solution to license remote sensing practitioners who “determine topography or contours for the purposes of design which will lead to construction, or the location of physical improvements for the purposes of design which will lead to construction” (fully licensed land surveyors would be the only ones authorized to determine the location of physical improvements in relation to internal or external land boundaries) under the licensing provisions of the APELSCIDLA Board.