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THE STATE'S OBLIGATIONS IN THE PROMOTION OF AVIATION*

FRED L. SMITH†

In looking over the subjects discussed at our previous annual meetings, it is somewhat surprising to find the regularity with which at least one paper has been presented at every meeting on this subject. However, in analyzing these papers it is immediately apparent that either because of the delicacy of his position, or because of some reluctance to face the problem squarely, no one has been at all specific in his discussions. I propose, therefore, to state my position plainly regardless of what discussion I may provoke. I would be very much surprised—and, in fact, slightly disappointed—if I found every one of you in entire accord with my ideas. You may rest assured that you will know what I mean, whether or not you agree with me.

In the first place, I wish to call to your attention a rather perplexing situation which faced me when I began the preparation of this paper, and that was that I found myself attempting to define the position of a subordinate unit like a state—in spite of the fact that I could get no definite idea as to what we might expect from the federal Bureau. (I am not offering this as a criticism of anyone in the federal Bureau, because we all know that they, too, have had a multitude of extra duties thrust upon them, especially during the past year.) It may be, therefore, that I will draw some conclusions based upon erroneous assumptions. If at a later date, after the recommendations of the newly created Federal Aviation Commission have been acted upon, the federal Bureau finds it necessary to modify its policy, I will reserve the right to alter my suggestions in accordance with any such changes. I have committed myself to being quite specific in this paper, and therefore I will discuss the following topics from the standpoint of conditions as they are and as we can reasonably expect to find them in the near future.

*Address delivered at the Fourth Annual Meeting of the National Association of State Aviation Officials, Cheyenne, Wyoming, September 28, 1934.

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THE FEDERAL BUREAU'S ACTIVITIES.

In order to insure the coordination of federal and state activities, it is highly important that we study the activities of the federal Bureau before attempting to suggest a state's duties. On May 20, 1926, Congress passed the Air Commerce Act. It has since been modified in a few details, the latest changes having been made June 19, 1934. Section 2 of this Act provides for the promotion of air commerce and for such purpose (1) to encourage the establishment of airports, civil airways and other air navigational facilities; (2) to make recommendations to the Secretary of Agriculture as to necessary meteorological services; (3) to study the possibilities for the development of air commerce and trade in the United States; (4) to advise with the Bureau of Standards and other agencies in the executive branch of the government in the improvement of air navigation facilities, aircraft, aircraft power plants and accessories; and (5) to investigate accidents in civil air navigation in the United States.

Section 3 of the Air Commerce Act provides for the regulation of air commerce by (1) the registration of aircraft; (2) the rating of aircraft as to airworthiness; (3) the examination and rating of airmen; (4) the examination and rating of air navigation facilities; and (5) the issuance of air traffic rules.

The federal Bureau of Air Commerce through its Airport Section and Air Navigation Division has assisted in the construction of a large number of airports and landing fields until, at the present time, we have over two thousand municipal, commercial, military and private fields in the United States. Thousands of miles of lighted airways have been established, and hourly weather reports are available along the principal airways. Radio beacons along many of the airways guide radio-equipped commercial and non-commercial aircraft to their destinations under weather conditions which would make the trips impossible otherwise.

In its regulatory work, the federal Bureau has provided for the registration of all aircraft, and for the licensing of all aircraft engaged in commercial operations. It has also provided quite completely for the examination and rating of airmen and all air navigation facilities, including repair shops and schools. The air traffic rules which have been established—although in need of constant revision as aerial traffic increases—are comprehensive enough to insure the safety of air transportation as well as to safeguard the interests and well-being of the general public.

This hasty summary of the activities of the federal Bureau does scant justice to the group of men who have worked so diligently and efficiently for the promotion of aviation. However, this paper is to be devoted primarily to a discussion of the state's part in the general program, and hence I will confine the rest of my remarks to state activities.

STATE ACTIVITIES.

I have outlined the activities of the federal Bureau because I feel that no state program can be justified when an attempt is made to encroach upon the work of the federal Bureau, or to obstruct such federal activities. The work planned in aviation development in any state should serve to complement and extend the federal program. It is highly important, therefore, that we limit the state's activities to definite fields.

It is essential that the present position of the average state be kept in mind. The July 15, 1934, bulletin of the Bureau of Air Commerce showed that there were 8,815 airplanes registered in the forty-eight states, the District of Columbia and Alaska. Of this number, 4,141 (or forty-seven per cent) were registered in seven states—California, New York, Illinois, Ohio, Pennsylvania, Texas, and Michigan—with the totals ranging from 948 to 385. Another 2,298 (or twenty-six per cent) were registered in Missouri, Indiana, New Jersey, Minnesota, Oklahoma, Wisconsin, Kansas, Massachusetts, Iowa and Florida, with registrations ranging from 258 in Missouri to 186 in Florida. The remaining 2,376 airplanes are registered in the other thirty-one states, the District of Columbia and Alaska—an average registration of approximately seventy-two per state.

These facts are of fundamental importance in considering any state's position. It can be seen readily that any ambitious attempt of a state to set up licensing, inspection and rating services independently of the federal government would result in prohibitive costs. It is not only impractical from the standpoint of the cost of administration, but also highly undesirable because of the lack of uniformity which would undoubtedly result were every state to assume this burden itself.

These same obligations apply generally to the efforts of individual states to establish lighted airways and weather stations. The present efforts of the federal Bureau indicate very definitely that they hope to include all the larger cities in the country in a

federal airways net, in the very near future. Since this complete chain of airways undoubtedly will include the establishment of adequate weather reporting facilities along them, any expenditures by states on what they consider their own airways systems may be altogether unnecessary. Furthermore, those of us who use weather information extensively know that even under the present highly coordinated federal system, supervisors of this work have their hands full in instructing their personnel so as to get reports which are uniformly reliable. Personally, I would be very skeptical about reports, especially when the weather was questionable, received from state operated stations whose personnel was not under the direction and constant supervision of the federal Bureau.

What, then, are the duties of the state?

I have indicated that insofar as the licensing of personnel and equipment is concerned, that work is being taken care of entirely satisfactorily by the federal government and, so long as the federal government is willing to continue its work in this field, I see no reason for any supplemental activity on the part of the state except to make it mandatory that all aircraft and airmen operating within the state be licensed by the federal Bureau, and that all operations should be in accordance with federal regulations. The state should, naturally, render every assistance possible in the enforcement of the federal regulations. The participation of any state in enforcement activities will vary considerably with the number and availability of federal inspectors located in or near it.

I see no need whatever for any state to cook up a lot of new regulations to inflict upon the aviation public. While I have always felt perfectly free to make what I considered desirable suggestions for changes in the federal regulations, I would never propose to our state legislature that they authorize me to draw up regulations not recommended by or considered necessary by the federal Bureau.

I would like to dwell somewhat at length on this point, because I think it is one of the most alarming tendencies exhibited by many of our state aviation officials—commissioners, or directors, or whatever they may be. There is no more certain way in which the ill-will of the industry can be incurred than by the over-zealous and well meant, but nevertheless ill-conceived ideas on regulation which are brought to the attention of state officials. We must remember that regulation, whether it be of aviation or any other activity, is beneficial only insofar as it keeps things moving along

in good order. Even the most harmless appearing regulations are apt to be unduly restrictive, imposing an unfair and unnecessary burden upon the very people to whom we look for support. "Promotional regulation" has become almost a by-word with those who seek to justify some new-fangled requirement. I have always felt that this attempt to sugarcoat a new thought on regulation was merely a smoke screen. No fair minded person ever supported any kind of regulation of any activity, unless he was convinced that the proposed measures would be for the common good, either immediately or ultimately. We all recognize the truth of the old saying that "He who governs least governs best." As Cy Caldwell might well say, this country was once known facetiously as the Land of the Free. Let us keep this in mind whenever anyone proposes new and attractive looking regulatory measures.

It is highly significant to me that in the Air Commerce Act of 1926, Section 2, providing for the *encouragement* of aviation, preceded Section 3, which made adequate provisions for its *regulation*. Thus it will be seen that from the beginning Congress (perhaps inadvertently) recognized the fact that promotion was more significant than regulation. Further, the separation of promotional and regulatory activities indicates that the sponsors of the Act did not confuse promotion with regulation.

I do not want to leave the impression that I feel that there is nothing whatever to be done in the regulatory field. Undoubtedly, with the constant changes in all phases of aviation, there will be some need for adding to regulatory activities, in addition to the already recognized need for a lightening of restrictions, especially as they affect non-commercial activities. However we, as members of the Association, knowing the great desirability of uniformity in such work, should not take any overly ambitious steps in this field without at least the unofficial sanction of the federal Bureau.

Since I have urged you to tread lightly insofar as regulation is concerned, the field for state activities naturally narrows itself down to promotional work. This is a very fertile field, as our experiences of the past year have shown. The promotional duties which can be done in any state and which will complement, rather than encroach upon, the work of the federal Bureau are:

- (1) The preparation of a state-wide plan for landing field facilities.
- (2) The assisting of smaller sub-divisions in the selection of landing field sites, the preparation of plans for construction, and the obtaining of future assistance for field maintenance.

- (3) The preparation of plans for a state-wide air-marking program, and the supervision of the construction of these markers as well as a continuous check on their maintenance.
- (4) The encouragement of local air shows, flying clubs, and similar activities of aeronautical groups about the state.
- (5) The collection and dissemination of information of state-wide interest.
- (6) Cooperation with the federal Bureau of Air Commerce in the rating and inspection of landing facilities so that this information will be as authoritative as possible, and available to all pilots or operators in the country.
- (7) Routine flying activities, such as furnishing transportation for official trips, for aerial photographic work for state departments, etc. (possible, of course, only where personnel and equipment are available).

Plan for State-Wide Landing Field Facilities:

Perhaps the most glaring weakness which was immediately apparent when the development of a large number of airports was suggested as a part of the Civil Works program was the utter absence of any definite plan. Neither the number of airports which might be necessary in any given state, nor the kind of facilities which should be provided, had been given any thought. After nine months' experience with the Civil Works and Emergency Relief Administrations, every state unquestionably now has some idea of what their airport facilities should be.

I would not presume to dictate an airport program for any other state. However, I would like to describe our situation in Ohio briefly at this time with the hope that it may be helpful. After listening to descriptions of the work done in our other states, I will certainly be very much disappointed if I do not go back with many ideas which will help me in making our plan for the State of Ohio much more complete.

In formulating a plan for airport development, we were faced by a situation which was somewhat unusual. Due to the location of the State of Ohio at practically the center of population of the United States, the three main transcontinental airways cover practically all of the state. As the table which I have prepared shows, over seventy-five per cent of the state is covered either by the main transcontinental airways or by already established connecting airways. These airway bands are only forty miles wide. The federal Bureau at the present time regards the airway as a fifty-mile band which, in the case of Ohio, would practically blanket the

state. However, on the basis of airways forty miles wide, only 9,600 square miles out of a total of slightly over 41,000 remain outside the federal airways. Parts of twenty of the eighty-eight counties in the state are included in this area off the airways. (Incidentally, this airway picture is not complete because of the location of the large Air Corps repair and development centers at Dayton, Ohio, from which many military airways radiate. For instance, the gap in the western part of the state is almost entirely closed by the airway between Wright Field and Selfridge Field at Mt. Clemens, Michigan. Thus our plan for fields in Ohio is affected not only by the needs of commercial aircraft, but of military as well.)

The total population of the 9,600 square miles not covered by the federal airways is slightly over 525,000 (or a little less than eight per cent of the total population of the state). Furthermore, of the 9,600 square miles, over fifty per cent of this area lies in a poorly developed portion of the state whose appearance may be changed greatly in the next twenty-five years due to the fact that much of the land is sub-marginal and may be converted into reforested areas, for the most part.

Naturally, our plan for airport development in Ohio was very much influenced by the presence of the established federal airways, and the nature of the territory unoccupied by these airways. Before the start of the C. W. A. program we already had over one hundred and thirty fields listed in the State of Ohio, and since most of the larger centers of population already had some landing facilities, our plan under the Civil Works Administration had to vary somewhat from the original plan suggested by the federal Bureau. Our problem was not so much one of developing entirely new fields, but of improving many of those which were already in existence but which, due to lack of financial backing, had never been put into first-class condition. The following tables show the status of our landing field situation insofar as our cities are concerned.

Table 1 shows the landing field situation in 1933, and the bold face figures show how greatly improved the landing facilities are at the present time (September, 1934) insofar as these same cities are concerned. Table 2 is a summary showing the total fields in the different classifications.

In order to analyze the landing field situation properly I found it necessary to develop an unofficial rating system which would indicate rather accurately the nature of the landing facilities avail-

Table 1
AIRCRAFT LANDING FACILITIES OF OHIO CITIES
 1933-1934*
 (Over 5,000 Population, 1930 Census)

POPULATION— 1930 CENSUS	TOTAL No. OF CITIES	ESTABLISHED MUNICIPAL OR COMMERCIAL AIRPORTS			PRIVATE OR AUXILIARY FIELDS ONLY			No LANDING FACILITIES
		<i>Municipal</i> A B L	<i>Commercial</i> A B L	<i>Total</i>	A	B	L	
Over 50,000	12	{ 7 3 0	0 2 0	12	0 0 0	0 0 0	0	0
10,000 - 50,000	47	{ 9 1 0	0 2 0	12	0 0 0	0 0 0	0	0
		{ 10 8 0	0 11 8	37	0 1 5	6	4	4
		{ 24 9 0	0 4 3	40	0 2 2	4	3	3
		{ 10 0 0	0 10 3	23	0 2 8	10	18	18
		{ 20 6 0	0 6 0	32	0 1 4	5	14	14
TOTALS	110	{ 27 11 0	0 23 11	72	0 3 13	16	22	22
		{ 53 16 0	0 12 3	84	0 3 6	9	17	17

*1934 figures are shown in bold face type.

Table 2
SUMMARY OF LANDING FACILITIES AT OHIO CITIES
 September, 1934

POPULATION— 1930 CENSUS	TOTAL NO. OF CITIES	AIRPORT CLASSIFICATION			
		<i>A</i>	<i>B</i>	<i>L</i>	<i>None</i>
Over 50,000	12	9	3	0	0
10,000 - 50,000	47	24	15	5	3
5,000 - 10,000	51	20	13	4	14
TOTALS	110	53	31	9	17

able in our state. In order to simplify the ratings, I have reduced the number to three, and they deal with the size and condition of the landing area exclusively. I do not know whether the federal Bureau will accept any such change in their official rating system or not, but I do think there are many advantages to this simpler system.

Minimum Rating Requirements:

"A" Rating:

(1) 2,000 ft. of effective length in at least four directions, with two landing strips converging at an angle of not less than 60°; maximum grade along landing strip, 2%; maximum grade laterally, 1%; minimum width of strips, 300 ft.

(2) 3,000 ft. of effective length in two directions; one landing strip; maximum grade along landing strip, 2%; maximum grade laterally, 1%; minimum width, 500 ft.

"B" Rating:

1,200 ft. in effective length in two directions; maximum grade along landing strip, 2%; maximum grade laterally, 1%; minimum width, 200 ft.

"L" Rating:

Fields not meeting minimum requirements of either "A" or "B", but usable for small planes, special types of aircraft or com-

mercial operations under favorable conditions, not recommended but available, should be merely listed.

Reduction in effective length of landing strips should be figured on the basis of 12-ft. reduction in effective length for every 1 foot in height of obstruction. Minimum requirements for effective length of strip are to be increased with altitude above sea level, in accordance with the recommendations contained in Aeronautics Bulletin No. 2 of July 1, 1931, of the federal Bureau of Air Commerce.

Pilots wishing to use a new field are primarily interested in knowing whether or not they have enough well conditioned landing area to get their planes in safely. Past operating experience indicates that fields which meet the minimum requirements under "A" will fill the need for any commercial airport. I do not mean that such facilities are ample, but in an emergency they will suffice. I have included under the "B" classification fields which are satisfactory for ordinary commercial aircraft, under average conditions. Under "L" I have included fields which may be quite extensive in size but which I do not feel deserve a rating, either due to the fact that they have never been conditioned properly or due to uncertainty as to regular maintenance. I appreciate that this rating may cause a great deal of comment; but whether or not it may be adopted generally, it has at least given us an opportunity to study and evaluate landing facilities in our state much more accurately than has ever been done in the past.

I think that the tables indicate very clearly that, in spite of the immense amount of work done under the Civil Works and Emergency Relief Administrations, we still have a long way to go in developing entirely adequate landing facilities for our Ohio cities.

Incidentally, our landing field program in Ohio is of immense federal importance, due to the airways system which I have described previously. Our program cannot be one designed merely to meet present or future *local* requirements. Ships of all kinds, both commercial and military, use the airways across the state so frequently as to make the development of first-class fields highly important even in the neighborhood of many of our smaller cities.

Included in the plan for any state should be an analysis of just what constitutes a "complete" airport. Federal E. R. A. engineers, particularly, have questioned the necessity of some of the work which we have sponsored. Therefore, I have set down the following list of requirements for airports in Ohio, not with

the idea that we were going to get all of this work done immediately, but to indicate exactly what an entirely satisfactory airport should provide:

- (1) Adequate landing area, whether it be an all-way field, or an area of sufficient length in two directions, for the landing and taking off of any airplane.
- (2) A surface graded to as uniform a grade as possible, this grade not to exceed 2% at any place in the landing area.
- (3) An adequate drainage system.
- (4) A sod surface which, combined with adequate drainage, should keep the field available for light traffic through practically all seasons of the year.
- (5) An adequate fence about the entire landing area, to prevent trespassing.
- (6) Standard Department of Commerce field and boundary markers, to make the field or runways easily identified from the air.
- (7) A landing tee or wind sock, located so as to be easily found by even inexperienced pilots.
- (8) Adequate toilet facilities.
- (9) The provision of a well supplying wholesome water (when city water is not available).
- (10) Where the traffic warrants it, a clean restaurant with a supply of food to take care of normal needs.
- (11) Again where traffic warrants, adequate storage and servicing facilities for airplanes.
- (12) Boundary lighting and an airport beacon, so as to make the field available for aircraft twenty-four hours of every day.
- (13) In states such as we have in the central west, adequate hard-surfaced runways, so as to permit landings and take-offs at all seasons of the year. While we are not and should not advocate the installation of such runways at every field, these runways must be regarded as absolutely essential on fields upon which the traffic is comparatively heavy and where operations are carried on all year round.
- (14) Up-to-date radio facilities. The radio stations for airport traffic control, such as we have on the Cleveland Airport, have proved their worth and unquestioned superiority over any other form of control yet devised. Unless some better system is developed, all commercial traffic, at least, about our larger airports, will be controlled in this manner.

I appreciate that the plan for the development of landing facilities differs greatly in many of the states. Ohioans are interested in airplanes merely as a better means of transportation. We have no large areas, as Michigan has, which attract sportsmen

and tourists and in which the development of landing fields can be justified because they make many of these places accessible. We all know that Florida has an additional incentive for the development of landing fields due to the conveniences they offer to their thousands of winter tourists. The great differences in the states, especially insofar as population, wealth, climate and terrain are concerned, make the preparation of adequate plans a distinctly individual state problem.

Assisting Municipalities:

Rendering assistance to municipalities in the selection of landing field sites and the preparation of plans for construction is a second state duty with which you have all had a world of first-hand experience during the past year. In Ohio this work, which has taken practically all of the time of our active officials during the Emergency Relief Administration, will continue to be an important function for many years.

I need not dwell at length on this function, because of the intimate contact you have all had with this work during the past year. I am sure that you have all been reminded many times of the need for proper direction of municipalities. If you have ever flown about the state and attempted to use fields recommended by chambers of commerce, American Legion posts or any other service clubs, you have a very clear understanding of the utter helplessness of people inexperienced in aviation in selecting adequate sites. Even after a site has been selected, you have all faced the necessity of instructing civil engineers of long experience in the preparation of proper plans for construction. An active aeronautical commissioner or director should have saved municipalities in his state many times the cost of the maintenance of his bureau or commission, if he has done his work properly during the past year.

Air-Marking:

The function of the state in developing an air-marking program is clearly defined. The federal government has provided very satisfactory plans for markers, and has in addition furnished new sectional airway maps upon which an air-marking program can be based. In Ohio our air-marking plan calls for the adequate marking of every city, town and village shown on the sectional maps which include the whole state. While I realize that not every

state has been entirely covered by these new maps, and that hence there may be some difficulty in developing a complete program at the present time in many states, I believe that the results of some of our work might interest you. The Rand McNally state maps (which were the best maps available until the special airway strip and sectional maps were developed) show a total of over 3,600 cities and villages in the State of Ohio. The state is now covered by the four new sectional maps described as the Cleveland, Chicago, Cincinnati and Huntington Sections. There is a total of 1,504 cities and towns shown on these maps. A state-wide check has shown that even some of this number should be left off due to the inability to locate all of these villages from the air. This is especially true of suburbs which are entirely swallowed up by metropolitan centers. It is also true of many so-called "villages" which are so scattered out over a large area as to make them indistinguishable from other fairly densely populated sections of the county. We have already asked the Bureau of Air Commerce to drop the names of several towns from the map.

Before we consider our initial construction program complete, we will have every recognizable village and city properly marked.

The biggest job for a state aviation body insofar as air-marking is concerned will be to see that these air-markers are properly maintained. Our experience in this work before the past year has indicated that a check-up on the air-markers will require plenty of the state aviation body's time.

The Encouragement of Local Air Shows, Etc.:

Local air shows are regarded by many people both in the federal and state aviation bodies with the same alarm as that shown by a fond parent in worrying over the wild antics of a precocious youngster. This feeling of uneasiness, however, is entirely unwarranted. We have spent considerable time in Ohio during the past two years, especially, in encouraging and assisting in the promotion of local air shows, with very satisfactory results. Some operators have been both surprised and greatly pleased to find that they could not only present a pleasing and interesting program to the public without violating any of the general rules laid down for the conduct of such shows by the federal Bureau, but that they were able to make a few dollars out of the show, and to find their business much better following such an exhibition. As one example of what can be done, I recently attended a combination regatta and air carnival

at Gallipolis, Ohio, a city of 6,000, located in a county whose total population is only 23,000. The paid admissions, at twenty-five cents a head, amounted to over 16,000. There were 726 passengers hauled. The American Legion assisted materially. Everyone participating was, of course, very much gratified over the success of the show.

Local enthusiasts have been exploited in the past by so-called "famous airmen," in much the same manner as fight fans and promoters have been imposed upon by high salaried performers. We have saved many local enthusiasts from the disappointment which is bound to follow the sponsoring of a show when receipts fall far below expenditures, by helping them make preliminary arrangements.

The fact that we have been able to get racing pilots of national reputation, as well as well-known parachute jumpers, to participate in some of our local shows without demanding guarantees which would wreck the possibilities of financial success, is a definite indication of the possibilities along this line.

There is no reason why such activities cannot be developed so as to include every municipality in the state at least once a year. We have a large number of smaller cities which sponsor aircraft exhibitions in connection with regattas, fairs, homecomings, and other community affairs. I believe this trend should be encouraged. We have had many expressions of good will from operators and enthusiasts who have received some small measure of assistance from our office.

The State of Connecticut has done a very splendid job in enlisting the aid of the Boy Scouts in the construction of air-markers about the state. These, and many similar activities, should be encouraged in accordance with a well-thought-out program, by every state aviation body.

The Collection and Dissemination of Information:

During this development stage, the collection of information on already established fields and fields which may be available for short periods during the year is a most valuable service which can be provided only through a state body. This work is already being done through the issuance of monthly or quarterly bulletins, by several state bodies. The great enthusiasm with which these bulletins are received by professional pilots, small operators and private pilots is ample proof of their basic worth. Once this work is or-

ganized the preparation of such a bulletin requires less than one day's time, and can be handled very nicely by a one-man bureau such as we have in most of our states.

The situation in Ohio is probably similar to that which exists in every other state, in that although we have a fairly large number of established fields already, pilots are continually finding new fields in outlying areas which can be used safely a large part of the year. The listing of these fields (with the owner's permission, of course) has helped develop flying activities at many places, and during our construction program we have found it possible to develop some of these sites as permanent fields.

Cooperation with the Federal Bureau in Rating and Inspecting Landing Facilities:

Although many state officials may feel, as I do, that they have cooperated with the federal Bureau to the fullest extent in furnishing information on fields, I am sure that a careful examination of the information furnished by the federal Bureau in Airway Bulletin No. 2 would show that there are many statements which are decidedly incorrect and, in some cases, dangerously misleading. I will mention just a few which I have picked up at random:

First, Airway Bulletin No. 2 states that the Cleveland Municipal Airport (incidentally rated A-T-A, to which it is undoubtedly entitled) is "square, 4,200 by 4,200 feet, sod, level." As a matter of fact, the area within the boundary lights provides a maximum effective length E./W. of 4,000 feet; N./S. of 3,600 feet; NW./SE. of 3,900 feet; and NE./SW. of 5,700 feet. From these dimensions you can readily see that the area is not a square, although this error is not a serious one. The fact that the dimensions as stated are in excess of their actual size is the most serious error. The additional facts that the field is not level, and that the area on which 90 per cent of the landings have been made has been devoid of grass for years, are other minor points which should be included in a correct description of the property.

Please do not feel that I am at all dissatisfied with the Cleveland Airport or that I think the information in the Bureau of Air Commerce bulletin is dangerously misleading in this instance. However, if such inaccurate information is put out on an airport which I consider one of the very best in the country, there are bound to be alarming errors in the information furnished by over-

enthusiastic small operators on whose word we have had to depend for much of the information on their landing fields.

As another example, I will show you some errors in the report on Dayton's present municipal airport at Vandalia, Ohio. To quote from the Airway Bulletin: "Dayton Municipal Airport, municipal. Rectangular, 5,280 feet by 2,782 feet, sod, level." This field has been a municipal field only since March, 1934, although it has been listed for a number of years as Dayton's "municipal" airport. Its actual dimensions inside the boundary lights are 2,500 feet E./W. rather than 5,280 feet, and 2,681 feet N./S. rather than 2,782 feet. Instead of being level, it is so rolling that the airlines will not use the field at night! The fact that we are now removing several of the knolls—not with scrapers but with a steam shovel—indicates how far from level the field was before improvements were started.

The most dangerous errors which exist in the present reports on landing facilities deal with the size of the landing area. If you will examine Airway Bulletin No. 2 closely you will find that while the reports on some fields show only the dimensions within the boundary lights—which are certainly of far more interest to the pilot, even though such dimensions are somewhat misleading when the boundary lights are placed along the edge of wooded areas and buildings which reduce the effective area greatly—a great many reports give the outside dimensions of the field only; and while the obstacles are listed, until the pilot actually looks over the field he has no exact idea of just what the effective runway length may be. Hangars and other buildings, trees, high tension wires, radio towers, parking areas and unimproved portions of the airport property often reduce the effective landing area to one-half of that which is included in the whole property.

I believe the correcting of reports on available landing facilities is the most important function of a state aviation body at this time. Regardless of a system of rating finally adopted by the federal Bureau of Air Commerce, I think the inexperienced pilot should be protected against any misleading information on landing facilities. I not only consider this work of first importance, but also feel that it should be done at the earliest possible moment.

I don't want anybody to get up and tell me that Ohio must be the only state in which these discrepancies exist, because I have already checked up on the information put out on a number of fields outside of my own state and can show you, if necessary, that there are plenty of others which need checking up!

On the final Judgment Day aviation will be responsible for two large groups of individuals whose status will be questioned seriously before they are passed through the Pearly Gates. One group will be the large (and ever increasing) number of aviation enthusiasts who were pretty good scouts, on the whole, during their stay on earth, but whose status will be questioned because of the terrible fibs they have told relative to their number of flying hours! Then, there will be a smaller group composed of small operators and airport managers, also of good reputation except for the totally unreasonable descriptions they furnished a trusting public of their airport facilities!

Routine Flying Activities, and Cooperation with State and Federal Agencies:

Assuming that the proper personnel is selected, a state aviation body can pay its way through the work which it does in connection with other departments. Most of our states are large enough to make the services of at least one airplane indispensable. There are many times during the year when the attendance of prominent state officials at distant points in the state (and, occasionally, at points outside the state) requires more rapid transportation than that available by automobile or railroad. The immediate presence of the governor or adjutant general at points where trouble is brewing may oftentimes save the state and smaller sub-divisions the cost of the bureau for a number of years. As you all know, strikes and oftentimes minor disorders are terrifically expensive. The cost must, of course, be borne eventually by the general public. A rapid adjustment of conditions which threaten any disorder results in a great saving to a state and its sub-divisions.

One year ago last spring, when flood waters threatened a crisis in the Ohio Valley, a 4-hour aerial inspection trip by the adjutant general of Ohio enabled him to make immediate plans for the emergency which resulted not only in prompt action, but also in the saving of a great deal of expense which would have resulted from sending assistance to some communities unnecessarily.

The division of conservation of the department of agriculture can also use aerial photographs in planning the development and improvement of fish hatcheries and game preserves. Especially in game preserves, blue prints, state and county maps and written descriptions are totally inadequate. In photographing areas for

the division of conservation of Ohio, we found that many of the state administrators could not even recognize the areas after they were photographed. This statement is offered not as a criticism of these men, who have been doing very effective work, but merely to show the utter inadequacy of drawings and written matter.

In the State of Ohio we are making an aerial map of approximately one-fourth the state in the Muskingum Valley, where a federal and state flood control project is under way. The personnel of the soil erosion service of the federal department of the interior are using our photographs in their work, and report that they can do the work better and four times as fast with the aid of aerial photographs as they can by using ground crews and existing maps. The final selection of reservoir sites will be made after an intensive study of our aerial maps—supplemented, of course, by the work of ground crews.

At the present time, with extensive reforestation and submarginal land programs either under way or contemplated, an aerial map will be almost indispensable. Even under normal conditions an aerial map will be very much worthwhile in planning state and local road programs, and for a study of properties by tax commissioners. State and county planning boards will find such a map of great assistance.

State highway department officials faced with decisions in controversies arising from highway re-locations can never be as certain of the fairness of their decisions as they can be after examining photographs of the re-locations. Where such controversies get into the courts, juries are far more apt to make reasonable awards when they can base their decisions on what they can see rather than to depend upon the eloquence of attorneys. In making preliminary surveys, even the local division offices of the highway department can save time and expense by the use of aerial photographs.

The extent of participation of state aviation officials in photographic work will depend upon the amount of this work which they can sell governmental departments. The personnel of a small bureau cannot, of course, do a great deal of this work and have very much time left for the other activities which have been described. In order to start this work, it may be necessary for the state personnel to do all the flying. It is highly desirable, however, to get most of this work in the hands of commercial photog-

raphers, as we are now doing in the State of Ohio. Two years ago I did all the photographic flying myself. Last year we got the highway department to get an airplane for its own special work, and this year we are supervising the work of commercial photographers who are making the aerial map of one-fourth of the state, under the Emergency Relief Administration.

METHODS OF FINANCING AN AVIATION BODY.

While this topic may be discussed in more detail by subsequent speakers, I feel that inasmuch as I have attempted to outline the proper fields of activity for state aviation bodies, I should make some mention of the financing of this work.

The maintenance of landing facilities constructed under the Civil Works and Emergency Relief Administrations will be taken care of for the next five years by the sub-divisions requesting these improvements, if the certificates which they furnished in making their applications are lived up to. State aviation bodies, therefore, will not be greatly concerned about the cost of the maintenance of these new fields during this period. Although I have no official expression from the federal Bureau, I believe that their attitude is that unless the continuance of these fields is justified after the 5-year period they will be perfectly willing to see them revert to pasture lots. Whether state bodies will be agreeable to this procedure remains to be seen.

The routine work of a state aviation body, stressing the points which I have discussed above, should not cost the state more than twelve or fifteen thousand dollars per year. One or two men, properly selected, and a secretary should be able to handle this work satisfactorily. Since this work is primarily promotional, I think that the cost of maintaining a state aviation body should be borne entirely by the state and should be provided for by appropriations from the general fund.

The collection of gasoline taxes similar to those imposed on users of gasoline in motor vehicles on the highway is neither necessary nor at all fair to the industry as it is operating at the present time. Taxes on aviation gasoline have resulted only in driving scheduled airline operators from states in which they logically expected to service their equipment. Their present objections to state taxes are entirely reasonable; a great many of the facilities which they use are now furnished by the federal government; also, at their terminals they have made satisfactory arrangements with

municipalities which at least cover the additional operating costs made necessary by their schedules. Hence it is altogether inconsistent for state bodies, in their desire to build up their bureaus or departments, to advocate a tax which would place the burden almost entirely upon scheduled airline operators—for whom most states have done little or nothing.

Insofar as Ohio is concerned, I would rather recommend that the work of the bureau be suspended altogether than to ask the industry to submit to special taxes to cover appropriations now made from the general fund for this work. I am sure that finance committees of legislatures will not be unreasonably niggardly insofar as small bureaus are concerned, once they understand how much the federal government has spent on the promotion of aeronautics, and the comparative insignificance of the amounts they will have to approve to insure the state's participation in the development of a form of transportation which gives so much promise.

Every state should have some active aviation body, whether it is supplemented by one or two full-time paid employes or not.

CONCLUSION.

In beginning this paper, it was pointed out that many things would be said to which there might be disagreement from many members of our Association. However, I also promised to be specific. I have tried to point out definite fields of activity for state aviation bodies, and to warn you against venturing into fields which may not only retard the industry but also weaken your positions.

Our Association has never been stronger than during the past year, and I sincerely hope that you all feel as optimistic as I do as to the possibilities of our Association in furthering the rapid advance of all forms of aeronautics.

I wish to thank all members of the Association for the splendid cooperation you have given me in the short time that I have been your active head. The splendid work which has been done under the Civil Works and Emergency Relief Administrations by all of our state bodies has been commented upon favorably by everyone in the federal Bureau. We have established ourselves firmly as a necessary aid to the federal government in the promotion of aeronautics. Let us carry on the good work with renewed enthusiasm, in the year to come!