

THE CREATION AND LICENSING OF A DIGITAL ORTHOPHOTOGRAPHY AND VECTOR LAND BASE AT A LARGE NORTH AMERICAN ELECTRIC/GAS UTILITY

Michael G. Anderson
Senior GIS Analyst
PECO Energy Company
2301 Market Street N3-2
Philadelphia, PA 19103
U.S.A.

Abstract

A digital orthophotography and vector land base was developed for one-third of PECO Energy Company's service territory by a photogrammetric firm. PECO drafted a Sublicensing Agreement granting sole marketing rights to the contractor in order to establish a common, regional land base and recoup part of its investment in the highly accurate product. This agreement allowed PECO to retain ownership and concentrate on its core business while making the product available to interested third parties through a true provider able to focus on their individual requirements. This paper focuses on the development of the new land base and the unique Sublicensing Agreement. Full details are provided on the methodologies that yielded the required accuracy and data base design; and the intellectual property laws that are pertinent to the licensing of this type of software product.

1 Introduction

PECO Energy Company, like most large electric/gas utilities in North America, is an investor-owned company. It therefore has a dual responsibility in all of its undertakings to provide economically reliable service to its customers and earn a return on investment to its share holders. PECO's GIS Project was subject to these criteria during all aspects of its design including the need for a new, accurate digital land base. However, the GIS system had the additional burden of providing an intelligent base map capable of fulfilling the requirements of local governments and other parties in the region. The methodology developed to fulfill these criteria is the subject of this paper.

2 Company Background

Founded in 1881, incorporated in 1929, PECO's service territory occupies some 2000 square miles in the state of Pennsylvania in the northeastern United States. The company has 1.5 million electric customers of which 350,000 are also natural gas clients. Eighty percent (80%) of the electrical generation derives from investment in three (3) nuclear plants with the remainder being supplied by seven (7) fossil-fueled plants and one (1) hydroelectric station. The total net electric installed capacity is 8,677 MW. One of the largest utilities in the U.S., its revenues exceed \$3.9 billion and has \$13.7 billion in assets.

3 Non-Consortium Approach

An accurate land base has always been an extremely desirable and expensive part of any past or contemporary GIS. Its appeal derived from the numerous governmental/municipal and utility applications which it could support and therefore serve as a common spatial database for all concerned parties. This would consequently foster more direct and effective communications between organizations. In short, a "consortium" was formed with all parties participating in every aspect of the land base development.

Naively cooperative in concept, the organizational differences in accuracy and detail requirements, budget cycles, and GIS project schedules has made the "consortium" approach to a common, accurate land base a nearly impossible endeavor in the United States. PECO has had at least two (2) such failed "consortiums" and many others litter the large urban areas of the country. Not wishing to repeat its previous attempts, PECO sought a "non-consortium" approach to the acquisition of a common, accurate land base that would prevent delays but still satisfy the needs of all possible participants.

The "non-consortium" approach is predicated on several key principles: (1) PECO provides full financial backing and therefore retains complete ownership of the land base, (2) the accuracy and data requirements would be developed to meet PECO's business needs and be robust enough to permit additional third party development, and (3) a Sublicensing Agreement with the land base provider would grant it sole marketing rights and be the vehicle by which the product would be made available to third parties.

4 Methodology

Fortunately, the cost for the many features in a planimetric land base have dropped at least fifty percent (50%) in the last ten (10) years primarily due to the introduction of new technology. GPS, high resolution scanning, and ever-improving computer hardware/software have all contributed to reduced costs and better end-products. Digital orthophotography, the associated terrain model, and stereodigitized natural and cultural features have finally become economically feasible for internally funded GIS projects. After performing an internal study of its accuracy and data requirements based on its own business needs, PECO requested rough estimates from several photogrammetric firms and determined that the cost was within the GIS budget. However, additional elements and costs would be required to produce a land base that was marketable to the remainder of the GIS community.

A determination of these additional requirements was made through a series of meetings conducted with organizations in the local GIS community and included municipal governments and utilities (water/telecommunications). These discussions were premised on information exchange and the "non-consortium" approach to prevent unnecessary dialogue. Participants were told of the land base requirements PECO had established and asked for their input and other specifications. These were then taken under advisement by the GIS project team and judged to be cost effective and recoverable in the final product.

The discussions took approximately two (2) months but resulted in the following accuracy and data requirements for the land base:

Digital Orthophotography

Black & White Film
Flight Altitude: 9600 feet
Negative Scale: 1 inch = 1600 feet
Pixel Size: 1.6 feet

Digital Elevation Model

Absolute Accuracy: 5 feet
Relative Accuracy: 1 feet
Mass Point Collection: 160 feet
Breakline Collection: Compiled vectors

**Vector Compilation (Mapping Scale: 1 inch = 200 feet,
Analytical Stereo Digitizing)**

Public Roads Edge-of-Pavement (paved and unpaved by jurisdiction)
Private Roads Edge-of Pavement (driveways exceeding 200 feet)
Road Centerlines (by jurisdiction)
Building Centroids (general, trailers, ruins, construction, vacant lots, etc.)
Major Building Roof Prints (PECO owned, major electric/gas customers)
Hydrology (rivers, lakes, streams, ponds)
Bridges
Railroads (primary, secondary, abandoned)
Parks
Cemeteries
Geo-political Boundaries
Subdivisions

Full data attribution accompanied all compiled vectors. Sixty (60) permanent monuments were sighted using Global Positioning System techniques to fulfill the required accuracies. Although, contour lines were not a requisite, their generation is possible at a five (5) foot elevation dissemination with the normal limitations associated with software generated contours.

The land base was then announced to the vendor community in a bid with a high emphasis placed on the bidders response to questions regarding their responsibility in the remarketing of the product. A supplier was eventually selected based on their technical, financial, and business capabilities. However, negotiations surrounding the Sublicensing Agreement granting sole marketing rights to the provider proved time-consuming due to the nature of the innovative "non-consortium" approach. All parties wanted to fully cooperate but the complicated legalities surrounding the dissemination of electronic data dictated the discussions from both ownership and liability standpoints. Curiously, the splitting of licensing fees was the easiest part of the agreement with PECO receiving the lion share for the direct license fees associated with the original product and a much smaller percentage for any additional work provided by the contractor and derived from the original product.

Obviously, PECO's primary concern was protection of its copyrights. In copyright law regarding software, this begins with the contractor. The U.S. 1976 Copyright Act, as of January 1, 1978, changed the "work made for hire" definition to make it more likely that a custom software contractor owns the software it produces. This is inordinately important because software ordered from a contractor rarely meets the extremely narrow legal definition of a "work made for hire", and as a result, ownership can windup with the contractor. In the U.S., this fact is often overlooked by organizations inexperienced in software contracts. There are two (2) ways to avoid this legal pitfall: (1) deem the work as "work made for hire" but insist that the contractor vest complete ownership in the employer, or (2) **DO NOT** deem the work as "work made for hire" anywhere in the contract [1, sect. 2.6 pp. 2-10]. PECO chose this latter method in its Sublicense Agreement because it was simpler and clearer.

Copyright protection then extends to the third parties wishing to license the data. It must be understood from all involved in the marketing of the product that the words "**sale**" or "**sell**" are never verbally expressed or written in any meeting or documentation. If either of these words is expressed then the purchaser, not licensee, has rights to sell the product through the "rights of first sale" principle [2, pp. 318-320]. It must be clear that the marketing agent will correctly represent the owner's copyright in all their negotiations with third parties and be liable for their mistakes. If the copyright owner's presence is required at all negotiations the marketing agent's purpose has been effectively defeated.

The size limitation on this paper by the ICC will not permit the coverage of all the minor ownership and liability issues contained in PECO's Sublicensing Agreement which is ten (10) pages long. However, primary concern must be extended to the legal area of "enhancements" and "modifications". PECO understood "enhancement" to its land base product to mean any new feature category added to the original data. For example, PECO did not include lot lines in the product because it had no business need, but, they are essential for any municipality from a taxation and land ownership perspective. The Sublicensing Agreement must contain provisions to allow licensees to independently develop these additional data categories.

This seems simple enough, however, copyright law could permit the copyright owner of the product used as the basis for a new data category to also claim ownership of the enhancement [1,3]. Obviously, a third party does not wish to invest large sums of money without retaining ownership of its investment. PECO agreed to waive any rights it might have in the "enhancements" area but reserved the right to consider them in negotiated license fees for the land base product. This was seen to foster openness and data sharing within the GIS community. Generally, licensees are not permitted to electronically distribute the data except for their own internal purposes. However, it is necessary to permit this activity in the case of "enhancements" with the provision that any subcontractor completely return or destroy all copies of the data. "Modifications" were taken to mean any change, revision, or update to the original land base data. The sublicensing agreement simply absolved PECO from any liability resulting from a "modification" or "enhancement" of the original work.

The marketable life of this type of product mirrors that of aerial photography, i.e. approximately five (5) years depending on urban growth or terrain changes. Therefore, global updates of the data were not seen as an important consideration in the initial agreement and could be better

handled in a separate agreement at a later date. Third parties using the land base would be contacted at the appropriate time to foster a partnership in the global update process.

PECO hired outside legal counsel specializing in patent and trademark law to review the draft of the original Sublicensing Agreement. It is strongly suggested that any organization interested in licensing software also secure this expertise to insure its copyright protection and limit its liability.

5 Successes

PECO has currently recovered approximately fifty percent (50%) of its investment through the first sublicense agreement with the county municipal government. PECO also has commitments to license the data from the two (2) largest water utilities in the area. If it is successful in these two additional licenses, the company will have recovered its total investment. It has also been necessary to develop a subscription type agreement for engineering and consulting firms wishing to use the data for smaller municipalities in the area which do not generally have the resources to do their own GIS work. These subscriptions are normally for a one year term and are renewable with the provision that all data must be returned or destroyed at the end of the subscription period.

Feedback from the GIS community has been extremely positive. The product was rapidly produced and the licensing fees are viewed as being extremely reasonable for the high quality nature of the product. The municipalities also like the fact that they do not have to bid a land base because it is the only available product of this nature. This saves them the great amount of time and expense associated with the U.S. municipal government bid process. It also allows them to have access to the product at their leisure and within the confines of their budget process.

The innovative "non-consortium" approach has worked well for PECO and may be an effective solution for other organizations wishing to develop an accurate, high quality land base and hoping to avoid the many delays and problems associated with other methodologies.

References

- [1] Hoffman, Paul S., 1995. The Software Legal Book. Shafer Books, Inc., New York, New York U.S.A.
- [2] Miller, Arthur R., and Michael H. Davis, 1987. Intellectual Property - Patents Trademarks, and Copyright. West Publishing Co., St. Paul, Minnesota U.S.A.
- [3] Schwartz, Laurens R., 1994. Computer Law Forms Handbook. Clark Boardman Callaghan, Cranbury, New Jersey U.S.A.