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AIR MARKING IN OHIO*

FRED L. SMITH†

Ohio has, in General Code Section 6310-44, the first mandatory municipal air marking law in the world. This law first became effective on June 25, 1929, and provides for the compulsory marking of all incorporated places in the state. It reads in full as follows:

"The legislative authority of each and every municipality in the state of Ohio shall cause said municipality to be marked for aeronautical purposes, and maintain such marking, subject to and in accordance with law and such rules and regulations as may from time to time be made by the director of aeronautics in that regard, the costs thereof to be paid from the general fund. In the event of a failure on the part of such legislative authority so to act, and sixty days after notice requiring such marking or the maintenance thereof, duly served by the director of aeronautics upon the clerk of such municipality, said director of aeronautics may cause such marking to be effected or maintained, and charge the cost thereof to such municipality, which shall in no case exceed the amount of \$50.00 per marker. It shall then be the duty of the taxing authority of such municipality to include the cost thereof, in accordance with the duly certified statement of costs filed by the director of aeronautics with said body, and the auditor of the respective county, in the next succeeding budget of said municipality; and the budget commission of the county shall allow the same without deduction, and insert it in such budget in case it be omitted, and it shall then be the duty of such county auditor to withhold such amount from the first semi-annual tax collection and remit same to the said director of aeronautics."

STATUS OF AIR MARKING IN OHIO

The results that have been accomplished since June, 1929, have been most gratifying. In spite of the fact that no pressure has as yet been brought to bear on any municipalities, except to remind them of the content of the law, our records show that practically all of our larger cities and towns are suitably air marked. The following table shows the exact status of air marking in Ohio, as of November 21, 1932:

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<i>Population</i>	<i>Total Municipalities</i>	<i>Excused</i>	<i>Marked</i>	<i>Un-marked</i>	<i>Percentage marked out of total Municipalities¹</i>
Over 5,000	109	8	97	4	96%
2,000-5,000	91	10	73	8	90%
1,000-2,000	133	7	105	21	83%
500-1,000	197	9	148	40	78%
Less than 500	323	36	167	120	58%
TOTALS	853	70	590	193	75%

Most of the "excused" municipalities are those which are so located with reference to larger metropolitan centers as to make their separate identification from the air practically impossible. The marking of such municipalities is considered not only useless, but perhaps even confusing. For instance, a marker on the village of Bratenahl, which lies along the shore of Lake Erie not far from downtown Cleveland, would not only be very hard to locate but, if seen by a transient pilot, might confuse him as to the identity of the larger center. In the case of some of the smaller municipalities, some of them have been excused because their population was below one hundred and hence the marking would result in a considerable burden to the individual taxpayers.

It might be noted here that no special effort has been made to cut down the number of unmarked towns in the various groups. It might have been possible to have had a perfect record on the cities of over 2,000 population, if this data had been compiled earlier. However, you are getting the data just as it is at present.

A brief glimpse at the table will indicate where the problem in universal air marking lies. Naturally, if it is possible to get 85 per cent or more of the towns of over 1,000 population marked without any pressure being brought to bear, it should be easy to get the others lined up by a little extra effort. It can be seen, however, that the marking of the smaller towns presents a very different problem. We have had replies from a large number of the smaller towns indicating that the present state of their finances is such as to preclude the possibility of any expenditures of municipal funds for air marking, either now or in the near future. Because of the present economic situation we have not felt it fair to press these smaller municipalities unduly. Whether or not we can fairly expect them to carry this load is something which can only be answered with the return of normal business conditions.

1. Excused municipalities not included in "Total Municipalities."

In checking the air markers on the larger cities, it has been found that a great many industrial concerns have not only been willing to allow the use of the roofs of their plants but, in many cases, have gone to the expense of constructing air markers themselves. In fairness to the smaller municipalities it should be noted that many times the larger cities which may not need the assistance are spared the expense of having to construct markers in order to comply with the state law.

Special mention should be made of the activities of such nation-wide distributing organizations as the Shell Petroleum Corporation and the Standard Oil Company. The markers erected by the Shell company are especially valuable due to the easy identification of their location because of the prominence of their bright orange colored storage tanks. In checking Ohio's air markers I have gotten into the habit of looking for Shell storage tanks and then looking for the markers themselves. The fact that these signs are sometimes rather small does not detract in the least from their usefulness. In Ohio, the Standard Oil Company of Ohio did a very valuable piece of work in air marking when they placed the name of the municipality on the roof of each of their bulk stations throughout the state. These two oil companies have been outstanding leaders in helping us with our air marking program, although there are a great many individual concerns in the various cities of Ohio which have been just as enthusiastic and active in constructing their local markers.

In discussing the effectiveness of our air marking program with pilots about the state, we were led to make an investigation of the number of towns present on various kinds of maps used in aerial navigation in order to explain just why it was that so many villages which look rather conspicuous from the air still remain unmarked. As you will note from the wording of the Ohio air marking law, we can compel the marking only of incorporated places, of which there are 853 in Ohio according to the 1930 census. In checking over the Rand McNally Standard Air Map of Ohio we found the names of 3,624 cities and villages. Even if our air marking program was one hundred per cent effective, a pilot wending his way across the state would be apt to become somewhat disgruntled at finding only one out of every four or five towns or villages marked. Personally, I feel that a map such as the Rand McNally has entirely too much detail on it for aerial navigation. The total of towns and cities on Air Corps and Department of Commerce-strip maps, which practically cover Ohio,

will support my contention. We found that even on the strip maps, from which a great many towns have been omitted, there are approximately 1,500 cities and towns shown in Ohio. Even on these maps there are twice as many places shown as there are municipalities from which we can require marking.

THE CONSTRUCTION AND MAINTENANCE OF AIR MARKERS IN OHIO

In advising municipalities concerning the construction of air markers, we have recommended in every case that they follow the instructions contained in Aeronautics Bulletin No. 4 issued by the U. S. Department of Commerce, Aeronautics Branch. We have made some exceptions in the case of municipalities which had no buildings large enough to accommodate markers of even the minimum size. We did not find it necessary to issue any additional regulations other than those set down in Bulletin No. 4.

A study of the air markers which we have photographed will show, of course, some discrepancies between the type of markers recommended and those which have been constructed. On the whole, however, I think you will find that the markers indicate an almost universal willingness to comply with the federal standard requirements. Where discrepancies occur, they have usually been due to lack of skill or to a peculiar interpretation placed on the instructions by the individual painters assigned to these jobs.

The State Highway Department, which has constructed a number of markers, both on state highways and on their service garages about the state, tell us that the average cost of markers placed on the highways was about \$35.00. The name of the city or town was printed out in letters twenty feet high. This cost included two coats of traffic paint as well as the entire cost of the labor necessary for the original layout. Repainting these signs costs approximately \$12.00 per marker. It is probably fair to assume that the cost of construction of the average roof marker would be about the same, even though the letters might be somewhat smaller.

Now that the State of Ohio has a great many markers constructed, we find that we have another job to do in checking the maintenance of these signs. Naturally, when roofs are refinished entirely the air markers are destroyed. Furthermore, on a great many of the roofs the letters may disappear rather suddenly due to the bleeding through of the asphalt. Proper sizing of the roof

surface, as outlined in the Aeronautics Bulletin, will eliminate this difficulty.

We do have somewhat of a problem to get a report on the legibility of these markers from time to time, especially from towns in those sections of the state where air travel is not particularly common. It is somewhat difficult to persuade municipal authorities to climb up on roofs to check their local markers, and then to report their condition to us with any regularity!

I think that perhaps the checking of the markers is a distinct function of the Bureau of Aeronautics, although I will grant that it is quite a task to visit and check the markings on eight or nine hundred towns annually.

In Ohio we are using a form for reporting air markings, copy of which is attached to this paper, on page 231.

TYPES OF AIR MARKERS

As to contents:

Aeronautics Bulletin No. 4 stresses simplicity. A plain, legible Location Marker is of course most important. Meridian Markers are desirable, but may be dangerously misleading when not constructed accurately. You can appreciate the inaccuracies which may exist when a well-meaning individual attempts to paint a Meridian Marker on a slanting roof with the aid of nothing but a pocket compass, especially when the building does not lie in a true north and south or east and west direction.

As to the Airport Pointers, these have not been stressed in Ohio particularly because of the lack of permanency in the location of private, commercial, and even intermediate landing fields. The situation along the lake shore east of Cleveland is typical—where the Department of Commerce has abandoned at least three different fields and has finally located a fourth one which may or may not be permanent. Naturally, an Airport Pointer which indicates the direction and distance to a field which has been abandoned is useless and may even be dangerous. We believe that pilots who expect to use the smaller fields will have to learn to use the information which is made available to them by the Bureau of Aeronautics, or by the Department of Commerce in their bi-monthly air commerce bulletins which describe changes in airports and landing fields.

We have, in Ohio, made some use of markers on the surface of highways. These were placed at the outskirts of various towns,

and gave the name, direction of, and distance to nearby cities. At the present time we do not feel that such markers are quite what the pilot needs. In the first place, they do not tell him just where he is; and, in the second place, while they may indicate the direction and distance to a certain town, it is by no means certain that he has any desire to go there.

As to location:

Surface markers may be considered quite acceptable when no building is available on which to construct a suitable marker. Those shown in the photographs² are typical. The marker along the railroad tracks, showing the direction and distance to Port Columbus, would be a very distinct aid to the pilot who relies upon the "iron compass" (the railroad) exclusively. The Fort Laurens marker, constructed on a hillside, is very easily picked up. The "Akron" air marker on the edge of the Akron Municipal Airport is perhaps the largest surface marker ever constructed; the letter "M" above the name is eighty-five feet high. The city of Troy, Ohio, has constructed its municipal marker in a city park, where it is kept in very good condition. The bridge marker at Napoleon was constructed by laying the letters in the pavement of the bridge, using a light colored brick.

Our State Highway Department constructed, altogether, about 140 markers on the surface of the state highways in the vicinity of the larger centers of population.

All of these surface markers are subject to criticism on several counts. First of all, in the winter time—in Ohio, at least—they may be covered with snow for rather extended periods of time, and hence may be hard to read or even completely obliterated. Secondly, as any pilot will tell you, the surface type marker is very hard to pick up unless you are almost directly over it, and hence a pilot may mill around very close to such a sign without finding it. And thirdly, when placed upon the highway, the cost of maintenance is excessive, due to the wearing away of the paint by a continual stream of automobile traffic.

The main advantage of such markers lies in the fact that they can be checked up from the ground, and hence are apt to be kept in much better condition than are the signs which are located on the roofs of buildings where they are seldom seen except by the

2. The photographs used by Captain Smith in connection with this paper have been here omitted.—[Ed.]

passing aviator. Markers constructed on the roofs of buildings are not only easier to see, but if a conspicuous building is selected for the marker a pilot need not waste any time in finding the building on which the information he desires has been placed. Personally, I think that a rounded or sloping roof is much more suitable for marking purposes than many of the flat roofs which have been used, especially when a high coping has been placed around a comparatively small roof surface. We have several markers which will illustrate this contention. Some of them are almost indiscernable due to the fact that the marking is shaded practically all day long, especially in the winter time. The photograph of the Brooklyn school marker shows how the coping may make it difficult to read the sign. Although the picture was taken from almost overhead, the coping cuts in a little bit on the lower edge of the letters.

The use of a sloping roof also makes it possible to check a marker from the ground and, hence, may remind the municipal authorities from time to time of the need for maintenance when the sign becomes a little bit shopworn.

RECOMMENDATIONS AS TO AIR MARKING

After a year's study of various types of air markers, we feel that the Department of Commerce procedure should be followed wherever possible. We think there are one or two things which might be added to their bulletin, however, which might make it somewhat easier for the pilot to locate air markers.

(1) It is recommended that, wherever possible, the markers should be constructed on the south side of hip roofs, when such roofs are used, for two reasons: (a) that in the northern hemisphere a pilot will then be reading the signs with his back toward the sun, which of course will make them more readily legible; and (b) that when buildings are not heated in the winter time, snow is melted off from the southern slopes of their roofs much more quickly than it is from the northern sides, and hence the markers will be exposed to view many more days out of the year. The Shell Oil markers at Bellefontaine and at Mansfield (shown in the photographs) face in a northerly direction, so that even in the pictures they do not stand out as prominently as they might otherwise. The Shell markers at Sandusky and Newark face south and are, as a consequence, very much more easily read. It might be noted further that the marker at Newark is

one of the few remaining Shell markers with their old color scheme of red lettering on a gold background. The marker is actually much clearer than the photograph would indicate.

(2) Our recommendation is that, wherever possible, markers should face the outskirts of the municipalities they identify, when they are located near the outer limits of the built-up areas, so that they can be read by the passing pilot without his being required to fly over the downtown areas in order to get a good look at the markers.

(3) Wherever possible, buildings which are heated during the cold weather should be used, so that accumulations of snow and ice will not hide the signs for extended periods. In this connection we have been recommending the use of school buildings, not only because they are heated and have large roof surfaces, but also because they are the most conspicuous buildings in many of the smaller communities.

HOW AN AIR MARKING PROGRAM CAN BE INITIATED AND COMPLETED

Our experience in Ohio makes us feel that the law requiring the air marking of at least all of the incorporated places in the state has been a very distinct help, even though we have never had occasion to use it except as a reminder. We believe that the use of as many different agencies as possible should be resorted to if the program is to be entirely completed. Among these are:

- (1) The State Highway Department—which, by marking its garages located in every county of the state, can provide a very fine nucleus about which to build.
- (2) The State Adjutant General's Department—which can be prevailed upon to air mark its armories, which are also located at many points about the state.
- (3) The State Department of Education—whose good will is necessary in obtaining permission to use the roofs of educational institutions throughout the state for air marking purposes.
- (4) Other state departments, such as the Department of Public Works and the Department of Public Welfare—which should be quite willing to cooperate by air marking the buildings under their jurisdiction, except in cases where such marking would detract greatly from the general appearance of the buildings as seen from the ground.

