# Boundary Disputes – The U.S. Surveyor's Role

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## SUMMARY

This paper considers the role of the professional land surveyor in disputes over land boundaries. Major sources of boundary disputes are considered, the principles of surveying as they apply are reviewed, and the relationship of the surveyor and the lawyer is discussed. Most of the cases referenced in this paper are Massachusetts cases but the principles discussed will apply in most United States jurisdictions. In fact the history of land titles in the United States is varied due to the history of land acquisitions over the first 200 years of the nation's existence beginning with the Colonial era, then followed by expansion of lands with French, Spanish and Mexican land systems. The Rectangular System of land division was introduced late in the 18th century and most of the western two-thirds of the country lie within this Public Land Surveys System. Massachusetts was one of the original thirteen colonies, established by charter from the English king in 1628, and has as its legacy the so-called metes and bounds system of land definition. Land parcels may be defined by general and particular descriptions but are defined as to location merely by reference to the immediate locale rather than to a statewide geographic system as in the rectangular system.

But wherever land surveying is practiced today in the US, property boundaries must be identified, recovered and memorialized. Evidence of location of ownership must be found and qualified. Statutory and case law must be considered and conclusions must be drawn as to original intent of the parties who first carved out those parcels. When disputes arise between or among property owner's surveyors will be called upon to exercise their craft, draw their conclusions and submit their opinions, often in a court of law. Surveying is an occupation requiring the highest professionalism and integrity, for the expertise of the surveyor is the key to solving land boundary disputes whether in Massachusetts, Georgia, Oregon or Hawaii.

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## 1. INTRODUCTION

Land is permanent, immovable and indestructible. Land titles in the United States are said to be protected by more legislation than any other single right or possession. Why, then, so many disputes over land ownership? Why is it that something so finite, visible and definable leads to so much argument between neighboring landowners? The answer may lie in the concept of ownership. In real property law in the United States, we speak of *title* when we speak of land ownership. "Title is the means whereby the owner of lands has the just possession of his property. The union of all the elements which constitute ownership."(Black's) Those elements may be described as proof and quality of claim – the attorney's area of expertise - and location and quantity of claim, the surveyor's area of expertise. Any one of those elements may lead to a dispute over land. Attorneys deal with disputes over the quality of title while most disputes brought to the surveyor are over the location of a line or lines dividing adjacent parcels.

Theories of nuisance and trespass may be applied in land disputes. Pill defines nuisance as "the use of one's own land in a way that unreasonably interferes with another's use and enjoyment of his/her real estate", and trespass as "the physical invasion of another's real estate." (Pill, 2004) These theories of law are noted here merely to demonstrate the issues that can lead to disputes over land; for the surveyor, it remains to reconcile, in his or her own opinion, disputes over boundaries no matter how the disputes manifest themselves in litigation.

## 2. BOUNDARY DISPUTES

### 2.1 The deed

Most boundary disputes are caused either by inadequate or erroneous legal descriptions or by obscure or ambiguous conditions on the ground. While the actual title to land may be securely delivered in a deed, uncertainty of location of boundary lines can result from poor descriptions of a parcel giving rise to a dispute between neighboring owners in a metes and bounds system (Deed is "A conveyance of realty; a writing signed by grantor, whereby title to realty is transferred from one to another." Realty is a "brief term for real property or real estate." Black's). An adequate deed description will clearly identify a starting point and will set forth direction control and distances for the boundary lines, monuments at corners and adjoining owners of record. A well-written document will stand the test of time and be as comprehensible 50 years later as at the time of writing

(Mariolis, 2005) When a deed description is inadequate to clearly define a boundary location the intent of the parties who agreed to its original location is the controlling factor. "Descriptions are to be construed so as to give effect to the intent of the parties unless this would be inconsistent with some rule of law or repugnant to the terms of the grant." (Simonds v. Simonds 199 Mass. 552, 554. 85 N.E.860, 861, 1908)

A well-written deed will contain both a general and a particular description of the intended conveyance. A general description may state "my house and the land parcel on which it is situated in the Town of …" Following will be a particular description, which defines the parcel sufficiently to identify it and to be able to reproduce it on the ground. The general and the particular descriptions in a deed should be consistent with each other. When they are not the standard is that a more particular description will usually govern over the general description (Mariolis, 2005) It is the particular description that the surveyor looks to in order to re-establish the lines on the ground.

A case in which a general description was held to govern over a particular description is found in the case *Worthington & Al. Executors v. Hylyer and Others* 4 Mass. 196, (1808), in which a 300 acre farm was generally described as "all that farm of land in Washington (Massachusetts), on which he then lived, containing 100 acres, with his dwelling house and barn thereon standing." However, the particular description described a 100 acre parcel across the road from the house and barn. The court determined that it was a 300-acre parcel that conveyed though the particular description could not have encompassed more than a third of the farm. The court agreed with the argument that "a man might not know the number of his lot, upon whose land it abutted, or the number of acres it contained; but he could not mistake his dwelling house and barn for anything else in existence" (Mariolis, 2005)

Perhaps the worst type of deed, from the surveyor's perspective, is the deed whose *only* description of the parcel being conveyed are calls for the adjoiners. Such a description might say, "A certain parcel on the north side Washington Street in the Town of … bounded on the east by Smith, bounded on the north by Jones and bounded on the west by Riley." Mulford suggests that a deed is "a lawyer's not a surveyor's document.

Its intention is to make the possession of a certain piece of land sure to the owner forever, not to give a minute description of the land for the comfort of the surveyor" and "…some lawyers prefer to omit from a deed all data of direction and length of the boundaries, describing it only by adjoiners…" (Mulford, 1912). By this strategy the lawyer has removed any chance of gaps or overlaps between the parcel conveyed and the neighboring properties. Mulford's "practical manual" was published in 1912; it is this writer's observation that few lawyers follow this practice today though we are still confronted by descriptions dating back to Mr. Mulford's era.

In an examination of title to land attorneys in Massachusetts search the chain of title in the public record back at least fifty years (Tully, 2005) For the surveyor a fifty-year search may be inadequate to produce a description showing the original intent of the parties in the definition of a specific parcel. An early description may have been dropped out of later conveyances, or copied in error. Whole lines of a description may have been lost in subsequent transfers. Magnetic directions are sometimes misquoted, e.g. a northeast bearing may be written as north*west*. Some later deeds merely refer in their general description to earlier deeds in wording such as "meaning and intending to convey all the real estate which I derived under deeds recorded …" (Mariolis, 2005) In the new England states it is not atypical for the surveyor to trace a chain of title back into the early 18th century in search of the original-intent description. A review of minimum standards for land surveying of more than forty states in the U.S. showed a variety of statements of the surveyor's responsibility in land title research from "the subject tract shall be researched as far back as practical to ensure the correctness of the record evidence" to "all property surveys shall include a thorough examination of appropriate records of the subject tracts and for the adjoining lands" and "any documentary material filed in the public records of a city, county or state office that pertains to the location of real property."(Wilson, 1990) These "standards" for records research are exhaustive and open-ended and challenge the surveyor to find a description of "original intent".

## 2.2 Monuments

The words "monument" and "monumentation" are used freely in this paper and require some explanation. Mariolis states that "(m)onuments can be natural or artificial. Natural monuments are often superior due to their permanence. Highways and building walls, while artificial, possess many of the attributes of a natural monument." (Mariolis, 2005) Natural monuments include streams, rivers, shores, ridge lines, trees and tree lines. Artificial monuments include fences, walls, piles of stones, concrete markers, iron rods, pipes, pins and buildings. As a principle of superiority natural monuments ("being less liable of change and not capable of counterfeit", Georgia Statute, 85-1601) will usually hold over artificial monuments which in turn, on the condition that they be original, will hold over other calls in a deed. "Monuments called for in a conveyance, if standing in their original position, prevail over courses and distance in case of conflict." *Bartlett v. Roche*lle, 44A301; 68 NH 211. An abutter, or owner of adjoining property as indicated above, may also be considered a monument as stated by Mariolis: "Owners of land adjoining a conveyed parcel, referred to on the description of the conveyed parcel, are monuments." *Fulgenitti v. Cariddi,* 292 Mass. 321, 327 (1935) (Mariolis, 2005)

Conditions on the ground may not reflect or agree with a deed description. Called-for monuments may not exist or recovered monuments may differ in kind or material from those described. Distances or directions between monuments may not agree with calls in the deed. Occupation of the land may not correspond either to the deed description or to monumentation. These discrepancies raise the question of the original intent of the

parties. The courts, accordingly, prefer to give greater weight to physical conditions on the ground, such as monuments, over abstract definitions of a deed description, so long as the monuments are called for in the deed. *Williston v. Morse,* 51 Mass 17 (1845). By the same token, where occupation over time is in disagreement with a description a court may conclude the intent of the parties is better reflected by the occupation than by the description. Bailin points out that "the location of the boundary, as a matter of record title, can be complicated or defeated by claims of adverse use or possession. In such cases, historical evidence of use will often come in the form of (the claimant's) and his predecessors-in-title's testimony and recollections as to use of the property." (Bailin, 2005)

A deed may recite a general and a particular description of a parcel to be conveyed, but the lack of a well-defined starting point and/or monumentation can make it impossible for a surveyor to reproduce the lines on the ground. Without a clearly defined starting point and monumentation the surveyor must depend on called-for adjoiners in the deed, in which case the intended parcel is dependant for its definition on the deed descriptions of the adjoining properties. *Van Ness v. Boinay*, 214 Mass. 340 (1913). Wilson, in a discussion of abutting parcels as monuments recites from 11 C.J.S. *Boundaries* S 55 (1995): "Where abutters are certain, they are monuments of the highest dignity. In order to have controlling effect, adjoining parcels must be established, well-known, and called for in the conveyance. When such calls are manifestly erroneous, they will be disregarded; when land is called for, it must be run to regardless of course and distance." (Wilson, 1990)

Williams and Onsrud observe that following monuments in superiority, direction and distance hold over calls for area. Where there is a discrepancy between distances and direction, direction has been held by many courts to be superior to distance because of the (historic) ability to measure angles more precisely than distances. However, they also point out that direction has often been determined by use of a compass while distance was being measured more precisely by use of a calibrated steel tape. In these instances courts have held that calls for distance in a deed will carry greater weight than calls for direction where there has been a discrepancy (Williams and Onsrud, 2000).

## 3. RESOLUTIONS

### 3.1 Negotiation

Friendly, well-intentioned neighbors will attempt to arrive at a mutually acceptable boundary line location through negotiation when differences of opinion occur.

Negotiation can be in the form of a discussion between the neighbors leading to an agreement over the boundary location, according to their best judgment. Disputing neighbors may also resolve their disagreement by appointing a mutually selected

surveyor who will act as an informal arbitrator by establishing the line, according to the surveyor's best judgment, which the neighbors agree beforehand they will accept. Boundary line agreements are often formalized by the erection of a fence or other monumentation, and the recording of a plan. But a boundary line agreement may not endure if the true line is later determined: "In an agreement fixing a boundary line under the belief that it is the true line, when in fact it is not, is not binding and may be set aside by either party when the mistake is discovered unless some principle of estoppel prevents." *Bemis v. Bradley,* 126 Me. 462. The uncertainty of boundary line agreements as shown in Bemis v. Bradley may be dealt with by a simultaneous conveyance by the neighboring landowners of any land from each owner to the other as determined by the agreed-upon line.

A more formal negotiation process is mediation in which disputing parties allow a disinterested third party to hear their dispute and attempt to bring them to a mutually agreed-upon resolution. The third party mediator acts as a facilitator who helps the parties reach agreement without him/herself making a judgement of the case. In formal mediation the parties may introduce the testimony of their own experts, including surveyors, and may be represented by counsel. But the objective of mediation is an agreement between the parties, not a solution pressed upon them by a third party. This, too, may result in a boundary line agreement, which should be properly memorialised.

### 3.2 Litigation

For neighboring landowners unable to resolve their boundary line dispute through negotiation or by the accepted work of a surveyor, the ultimate resolution may require litigation. Bailin describes the available types of action in Massachusetts as follows:
"For the most part actions regarding boundary disputes, easements, profit a prendre and restrictions may be brought in either the Land Court or in the Superior Courts. However, the form of action may dictate the choice of court. Thus, a Registration action (G.L. c. 185); a Confirmation action (G.L. c 185 S.26A) a Petition to Require Action to Try Title (G.L. c. 240, S1); Declaratory Judgment under G.L. c 240, S14A (can be used when there is no actual present controversy); and Writs of Entry to Recover Title may be brought only in the Land Court. The obvious advantages of the Land Court are the experience and expertise of its judges in dealing with property disputes and the ability (usually) to get definite trial dates…. An action to Quiet or Establish Title (G.L. c. 240, S 6); an Action to Remove Cloud on Title (G.L. c. 240, S 6); an Action Regarding Enforceability and Limits of Private Restrictions (G.L. c 240, S 10 and LOC); and General Equitable Actions including Declaratory Judgments (G.L.c. 185, S 1(k) and G.L. c. 23 IA) may be brought in either the Land Court or Superior Court. (Bailin, 2005)".

Massachusetts General Laws, chapter 185, is a land registration law, known as a Torrens system, in which through a rigorous process of title examination "once and for all", and a

land survey, "title is ascertained and established as against all the world." Governor Wm. E. Russell to the Massachusetts Legislature, February 17, 1891.

Clearly, there are many routes to litigation in the American system and the parties bear the cost of their own counsel and experts regardless of the outcome at trial. But there is more to litigation than just trial. Litigation includes trial preparation and discovery, interrogatories, depositions, the demand for and the production of documents, and the filing of motions by the lawyers. The process can be long and expensive. But the surveyor's role in litigation must be as an objective expert. The surveyor is not an advocate and his or her participation must be seen by the court and all parties as unbiased.

### 3.3 Arbitration

Arbitration is commonly referred to as a form of alternative dispute resolution, as is mediation. But unlike mediation arbitration is not a form of negotiation. Black's describes arbitration as "(t)he reference of a dispute to an impartial (third) person chosen by the parties to the dispute who agree in advance to abide by the arbitrator's award issued after a hearing at which both parties have an opportunity to be heard." The parties volunteer to submit to arbitration, as they do in mediation, but as in litigation in which a court imposes a decision upon the parties, the parties in arbitration must abide by some one else's judgment. The parties at litigation, however, have a right to appeal a decision, whereas in arbitration they have usually agreed to abide by the arbitrator's decision without appeal (i.e., "binding arbitration").

## 4. THE SURVEYOR'S ROLE

The role of the surveyor was defined famously by Thomas M. Cooley, Chief Justice of the Supreme Court of the State of Michigan in an essay first published in the Michigan Engineering Society Journal late in the 19th century (this essay was reprinted in the July-Sept. 1953 issue of Surveying And Mapping, a journal of the American Congress on Surveying and Mapping and in "The Surveyor in Court", an ACSM-published collection of articles first appearing in Surveying and Mapping). In "The Judicial Function of Surveyors" Judge Cooley offered two rules for the surveyor when property boundaries are in dispute. The first rule is "to search for original monuments or the place where they were originally located…" The second rule is, when original monuments are no longer discoverable "the question of location becomes one of evidence merely." State statutes should not direct the surveyor "to locate or establish a corner, as the place of the original monument, according to some inflexible rule." Instead the surveyor "must inquire into all the facts … always keeping in mind, first, *that neither his opinion nor his survey can be conclusive upon parties concerned,* (emphasis added) and, second, that courts and juries may be required to follow after the surveyor over the same ground, and that it is exceedingly desirable that he govern his action by the same lights and the same rules that

will govern theirs." Judge Cooley summarizes by observing that "(s)urveyors are not and cannot be judicial officers, but in a great many cases they act in a quasi-judicial capacity with the acquiescence of the parties concerned…" In other words the culmination of the surveyor's work is an opinion expressed by the plan he produces and by the marks or monuments he sets on the ground. He has no official judicial function or authority but his opinion will be accepted most of the time by the property owners affected until or unless it is overturned by a court.

### 4.1 Surveyor judgment

It is clear, then, that there are several principles for the surveyor to consider before arriving at an opinion as to the location of a property boundary. In construing a deed she must consider the superiority of calls for monuments over distance and direction; and direction over distance except where distance would be more reliable - but she must first be satisfied that the monuments she has recovered in her field survey are the original called-for monuments. She must attempt to find original intent of the grantor and grantee when the description is ambiguous or inadequate. She must also consider both the general and the particular descriptions of a deed and make a judgment when there is a contradiction between the two. Another principle is that "any ambiguity in the description should be resolved in favor of the grantee." (Williams and Onsrud, 2000) All these judgments require careful study and thoughtful consideration and may well be contradicted by another surveyor and may be overturned as a result of litigation. Williams and Onsrud explain it this way: "If a court upheld the surveyor's evaluation of the evidence in the example, it is because the surveyor arrived at a comprehensive and well-reasoned answer rather than because he arrived at the theoretically correct answer. … there are no "true" answers waiting to be discovered, only well-reasoned answers." (Williams and Onsrud, 2000)

### 4.2 Professional cooperation

Boundary disputes occur when owners of adjacent land parcels disagree on the location of the line between their properties. This may be because of their own impressions of where the line should be but more often it is because a surveyor for one of the owners has defined the line contrary to the understanding or belief of the other owner. If the second owner cannot be convinced by the first neighbor's surveyor, he will hire his own surveyor hoping to support his own understanding or belief. Logic suggests that the second surveyor will come to the same conclusion as the first surveyor, as to the location of the line. But history and experience show otherwise. Each surveyor will come to her own conclusions based on a study of the deeds involved and the conditions on the ground. When, as described above, there are ambiguities, contradictions or errors in the record or as evidenced in conditions on the ground, surveyors must weigh the evidence and arrive at their own conclusions. Williams and Onsrud explain that "(s)urveyors occasionally disagree on the proper location of a boundary line not necessarily because

one surveyor measures better than the other, but more commonly because each surveyor has weighed the evidence differently and has formed different opinions." (Williams and Onsrud, 2000)

Two surveyors coming to differing "well-reasoned answers" have a regulatory obligation in some jurisdictions to seek a common understanding. For instance: "In the event of substantial disagreement with the work of another surveyor, contact the other surveyor and investigate the disagreement." (Code of Massachusetts Regulations, 1986) Besides a regulatory obligation, surveyors have an ethical obligation to reconcile their differences in order to meet their social responsibilities. "In the event a property surveyor … disagrees with the work of another property surveyor, it is the duty of that surveyor to inform the other surveyor of such fact."(11) By following a regulatory directive, and by recognizing an ethical obligation, the two surveyors with differing conclusions in their neighboring surveys are in a position to avoid or settle a dispute between abutting property owners. It is a dispute that could lead to expensive and protracted litigation. Unfortunately, a misplaced concern for their clients' interests, ego and a reluctance to yield to another's opinion, or a concern for a supposed professional liability exposure often mitigate against cooperation between surveyors with contradictory opinions.

## 5. THE SURVEYOR AND THE ATTORNEY

Ward discusses the need for the surveyor and the attorney to prepare carefully for the surveyor's intended testimony in litigation: "The attorney discusses the merits of the case long before the trial date. He wants to know whether the surveyor can testify in an unimpeachable fashion to sustain a position that he is trying to establish, and do so in the framework of ethics of his profession with honesty, accuracy and knowledge."

The surveyor and the attorney have distinctly different roles when trying a boundary dispute in litigation. The attorney is an advocate for her client while the surveyor is a witness offering expert testimony in an unbiased, objective manner. Babitsky and Mangravini explain it this way:
"Your role as an expert is to tell the truth and render an objective opinion. You will be a much more effective witness if you … do not attempt to advocate for the party who has retained you.
The attorneys in the case have a far different role. Although they are also obligated to tell the truth, they are ethically obligated to advocate the position of their respective clients. It is their job, not the expert's, to present the evidence to make it appear as favorable as possible to their clients." (Babitsky and Mangraviti, 1999)

Pill describes how lawyers reason by analogy: "In a legal dispute, the lawyer for each side sifts through published court decisions, looking for those that support his/her client's case, then argues that the cases apply by analogy to the facts at hand. The opposing

lawyer' job is to distinguish those cases and show that some other case, leading to a different conclusion, is really more similar." (Pill, 2004)

The expert cannot "sift through" the facts or the principles of surveying to support her testimony. Thomas makes an emphatic statement regarding the position of the expert witness: "Be sure that you are an expert witness and not an expert advocate. When you become an expert advocate you destroy your effectiveness completely. You are not there to shove a proposition down the throats of the jury; you are there to tell whatever the truth is, to tell them that you are an expert, that in your opinion this is true, that you believe it could not be otherwise." (Thomas, 1963)

Finally, the Manual of Instructions of the Massachusetts Land Court instructs the surveyor on this issue in unequivocal terms: "The surveyor should consider his work as being performed for the Court, and that these instructions are paramount to any given by his client or his client's attorney." (Massachusetts Land Court, 1989)

It is well understood by the courts, attorneys and experts that the expert witness is a professional and is entitled to be paid for his time in preparation and in trial. However, unlike the attorney the expert witness may not be engaged on a contingent fee basis. Thomas explains the fee arrangement between lawyer and expert as follows: "There are a number of things that must occur before you ever climb on the witness stand. First of all, and it may be the most important, better have a good fee schedule lined up and know who is going to pay you … never under any circumstances have a contingent fee … a fee that is based on the outcome of the case. That is a criminal offense … an expert witness is supposed to be there to testify to his opinion … and to exercise judgment and discretion; and if the outcome of the case is going to affect … his remuneration, then he has a situation which prevents him from being a true expert witness, and his testimony is subject to violent impeachment." (Thomas, 1963)

## 6. OBSERVATIONS AND CONCLUSIONS

The physician's Hippocratic Oath to "do no harm" may be reflected in the surveyor's ethical obligation not to disrupt peace in the neighborhood. Disputes between neighbors over their common boundaries are ubiquitous. The source of those disputes is found quite often within the realm of the surveyor's expertise and it is often within the surveyor's ability to reconcile differences, whether in friendly negotiation or bitter litigation. But it is also true that many boundary disputes have their origin in the retracement work of a surveyor who, in her zeal to serve her client's interests, has failed to recognize a neighbor's just claim.

In seeking to arrive at "a well-reasoned answer", whether in a retracement survey or in an attempt to reconcile a boundary dispute, the surveyor must work objectively. He must be

an advocate for no single party. His role is to find evidence of the intent of the parties in their original descriptions of the boundary lines in question. A surveyor's inadequate consideration of the record, or failure to identify controlling evidence, or poor reasoning in arriving at her conclusions will almost assuredly lead to disputes between neighbors, if not now, then in the future.

Whether in performing a retracement survey or in attempting to reconcile a boundary dispute the key will always be in the surveyor's obligation to the public being equal to his responsibility to his client's interests. There is a profound dichotomy in the division of the surveyor's responsibilities between those to her client and those to her client's (potentially adversarial) neighbor. The situation is endemic in the professional status assigned to the surveyor through public licensure, assigning to him or her a responsibility to keep peace in the neighborhood.

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**Biographical Notes**

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Robert W. Foster is a Registered Professional Engineer and a Registered Professional Surveyor with over 35 years experience in the planning and design of residential, commercial and industrial land uses, including the design of road systems and their infrastructure. He received a Bachelor of Science degree in civil engineering from the University of Vermont in 1955.

Mr. Foster has provided consulting services in engineering and surveying as sole proprietor since 1992. He reviews the construction of road and infrastructure systems for the towns of Hopkinton and Hopedale, reporting on the progress of construction and the cost of remaining work for bonding purposes. He offers professional consulting services nationally in dispute resolution and litigation involving civil engineering and surveying issues

Mr. Foster is a member of the Boston Chapter of the American Society of Civil Engineers and has served on the Board of Trustees of The Engineering Center Education Trust (Boston). He is a member of the New England Land Title Association, the Massachusetts Association of Land Surveyors and Civil Engineers (MALSCE), the Massachusetts Real Estate Bar Association (REBA) Dispute Resolution Register, and is a member and past chairman of the Hopkinton Zoning Board of Appeals. Mr. Foster is a past president of the International Federation of Surveyors (FIG) and is a past president of the American Congress on Surveying and Mapping (ACSM), He has received awards and citations from FIG, MALSCE, ACSM, the American Society of Photogrammetry and Remote Sensing, The Engineering Center and the American Society of Civil Engineering.

Mr. Foster has conducted mediation sessions in property disputes for the REBA Dispute Resolution Register and has provided testimony in appeals for permit denials, eminent domain proceedings, and professional negligence litigation. He has testified before the United States Congress and the Massachusetts Legislature on pending legislation and budgetary matters. He has conducted numerous seminars on the subjects of planning and zoning, professional practice issues and ethics, and professional standards. For several years he conducted refresher courses for candidates for licensure as professional engineer and as professional surveyor.

Mr. Foster is author of *The Liability Environment,* a compendium of his columns appearing in the ACSM *Bulletin.* He has written papers and articles on planning and zoning, the global positioning system (GPS), ethics, professional practice, public relations, mapping the wetlands of Massachusetts, and the need for a land data system in New England. Mr. Foster has written a column regularly for the monthly *Civil Engineering News* and is a Contributing Editor for *P.O.B. Magazine,* a publication of Business News Publishing Company.

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