

# **The importance of archive aerial photos for legal and administrative proceedings in Warsaw**

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## **SUMMARY**

Archive aerial photographs could be a very important document that allows to obtain information about particular areas for the day of photo collection.

For the city of Warsaw, a very rich collection of photogrammetric aerial photographs is preserved in the state archives. The oldest of which date back to 1925. This year, a Photoplan was prepared for Warsaw. It was the first Photoplan in the world developed for the area of the entire city.

Aerial photographs can be a source of many unique information about the area, because they show a lot of details that cannot be found on maps or other documents. Aerial photos in Poland are stored in state archives and they are a type of official document. Photographs have a specified date of taking and confirmation of authenticity. Thanks to this, it is possible to use them in many different proceedings in which it is necessary, for example, to determine the legal status of the area or the area coverage. In the article, the author presents what kind of proceedings the photos are used in and how much important information they can provide. This allows to appreciate the importance of the archives in which the aerial photographs are stored.

# **The importance of archive aerial photos for legal and administrative proceedings in Warsaw**

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## **1. INTRODUCTION**

Aerial photogrammetric photographs are a priceless source of information about the terrain they cover. Photography provides unprocessed images and this distinguishes it from other methods of documenting objects, such as, description or maps representing objects on the ground. This means that for one thing, a photograph always requires interpretation, that is, description of features visible in it but, on the other, it allows identification of many features which are not available in other sources, like, for instance, information discarded as redundant in production of a map. Such information may be of great value in various historical studies and – what is demonstrated below – also in court and administrative proceedings.

This paper discusses only aerial photogrammetric images, that is, ones taken from an airplane using a photogrammetric camera with defined interial orientation. Photogrammetric images are made in a special regimen of distribution of the pictures whose coverage allows stereoscopic measurement. Such photographs are usually made for the purpose of measurement (e.g., making maps). Since only part of all Warsaw's photographic resource is available today, this paper will also discuss selected photoplans made on the basis of photographs. The discussion will not touch the subject of oblique reconnaissance images whose resource is quite abundant in the archives.

## **2. AERIAL PHOTOGRAPHS OF THE WARSAW AREA**

An ample collection of surviving aerial photos and photoplans of the Warsaw area are kept in the archives. The oldest available items date back to 1925 when a photoplan of the city's central area was made. The next photoplan was made in 1935 by the "Fotolot" company (a photogrammetric arm of the LOT Polish Airlines). These two photo plans are now in the State Archive in Warsaw. The 1935 photo plan has been published in many on-line services, the Goole Earth included. A lot of reconnaissance photographs of Warsaw, among them oblique photos, were made during World War II. This resource is available, at the Library of Congress in Washington, the Magdeburg Archives and in some other places.

One of the items in that collection is a photoplan Bildplan Warschau P263 which covers the entire city of Warsaw and was made by the 3rd Reich's cartographic services. However, all information about the source photographs used in producing these photoplans is missing and, probably, lost for ever *Barański M., Soltan A. (2004)*.

Aerial photographs were made many times after the dramatic pause caused by World War II in the life of Warsaw and the whole nation. Owing to a very efficient organisation of the cartographic authorities, all these images have survived until today and are accessible in the State Archives. The administration officials understood and highly appreciated the

documentary value of photo images and they included in the 1989 Geodetic and Cartographic Law a requirement that all the aerial photogrammetric images must be submitted to the Main Geodetic and Cartographic Documentation Centre. This regulation ensured that aerial images would be preserved in proper conditions and would be accessible to all the interested.

Pictures taken after World War II are kept in two different archives. In the years 1945-1960, aerial photographs were taken by military cartographers and this part of all the imagery is kept in the archives of the Military Institute of History. At the end of 1950s and early 1960s, such photographs were also made for the needs of civil services and these are now stored at the National Geodetic and Cartographic Resource (PZGiK) which is controlled by the Surveyor-General of Poland. From 2008 on, pictures showing the area of Warsaw also end up in the collections of Warsaw's Office of Geodesy and Cadastre.

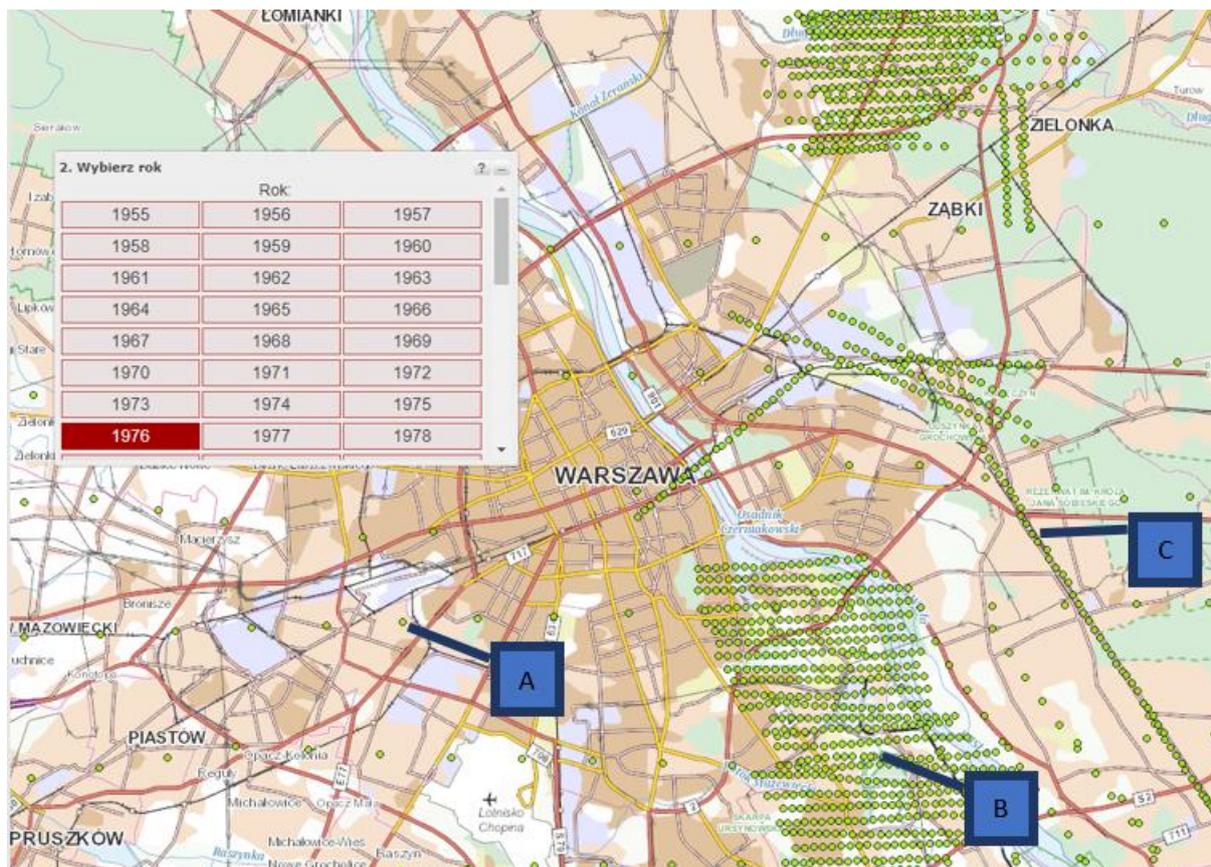
An analysis of the scale of different photographs and the areas they cover allows a conclusion that the surviving archival images were used for a variety of purposes:

- Production of maps of the city or its parts (e.g. districts) – these pictures come in large scales from 1:3,000 to 1:10,000 and they cover the area within the borders of the town or of its part;
- Production of topographic maps – these pictures come in scales smaller 1:10,000 and they cover much more area than the city itself. Such pictures usually cover an area of a map sheet (e.g. an N-34-139 sheet according to the international classification of maps);
- Special projects, such as, measurements of roads and other civil engineering structures – such pictures come in large scales, above 1:5,000, and they offer irregular coverage whose shape corresponds with the area or structure under study.

Majority images available in the archives lack detailed information, such as, camera calibration data, flight planning, or coordinates of ground control points used in aerial triangulation. The quality of the photographic material is diversified too. In some cases, original film negatives are available, in other cases – only contact prints spotted with marks left by previous users, such as, many scratches, punctures, and photo point markings. Despite that, all those images can have their key parameters determined based on information present on the frame which includes the photo number, camera serial number, time and altitude at which the picture was shot. In most cases, the focal length is also given. When the key camera data are available, it is possible to do the external orientation and, then, photogrammetric measurements in the pictures. It should be remembered, however, that missing camera data and the film's time-related shrinking may cause a more significant measurement error than measurement done strictly according to the regimens of contemporary photogrammetry. In any case, the precision of such measurements is good enough for many applications.



*Fig. 1. Samples of photo frames filled with camera and focal length data*



*Fig. 2. A mapindex of images from the National Geodetic and Cartographic Resource’s portal run by the Head Office of Geodesy and Cartography which shows the available images of the Warsaw area as it was in 1976. The distribution of pictures suggests their purpose. A—pictures in small scales made for the production of a topographic map; B—pictures in large scales made for the production of a detailed map of a city district; C—pictures in large scales made for special measurements of a railway line. Source: [pzgik.geoportal.gov.pl](http://pzgik.geoportal.gov.pl)*

### **3. THE USE OF AERIAL IMAGERY IN COURT AND ADMINISTRATIVE PROCEEDINGS**

Since aerial photographs are full of information which cannot be obtained from other sources, they can be used in establishing facts which are often crucial for court and administrative proceedings. Photographs are accepted as legal evidence because they come from a reliable source – an archive kept by a competent official agency which can certify the legal provenance of each image. The process of working on such photographs is similar in all types of proceedings and it includes the following:

- Plotting a former piece of land/area required for a contemporary map;
- Identification of the required area in the picture;
- External orientation of the image and plotting the area borderlines and location of the required terrain features;

- Photogrammetric measurement of the features visible in the picture;
- Description and interpretation of the visible facts;

Further on, this paper will describe several types of proceedings the author has worked for. Most of these proceedings were located in the Warsaw area. They were sorted out according to different purposes they served.



*Fig. 3. Materials routinely used in court and administrative proceedings: a map with plotted former land plot. Aerial photographs taken in different years with plotted borders of the former piece of land*

### **3.1 Proceedings in the case of hostile possession of land to the benefit of metropolitan Warsaw**

A decree published on October 26, 1945 (also known as the “Bierut decree”) ruled that all land within the Warsaw area becomes the sole property of the municipality of Warsaw. This decree has been often pondered at court trials until today and the Warsaw Town Hall had to open a special department called Office for Decree-related Cases which employs a strong group of workers responsible for handling the incoming applications for the return of real estate. The provisions of the decree and later laws allowed returning some pieces of land to former owners. These included, for instance, land plots on which no investment projects were commenced until 1958. But the state authorities hardly obeyed this provision until 1989, by which time a great number of applications were lodged and they are now being processed with a longtime delay. Meanwhile the situation on the claimed land plots has changed and documentation of their management is often incomplete or unreliable. This is exactly when aerial imagery can really help. Surviving photographs which cover the Warsaw area were

made in: 1945, 1947, 1951, 1953, 1955, 1959 (part of the town), and 1960. Such a collection of images allows a thorough review of all changes which have taken place on the property over time. Some of the available images, especially those dating to 1945 and 1955 were made in a large scale – 1:8,000 which allows identification of many details, such as, people and cars. This, in turn, allows the verification of image descriptions.

Comments and descriptions of the images are attached to the court case files. The court's job is to compare these descriptions with other documents available in the archives. The author has been told that information on land plot management can often be obtained only from aerial photographs.

### **3.2 Confirming the implementation of justified expropriation's purpose**

According to the Property Management Act, each decision on property expropriation must define the public benefit as its purpose. However, if the implementation of that purpose does not start within 7 years after the expropriation, the owner may seek its return. In Poland, many such proceedings are held to solve expropriations done at the late 1970s and during the 1980s. That was a time of crisis and subsequent political transition when many planned investment projects were abandoned but the properties involved were not automatically returned to their owners and, as a result, many owners are now eligible for indemnification. In many such cases it is impossible to confirm whether the expropriation purpose actually was or was not implemented in due time because the construction documentation happens to be incomplete. Here too, archival photo images can be used to find out if the purpose (e.g. building a road) was implemented or to conclude that it was not because no such features are visible in the image.

### **3.3 Verification of land plot boundaries**

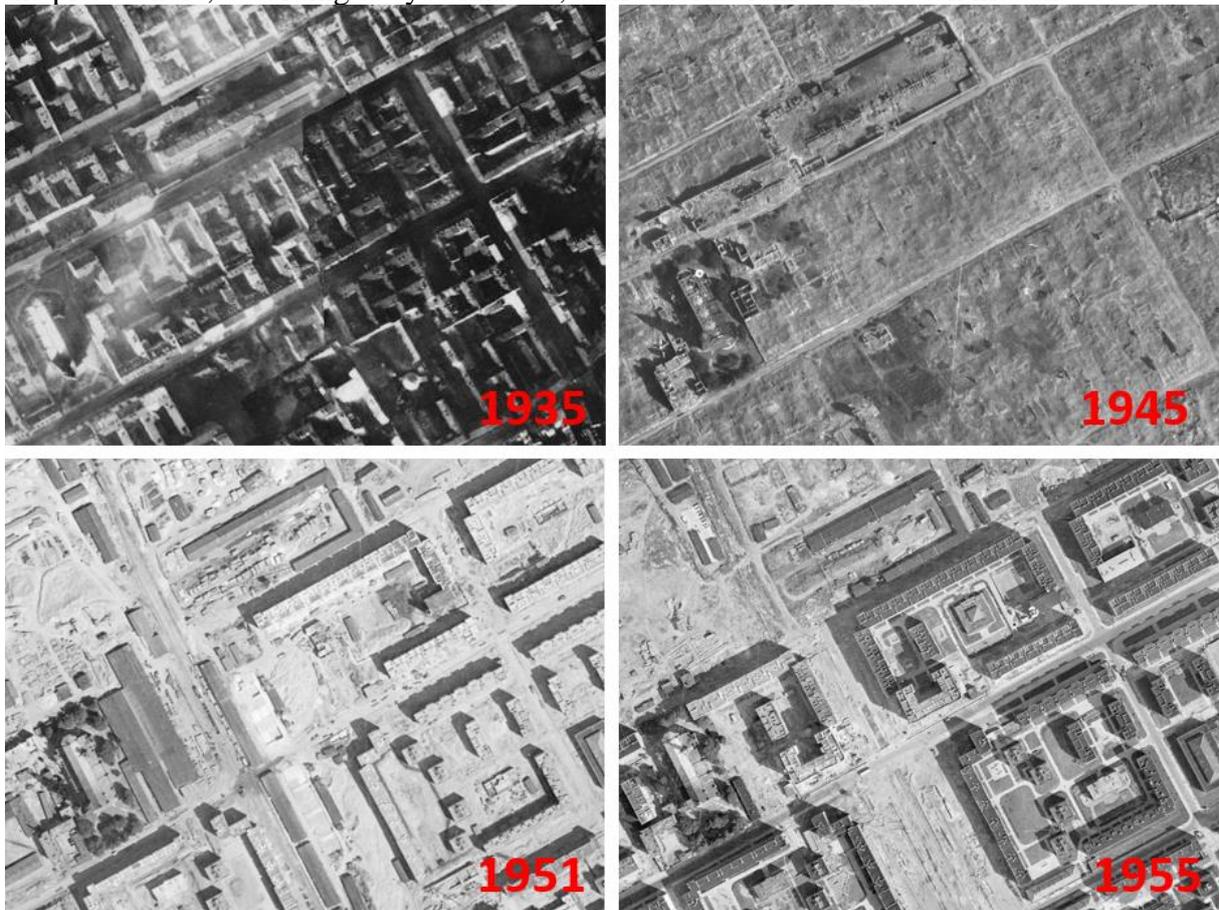
Another situation where aerial photographs may be of great help is when it comes to identification of errors made in measuring property boundaries. Owners who claim that errors were made in measuring their property boundaries for land register or property demarcation purposes often reach for this method.

In this type of proceedings, the measurement documentation may include a statement that the property border runs along the peaceable possession line or along some visible terrain features (e.g. a fence) but the measurement data values may suggest a different shape of the borderline. In such a case, the only possible verification is to measure those features on archival photographs. This type of measurement requires the greatest care in image orientation so as any potential errors are minimized in the process. When such analysis is ordered for the needs of court or administrative proceedings, images done before and after measurement are usually studied. The analysts first plot the borderline defined by the contested documentation on a photograph and then the borderline seen in the picture is plotted. Further analysis shows whether any errors were really made during the direct measurements.

### 3.4 Other studies

Archival aerial photographs may also be used in many other types of proceedings. In one of those, the author of this paper was asked to put together documentation substantiating an appeal against a decision to enter a building in the register of historical monuments. Aerial photographs helped to demonstrate that the building had been heavily damaged during the war and later reconstructed without much care to restore its original forms.

The author also used archival aerial images in archaeological works carried out in the area of what was the Jewish ghetto during the Nazi occupation in Warsaw. This urban area was totally flattened in 1943 and buildings of a different type were built there in the 1950s. Before new construction started, images showing the exposed cellar walls helped to precisely localise the place where, according to eyewitnesses, some secret archives had been hidden.



*Fig. 4. Overground development changes at the Jewish ghetto in Warsaw during a period of two decades. These changes have been so extensive in some places that identification of streets and buildings is no longer possible*

#### **4. SUMMARY**

Archival aerial images of the Warsaw area are these days used in 200-300 court and administrative proceedings every year. Without those pictures many cases could never be solved or they would be solved in a wrong way. This shows how important archival aerial photographs can really be and how important it is to preserve and carefully protect them. It is worthwhile to say that the Main Office of Geodesy and Cartography has done a mammoth work of scanning all the pictures in its resource and is now offering access to them on a dedicated portal. The portal solution not only protects information present in the pictures from time-dependent degradation but also offers easier access and use of the whole existing imagery.

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#### **BIOGRAPHICAL NOTES**

Piotr Falkowski is a surveyor specialized in Photogrammetry. He graduated Warsaw University of Technology in 2003. From 2002 he works for Warsaw Surveying Company as a head of Photogrammetry Division. He is interested in history of Warsaw's cartography.

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