

THE USE OF AERIAL PHOTOGRAPHS IN THE DESIGN AND LOCATION OF HIGHWAYS

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Aerial photographs have been used for some time in topographic mapping and the preparation of aerial maps (mosaics). In the last few years, a new use, Engineering interpretation, has been developed for air photos. New photographs are available to Kentucky highway designers now, more than ever before, and can be seen at the Highway Location Office in Frankfort, the Kentucky Agricultural and Industrial Development Board in Frankfort, and the Production and Marketing Administration office in Lexington. Aerial photos of any area in the United States may be located by contacting the Map Information Office of the United States Geological Survey, Washington, D.C.

It may be said truthfully that everything on the ground appears in the photograph. The user needs some experience and a good imagination to detect features he needs, since they may appear quite different when seen through the eyes of a camera from several thousand feet in the air.

All buildings, fences, roads, and other culture, as well as streams, and natural features show up in various light intensities. Figure No. 1 is a copy of a vertical aerial photograph of an area just north of Lexington and illustrates these points. The belt line around Lexington is shown under construction. Photos are especially useful in the planning of projects of this type, since the entire area can be studied at one time. When overlapping-pairs are viewed stereoptically, preliminary routes can be established in the office.

In connection with the purchase of land, farmer landowners can readily read enlarged prints and visualize how the construction of the road would affect their property. This understanding will aid the completion of land purchase transactions.

Prints that cover a final line may be sent to the construction engineer before the work begins. These prints enable him to familiarize himself quickly with his work since the entire area can be checked in the office to get a good overall picture of the job. He can plan his work better with the photo since he can see the places that require special attention.

Many geologic and soil formations can be mapped and identified, thus enabling the locating engineer to place the highway on the best foundation. Each rock formation has a characteristic land form and



Figure No. 1

Aerial Photograph of Area Near Lexington
Approx. Scale — 1" = 1500'

- (a) Construction in Progress on the Belt Line Highway**
- (b) Winchester Pike**
- (c) Wooded Area**
- (d) Fence Line Around Field**
- (e) C & O Railroad**
- (f) Streets and Residential Area**



Figure No. 2

Aerial Photograph of an Area west of Junction City
Approx. Scale — 1" = 1200'

- (a) Shale rocks and Shallow Clay Soils — Wooded Area
- (b) Transition Zone with Shale and Limestone Rocks
- (c) Limestone Rock and Silty Clay Soil
- (d) Plowed Field
- (e) L. & N. Railroad
- (f) Southern Railroad
- (g) State Highway No. 300
- (h) Junction City

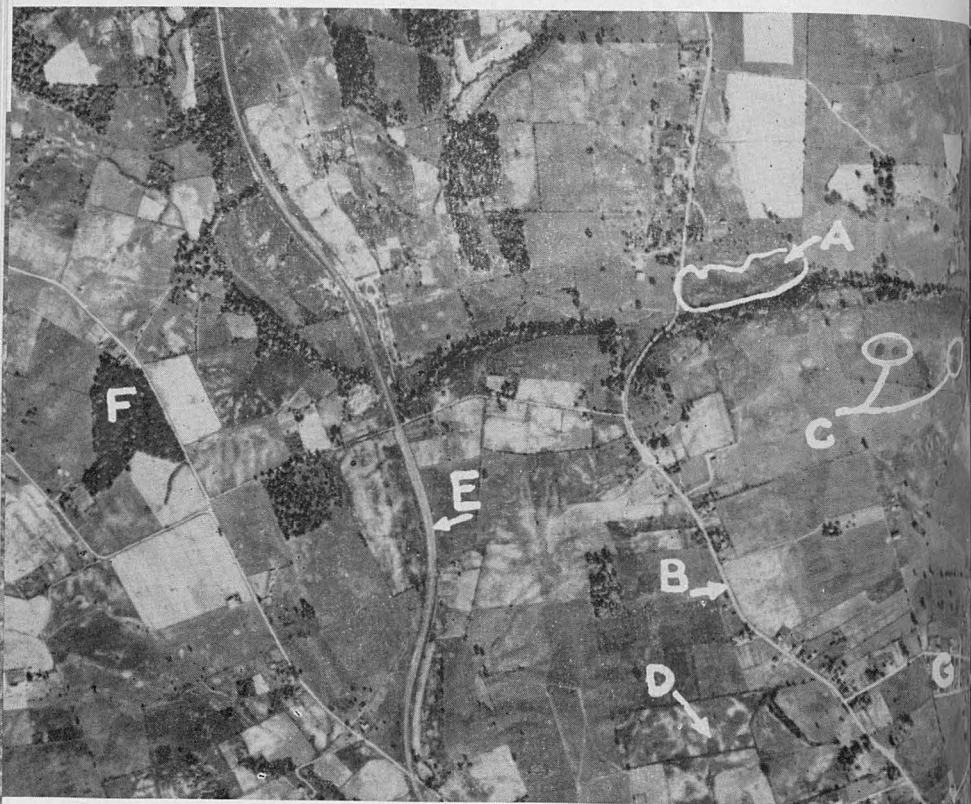


Figure No. 3

**Aerial Photograph of an Area North of Somerset
Approx. Scale — 1" = 1200'**

- (a) Poorly Drained Soil Along Caney Creek
- (b) U. S. Highway 27
- (c) & (d) Limestone Sinkholes
- (e) Southern Railroad
- (f) Trees
- (g) North Somerset Streets

type of soil. These can be identified when the photo-interpreter learns to correlate the variations in color and relief (as seen through the stereoscope) with the land forms as they are found in the field. Figure No. 2 is a photograph of the area near Junction City. The striking difference between shale and limestones formations can easily be identified. There is also a transition zone of shale and limestone outlined by erosion ditches.

Poor drainage conditions in the soil are recognizable in many instances. The photo user soon learns to identify these areas by differences in color tone, vegetation, and relief. Figure No. 3 includes an area along the creek north of Somerset which illustrates this point. It is interesting to note that the pavement failed across the fill section due to poor drainage conditions.

It is up to the photo interpreter to use his knowledge and imagination to take the information off the picture and transform it into engineering data which will be useful to the highway engineer. Any engineer can use aerial photographs by studying them and checking his deductions in the field. As he gains experience, he can do more and more work in the office with a minimum amount of field work. Thus, aerial photographs give the highway engineer another tool which will help him build better highways for less money.