

THE FUTURE OF AVIATION  
IN NEW JERSEY

AN APPROACH TOWARD A PLANNED PROGRAM

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# THE FUTURE OF AVIATION IN NEW JERSEY

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THE NEW JERSEY STATE DEPARTMENT OF AVIATION

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(TRANSMITTAL LETTER TO APPEAR ON THIS PAGE)

# FOREWORD

## FOREWORD

The basic factors that underlie the science and service of air transport require specific re-statement in order to establish a general understanding of aviation's place in modern life. It would be less than accurate or thorough to gauge the proper position of aviation and its relations to other specializations in the modern civilized state without first evaluating the fundamentals upon which all inter-related activities of economic and social life are determined and dependent. Let us, therefore, examine certain essential facts which, strangely enough, are not too well known or too widely appreciated.

There is no technical obstacle to the universal use of the air carrier both as a passenger and cargo vehicle. There is no hazard in ?  
aerial operation which is not multiplied in surface transportation. The capacity of aviation to meet the universal demands of public service has no limitations either in economics, operating procedures or safety factors.

Nowhere within the scope of modern enterprise is there an agency of travel which can be established at so small a cost or maintained at so nominal an expenditure in proportion to its ability to produce revenue. No other organized transportation can produce greater essential results with so little working capital in proportion to the revenue dollar. There is, moreover, no other form or type of transport which can be established so quickly or economically, with such vast mobility of organization and expansion. Aviation is the primary development of transportation in the measure of capacity to link every section of the world without regard to physical or political limitations. Aviation is, in fact, the universal language of national and international commerce.

Yet, aviation in the United States is but in its infancy; and it is truly significant to insist that its development to date is remarkable, not for its growth but for its sheer ability to survive the most stringent curtailment and regulation ever imposed upon any public utility or system of commerce by the Federal government. Economic control, rather than encouragement for expansion, has been the national philosophy. Struggling for growth and improvement within this stringent control has developed the sinew and fibre of American aviation companies, and the survival of the fittest has resulted.

Possibly, it requires an historical viewpoint to appreciate fully the pioneering that has gone into the development of aviation in this nation. In this viewpoint, the factual evidence of aviation's history reflects vast contrast when compared with the development of other systems of national transportation. No carrier system has ever been developed in the United States with so little government assistance. It would be sheer fallacy to regard aviation as a subsidized enterprise. The evidence is almost exactly to the contrary.

While many of us are casually familiar with government stimulus and aid to aviation in respect to transporting the mails, it would be a mistake to consider that this factor alone has been of any estimable value in the development of either air travel or air industry. It must be pointed out, and it merits frequent reiteration, that the fundamental enterprise in the development of aviation rests with the manufactoryes<sup>?</sup> and that these so-called governmental subsidies have aided the primary phases of aviation -- the industrial plant -- only indirectly.

In contrast to either rail, motor or waterway carriers, richly endowed with all varieties of direct and indirect government aid and subsidy,

aviation has been obliged to make its own way, encountering obstacles where other agencies of transportation have encountered assistance. But, in a current appraisal of aviation's status in the United States, the pioneers of the airways find much hope for the future. When the American people become truly aware of the economic and social potentialities of aviation, their demand for its expansion to every community will become the new national philosophy. It is then that aviation-consciousness will be translated into the commonplace habit of aviation use, and inventive genius will be rewarded by the realization of its gifts in the public utility. 2

Recent history and the anticipation of historical consequences throughout the world tend to convince the people of this inevitability. The rapid progress of aviation as a supreme arm in military affairs, on the results of which depends the destiny of nations, is lesson enough before the eyes of millions everywhere. Therefore, in our peace and preparedness programs, aviation is a significant and direct agency of national security, and to the soundness of aviation as an industrially-integrated enterprise we must look for the vital insurance for our national existence. Thus, aviation occupies a basic position in any intelligent appraisal of our national values.

Aviation is more than an industry or a transportation system. It represents an era. It changes the time factor in all human relations and relationships. Already, it has abolished all national isolation. It has, moreover, already brought into direct conflict both the social customs and the political philosophies of the world of inimical men. It therefore holds the promise of yet a further development; for, while it has curtailed the traditional values of both land and sea power in commercial and military aspects, it may yet attain a vastly greater effect. Along with radio, aviation constitutes the most revolutionary step in human affairs since the invention of the wheel. World imperia, as we have known them through the ages, controlled and controllable, are forever gone.

When these facts are understood, every man can better realize that his destiny is in the air, and that through present aviation and its inevitable future he is vicariously a citizen of the flying world.

The place New Jersey occupies in this vast enterprise and development is basically industrial. More than two-thirds of the total aviation dollar will always be on the ground: that is, in manufacturing, in maintenance, in the collection and distribution of cargo in the dissemination of kindred services. And, since aviation in New Jersey is only now entering the phase of industrial integration, the proportion of the aviation dollar that must be devoted to plant and production is even greater. Today, only one dollar out of eight that flows through the channels of aviation operations can be seen in flight. And we are only beginning in the arts of vocational and occupational education in industrial aviation.

There are crowded years ahead, in New Jersey as elsewhere, in the fruition of aviation's potentialities in the industrial sense. What has been the history in the automobile industry, with its manifold effects in highway and regional planning, employment, housing, and all other delineated manifestations of an accomplished industrial revolution, is now the future prospect in a state grown suddenly aviation conscious.

Meanwhile, it seems readily apparent that the outstanding need, particularly at this time, is that of an adequately trained personnel -- shop personnel in a mass industry: technicians, tool-makers, designers, mechanics. The manufacturing facility has already outrun the trained minds and hands necessary to coordinate and consummate the vast mechanical potentialities of our industrial era.

Fitted between the productive plant in aircraft manufacture and the maintenance of airways services, is the airport. The airport, as a terminal facility, is itself an integration factor in the whole enterprise of aviation. At the present, in the analysis of experience; and in the future, as planning can foresee development; the airport will have its most significant relation to cargo. Cargo, in this definition, means all payload exclusive of service weight: express, freight, mails, passengers and military complement. The very economic foundation of air transportation must rest upon its capacity to serve as a cargo carrier. Passenger and mail service will have approximately the same economic relation in aviation as they have today, and have had for the past fifty years in the rail and water carriers.

The airport is destined to serve in still another way as the primary factor in aviation development, since it is around the airport that collateral industry will locate itself. The airport of the future will serve as the magnet to increasing technological expansion, because of the cargo carrying capacity of air freight and air express.

Distribution time today is a basic control over the value of essential materials available only in a limited extent to the American public. Many airports of the future will have the same relation to transportation as loading platform and freight yards have today. Already many manufacturers have begun to study the weight and size of their products in relation to potential air shipments. When the aircraft cargo carriers assume their destined universal service, other forms of transportation will then be able to specialize and so adjust overhead as to effect economies of facility and operation rather than strive as competitors in transportation. This, of course, represents a significant phase in industrial integration within the transportation field itself. The air carrier is the potential instrument to permit all transportation to make adjustments of wide consequence, of extensive mutual benefit.

There is already sufficient evidence to justify this expectation. We already know that the economics involved in air transportation are favorable to its development in the cargo field. We already have cargo aircraft capable of transporting from eight tons upward over a potential eight hundred mile run at direct operation costs of about six cents per ton mile. This is nominal, with the time element considered. To put the matter another way, such craft could be operated to produce a very reasonable profit and allow for some variation in cargo complement at nine cents per ton mile. There is a vast volume of L. C. L. merchandise which could well afford this tariff as a premium for the high speed delivery of two hundred miles per hour.

Market surveys, cargo aircraft design, surface collection facilities and many such kindred problems are now being studied, by the Federal government and by individual enterprise. The Railway Express Company and the United States Freight Company have taken the lead in the exploration of the air cargo field.

New Jersey is unique geographically. It has limited areas and vast industrial establishments. Not air commerce, but air industry, has been the vision of the New Jersey State Department of Aviation. The industrial integration of aviation, as a primary factor in the vital industrial dynamism of the state, has been the motive of my services as Director of the department. In terms of the common denominators of industrial integration, such a program can bring home to civic-minded citizens the advantages of working toward the accomplishment of these objectives.

Air industry means jobs for our working men, tax ratables for our municipal <sup>ities</sup> communities, vocational education for our youth, sound investment for our capital. These are the things aviation can mean to our state, primarily; happily enough, we already have them started, and we are increasing them constantly. Unlimited expansion of aviation will automatically enhance New Jersey's industrial stake in the future.

Because New Jersey has its counterpart in other industrial states, and because these states severally are the keystone of a national prosperity and security, I have worked unremittingly for a nationally integrated airport program, to provide unlimited opportunity for the essential expansion of facilities for air transportation, for a sound industrial foundation for both civil and military air development, and for an economic and widespread private flying program.

I am convinced that nothing can stop the progress of aviation but a closed mind and a lack of vision on the part of the public. The necessity for an open mind as well as curiosity and vision, in federal, state and municipal government is urgent from a domestic standpoint and vital from a national defense standpoint. The problems of aviation must continue to be the imperative concern of all persons concerned with the national welfare.

In New Jersey, our philosophy has been one to protect and foster and promote, rather than to regulate and tax and curtail. We have tried to till and make fertile the ground from which aviation must grow; we have labored to cultivate aviation development so that it might get its roots down in our state. The record speaks for itself. Not what we have promised, but what we have performed for aviation, remains the standing invitation to a dynamic future. The historic background plainly shows the constructive effort to encourage every component of this vast new enterprise to establish itself in New Jersey.

There is no place where a sound vision of this force in a modern world needs to be more thoroughly understood than among our municipal officials. It is there that temporary economic pressure in a critical economic period has made it difficult to think in terms of long-range planning. Long-range planning is the essential, the dominant factor in the industrial integration of aviation in New Jersey.

Having conveyed these particulars as the premise to this comprehensive report, prepared by the State Planning Board, I can assure you that we stand at a new frontier. It has been my business to scout ahead, to survey the land from which flight must arise. I introduce a report of great promise, providing the specifications on which the future can be accomplished. Never did the United States, and particularly the state of New Jersey, have a more historic opportunity for enhancement than it has today -- through aviation.

CAPTAIN GILL ROBB WILSON, Director

New Jersey State Department of Aviation

PRE-VIEW OF A PLANNING PROGRAM

## PRE-VIEW OF A PLANNING PROGRAM

With the advent of 1940, air commerce and industry in New Jersey embarked upon its eleventh year of continuous growth and development.

Although great increases in commercial aviation in New Jersey have been recorded in practically every division during recent years, much in the way of thoughtful planning and coordinated effort remains to be done in order to effect sturdy growth and development, not only in commercial aviation but also to formulate the ground work for a broad program of aviation facilities for national defense and practical military purposes. While this state boasts of a geographical area of only eight thousand square miles and an unevenly distributed population, it is considered among the foremost strategic locations for national defense, and one of the important key points admirably placed for the expansion of aviation manufacturing and the development of kindred industries.

The subjects to be considered in any effective and efficient program of air development require careful inventory and research regarding existing aviation facilities and equipment, airports and other available land for field operations, manufacturing production and plant capacity, availability of labor, educational<sup>a</sup> institutions, vocational schools, weather reports and averages and many other related or collateral subjects.

Some of the most important data to be assembled to accomplish thorough research for every usable fact, going back to the very beginnings and foundations of aviation in New Jersey, can be provided only after long months of serious study. This is the only method that insures the planning of a program of development successful or comprehensive enough to assure a constructive and vitally necessary expansion over the long-range period of the future.

An inventory and careful study of every existing airport and landing field, as well as all proposed and potential field facilities for operations or aircraft servicing, would be the first requirement. A minute study of United States weather reports and averages, covering New Jersey territory, would reveal the seasonal weather variations and indicate how desirable and favorable is New Jersey climate for aviation activity.

Enumeration of the principle industries of New Jersey would be an important consideration, and show approximate values, classification, location, plant capacities and the possible relation of collateral industry to the aviation industry in this State. Next would come a study of the towns and cities of New Jersey <sup>and</sup> their populations according to the latest census, to show proportion of land area occupied or available for industrial and residential purposes in each locality. Added to this would be the study of state highways, county and municipal roadways, and their adaptability to airport or landing field <sup>access</sup> accommodations.

A study and survey of all railroad facilities, truck and bus travel, freight and express shipments, originating or terminating in New Jersey, would reveal helpful information, as would the study of shipping facilities and a survey of the navigable waterways in or bordering New Jersey. Also important would be the yearly totals on exports and imports.

Availability of skilled and unskilled labor is another necessary consideration. A study of labor data would show the number of skilled and unskilled employees in each district or county, the proportion of male and female workers, job classifications, labor requirements of the Aviation industry, and the problems of personnel training. The educational <sup>phase</sup> section of such a plan requires a survey of all institutions of higher learning in New Jersey, their classification, location, capacity

etc., <sup>as well as</sup> also a study of vocational and trade school establishments throughout the State, their location, classification and rating.

These are the cardinal points required in any well-rounded programs of aeronautic development, though there are many other minor subjects to be explored. They give some idea of the requirements for research and study and the viewpoints from which all facts and details of planning should be considered. A great mass of necessary research work must be expected in any undertaking which is designed to provide working plans and furnish the basic materials with which to work intelligently and effectively.

It is estimated that preliminary survey and research and the formulation of such a far-reaching plan, covering all angles of aviation development, would require from eighteen months to two years to complete; however, the importance of aviation development for national defense, as well as for industrial expansion in New Jersey, fully justifies all the time, work, thought, research and expense necessary to put such a planned program into actual operation.

THE NEED FOR FEDERAL - STATE COORDINATION

THE NEED FOR FEDERAL - STATE COORDINATION

While the need for Federal - State coordination and collaboration in the development of aviation is primarily an industrial need, its best editorial emphasis can be asserted in terms of military and defense considerations.

Advance in the science of aviation has been unusually swift during the past decade. This progress is truly remarkable, because of its almost complete dependence upon commercial development, and with so little direct assistance from Federal agencies until recent months. During these development years, aviation has surmounted serious handicaps, skepticism, fear on the part of many to try their wings as well as the necessity of solving the many problems arising constantly in a comparatively new and rapidly advancing industry.

Under the leadership of a mere handful of trail-blazers, commercial aviation has grown of its own determination; it has survived the strain and stress of difficult times, surmounted untold obstacles, overcome the temper of the elements and innumerable trying tests, and it has emerged as one of the most important industrial and defense developments in America.

As far back as seven years ago, aviation authorities of New Jersey recommended a Federal appropriation which would make possible the establishment of a planned program of aviation development throughout the United States, by developing airports and landing facilities in the thousands of communities where local field operation could be sustained.

Under such a planned program, the acquiring and building of airports and facilities and the furthering of experiments and research could have resulted in a definite public service, operating under public works departments as do so many other public utilities, serving community interests and becoming a bulwark of national defense for government use in times of emergency. Lacking such Federal - State coordinated sponsorship and effort, the goal has remained impossible of attainment.

~~As early as~~ <sup>F</sup> five years ago, New Jersey aviation authorities advocated Federal - State coordination of aviation activity for national safety and defense. Since that time, realization of comparative weakness in air strength has been brought forcibly to everyone and revealed a notable lack of balance between commercial and military aviation in this country. Today, America surpasses every nation in civil aviation development. The deficiency in military aviation development was seen as impairing our national security, a condition which could not have existed had a planned program of Federal - State collaboration been instituted at that earlier time.

In many countries of Europe, lack of air strength prevented adequate <sup>stilted</sup> defense and provided opportunity for aggressor powers, possessing air supremacy, the incentive to precipitate military conflict which could only result in defeat for the country lacking air power. The lack of air power was actually an invitation to be conquered.

Modern air warfare has brought forcibly to attention the need for cooperative effort between the Federal government and individual States located in strategically important defense areas. This need, plus the devastating results of the present aerial war ~~in Europe~~, has caused millions of our citizens to become air-minded almost overnight. Many who were previously unconcerned about the progress and future development of aviation have hurriedly revised their opinions of the aeroplane as a ~~defense~~ weapon and are now seriously concerned in a rapid inventory of aeronautical plant and equipment possessed in this country. Others are making vociferous demands for rush mobilization of all aviation facilities to avert calamity.

Other countries, as well as our own, have suddenly <sup>ly</sup> become aware of an insufficiency in air defense and are now busily engaged in developing a stronger air arm for national safety and protection. Aviation authorities

agree that war planes are the only thoroughly effective defense against war planes, so aviation has become a great force that must be dealt with intelligently, efficiently and effectively, requiring coordinated effort of Federal - State planning and production.

The development of airports, production of aviation equipment and arrangements for the servicing of aircraft have become a matter of urgent cooperative interest, to be carried forward by joint-action of Federal and State agencies, working together on a program of aviation development, improvement, experimentation and research, and providing a network of ground facilities unequaled by any other nation, thereby welding an unbreakable link in the chain of national defense for America.

Due to the tremendous amount of attention focussed upon the importance of aviation to defense and the greatly increased interest in aeronautics generally, recently initiated action between the New Jersey State Planning Board and the Civil Aeronautics Authority has resulted in a limited program of aviation development, civilian pilot training and other measures as a forerunner to the establishment of a system of Federal - State coordinated effort and a forward step in the National Defense Program. Reports indicate that during the year 1940, approximately 25,000 young Americans have become flyers under government civilian pilot training auspices. Ten schools, colleges and universities in New Jersey are giving courses under the civilian pilot training program.

2 What is this?

Here in New Jersey there is unlimited opportunity for the further development of aviation facilities whether for military or commercial use -- facilities that will render greater public service in peace time and provide ample security for defense purposes and military control whenever necessary in today's uncertain course of human affairs.

\* \* \* \*

It is not clearly defined in the minds of many persons just what jurisdiction is exercised by the Federal and State governments in aviation. To clarify this point, the facts are re-stated.

The Federal government appropriates to itself jurisdiction over so much of the navigable space of the territory of the United States as is necessary for carrying on interstate commerce and the activities of the national defense system. The Federal government establishes standards of airworthiness for aircraft and airmen who wish to operate in interstate commerce, or who wish to use the facilities of the Federal airways at terminal establishments.

The standards established for airmen and aircraft cannot be made effective in intra-state operations except by the participation of the State in making them effective. By far the greater proportion of aircraft and pilots and airports are not engaged in interstate commerce. The Federal law specifically recognizes this fact, and requires the Civil Aeronautics Authority of the Federal government to cooperate with the States, and such a section is set up in the Civil Aeronautics Authority. The duties of the two agencies do not overlap any more than the duties of the Federal Bureau of Investigation overlap the work of a local police force, or any more than the Federal Highway Commission overlaps the work of a State Highway Department.

If a State Department of Aviation is properly set up, it makes effective the Federal standards of airworthiness and supplements the skeleton

inspection force of the Civil Aeronautics Authority by its own more detailed service. It is obviously impossible for a small Federal staff to do more than establish offices and invite the pilots and owners to bring their aircraft and themselves in for inspection and the granting of certificates. There are many local flying fields and operations whose existence is never even known to the national government. There are more than 2,500 airports of all classes in the United States, and effective supervision over them by the Federal government would be impossible, even if it were not unconstitutional as an exercise of police power which is the sovereign right of the State alone.

It would be, obviously, a duplication for New Jersey to issue pilot certificates or aircraft certificates, but it is just as obviously necessary for the State of New Jersey to see that the aircraft and pilots operating in the State either have Federal certificates denoting airworthiness - or lacking that - to secure the counterpart from the State. The matter of airworthiness certificates is, however, a small though necessary discipline. The secret of safe and profitable aeronautic progress in a State is its jurisdiction over the local airport and over the intra-state commercial operator. Local passenger rides exceed by millions the inter-state traffic.

The Federal government has nothing to do directly with the promotion of aviation industry and commerce within any State. If a State abuses aviation by over-taxation or over-regulation, or by an unnecessary duplication of the Federal jurisdiction, that is an example of poor government policy.

The State Aviation Department of New Jersey is charged, by law, with responsibility for the public safety and the aeronautic progress, and the regulation of aeronautics in and over the State; "to require that aircraft,

airports, airport managements, landing fields, landing strips, and other navigational facilities, airmen, ground personnel and all persons engaged in aeronautics within or over this State, shall conform to standards of safety and sound practice as prescribed by the laws of this State and any rules or regulations thereunder, and for uniformity in certain regards with the laws, rules and regulations thereunder, and for uniformity in certain regards with the laws, rules and regulations of the United States Government."

The detail of this work, in practical terms, breaks down into the following activities:

- (1) To make certain, by continual inspection, that all aircraft operating in the State have current effective Federal airworthiness certificates, or, lacking them have authority from the State for flight operation.
- (2) To ascertain that all airmen flying in the State have current effective certificates of competency for the class of operation in which they are engaged, or, lacking them, have authority from the State to operate.
- (3) To currently ascertain that all aircraft operating in the State are maintained in an airworthy condition at all times between the periods of annual inspection when they may be submitted to the Federal authority for relicensing.
- (4) To <sup>assure</sup> ascertain that airmen do not engaged~~x~~ in activities for which they have no certificate of competency, or authority.

- (5) To inspect all areas of land or water before their use is permitted in commercial aviation, and if such use is justified to license such areas for that class of operation permitted and for the type of aircraft which can safely be flown from the given area. Following this to maintain a constant inspection of the area, its facilities, equipment, and improvements.
- (6) To investigate the equipment, personnel and character of any person, persons, or group desiring to conduct commercial aviation enterprise in the State, and, if the applicant qualifies, to license such commercial operation and to conduct such supervision as will guarantee the maintenance of proper standards of operation.
- (7) To receive complaints of air traffic violations, to investigate such complaints and ascertain that proper discipline is restored.
- (8) To investigate and analyze all accidents in which aircraft are involved, and to take such steps as will guard against repetition if the causes of the accident be subject to remedial measures.
- (9) To secure the removal, marking, or lighting of such obstacles about the airports as are hazards to the public safety.

- (10) To develop in the State air marking and navigational facilities necessary to the public safety.
- (11) To cooperate with the Federal government, with other States, and with local municipalities in the development of airports, airways facilities, educational projects, or in the abatement of any nuisance for which aviation is responsible.
- (12) To furnish our public school systems, civic~~x~~ and social enterprises with that information and vocational guidance which will enable them to best serve the public.
- (13) To prevent, by study and research, the development of unsafe practices, unwise investment, and sensational activity.
- (14) To authorize and supervise the conducting of all air meets, races, and exhibitions.
- (15) To exercise a general supervision over aviation trade schools and all those <sup>professing</sup>~~pretending~~ to give training in any component of aviation.

It will be realized that aviation has little precedent and a comparatively brief history before the law. In these formative years, regulation, supervision and promotion must be handled with extreme care in order that destructive trends do not develop. Constant and vigorous personal contact must be maintained, for law covers a small proportion of the activity.

Industries have moved because their requirements were not understood. The wrong equipment has been used on the wrong airports, and bad discipline has developed because the operator had to quarrel with his bread and butter to maintain it. The laws and regulations have had to be kept flexible in order not to retard proper growth and development. Every detail of development and every trend must be watched because of its effect on a swiftly progressing science.

The State Aviation Commission is composed of five, non-salaried members, three of whom must be engaged in aviation. A Chairman, A Vice Chairman, and a Secretary are elected annually. The commission meets officially each month, but the official meetings are a very small part of their real activity. A great deal of thought and study are given to trends and development, to keep abreast of the problems which constantly arise. The public spirit which leads the Commission to devote so much time and thought<sup>1</sup> to its work is typical of that citizenship which has given New Jersey such precedence in every form of development.

The main office of the State Department of Aviation is located at 162 West State Street, Trenton, New Jersey, on the third floor of the State Police Building and is staffed by two employees. For two years, for the convenience of the Commissioners, the City of Newark granted the Department space in the Administration Building at the Newark Airport without rental. The field personnel of the Department is composed of but one employee, an Aircraft and Airport Inspector. His chief responsibility is to see that all aircraft are maintained in an airworthy condition between their periods of annual inspection, and to attend to such other details of investigation as shall

be assigned. The duties of the Director cover the entire field of inspection, regulation, promotion, education and administration, and he is required to maintain an active flight status and a pilot rating.

The Department of Aviation owns no automobiles or aircraft, although request has been repeatedly made that transportation equipment, both for the surface and for the air, be authorized. Under the present arrangement any employee on travel status must furnish his own equipment. The Department maintains a small but serviceable library of legal and technical books.

The cooperation of other Departments; that of the Highway Department, the State Police, the National Guard Observation Squadron, and the Motor Fuel Tax Department, is particularly appreciated and service is reciprocated at every opportunity. A new plan for cooperation between the Highway Department, the State Police and the Aviation Department has been worked out and will prove both beneficial and economic.

The annual Reports of the Department are mimeographed to save the expense of more formal reports, and other such like economies are practiced wherever possible. The fundamental question of eventual airport expansion and other long range planning will require financing far beyond the present budget covering merely department routine and guaranteeing public safety.

THE INDUSTRIAL STRUCTURE

## THE INDUSTRIAL STRUCTURE

Aviation, like every other industrial utility, has its roots in economics. So long as aviation development remains in the field of free enterprise, the aviation industry will continue to function as a public utility, privately managed and privately owned. Therefore, the manifold diversifications in industrial aviation must be correlated--but not regimented. Unity rather than uniformity must be the goal of all essential industrial operations. To work out a practical approach to efficient integration of industrial processes, a program of research and planning is imperative.

The statistical approach in research is frequently the best--if the least interpretive. Figures are facts, but it is only in the analysis of figures that basic conclusions become helpful in planning.

A key to New Jersey's industrial potentialities, essential to planning aviation's place in future industrial integration, is provided by comparative figures on past industrial activity within the State in an average year. Taking 1937 as an example, the statistics assembled by the United States Biennial Census of Manufacturers (the most recent obtainable) provide an adequate basis on which future expectations may be computed. Compiled by counties, the indices classified and evaluated in this census are tabulated for reference here.

In this tabulation, the figures for Salem and Sussex counties are shown as incomplete to avoid disclosing approximations for individual business firms. As a result, the sums of the first and second columns are necessarily larger than corresponding totals for the State. For the same reason--to avoid commercial disadvantages to business firms in these two counties where statistics make too specific identification possible--no figures are given for annual wages or value of products.

(6)

<u>Counties</u>	<u>Number of Establishments</u>	<u>Wage earners Average for year</u>	<u>Wages Average for year</u>	<u>Value of Products</u>
Atlantic	162	3,722	\$3,213,710.	\$14,855,550.
Bergen	496	27,182	31,961,223.	264,043,489.
Burlington	110	9,259	10,787,495.	43,651,362.
Camden	288	29,763	36,741,114.	185,089,127.
Cape May	47	540	492,030.	1,983,879.
Cumberland	145	9,629	9,030,413.	34,077,699.
Essex	1,731	82,677	102,915,826.	619,146,173.
Gloucester	70	4,403	6,067,951.	52,042,030.
Hudson	1,427	84,208	107,558,376.	738,161,930.
Hunterdon	46	2,984	3,443,224.	15,377,108.
Mercer	319	23,368	25,651,541.	113,387,241.
Middlesex	380	35,820	41,066,445.	434,547,459.
Monmouth	175	6,281	5,639,172.	26,246,023.
Morris	110	6,648	8,461,303.	38,710,866.
Ocean	45	380	426,026.	2,300,645.
Passaic	841	53,751	57,110,002.	243,556,109.
Salem	36	5,999		
Somerset	89	7,679	8,629,063.	47,236,450.
Sussex	29	830		
Union	443	35,859	47,845,000.	278,216,197.
Warren	75	5,763	7,054,434.	34,416,012.
All other	65	6,829	9,409,784.	66,200,869.
The State	7,064	436,745	523,504,132.	3,253,246,218.

(7)

The present industry of aviation has a heavy backlog. Many New Hersey plants are completely occupied with government orders. World conditions and the repeal, of neutrality laws have created a heavy export demand. Practically all domestic air lines have ordered, or ~~are~~ in process of ordering, new fleets of equipment. These craft, for scheduled operation, range everywhere from feeder line ships to four-engined long-range airplanes for transcontinental and transoceanic use.

In the field of miscellaneous flying the same degree of activity prevails. The Civil Aeronautics Authority planned training program, involving ten thousand students, will itself require more than 1,000 new light aircraft. Production rather than sales is the bottleneck of the light aircraft market. For military and defense purposes, demand exceeds productive capacity.

As the significance of aviation develops, many units of industry find re-location necessary. Aviation must continue to be a basic industry because of its relation to national security and the public welfare. New Jersey, therefore, has consistently sought various manufacturing units and has located a large proportion of the aviation industry in this State. It has been often difficult to persuade municipal and civic leaders that the industry of aviation constituted seventy per cent of its entire economy. There is nothing colorful about industry in comparison to airports or to flying.

There is still a great amount of aviation industry to be brought into the State. Most airplane manufacturing is done on the West Coast, chiefly because of climatic conditions. It is now, however, becoming apparent that other tactical considerations must be evaluated, and eventually there will be much re-distribution of such units. Nothing is so important to a State, from an aviation standpoint, as the location of manufacturing elements which provide increased ratables, work for citizens, and a high class of individual character in personnel.

The following is an incomplete but informative list of corporations which manufacture products for aviation in New Jersey:

Bergen County

Randolph Finishing Products Company, Carlstadt

Pioneer Instrument Company, Bendix

Vidal Research Corporation, Bendix

Eclipse Aviation, Bendix

Burlington County

H. B. Smith Machine Company Smithville

Camden County

Radio Corporation of America Camden

Cumberland County

Ferracute Machine Company Bridgeton

Essex County

Tite Flex Metal Hose Company Newark

Fiske Bros. Refining Company Newark

Chas. Engelhard, Inc. Newark

Pyrene Manufacturing Company "

Gould & Eberhardt "

Newark Gear Cutting Machine Company "

Motor Improvements, Inc. "

J.V.W. Corporation "

Murphy Varnish Co. "

H.P. Prois Engraving Machine Company "

Eclipse Air Brush Company "

Barnard Mfg. Corporation "

Casey Jones School "

Marianno Seaplane Ramp Company "

Breeze Corporation "

*Anten Wright - Caldwell*

Brewster Aeronautical Corporation	Newark
Weston Elect. Inst. Corporation	"
C-O-Two Fire Equipt. Company	"
Wadell Engineering Company	"
Palnut Company, Inc.	Irvington
Walter-Kidde Company	Bloomfield
Star Machine & Engine Corporation	"
Edison-Splitdorf Corporation,	W. Orange
U.S. Tool Company	Ampere

#### Hudson County

Hyatt Bearings Division	Harrison
Metal & Thermit Corporation	Jersey City
Rogers Products Company	Jersey City
U.S. Fire Protection Company	Hoboken
Ingas Company	"
E.I. DuPont De Nemours	Arlington
Standard Tool & Mfg. Company	"
Sperry Products, Inc.	Hoboken

#### Mercer County

Thiokol Mfg. Corporation	Yardville
Luscombe Airplane Corporation	W. Trenton
Switlik Parachute Company	Trenton
Atlantic Products Company	"
John A. Roebling's Sons Company	"

#### Middlesex County

Johnson & Johnson, Inc.	New Brunswick
Goetze Gasket & Packing Company	" "
Seabury, Inc.	" "

Monmouth County

Burnelli, Aircraft, Ltd.,	Keyport
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Morris County

Aircraft Radio Corporation	Boonton
Radio Frequency Laboratory	"
U.S. Hammered Piston Ring Company	Stirling

Passaic County

Manhattan Rubber Company	Passaic
Air Cruisers, Inc.	Clifton
American Gas Accumulator Company	Paterson
Hy-Grade-Sylvania Corporation	Clifton
Wright Aeroautical Corporation	Paterson

*Center Wright Clifton*

Somerset County

Bound Brook Oil-less Bearing Company	Bound Brook
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Union County

Magnus Chemical Company	Garwood
B. B. T. Corporation of America	Elizabeth
American Gas Furnace Company	"
Elastic Stop Nut Corporation	"
Watson-Stillman Company	Roselle
Walker-Turner Company, Incorporated	Plainfield
Titanine, Incorporated	Union
Lawrence Engineering & Research	Linden
Crusador Oil Company	Elizabeth

This list is but a fractional indication and is given only to illustrate how wide a range the demands of aviation cover. The aviation output of several of these firms runs into millions of dollars annually. Production figures are, in many cases, confidential and cannot be quoted, but the total is far beyond the conception of the average individual whose only knowledge of aviation is of the aircraft flying overhead. To bring aviation industry into the State, and to enhance opportunity for the industry already here, must be definitely a part of the work of planning for the development of industrial aviation.

Other New Jersey factories are now working full-time and top-speed to accelerate the production of essential industrial equipment for emergency defense use, such as: turbines for marine service; motors and control equipment for cargo ships; motors and generators for submarine tenders; generators and X-ray parts for the army; radio equipment for all the services; seadrome contact lights for naval air bases; distribution and instrument transformers for shipbuilders, along with numerous other electrical implements. The shipbuilding yards in New Jersey, at Kearny and Camden, are operating at capacity peak--with as much as six years' work ahead on order. It is an industrial race against time.

There is not an industrial plant in New Jersey that is not playing some vital role in the vast defense program. Every effort is being expended to utilize both facility and capacity to produce machine tools to expedite military, naval and aircraft production. In New Jersey, industry itself has become armament.

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THE ECONOMIC FOUNDATION

## THE ECONOMIC FOUNDATION

Aviation begins in research and industry. New Jersey is primarily an industrial State, close to sources of raw materials, close to domestic and export markets, close to the financial centers of New York and Philadelphia. Among its population is a large percentage of skilled labor. These factors contribute to aviation's potential development a promise beyond calculation, particularly since it is factually true that the industry of aviation is more important to New Jersey than any other single component.

Evaluating this economic foundation in terms of finished products, here is but a brief list of aviation materials produced in New Jersey: control and brake cables; electrical recording instruments; plastics; fire prevention equipment; aircraft motors; magnetos; generators; radio shielding; paints and varnish; spark plugs; chemical and alloys; steel and fabric bearings; metal hose; special fuels and oils; gaskets and packing; airplanes; parachutes; radio receivers and transmitters; airport lighting equipment; motor and flight instruments; seaplane ramps and moorings; airport paving; steel and hangar construction; castings; machined fittings; jiggs, dies and mandrills; foundry products; pyralin; tires and tubes; asbestos bulkheading; silk for parachutes.

A primary key to the economic foundation of a State is found in its distribution of population. According to the Summary of preliminary population figures for New Jersey, released August 21, 1940, by the Department of Commerce, Bureau of the Census, the following tables are shown, based on the returns of the Sixteenth Decennial Census. On April 1, 1940, New Jersey had a population of 4,148,562, as compared with 4,041,334 in 1930, an increase of 107,228 during the decade.

This change represents an increase of 2.7 per cent between 1930 and 1940, as compared with an increase of 28.1 per cent between 1920 and 1930. Of the 21 counties, 18 increased in population between 1930 and 1940, the highest increase being shown in Somerset County--13.5 per cent. Of the State's 68 urban communities of 10,000 or more population, 39 showed increases during the decade, the most rapid

increase occurring in Teaneck—52.2 per cent.

The following tables give the population of New Jersey by counties and also the population of the 68 urban communities of 10,000 or more.

County or city	Population		Increase* 1930-40	Percent of Increase*	
	1940	1930		1930-40	1920-30
State total.....	4,148,562	4,041,334	107,228	2.7	28.1

Counties:

Atlantic.....	124,079	124,823	-744	-0.6	48.8
Bergen.....	408,507	364,977	43,530	11.9	73.2
Burlington.....	96,836	93,541	3,295	3.5	14.4
Camden.....	255,867	252,312	3,555	1.4	32.4
Cape May.....	28,566	29,486	-920	-3.1	51.5
Cumberland.....	72,850	69,895	2,955	4.2	13.9
Essex.....	835,272	833,513	1,759	0.2	27.8
Gloucester.....	71,928	70,802	1,126	1.6	46.8
Hudson.....	649,798	690,730	-40,932	-5.9	9.8
Hunterdon.....	36,706	34,728	1,978	5.7	5.6
Mercer.....	197,124	187,143	9,981	5.3	17.1
Middlesex.....	216,909	212,208	4,701	2.2	30.7
Monmouth.....	160,212	147,209	13,003	8.8	40.3
Morris.....	125,268	110,445	14,823	13.4	33.6
Ocean.....	37,401	33,069	4,332	13.1	49.3
Passaic.....	309,270	302,129	7,141	2.4	16.6
Salem.....	41,704	36,834	4,870	13.2	0.7
Somerset.....	73,941	65,132	8,809	13.5	35.7
Sussex.....	29,506	27,830	1,676	6.0	11.7
Union.....	326,720	305,209	21,511	7.0	52.5
Warren.....	50,098	49,319	779	1.6	9.5

Urban places of  
10,000 or more

Asbury Park.....	14,537	14,981	-444	-3.0	20.8
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Atlantic City.....	63,787	66,198	-2,411	-3.6	30.6
Bayonne.....	78,905	88,979	-10,074	-11.3	15.9
Belleville.....	28,059	26,974	1,085	4.0	72.2
Bergenfield.....	10,262	8,816	1,446	16.4	140.4
Bloomfield.....	41,636	38,077	3,559	9.3	72.9
Bridgeton.....	15,931	15,699	232	1.5	9.6
Burlington.....	10,865	10,844	21	0.2	19.8
Camden.....	117,777	118,700	-923	-0.8	2.1
Carteret.....	11,962	13,339	-1,377	-10.3	20.7
Cliffside Park.....	16,880	15,267	1,613	10.6	167.4
Clifton.....	48,840	46,875	1,965	4.2	77.1
Collingswood.....	12,651	12,723	-72	-0.6	46.0
Cranford twp.**.,.,.	12,845	11,126	1,719	15.5	85.4
Dover.....	10,462	10,031	431	4.3	2.3
East Orange.....	68,589	68,020	569	0.8	34.1
Elizabeth.....	109,396	114,589	-5,193	-4.5	19.6
Englewood.....	18,736	17,805	931	5.2	53.1
Garfield.....	27,988	29,739	-1,751	-5.9	53.4
Gloucester.....	13,685	13,796	-111	-0.8	13.4
Hackensack.....	26,228	24,568	1,660	6.8	39.1
Harrison.....	14,116	15,601	-1,485	-9.5	-0.8
Hawthorne.....	12,609	11,868	741	6.2	131.1
Hillside twp.**.....	18,524	17,601	923	5.2	234.2
Hoboken.....	49,603	59,261	-9,658	-16.3	-13.1
Irvington.....	54,955	56,733	-1,778	-3.1	122.7
Jersey City.....	301,012	316,715	-15,703	-5.0	6.2
Kearny.....	38,815	40,716	-1,901	-4.7	52.4
Linden.....	23,927	21,206	2,721	12.8	1107.6
Lodi.....	11,545	11,549	-4	***	41.3

Long Branch.....	17,382	18,399	-1,017	-5.5	36.1
Lyndhurst twp.**.....	17,410	17,362	48	0.3	82.5
Maplewood twp.**.....	22,631	21,321	1,310	6.1	303.6
Millville.....	14,788	14,706	83	0.6	0.1
Montclair.....	38,543	42,017	-3,474	-8.3	45.8
Morristown.....	15,214	15,197	17	0.1	21.1
Neptune twp.**.....	10,165	10,625	-460	-4.3	64.2
Newark.....	428,236	442,337	-14, 101	-3.2	6.7
New Brunswick.....	33,165	34,555	-1,390	-4.0	5.4
North Bergen twp**.....	39,488	40,714	-1,226	-3.0	74.4
North Plainfield.....	10,558	9,760	798	8.2	41.1
Nutley.....	21,963	20,572	1,391	6.8	118.4
Orange.....	35,449	35,399	50	0.1	6.4
Passaic.....	61,341	62,959	-1,618	-2.6	-1.4
Paterson.....	139,651	138,513	1,138	0.8	1.9
Pennsauken twp**.....	17,730	16,915	815	4.8	161.3
Perth Amboy.....	41,071	43,516	-2,445	-5.6	4.3
Phillipsburg.....	18,295	19,255	-960	-5.0	13.8
Plainfield.....	37,350	34,422	2,928	8.5	24.3
Pleasantville.....	11,017	11,580	- 563	-4.9	96.7
Rahway.....	17,579	16,011	1,568	9.8	45.0
Red Bank.....	10,965	11,622	-657	-5.7	25.6
Ridgefield Park.....	11,238	10,764	474	4.4	25.5
Ridgewood.....	14,850	12,188	2,662	21.8	60.8
Roselle.....	13,542	13,021	521	4.0	127.0
Rutherford.....	15,498	14,915	583	3.9	57. 0
South Orange.....	13,750	13,630	120	0.9	87.4
South River.....	10,702	10,759	-57	-0.5	63.1

Summit.....	16,007	14,556	1,451	10.0	43.1
Teaneck. twp.**....	25,130	16,513	8,617	52.2	293.9
Trenton.....	124,685	123,356	1,329	1.1	3.4
Union City.....	55,947	58,659	-2,712	-4.6	184.0
Union twp.**.....	24,713	16,472	8,241	50.0	315.7
Weehawken twp.**....	14,324	14,807	-483	-3.3	2.2
Westfield.....	18,201	15,801	2,400	15.2	74.3
West New York.....	39,426	37,107	2,319	6.2	24.0
West Orange.....	25,501	24,327	1,174	4.8	56.2
Woodbridge twp**....	27,157	25,266	1,891	7.5	88.2

\* A minus sign (-) denotes decrease. \*\*Classified as urban under special rule.

\*\*\*Less than one-tenth of 1 percent.

In such a statistical table as this, almost each figure has a separate importance and comparisons are frequently misleading. An increase in one municipality may be due to residential development; in another, to industrial expansion. Trends are not identified in the changes that are shown, but the census does indicate a decided levelling off, closely approaching a population constant in New Jersey.

Equally important from the analytical viewpoint of industrial integration is the composition of railroad utilities in New Jersey. According to data prepared by the Public Utility Commission, the following statistical break-down of railroad mileage in New Jersey illustrates the road equipment in rights of way now in use:

Title

miles

New York and Long Branch Railroad	39.45
New York Central Railroad	23.27
New York, Susquehanna and Western Railroad	138.89
Pennsylvania Railroad	387.60
Pennsylvania and Atlantic Railroad	58.74
Pennsylvania, Reading and Seashore Lines	410.80
Railway Valley Company	11.73
Raritan River Railroad Company	20.78
Reading Company	61.38
Southern New Jersey Railroad Company	15.27
Union Transportation Company	27.99
Wharton and Northern Railroad Company	15.90
Baltimore and New York Railway Company	5.30
Central Railroad of New Jersey	478.65
Delaware, Lackawanna and Western Railroad Company	236.23
East Jersey Railroad and Terminal Company	3.07
Erie Railroad Company	134.55
Hoboken Manufacturers Railroad Company	8.85
Lehigh and Hudson River Railway Company	70.33
Lehigh and New England Railroad Company	42.36
Lehigh Valley Railroad Company	134.87
Morristown and Erie Railroad Company	12.39
Mount Hope Mineral Railroad Company	3.60
New Jersey and New York Railroad Company	25.19
Total Miles Operated in New Jersey	<hr/> 2367.19

Billions of dollars in preparedness orders have been placed by the War and Navy departments since July, 1940. These orders have been placed with more than 2,500 different industrial plants throughout the United States. Almost one-third of these orders have come to New Jersey industry and labor. Defense has already introduced industrial integration to New Jersey.

From the latest information available to the Planning Board, a cross-section of a portion of this emergency business shows the tremendous stimulus to New Jersey industry provided by the Defense Program.

In working a cross-section analysis of Defense Program orders applying to aeronautical equipment over a brief period, we find that in the allocation of approximately two hundred and sixty million dollars to this industry shows the following counties have been benefitted to this extent:-

Bergen	\$226,000,000
Essex	\$ 2,500,000
Hudson	\$ 300,000
Mercer	\$ 850,000
Passaic	\$ 30,350,000

The employment service division of the Unemployment Compensation Commission, through its many agencies in the State, has proved a valuable aid in placement of trained or adaptable workers in aviation industries. However small the net percentage of technically proficient workers of experienced skill, established in aircraft trades by such placement, the facility of fitting workers to jobs has been a large benefit. Between January 1 and mid-September, 1939, no less than 79,000 employable workers were placed back at work, and the bulk of these secured placement in industries now essential in the National Defense Program.

*New Subject - New Heading ?*

According to the New York World-Telegram, issue of December 14, 1940, a recent survey reflects the rapid expansion of air transportation throughout the United States. This survey, completed by the Air Transport Division of the Brooks Earning Indicator, Inc., justifies the forecast that 1940 will show a new record for net income earned by American air transport companies.

This survey is based upon the total reports of 14 leading air carrier companies, covering the first ten months of the current year, and supplemented by estimates for the two final months of 1940. Approximate net income for 1939 for these same companies was \$3,129,000., so that the increase to an estimated \$6,000,000. net income will mean a rise of more than 90 per cent. Equally significant is the use of <sup>rise?</sup> 33 1/3 per cent in gross operating revenue, from less than \$56,000,000. in 1939 to approximately \$75,000,000. in 1940.

For the period of ten months, from January through October, 1940, the 14 companies report total operating revenues of \$61,280,000., an increase of more than 42 per cent over 1939; while net income after <sup>deducting</sup> taxes for this same period amounted to \$4,887,000., a gain of more than 82 per cent over a year ago.

The tables showing the individual amounts aggregating these totals follow:

# COMPARATIVE U. S. AIR TRANSPORT OPERATIONS

(10 months ended Oct. 31, 1940)

	Total Oper. Revenue	Net After Taxes	Revenue Plane Miles	Revenue Pass. Miles	Load Factor
American Air Lines	\$17,392,000	\$ 1,887,000	22,059,000	263,977,000	68.8%
Braniff Airways	2,156,000	56,000	3,837,000	30,366,000	47.7
Chicago & Southern Airways	978,000	11,000	1,687,000	13,839,000	51.4
Continental Air Lines	533,000	38,000	1,115,000	3,981,000	45.9
Delta Air Corporation	909,000	41,000	1,889,000	10,917,000	53.0
Eastern Airlines	8,761,000	747,000	12,638,000	130,085,000	56.5
Inland Air Lines	417,000	17,000	907,000	2,819,000	31.1
Mid-Continent	707,000	417,000	1,259,000	5,372,000	40.0
National Airways	418,000	43,000	868,000	3,837,000	44.3
Northeast Airways	428,000	14,000	773,000	3,591,000	47.5
Northwest Airways	3,488,000	274,000	4,945,000	45,109,000	46.7
Transcontinental & Western Airways	9,834,000	329,000	13,218,000	133,631,000	59.5
United Air Lines	13,849,000	1,321,000	19,335,000	195,592,000	64.3
Western Air Lines	1,410,000	168,000	1,983,000	13,862,000	52.3
Total	\$61,280,000	\$ 4,887,000	86,513,000	856,678,000	60.3
(d) Deficit					

## RECAPITULATION

(Industry--10 mos. ended Oct. 31)

	1940	1939	Change	%
Total Oper. Revenue	61,280,000	43,063,000	✓ 18,217,000	✓ 42.3
Net Income After Taxes	4,887,000	2,676,000	✓ 2,211,000	✓ 82.6
Revenue Plane Miles	86,513,000	63,761,000	✓ 22,752,000	✓ 35.7
Revenue Pass. Miles	856,678,000	534,002,000	✓ 322,676,000	✓ 60.4
Seat Miles Operated	1,421,766,000	951,522,000	✓ 470,244,000	✓ 49.4
Load Factor	60.3	56.1		

### THE FACTOR OF SAFETY

### THE FACTOR OF SAFETY

Safety itself is the cornerstone of public confidence in aviation. In New Jersey, this confidence is well invested, as the safety record for the past decade serves amply to illustrate.

Analysis of the safety factor in aviation in New Jersey reveals certain pertinent facts:

- (1) Intelligent promotion, rather than stringent regulation, has provided the dominant control over accident hazards in air transportation.
- (2) Increased use of airways and airport facilities tends to reduce accident hazards encountered in routine operation.
- (3) Private, rather than public, management of aviation transportation has demonstrated the best course for further continuance of development of aviation as a public utility.

Let us further examine the analytical basis for these conclusions.

The record of experience, particularly during the peak of aviation activity between 1933 and 1938, inclusive, substantiates these definite conclusions.

By 1933, aviation in New Jersey had ceased entirely to be an experiment of inventors and had become both a substantial industry and a practical utility. The airlines within the State flew five times the air mileage of five years earlier. Within that brief span, average air mail contract costs were cut from more than one dollar to less than thirty-nine

cents, and the average passenger fare was reduced to six cents per mile; much greater flying speeds were attained; radio two-way communication became a definitely fixed factor in operations; the status of flying fields had been so improved and their regulation had been made so efficient that the total fatalities in civil aircraft operation for the entire year were but three. Not one of these was either a commercial or non-commercial passenger. New Jersey had developed the safest - as well as the busiest - airways in the world.

Such a record was not only a tribute to aviation management but reflected great credit to those responsible for the condition of flying fields. The fire insurance underwriters had, through precaution and education, curtailed material losses. The development of the self-starter had eliminated propeller hazards on the field. The policing of air meets had prevented crowd accidents. And - not the least factor among all these - skilled labor had developed vocational competence that only industrial coordination of personnel could accomplish. Added together, all these measured the attainment of maximum safety.

Five years later, in 1938, New Jersey had held its primary position in aviation. It continued in its record of having the busiest and safest airways in the world. Not, a single commercial fatality had occurred in the entire five year period. Promotion, rather than regulation, had continued to be the keynote in State legislation governing aviation in New Jersey.

In 1938, there were 54 State licensed commercial operators in the five interstate airlines operating out of the State's 30 airports. These same airport facilities were being used annually by more than 1,000

resident pilots and student pilots, flying every known type of aircraft in all conditions of weather. And they carried more than 250,000 passengers during the year. Not to be overlooked is the fact that a great proportion of air commerce was accommodated in night operation. Night flying on Europe's civil airways was virtually non-existent; so New Jersey, leading the way for America, had developed air service around the clock - and had developed it with the utter maximum of safety.

It should be carefully noted that any comparison between aviation in any of the United States with aviation in any of the European nations must observe this one major difference between them. Aviation personnel in America is primarily civil and commercial. In Europe it is chiefly governmental and military. In the industrial sense, American aviation leads the world, and it is the industrial implementation of aviation that determines its ultimate value in the national defense.

Added to this, the ownership and operation of American aviation continues in the hands of free enterprise, where private risk has required maximum insurance against hazard and loss. Since the key to aviation safety is the control of the airport and the commercial operator, the fact that the auspices of ownership and operation have been private rather than public seems to indicate an accomplished advantage to the nation and the State at large.

This fact should not be misinterpreted, however, lest its significance be lost. It is apparent, of course, that airports and pilots are licensed, and that governmental care and precaution contribute much to the safety factor. However, it is in the routine operation discipline that safety lies, and it is here that private management has demonstrated the efficacy of its work. It should be clearly understood that the municipal

ownership of major airport facilities does not insure adequate maintenance; it remains for the transportation system itself to control the routine that insures operation safety. Laws can not make aviation safe by compulsion, but technical competence and operation experience have made air travel the safest means of transportation in New Jersey.

The record of eight years of civil and commercial aviation without a passenger fatality speaks for itself.

This safety record in New Jersey truly reflects the condition of commercial aviation throughout the United States. During 1939, the scheduled air lines of the nation carried more than 2,000,000 passengers, and from March 26, 1939, to January 1, 1940, maintained a perfect safety record. During this period, not a single crew or passenger fatality occurred.

AIRPORT DEVELOPMENT

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## AIRPORT DEVELOPMENT

In 1932, New Jersey inaugurated its own State airport development program as a step toward aviation progress within the State. Without benefit of aid from any outside agency, this program was designed to meet the needs by that time considered paramount. These were: safety factors, traffic economics, regulation of field and flying operations, planning and establishing airfields, and safeguarding existing developments in the interest of the aviation industry.

This was a significant step, eight years ago, and, following the establishment of the New Jersey State Aviation Commission, all that has been possible of accomplishment has been realized in airport development, so that recent years showed New Jersey handling more than one-quarter of the entire traffic in passengers and mail and more than one-third of all express shipments in the United States.

Before the establishment of a State agency, certain municipalities developed their own airports, only to abandon the developments when they encountered problems due to lack of planning. Since the organization of State control and assistance, the State has pursued the policy of withholding official approval of any airport construction unless there is a logical purpose for its creation and sufficient reasons to justify its operation.

In view of the many angles from which airport development must now be considered, covering national as well as State welfare, and from the experience and facts gathered from many sources, it is apparent that successful development of airports and aviation facilities must come through a broad policy of standardized procedure under coordinated Federal-State sponsorship.

Passenger and cargo air transportation crosses the State lines, requires strategically situated airports and emergency landing fields, requires regulatory supervision and necessitates regularly spaced servicing facilities. Such widespread requirements and needs for aviation development call for cooperative effort and judicious planning between neighboring States and the Federal Government. A coordinated network of airways throughout the nation <sup>S</sup>is the goal -- a network that will prove invaluable in any program of national defense.

In the development of airports within its own boundaries, New Jersey has been fortunate in possessing a far-sighted State government, which early recognized the needs of aviation and encouraged its development and expansion. It has aided airport development and advanced the interests of aviation in all its phases, through constructive legislation and by establishment of a dependable State aviation agency to carry its program through. It is for these reasons that New Jersey, although the third smallest state in point of size, has become one of the few top-ranking States in aggregate of air commerce and traffic, in number of individual airplanes owned within the State and the number of licensed pilots residing therein.

Future airport needs must be measured in terms of an increasing variety in type and speed of aircraft.

Development of air equipment has far exceeded development in airport and field facilities. It is only thirteen years since Charles Lindbergh flew the Atlantic non-stop to Paris, but the United States now has a new bomber that will fly the Atlantic and back, nonstop, maintaining an average speed of two-hundred miles an hour, with a crew of ten men. The U. S. Army has developed a pursuit ship that can dive eight miles a minute, with a small cannon and four machine guns, blazing away at the same time. These vast improvements indicate the rapid advances in design of flight equipment. There

has been woeful lack of coordinated effort in airport development to keep in step with these advances.

It will not suffice, however, to develop airport facilities with the idea of only keeping abreast of present day requirements, for aviation is advancing so rapidly that any planned program of development must make provision for sizable increases and expansions. This is readily realized when we contemplate the great increase in passengers transported along America's skyways in regularly scheduled commercial planes. In 1928, fifty thousand passengers traveled by air, and in 1938, one and a half million passengers were transported, an increase of almost three thousand per cent in ten years. In 1939, figures showed a 30% jump over 1938.

Airport development has rapidly become a subject of national importance, a problem to each individual State, to be dealt with jointly under a broad plan of Federal-State collaboration. Each airport now in use or to be developed in the future, cannot be considered as a separate, self-contained unit, but as a link in a vast checkerboard of airports and landing fields established, not only for public convenience and commercial purposes, but also in preparation for an adequate air defense for America.

New Jersey is ideally situated geographically, blest with a favorable climate and well-equipped both in airport facilities and industrial capacity, to undertake further expansion and airport development under a coordinated program with other states and the Federal Government. Such a program is highly desirable and urgently recommended. It is a signal compliment that New Jersey is ready to go forward in airport development, thanks to the practical and intelligent planning and aeronautical advances so far achieved under independent action and initiative, within the State and within the industry itself.

EXISTING AIRPORT FACILITIES

EXISTING AIRPORT FACILITIES

During 1939 the State Department of Aviation licensed and supervised activities at 42 landing fields and airports and at 15 seaplane bases. These areas were constantly inspected and kept in safe operating status, and not one location developed an abnormal number of mishaps or accidents because of bad field maintenance or operating policy. The most successful year in the history of aviation was enjoyed by all operating bases, a list of which follows:

Atlantic County

Atlantic City Airport

Atlantic City

Bergen County

Bendix Airport

Bendix

Closter Landing Field

Closter

Little Ferry Seaplane Base

Little Ferry

Ridgefield Park Seaplane Base

Ridgefield Park

Sky Harbor Seaplane Terminal

Little Ferry

Burlington County

Bridgeport Airport

Bridgeport

Central Jersey Airport

Hightstown

Moorestown Airport

Moorestown

*Mercer County*

Camden County

Central Airport

Camden

Pine Valley Airport

Pine Valley

Cape May County

Ocean City Airport

Ocean City

Smith Field

Cape May Courthouse

Wildwood Crest Airport

Wildwood

Cumberland County

Kroelinger Airport	Vineland
Seabrook Farms	Bridgeton

Essex County

Caldwell-Wright Airport	Caldwell
Newark Airport	Newark
Port Newark Seaplane Base	Newark

Hunterdon County

Northwest Jersey Airport	Clinton
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Mercer County

Mercer Airport	West Trenton
Trenton Airport	Trenton

Monmouth County

Asbury Park-Jumping Brook Airport	Hamilton
Belmar Seaplane Base	Belmar
Freehold Flying Field	Freehold
Matawan Test Field	Matawan
Red Bank Airport	Red Bank
Schneider Field	Freehold
Walling Field	Keyport

Middlesex County

Hadley Field	New Brunswick
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Morris County

Aircraft Radio Corporation	Boonton
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Ocean County

Forked River Field	Forked River
Manasquan River Seaplane Base	Point Pleasant
Pelican Island Seaplane Base	Seaside Park

Passaic County

Lincoln Park Landing Field

Little Falls

Murchio Field

Preakness

North Jersey Airport

Franklin Lakes

Somerset County

Rocky Hill Airport

Rocky Hill

Somerset Hills Airport

Basking Ridge

Sussex County

Trinca Airport

Andover

Union County

Westfield Airport

Westfield

According to the United States Civil Aeronautics Authority--  
Civil Aeronautics Bulletin Number 11, dated September 1, 1939,  
and issued by the U. S. Government printing Office, Washington--  
there were 22 airports and seven seaplane bases located in New  
Jersey. These are listed alphabetically, by counties, as follows:

## ATLANTIC COUNTY

### ATLANTIC CITY

Atlantic City Airport, municipal.

One-half mile West on East Side of highway.  $39^{\circ}21'$ ;  $74^{\circ}27'$ .

Elevation 12 ft.

Triangle, sand, level, natural drainings.;

3 runways, 3,075 ft. E/W.; 1,980 ft.

NE/SW.; 2,840 ft. NW/SE., all 150 ft. wide.

use runways only, as there are washouts in certain areas.

Atlantic City Airport on hangar.

Poles to SW.; 165 ft. radio towers to S.

200 ft. smoke stacks to E.; floodlighted;

200 ft. gas tank to E.; obstruction, lighted.

Landing area floodlights.

Day servicing.

## BERGEN COUNTY

### BENDIX

Bendix Airport, Commercial

Three-fourths mile W. of Hasbrouck Heights, and just E. of R.R. station;

2 miles W. of Hackensack River

5 1/2 miles W. of Hudson River, opposite Grant's Tomb, New York City.

10 miles NW. of Newark, N.J.

2 miles E. of Passaic River  $40^{\circ}51'$ ;  $74^{\circ}04'$ .

Elevation 5 ft. Rectangular, 4,800 by 3,500 ft.

sod, level, artificial drains under runways.

4 runways, 1,850 by 150 ft. N/S.;

1,750 by 200 ft. E/W.;

3,250 by 400 ft. NE/SW.;

2,150 by 200 ft. NW/SE.;

use runways only.

Water towers and 200 ft. chimney on W.;

field surrounded by ditches;

radio tower 2 1/2 mi. S.

Beacon, green rotating, three amber course lights flash (.-.-).

Day, night servicing.

## LITTLE FERRY

Sky Harbor Seaplane Base.

On Hackensack River  
40°51'; 74°02'.

Sea level.

Day servicing.  
(New York Chart)

## RIDGEFIELD PARK

A.F.A. Seaplane Base.

At S. end of City on N. shore of Overpeck Creek.  
40°51'; 74°01'.

Sea level.

Day servicing.  
(New York Chart)

## RIDGEFIELD PARK

Ridgefield Park Seaplane Base

On W. side of Hackensack River,  
S. of bridge,  
3 miles E. of Bendix Airport.  
40°51'; 74°02'.

Elevation sea level.

Ramp, float, moorings.

Day servicing.

Closed during ice period.

BURLINGTON COUNTY

*Mercer County*

HIGHTSTOWN

Central Jersey Airport, commercial.

Four and one-half miles SW.;  
7 miles NE. of Trenton,  
1/2 mile W. of Windsor, on highway,  
40°14'; 74°36'.

Elevation 100 ft.  
Irregular, 1,900 by 1,600 ft.  
sod, slightly rolling, natural drainings.

Windsor and Central Jersey Airport on hangar.

Poles on N.E.;  
hangar office to NE.;  
low rough ground in SW. corner;  
ditch, trees on W.;  
house to SE.;

Aviation fuel, day.

MOORESTOWN

Moorestown Airport, commercial.

One and a half miles N.N.E., of town, on road. 39°59'; 74°56'.

Elevation 70 ft.  
Rectangular, clay, sand, slight slope to W. and SW.,  
natural and artificial drainage;

3 strips,  
1,700 ft. EW., NW/SE., NNW/SSE.;  
entire field available but tall grass off strips.

Hangar, aviation fuel, limited repairs, day.  
(Washington Chart)

## WRIGHTSTOWN

Fort Dix Field, Army.

One and a half miles SE.;

One mile E. of Fort.  
40°01'; 74°36'.

Elevation, 120 ft.  
Irregular, sandy soil, sod, level, natural drainage;

1 runway,  
3,000 by 600 ft. N/S., through center field, rough in spots.

Trees surround field,;  
brush, creek, sewage-disposal plant to S.;  
creeks to N.S., W.;  
farm buildings in NE. corner.

No servicing.

## CAMDEN COUNTY

### CAMDEN

Central Airport, commercial

One and three-fourths mile E. of Camden;  
two (2) miles SE. of Philadelphia Camden Bridge;  
four and one-half (4 1/2) miles SE. of Philadelphia;  
roads on N. and W. 39°65'; 75°05'.

Elevation 20 ft.  
Irregular shape, sod, level, natural drainage.

2 macadam take-off strips, 1000 by 50 ft.  
3 gravel runways, 2,500 by 150 ft.  
entire field available.

Central Airport on hangars.

Trees and gulley in NE. corner;  
buildings to NW.;  
golf course to E.;  
River on S. and W.;  
200 ft. smokestack 1 mile W., floodlighted;  
50 ft. radio poles in NE. corner, obstruction lighted;  
chimney 100 ft. high, 1/2 mile NW.;  
200 ft. chimney, 1.2 mile W., floodlighted;  
170 ft. water tank, 1 mile N.

Beacon, boundary range, landing-area floodlights.

Beacon, clear, rotating, green auxiliary code beacon.

Day, night servicing.

Teletype.

Radio facility.

## CAPE MAY COUNTY

### CAPE MAY

U. S. Naval Air Station, Navy.

One and a half mile E.  $38^{\circ}57'$ ;  $74^{\circ}53'$ .

Elevation sea level

Rectangular 1,800 by 2,200 ft.

sod, level, natural drainage;

4 runways, 1,800 ft. NE/SW., NW/SE.;

1,760 ft. N/S;

1,900 ft. E/W.;

all 75 ft. wide;

entire field available.

Poles to W., SW.;

dirigible hangar 200 ft. high;

water tanks, smokestacks, 190 ft. high,

radio towers, 100 ft. high, on N. side.

Day servicing for Government planes.

### CAPE MAY

U.S. Coast Guard Seaplane Base.

One and a half miles E.

adjacent to airport in Cape Island Sound.

$38^{\circ}57'$ ;  $74^{\circ}53'$ .

Elevation, sea level.

One (1) runway and ramp with hauling out equipment.

Aviation fuel at ramp and small boats by arrangements,  
available for Government craft only, except in emergency.

Closed during ice period.

## OCEAN CITY

Clark Field, auxiliary

One and a half miles W.;  
NW. of R.R. and highway.  
39°17'; 74°35'.

Elevation 8 ft.  
Irregular, soil, level, natural drainage.

2 gravel runways;  
1,900 ft. NW/SE.;  
2,300 ft. NE/SW.;  
both 150 ft. wide.

OCEAN CITY on BOARDWALK, BUILDING E. of field.

Chimney 100 ft. high on building at S.  
corner of field.

No servicing.

## CUMBERLAND COUNTY

### VINELAND

Vineland Airport, commercial.

Two and one-half miles N.N.W., on W. side of highway;  
country roads on S. and W.  
39°31'; 75°03'.

Elevation 100 ft.  
T- shape;  
slight grade to S.,  
sandy loam, natural drainage;

2 strips,  
1,400 by 300 ft. N/S.,  
1,500 by 250 ft. E/W.  
Poles 50 ft. high, on E.,  
40 ft. line on S., and 30 ft. line on W.;  
hangar to NE.

Aviation fuel and minor repairs, days.  
(Washington Chart).

ESSEX COUNTY

CALDWELL

Caldwell Wright Airport, commercial.

Two (2) miles N.  $40^{\circ}52'$ ;  $74^{\circ}17'$ .

Elevation 175 ft. Irregular, sod, level, artificial drainage;  
landing area, 2,900 ft. N/S.

3,000 ft. NE/SW.,

2,400 ft. E/W.;

entire field available.

Caldwell Wright on hangar.

Poles on E., SE., woods on N., W.,  
brook, bridge on NE., E.

Day servicing.

NEWARK

Newark Seaplane Anchorage.

Two and one half miles SE.,

1 mile E. of airport on W. side of Newark Bay.

Elevation sea level.

Float; aviation fuel from airport.

Closed during ice period.

NEWARK

Newark Airport, municipal.

Two miles S.  $40^{\circ}43'$ ;  $74^{\circ}10'$ .

Elevation 10 ft.

Irregular, oiled cinder surface, level, artificial drainage.

Five runways;

3,700 by 300 ft. NE/SW.

2,750 by 200 ft. NE/SW.

3,100 by 300 ft. NW/SE.

2,000 ft. N/S.

2,800 ft. E/W.

graded surface not to be used except in emergency.

Newark on hangar.

Poles, bldgs., radio towers to E.;  
125 ft. radio towers 3 miles SE. obstruction lighted;  
buildings, hangars to N.;  
smokestack 1 mile N., obstruction lighted;  
Water tower to SE., obstruction lighted;  
house NE. end of NE/SW. strip.

Beacon, boundary, range, obstruction, landing-area  
floodlights.

Beacon flash clear and green.

Day, night servicing.

Radio facility.

Teletype.

#### MERCER COUNTY

##### TRENTON

Mercer Airport, municipal.

Five and one half miles NW.  
40°17'; 74°50'.

Elevation, 200 ft.  
Rectangular, 2,700 by 2,370 ft.,  
sod, level, natural and artificial drainage;

3 runways;  
2,700 ft. NW/SE.;  
2,400 ft. E/W.;  
2,340 ft. NE/SW.;  
entire field available, except NE. corner.

Mercer embedded in field.

Trenton on hangar.

Beacon, boundary, range, obstruction lights.

Beacon, green, rotating.

Day and night servicing.

MIDDLESEX COUNTY

NEW BRUNSWICK

Hadley Airport, commercial.

Three and one half miles NE. of Steltoh;  
4 miles S. of Plainfield;  
6 miles E. of river.  
40°32'; 74°26'.

Elevation, 57 ft.  
Irregular, 1,988 by 1,980 by 1,760 by 1,890 ft.;  
sod, slightly rolling, artificial drainage.

Farm buildings to N.;  
Trees to SE.;  
poles, houses on W.

Beacon, boundary, range, obstruction, floodlights.

Beacon clear and rotating.

All lights operated upon request, or by circling field.

Day, night servicing.

MONMOUTH COUNTY

RED BANK

Red Bank Airport, commercial.

One mile S. 40°20'; 74°04'.

Elevation, 60 ft.  
Rectangular 2,700 by 2,200 ft.,  
sod, level, natural drainage;  
entire field available.

Red Bank on hangar.

Poles to W.;  
Trees to E.S.N.

Beacon, floodlights for landing.

Beacon, clear, rotating.

Day servicing.

## KEYPORT

Aeromarine Seaplane Base.

One mile N. of Keyport, on Raritan Bay,  
adjacent to airport.  
40°27'; 74°11'.

Elevation sea level.

Good beaches for hauling out, repairs,  
marine railway, fuel for boats.

## MORRIS COUNTY

### BOONTON

Aircraft Radio Corporation  
Airport, private

Two miles NW. 40°56'; 74°26'.

Elevation 500 ft. Irregular, 2,200 by 1,125 ft.  
sod, level, natural drainage;  
runways at right angles, each 2,200 ft.  
one (1) diagonal runway E/W.;  
entire field available.

Trees, bushes to N.; woods to SE.; Buildings, brook to NW.

Day servicing in emergency only.

### LINCOLN PARK

Lincoln Airport, commercial.

One and a half miles N. of Lincoln Park,  
6 miles W. of Paterson,  
1 3/4 miles W. of river. 40°57'; 74°19'.

Elevation 180 ft.  
Irregular, sod, level, natural drainage, and artificial drainage.

Three strips, 1,600 by 260-360 ft. N/S.,  
1,700 by 150 ft. NW/SE.  
1,400 by 150 ft. NE/SW.

Lincoln Airport on hangar.

Poles to NE.;  
trees to NE., NW.  
550 ft. tower 3 miles SE.

Day servicing.

OCEAN COUNTY

FORKED RIVER

Forked River Airport, commercial.

Three-fourths miles E., at inlet to Barnegat Bay.  
39°50'; 74°11'.

Elevation 17 ft.  
Rectangular, 2,000 by 1,000 ft.,  
sod, level, natural drainage;  
entire field available.

Forked Airport on hangar.

Poles, buildings on S., house, barn, trees on W.;  
trees to N., with 3000 ft. opening for approach.

Day servicing.

LAKEHURST

Naval Air Station, Navy.

One mile N. 40°02'; 74°19'.

Elevation 70 ft.  
Triangular, sand, level, natural drainage;

3 runways, 3,000 ft. E/W.; 3,000 ft. NE/SW.;  
3,000 ft. NW/SE., all 100 ft. wide.  
circle in center of field with  
USE RUNWAYS ONLY.

Airship hangars, water tower, brick stack to N. and NE.,  
85 ft. steel towers 3/4 mile NW., obstruction lighted;  
spire 72 ft. high, 1/2 mile S., obstruction lighted.

Beacon, boundary, obstruction, landing-area floodlights.

Beacon, clear, rotating, green auxiliary code beacon flash (.-..)

Boundary lights operated upon approach of planes.

Radio facility.

Day servicing, Government aircraft.

PASSAIC COUNTY

PATERSON

Murchio Field, commercial.

Two and one-half miles NW.  
40°57'; 74°14'.

Elevation 420 ft.  
Irregular 1,800-2,300 ft. N/S.,  
1,000 ft. E/W.;  
sod, level, natural drainage;  
entire field available.

Murchio Field on hangar.

Paterson on other hangar.

Poles to N.;  
trees to NW.

Day servicing.

PATERSON

North Jersey Airport, commercial.

Six miles NW., on N. side of road.  
41°00'; 74°14'.

Elevation 460 ft.  
Irregular, sod, level, natural drainage.

2 strips;  
1,400 ft. E/W.;  
1,200 ft. NW/SE.;  
entire field available.

Nelson on hangar.

Trees to E., NE.;  
hangars to NE.;  
buildings to S.

Day servicing.

SALEM COUNTY

PENNSVILLE

Pennsville Airport, commercial

One-fourth mile E.;  
highway one-eighth mile N.  
39°39'; 75°31'.

Elevation 10 ft.  
Rectangular, sandy, loam, level, natural drainage;

1 strip, 1,600 by 300 ft. E/W.

Pennsville, N.J. on hangar.

Trees to E., SE., NW.;  
hangar to N.;  
Poles 1/8 mile N.

Day servicing.

PENNSVILLE

Pennsville Seaplane Anchorage.

N. of City,  
E. of airport, on Delaware River.  
39°39'; 75°31'.

Elevation sea level.

Unlimited landing area.  
Aviation fuel available at beach or by boat,  
circle field three times.  
Available March to November.

SOMERSET COUNTY

BASKING RIDGE

Somerset Hills Airport, commercial.  
One mile SE. on concrete highway,  
Stone-quarry one-half mile S. 40°42';  
74°33'. Elevation 250 ft. Irregular sod, level, natural drainage;

3 runways, 2,300 ft. E/W.; 1,500 ft.  
N/S.; 1,700 ft. NW/SE., each 100-300 ft. wide;  
best runway E/W.

Somerset Hills Airport on office. Poles on W., N.  
Day servicing.

Use caution when field is wet, drainage poor.

POTENTIAL AIRPORT DEVELOPMENT.

## POTENTIAL AIRPORT DEVELOPMENT

An accurate evaluation of New Jersey's airport facilities would make imperative the technical demand for immediate development on a coordinated basis. In spite of the fact that this State has enjoyed a primary position in the realization of aviation's progress, the ground facilities do not approach minimum standards required for modern air transportation. A vast program in the development of potential airport accommodations throughout the State - correlated to the scientific expansion of aviation economics and industry - awaits our undertaking.

The past decade has been devoted largely to experimentation and research. The advances made in public service have been large, but they have been accomplished in pioneering stages and are no criterion to the percentage of advances to be expected during the next ten years.

New Jersey, with a geographical area of but 8,000 square miles and with a very uneven population distribution, is yet one of the key locations of aviation expansion. Our industrial traditions and equitable laws along with our nearness to the financial and export markets and a skilled labor supply makes us most attractive to aeronautic and collateral industry. Since 1938, we show a rapid increase of aeronautic industries located here. Some of these are world leaders in their field and some of them only develop aviation materials as by-products but their total is tremendous. They furnish employment for skilled engineers and workmen, and the tax ratables they bring to the state are a very significant part of our prosperity.

But the airport system in New Jersey is particularly lamentable. Of the approximately 30 airports licensed by the state for year-round operation, but four are municipally owned. This is in great contrast to other states. It is accounted for by the fact that our population density has made it possible for privately-owned airports or landing field to develop a degree of activity which could justify the private ownership, although the improvement of such fields has been impossible to operators. Surfacing of runways, airport lighting and other facilities of this nature have been impossible.

The State Department of Aviation has been unwilling to recommend an airport development program until a national policy was enunciated and a Federally-correlated system was established. So long as mere municipal competition remains the basis of airport development the State of New Jersey has been unwilling to invest in airports.

The situation at Newark has been an outstanding example of what happens when development is made without an established policy from a national standpoint. The destiny of the Newark Airport as a great air carrier facility was without question. The natural expansion of service would have shortly overwhelmed the capacity not only of the Newark field but of the existing fields in New York. In the meantime, however, the airport at Newark had been subjected to an adjustment which was purely a matter of municipal competition. The same thing will be true of the airports in any situation where heavy metropolitan traffic is involved. The lack of a national policy lies at the root of the whole matter.

Any intelligently governed State realizes the possibilities of a comprehensive State airport program. Airports must be located with a view to serving industrial areas, for collateral industry tends to cluster around air carrier facilities just as it does around surface shipping points. Our educational institutions have a definite relation to airport development, and the airport is proving as essential to Princeton, to Rutgers, to the Newark College of Engineering, Newark University and other such schools as any other laboratory. Of special significance to New Jersey are the airports to serve our heavy seasonal recreational areas. Hundreds of thousands of flights originate every year from the totally inadequate fields that we now have. An adequate system of airports would multiply this traffic enormously.

only  
harsh  
objection  
and not  
always  
or  
usually  
controlling

But to regard the Federal treasury as the Christmas stocking is one of the gravest errors that could be made. Nothing would more retard orderly progress of aviation than for the States and communities to sell out their own interests in airport development completely to the Federal government. If the Federal government builds airports, they will be built basically for specialized purposes not best designed to serve the communities where the airports are located. There has already been too much talk of the centralization of all aviation responsibility and authority in the Federal government. The Federal government has made no move to usurp authority, and it has no more business to assume the sole responsibility for a community airport than if it were a city hall or railroad depot.

New Jersey is confronted by a unique problem in the development of a State airport program, since it is necessary to consider two distinct metropolitan areas, portions of which lie in neighboring states: the New Jersey-New York City area and the New Jersey-Philadelphia area. Due to this problem, inter-state cooperation is necessary in planning suitable development for New Jersey's metropolitan airport facilities.

New Jersey <sup>will</sup> has not been able to project the ultimate in a State airport program until, in conjunction with its neighbor states and the federal government, some correlated policy is established dealing with these metropolitan areas as separate problems. So vitally do these great metropolitan areas affect traffic flow in the air that their influence will extend out hundreds of miles in every direction across the country. Planning for traffic flow into them as seaboard terminals must start at least 500 miles away. The State of New Jersey must know basically what long-range policy is to prevail in scheduled inter-state transportation before it is able to invest in facilities which are essentially component parts of such a system.

New Jersey can not afford to become interested in the development of inter-state traffic to the detriment of intra-state operation. Until New Jersey knows that its facilities are other than merely competitive facilities with neighboring states or neighboring municipalities, it is impossible to enunciate an airport program dealing with interests other than intra-state. Responsibility for the correlation of facilities catering to these metropolitan areas primarily rests upon the Civil Aeronautics Authority of the Federal government. New Jersey is prepared to play its part in such a cooperative effort, but it is recommended that a long-range policy be determined to guide this effort. Such a policy is imperative - not only from an economic standpoint but from the standpoint of safety. Safety alone even now demands a correlation of navigational procedure for air traffic in these areas.

The establishment of airport facilities involves a great deal more than the average lay conception takes into account. An airport is thought of as a passenger and mail convenience. This is but a fraction of the story. The air carrier of the future will find its greatest utility in serving collateral industry. It has always been true that the transportation of commerce is more important than the transportation of passengers. Failure to realize this in planning would be to deny history and would handicap air carrier progress.

The economic advantage of air transportation is still but dimly realized. The time, however, is fast approaching when commerce of great significance must ~~move~~<sup>2</sup> through the skies. The location of an airport will be more important to the wholesale jeweler, and to the furrier, and to the securities houses, and to the film distributors and countless others than it will be to the pilot himself. We are accustomed to hear airport locations constantly related to hotel facilities and passenger travel as if this were the entire and ultimate destiny of aviation. Nothing could express less vision in regard to flight. These things merely illustrate that in planning for the location of airports cooperative effort between states and municipalities will be fundamental.

Although the time is far past for the necessity of a national airport program, not one more airport should be built until it can be developed as a unit based on national policy serving the purposes of national defense, public convenience and necessity, pilot training and private flying, and air mail and express distribution. If any of these elemental considerations are neglected, each other consideration will be proportionately weaker. There is no single component of aviation that is not in a state of economic chaos through lack of a long range national policy which correlates state plans and deals with particular situations such as is exemplified in the North Jersey-New York metropolitan area.

In consideration of potential airport facilities in New Jersey which have significance to the metropolitan area, there are three outstanding locations. One of these is the Newark Airport serving its own community interest, but thoroughly capable of also serving through adequate surface connection, portions of Jersey City and downtown Manhattan.

The second outstanding great facility as yet unheralded will be the development of an airport at Seacaucus, in Hudson County, having direct connection with midtown New York through the Lincoln Tunnel.

The third location is the development of the Bendix Airport, in the Hackensack Meadows, serving a large urban section and also a growing industrial development, and having connections of great advantage over the George Washington Bridge with upper Manhattan and the Bronx.

These three locations are essential to the entire metropolitan development in the New Jersey-New York City area. A definite portion of this development should be devoted exclusively to non-scheduled aviation, thus bringing into the metropolitan area facilities dedicated to the private and charter operator fully as adequate as those dedicated to scheduled operation. These operations should be segregated purely as a solution to air traffic and public safety, and not because there is any other justified distinction between them. Air traffic can deal with the dimension of altitude, and it is recommended that advantage be taken of this in the correlation of air traffic flow about the metropolitan area.

The airport at Camden is one of the outstanding fields of this state. It is privately owned. When the municipally-owned field at Philadelphia is eventually completed, Camden will suffer the same comparative loss of traffic which Newark has suffered, yet the Camden field will be essential to the aerial operations of the Philadelphia area, if it survives the period of transition. Without a plan, how can the private interests which have created this airport feel justified in maintaining their investment in the airport?

There are some situations in which the county should be the unit interested in the airport development. For example, application has now been made by Penn-Central Air Lines for a scheduled route from Washington via Dover to Atlantic City. This route would bisect Cumberland County. It would be advantageous to locate a large airport somewhere near Carmel serving the three towns of Bridgeton, Millville and Vineland. Another instance for county participation is Ocean county, with one of the finest vacation coast lines in the world. There will, beyond question, be developed a Federal airway reaching from the Newark Airport to Norfolk. Airports located at Lakewood and Toms River and seaplane ramps located in the Metedeconk, the Toms and Forked rivers and at certain other locations such as Beach Haven, ~~and~~ Barnegat City and Seaside Park, would help to develop the vacational aspects of Ocean County.

The third such instance would be the development of the old Teterboro Airport in Bergen County. This airport is located in the industrial area of Bergen county and has already attracted the Bendix Aviation Corporation to that location. If the area were stabilized by county ownership, other industries would cluster around it. The Goodyear Lighter-than-air operation was established there three years ago and immediately became the most outstanding of all the Goodyear operations.

Passaic County could enhance its commercial future by an adequate airport designed to serve the industrial centers of Paterson, Passaic, Clifton and the development in the Passaic Valley. A project which one municipality might feel was too much of a burden might be a cooperative effort between several municipalities, but here again the entire question waits on a national program composed of the correlated State plans.

There is much encouragement in the fact that, for the first time, such a national program appears to be getting under way. The Federal government has requested the State of New Jersey to submit a state airport program based not only on aeronautic considerations but related to the industrial, commercial, educational, vocational and social complexion of the State and its component municipalities and counties. The State Department of Aviation presented this request to the New Jersey Council and, with the assistance of the State Planning Board, the Department of Commerce and Navigation, the Highway Department, the National Guard Aviation Section, and with the encouragement of the Governor, prepared a plan to be matched with neighboring States and correlated in a series of conferences.

The ultimate <sup>solution</sup> will be to have the State plan approved by the Federal government as a unit of the national program and then to arrive at a policy of finance and supervision through national and state legislation. In the meantime, every possible exploration through temporary operations has surveyed the possible needs and uses for airports in many communities and localities, and an accumulated experience will enable the State to act with promptness and understanding once coordination is effected by proper legislation of the State and nation.

It is a mistake to consider the present emergency a justification for illogical short-cuts in planning future airport development. Only a most definitive and detailed survey can establish a planned approach. Certain specifications for such a survey are cited in Preview Of A Planning Program and are referred to in the Foreword.

At the present, existing <sup>areas</sup> facilities, other than those licensed for operations, are listed alphabetically as follows:

ATLANTIC COUNTY

Atlantic City - 692 acres, known as Great Island, located  $1\frac{1}{2}$  miles from city limits. Undeveloped, privately owned.

Atlantic City - approximately 400 acres, north of Absecon Boulevard, suitable for airport and seaplane base. Undeveloped marsh land with water frontage, privately owned.

Atlantic City -  $11\frac{1}{2}$  acres, between Maryland Avenue and Brigantine Boulevard. Undeveloped, owned by the Federal government.

Egg Harbor City - 86.77 acres, adjoining City Park Landing Field, extending from Mozart to Pindar Street and New York to Philadelphia Avenue. Undeveloped, joint private and city ownership.

Egg Harbor City - 41.3 acres, extending from Mozart to Oker Street and Philadelphia and Washington Avenues. Undeveloped, city ownership.

Hammononton - 1484 acres, extending from State Highway 206 to 39. Undeveloped elevated ground, with scrub growth. Privately owned.

Hammononton - approximately 1200 acres, situated about  $2\frac{1}{2}$  miles from the center of the town. Partially developed, privately owned.

Hammononton - 561 acres located west from Columbia Road and north of Pleasant Mill Road. Undeveloped, privately owned.

Ventnor City - 293 acres, situated in what is known as Ventnor Heights. Marsh land although part is graded. Privately owned.

Ventnor City - 188 acres, near Garden Plaza, east of Newark Avenue. Partially developed, privately owned.

## BERGEN COUNTY

Haworth - 32 acres, known as White Beeches Golf and Country Club, bounded on the south by Sunset Avenue and on the east by Haworth Drive. Undeveloped, privately owned.

New Milford - approximately 115 acres, bounded on the west by New Milford Boulevard. Undeveloped, privately owned.

Norwood - 35 acres, located on Blanche Avenue, improved with a hangar (26' x 40') and a runway. Privately owned.

River Edge - 60 acres, located on River Road, bounded on the north by the Stueben School. Undeveloped, privately owned.

## CAPE MAY COUNTY

Cape May Court House - 40 acres, located on Route 4 above township. Additional 40 acres available. Property improved with 1 hangar and 3 runways. Privately owned.

Wildwood Crest - 2 acres, located at the upper end of beach front, improved with a hangar runway. Owned by borough.

Woodbine - 180 acres, adjoins Pennsylvania, Reading and Seashore Railroad right-of-way, south of Dehirsch Avenue. Undeveloped, borough owned.

## CUMBERLAND COUNTY

Greenwich - 20 acres, located  $1\frac{1}{2}$  miles from township center, improved with a hangar and 4 runways. Undeveloped, privately owned.

Landis Township - 10 acres, on Elmer Road, with a hangar and 4 runways. Privately owned.

Millville - 55 acres, located on Cedar Road,  $1\frac{1}{2}$  miles southwest of city, with one hangar and 4 runways. Privately owned.

Vineland - 10 acres, on the Bridgeton Pike 3 miles northeast of Bridgeton, improved with a hangar and 4 runways. Privately owned.

Upper Deerfield - 4 acres, located 4 miles northeast of Bridgeton, near Salem Turnpike. Includes 2 runways. Undeveloped, privately owned.

#### ESSEX COUNTY

West Orange - 118 acres, known as the Essex County Golf Club, situated at Mt. Pleasant and Prospect Avenues. Undeveloped, privately owned.

West Orange - approximately 100 acres, near State Highway #10. Undeveloped, privately owned.

West Orange - 55 acres, known as the West Orange Public Golf course, located on Prospect Avenue. Undeveloped, privately owned.

West Orange - 50 acres, known as Cresmont Country Club, located at Eagle Rock and Laurel Avenues. Undeveloped, privately owned.

#### HUDSON COUNTY

Jersey City - approximately 700 acres, part of which is along New York Bay. Located at Caven Point. Undeveloped, owned by the city.

Kearny - 790 acres, adjoining Greenwood Lake Railroad right-of-way west of Bellville Turnpike. Undeveloped, privately owned.

Secaucus - 1500 acres, located in the so-called Hackensack Meadows, west of County Road north of Paterson Plank Road. Marsh land, approximately 50% filled, privately owned.

#### HUNTERDON COUNTY

Baptistown - 40 acres, located on State Highway 12, improved with 2 hangars each adequate for housing 2 planes. Hard sod land, privately owned.

Bethlehem - 84 acres, located on State Highway 28, between Clinton and West Portal, improved with 3 small hangars and 4 runways. Hard sod land, privately owned.

Locktown - 45 acres, known as Point Breeze Farm, on route 12, between Baptistown and Croton. Undeveloped, privately owned.

Raritan Township - 100 acres, situated on state highway between Flemington and Trenton at Copper Hill. Field used as landing base by private planes.

Readington Township - 90 acres, known as Richard Voller's Farm, located on county road. Partially developed, privately owned.

#### MIDDLESEX COUNTY

East Brunswick Township - approximately 100 acres along South River near Cranbury road. Undeveloped, privately owned.

East Brunswick Township - approximately 60 acres, situated on route S-28, near clay banks. Undeveloped, owned by township.

Sayreville - about 300 acres located near the Victory Bridge. Undeveloped, privately owned.

Sayreville - joint tract of 250 acres, part borough owned, part privately owned, located between South River and Journey Mill Road and Washington Road and Bordertown Amboy Turnpike. Partially developed.

Sayreville - 150 acres, traverses from Sandfield Road and Washington Road to South River. Undeveloped, borough owned.

Sayreville - approximately 130 acres, bounded by Sanfield Road, Washington Road and Main Street. Undeveloped, privately owned.

#### MORRIS COUNTY

Chester - 52 acres, known as the Chester Airport, located on the Washington Turnpike near Shell gasoline station. Undeveloped, privately owned.

Denville - 97 acres, known as Bush's Farm, located near old Boonton Road. Undeveloped, privately owned.

Denville - approximately  $69\frac{1}{2}$  acres, known as Rockaway River Country Club, along old Denville Powerville Road. Undeveloped, privately owned.

East Hanover Township - approximately 211 acres, formerly known as the Hanover Airport, situated at Hanover and Evergreen Avenues. Undeveloped, privately owned.

Florham Park - 250 acres, site of Braiburn Golf Club off Brook Lake Avenue in Florham and Brook Lake Parks. Undeveloped, privately owned.

Hanover Township - 200 acres, located off Columbia Road. Two hangars, three runways and an administration building are available on the property. Privately owned.

Kenvil - 50 acres, known as Corwin Farm, located off Route 6. Undeveloped, privately owned.

Morris Township - 240 acres, known as Neise's Farm, located on Mt. Kemble Avenue. Undeveloped, privately owned.

Morris Township - 156 acres, known as Spring Brook Golf Club, located on Mt. Kemble Avenue. Undeveloped, privately owned.

Morris Township - approximately 125 acres, known as Morris County Golf Club, located on Punch Bowl Road. Undeveloped, privately owned.

Morris Township - 98 acres, known as Whippany River Club, located on Office Evergreen Avenue and principally used as polo fields. Undeveloped, privately owned.

Parsippany - Troy Hills Township - 316 acres, known as Knoll Golf Club, off Knoll Road. Undeveloped, privately owned.

Parsippany - Troy Hills Township - 30 acres, known as Mt. Tabor Golf Club, located off route 3N. Consists of undeveloped hills, privately owned.

Rockaway Township - approximately 25 acres, known as the Picatinny Golf Course. Undeveloped, Federally owned.

## PASSAIC COUNTY

Clifton - 50 acres, located in the Delawanna section along River Road. Formerly used as a commercial airport. Undeveloped, privately owned.

Wayne Township - 53 acres, located in Lower Preakness along Preakness Avenue and Lower Valley Road. Undeveloped, privately owned.

## SOMERSET COUNTY

Bernardsville - 42 acres, currently used as in Public Park, formerly known as the Old Polo Grounds, situated on Chestnut Avenue. Undeveloped, owned by the Boro.

Bridgewater - 36 acres, located on Country Club Road about 2 miles from Highway 28. Property improved with 1 hangar and 2 runways. 20 adjoining acres available. Land hard sod, privately owned.

Burnt Hills - approximately 34 acres, known as the Burnt Hills Polo Club property, situated on the Pluckemin-Burnt Mills Road. Undeveloped, privately owned.

Montgomery - 125 acres, known as the Princeton University Airfield, located 3 miles north of Princeton on route 31. Improved with 2 hangars and 5 runways. Privately owned.

Pluckemin - 41 acres, located on Burnt Miles Road, west of route 31. Improved with 1 hangar and 3 runways. Land hard sod, privately owned.

Pluckemin - 36 acres, known as the Schley Glider Field, located at Liberty Corner Road. Hard sod, level land, privately owned.

Pluckemin - 18 acres, on Pluckemin Road. Two temporary hangars and 1 runway available. Privately owned.

Somerville - 48 acres, located on Route 31 near Rocky Hill. Two hangars available on this property. No runways. Undeveloped, privately owned.

Somerville - 32 acres, located on Route 31 near Royce Valley. Improved with 1 hangar and 3 runways. Privately owned.

Weston - 55 acres, known as Student's Flying Club Field, located along the Pennsylvania Railroad tracks in Weston-Manville. Undeveloped, privately owned.

#### SUSSEX COUNTY

Andover - 12 acres, located 3 miles west of Andover. Four runways. Privately owned.

Greendell Township - 12 acres located  $\frac{1}{2}$  mile west of Greendell. Property improved with one hangar, adequate for housing one plane, and two runways. Privately owned.

Hamburg - field located 3 miles west of Hamburg, along route 31. Property has one hangar, adequate for housing one plane, without runways. Privately owned.

Sussex Borough - 40 acres, located on route 31, opposite school building. Use of field discontinued 6 years ago. Privately owned.

Tranquillity - approximately 50 acres, improved with one hangar, adequate for housing 6 planes, and runway. Privately owned.

#### UNION COUNTY

Clark Township - 60 acres, in poor condition but formerly used as an instruction field. Privately owned.

Springfield Township - 400 acres, known as the Balustrol Golf Club course.

Westfield - Clark Township - 58.45 acres. Part in Clark Township, Union County, part in Woodbridge, Middlesex County. Equipped with 3 runways. Irregular sod level, privately owned.

#### WARREN COUNTY

Mansfield Township - 42 acres, located one mile off route 24 in Beatyestown, improved with 4 hangars and 2 runways. Privately owned.

### NEWARK AIRPORT: A DECADE OF DEVELOPMENT

NEWARK AIRPORT: A DECADE OF DEVELOPMENT

As an illustration of individual airport development in New Jersey, Newark Airport provides an interesting case history. It also serves to emphasize the need for long-range planning and industrial integration essential to adequate fulfillment of aviation's service as a public utility.

The fact that the story of Newark Airport must be told, at the present, in the past tense is itself a lesson to all who serve the best interests of aviation development. In this facility, destined to assume a position of preeminence in the nation's progress, all the important potentialities essential to a perfect airways terminal were happily combined. But, due to the lag in public understanding of the basic needs in aviation's development along industrial lines, the story of Newark Airport is valuable today mainly from the viewpoint of experimental experience.

On May 20, 1936<sup>2</sup>, the Congress passed the Air Commerce Act, definitely committing the United States Government to encourage air passenger and transport lines and establishing a new department within the Department of Commerce which was to be devoted to the promotion of airways. The Federal government proposed the development of intermediate landing fields between terminals and to furnish light beacons along the principle airways so as to make night flying possible, but, however, refused to assume the responsibility for airport establishment and operation since it was logical for municipalities and private companies to build their own air terminals.

Immediately after Federal government aid was assured, there was an immense expansion in all departments of the air industry. There was an increase in air transport lines, number of passengers carried and quantity of mail and express shipments. Public confidence, interest and air-mindedness was climaxed by the flight of Lindbergh to Paris on May 20, 1927, exactly one year after the Air Commerce Act had been passed.

On December 20, 1927, the Hoover Fact Finding Committee announced the selection of five airport sites with<sup>in</sup> the New York City area. Port Newark was the most favorable Jersey location, especially favorable as a metropolitan terminus for airway operations. The site was adjacent to a proposed State Super-Highway which, in a few months, was to put the Port of Newark in direct contact with lower New York City.

In the meantime, the Engineering Department of the City of Newark had completed exhaustive research, gathering data pertaining to all known phases of airport development; with the adoption of a site, it was ready to proceed with the project.

It was determined that the Newark Airport would be located within the Port Newark development zone west of the Central Railroad of New Jersey and bounded on the north by Port Street and the proposed new State Highway. The area allotted for the development comprised approximately 400 acres of meadow lands, free from hazardous obstructions such as tall buildings and other structures that would adversely affect the safe operation of airplanes approaching and leaving the field. In order to expedite the work, it was decided to develop the airport in units, and the first unit known as Unit A comprises 36 acres to be reclaimed, drained, and top surfaced adjacent to the State Highway, with the thought that ultimate expansion would eventually develop

practically an all-way field or if necessary provide for the installation of eight runways for the landing of ships regardless of wind direction. The site selected was also comparatively free from thick fogs which are detrimental to the operation of transport planes.

The first contracts were awarded during and subsequent to April, 1928, and comprised the placing of hydraulic fill, drainage and dry fill together with the erection of one hanger, 120 feet square. In conjunction with these contracts, it was also necessary for the city to divert a watercourse approximately 60 feet wide and about two miles in length, which carried storm water overflow from the southern section of the city. Numerous other ditches and creeks functioning as outfalls for the drainage system installed by the Essex County Mosquito Extermination Commission were also diverted in order that the area reserved for airport purposes would be properly developed.

During the completion of the first unit, it was necessary also to install a drainage system of corrugated iron pipe treated with an asphalt covering to prevent corrosion and perforated over one-third of the circumferential area in order to permit sub-soil drainage. Subsequent to the development of the first unit, which was ready for operation in August, 1928, ~~by~~ hydraulic fill contracts were awarded for further expansion of the area. Then dry fill was placed and the top was surfaced with cinders.

As the physical work of reclamation and drainage progressed, the next problem was the installation of runways, lighting of the field and the placing of necessary utilities for service to the operators. One semi-hard surface roadway, 1,500 feet long and 200 feet wide, was placed in the first unit extending in a southwesterly and northeasterly direction. This runway was constructed of cinders, graded and rolled, and was finally treated with hot liquid asphalt.

The lighting of the field included boundary lights which defined the limits of the landing area and designated the direction of the runways, augmented by a bank of twenty-three flood light projects necessary to illuminate landing field for night operations. The field was also equipped with a revolving beacon and an illuminated wind-sock, both of which are necessary for locating the airport from above and indicating to pilots the direction of ground wind. The boundary lighting system was approximately 9,000 feet in length, enclosing the landing field proper. All buildings constructed were confined to the areas outside these boundary lights.

The foregoing steps constituted the major operations in the development of the Newark Airport for the construction of the field proper. After the initiation of this work, the city placed or installed the following items:

- (a) 5,000,000 yards of hydraulic fill
- (b) 1,500,000 cu. yds. of dry fill
- (c) 100,000 cu yds. cinders
- (d) Diverted 4 miles of creeks
- (e) Installed 6 miles of underground drainage
- (f) Approximately 3,000 feet of sanitary sewers
- (g) Approximately 5,000 lin. ft. of underground electric service
- (h) 2,000 feet of paved highway and approximately 40,000 sq. yds of paving adjacent to hangars and on taxi strips

One of the major considerations in the design of the airport was the segregation of certain areas and their use designation for hangar construction. An area adjacent to the State Highway on the northwesterly side of the Port was allocated for hangars and for the location of an Administration and Terminal building. At the same time, an area adjacent to the easterly side of the field was allocated for the construction of large hangars;

this location was considered most suitable for air mail and transport operations. Following this plan, four hangars were erected in the area adjacent to the State Highway and five hangars erected on the easterly side of the field.

It was the general policy of the city to lease land to a tenant, who in most cases erected a hangar suitable in size for his own operations. One of the major considerations in hangar construction was the provision for adequate fire protection. The City of Newark, after a careful study of various systems, finally adopted and installed a type of sprinkler system which functions within one-half minute after the origin of a fire. The adoption of this system resulted in a considerable saving in insurance premiums. Due to the inflammability and rapid spread of fire in an airplane hangar, the insurance rates in 1928, where a sealed head sprinkler system was to be installed, was in the neighborhood of 65¢ per hundred dollars of valuation; and this rate, with the sprinkler system installed, was reduced to approximately 25¢ per hundred.

Another item entering into the construction of hangars was the type of heating system, the maintenance of which, due to the nature of the building, was an expensive item. The City of Newark in its hangar adopted overhead heaters with rotary fans distributing heat originating in an oil-burning boiler. Other operators have adopted similar systems with the exception that floor heaters with rotary fans have been installed in the place of overhead units.

Hangars were erected on the westerly side of the field by the Standard Oil Co. of N. J., the Eastern Aeronautical Corporation of N. J., the Newark Air Service, and the City of Newark. On the easterly side of

the field, hangars were erected by the Eastern Air Transport, the United Airways, N. J. National Guard, besides a large hangar erected by the City of Newark which leased it to the American Airways. This section of the field was improved with paved areas between the hangars, and practically all transport operations originated and terminated at these hangars. As an added facility the Federal government erected a Post Office building which included also the U. S. Weather Bureau from which all information concerning the weather was obtained.

Approximately 50% of the original 400 acre site was developed to the extent that operations could be safely carried on, and new growth of transport operations were adequately taken care of. This expansion necessarily included the extension of the drainage system, revision and expansion of boundary lights, supplemental flood control and other related features as required.

The City of Newark proceeded very carefully with its installation of permanent features, such as definitely located runways and the erection of a terminal building. The city endeavored to keep ample field available for the operation of planes, surfaced in a manner that was temporarily satisfactory, but guarded against expenditure for future permanent installation of hard surface runways, in traffice zones, so as not to duplicate improvements in meeting the ultimate requirements. <sup>Since</sup> The location of a terminal station of the dimensions necessary to accommodate a large traffic~~y~~ would represent a very large expenditure of money, it was considered advisable to hold in abeyance the erection of such a facility at the Newark Airport until such time as the city authorities could be assured that the location selected and its relation to the rest of the operations would obviate future relocation.

A primary factor in the development and improvement of Newark Airport was the Federal Work Program. Through its work relief projects, the Work Projects Administration constructed a hangar which provided the largest unobstructed floor space in the world. Second only to the Detroit Airport hangar in over-all size, this building was adequate to house 14 of the 20-passenger transport planes then in commercial use.

The hangar was divided into three sections, each 350 feet long, separated by a brick fire wall 12 inches thick. An automatic sprinkler system was installed, and explosion-proof windows were a feature of the modern construction. Six lift doors, each 32 feet high and divided into 40- and 80-foot sections, provided access to the vast interior space.

The W.P.A. also installed the system of lights to guide pilots in the use of the airport runways. The system consisted of a series of seven-foot red neon light tubes, laid in a line 1,500 feet long and parallel with the approach of the landing runway, the lights 100 feet apart. Operated by a magnetic switch controlled by a photo-electric cell, prevailing natural light conditions automatically caused the indicators to become illuminated whenever ground was obscured from the air.

Other essential work accomplished by the W.P.A. in the development and improvement of the airport was extensive. For drainage, 200 catch basins were constructed and  $6\frac{1}{2}$  miles of concrete pipe installed. Beyond the limits of the field, the drainage system connected with three ditches constructed a total length of two miles through the meadow lands. In addition to the large pipe, six miles of 6" under-drains were constructed.

Due to the character of the supporting ground at the airport, it was necessary to drive piling to carry the large reinforced concrete pipes. Some of the trenches were twelve feet in depth, and it was necessary to drive sheathing

along the sides, and to place cross-bracing against it to keep the embankment from caving in. Considerable difficulty was encountered with water in all underground construction at the airport, as the elevation of the ground is only a few feet above extreme high tide.

More than 350,000 square-yards of bituminous pavement were used for the construction of runways and related areas. Two new runways were added and the main runway was extended from 3,100 feet in length to 4,500 feet. In addition to the hard surface areas, 300,000 square yards of treated cinders were placed over the runways in the freshly filled areas.

With present commercial activities at Newark Airport practically suspended, due to the loss of terminal contracts to La Guardia Field, the future of New Jersey's greatest experiment in aviation operations remains indefinite. One chapter has been written, and another awaits writing. But at this time it is appropriate to review certain of the intangibles that can not be overlooked in any appraisal of the decade of development that all the world watched at Newark.

Busiest commercial airport in the world, Newark Airport brought more constructive advertising to the city than all the "Made in Newark" insignia ever carried to the world's farthest reaches. Although the port did not compare with Croydon in London or LeBourget in Paris in either design or lay-out, it served a commercial traffic greater than the combined utility of both European airports. It served as a laboratory in the difficult evolution of aviation as an industrial element in America. Its service was rendered, efficiently and safely. Its promise for the future is great -- if incalculable at this time.

FEDERAL AGENCIES SERVING AVIATION IN NEW JERSEY

## FEDERAL AGENCIES SERVING AVIATION IN NEW JERSEY

Prior to 1940, for many years during which it was the busiest and safest airport in the world, Newark Airport served as the eastern terminal of the four major airlines operating a trans-continental service. To expedite the necessary services supplemental to this transportation and terminal operation, the Federal government located offices of various agencies relating to aviation close to Newark Airport.

The Department of Commerce, to carry out the Air Commerce Act approved May 20, 1926, established at Newark Airport a Teletype and Radio Station, an Airway Traffic Control Station, an Airways Communication Station, an Airline Inspection Service Office and an Air Navigation District Office. The Aerological Division of the Weather Bureau of the Department of Agriculture established an office at Newark Airport on March 14, 1929.

The importance of these government agencies to the operation of major airports may be seen from an analysis and review of their functions.

### 1. District Office Air Navigation Division.

This office is charged with the responsibility of maintaining air navigation facilities within its territory, which includes the New England States, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia and a part of Ohio. Under its jurisdiction there are twelve lighted airways, extending over 3,000 miles. Four of these terminated at Newark, and were considered the most important in the United States. The network embraces 275 beacon sites, 31 intermediate landing fields and 36 radio and communications stations. To conduct this maintenance service the district has been divided into sectors, which are manned by field

personnel thoroughly trained to do this highly specialized work. The force consists of radio operators who transmit meteorological reports,

~~radio electricians, airway mechanics and maintenance inspectors who service and repair radio apparatus and airway lights, and report any obstructions to or failures in air navigation facilities.~~

radio electricians, airway mechanics and maintenance inspectors who service and repair radio apparatus and airway lights, and report any obstructions to or failures in air navigation facilities.

Further duties of this office are the rating of privately owned aeronautical lights and the marking of radio antennas, transmission lines and other hazards. It also publishes and distributes notices to airmen regarding all changes in air navigation facilities and municipal airports.

To equip its field men with supplies and replacement parts the office maintained a depot warehouse at Newark in which some 5,000 items of equipment were carried. Within the warehouse was a repair shop at which major repairs and overhauls of various types of equipment were conducted.

## 2. Airway Traffic Control Station.

Its purpose is to enforce safety regulations as applied to civil flying. It is mainly concerned with preventing collisions between airplanes flying on instruments by assigning altitudes and establishing separations. Its area of jurisdiction extended from Newark to the following points: Wilmington, Delaware; Harrisburg, Mercer, and Buckstown, Pennsylvania; Elmira and New Hackensack, New York; and Hartford, Connecticut.

## 3. Airways Communication Station.

This agency was established as a Radio and Teletype Station in 1931 upon its removal to Newark Airport. When new Airways Districts were set-up in 1933, this office was placed under the supervision of the First Airways District Headquarters, located at Newark. In 1935 the Aeronautics Branch was superseded by the Bureau of Air Commerce, and

jurisdiction over this office together with its headquarters was given to the Air Navigation Division of the newly created Bureau. On September 1, 1937, the Air Navigation Division ceased to exist, and this office received its present designation.

This station collects and disseminates weather information by means of the Department of Commerce teletype circuits; broadcasts meteorological reports on regular schedule for the benefit of pilots; and furnishes directive range facilities for the guidance of aircraft flying within the Newark radius.

#### 4. Airline Inspection Service Office.

This office is responsible for the inspection of airlines under its jurisdiction, including the general maintenance and condition of grounds, routes, and commercial sites; the licensing of pilots and the renewal of licenses; the investigation of accidents; and the enforcing of air traffic rules and air commerce regulations.

#### 5. Teletype and Radio Station.

This station furnishes directive range facilities along the Atlanta-New York Airways as well as directive courses over the airport, and also makes radio contacts with pilots in flight. Weather observations are made by the personnel and relayed on teletype circuits at scheduled intervals. The personnel also exerts monitory authority over the teletype and radio facilities of stations in the northeastern part of the district, and reports discrepancies.

#### 6. Aerological Division, Weather Bureau.

This office, formerly located at Hadley Field, New Brunswick, was established at Newark Airport on March 14, 1929. It served as the Aerological Headquarters for the Newark District, which embraces New England, New York,

New Jersey, a portion of Pennsylvania, Delaware, the District of Columbia and eastern Maryland. All reports originating with the forty-nine cooperative stations located within the district were received at this office, where a personnel of nine men was employed to carry on a twenty-four hour service.

In order to provide aviation interests with the most complete information available, these stations sent about 700 reports each day on sky conditions, cloud heights, visibility, wind direction and velocity, temperature, dew point, barometric pressure and other factors that affect flying. In addition, 1,200 or more reports were received from stations in other districts, bringing the total to about 1,900 messages each day on conditions as observed from the ground. One hundred reports on wind direction and velocity at different altitudes were also received daily from various places in the United States and Canada. All these reports were transmitted by telegraph, telephone, teletype or radio. All of the observational work is under the Weather Bureau; the communication system is supervised by the Department of Commerce through its Bureau of Air Commerce.

On the basis of the reports received, eight to twelve maps were made each day to facilitate the study of the data. Four predictions of expected flying conditions over the district and at various plane terminals were also made daily by the forecasters at the station. Another activity was the procurement of upper air records by airplanes equipped with self-recording instruments which indicate the temperature, humidity and barometric pressure continuously during the flight. The data thus obtained were used in research work pertaining to air-mass analysis to determine the effects of the various kinds of air masses upon future weather conditions.

This station is directly responsible to the Aerological Division at Washington and sends reports to that Division as required. All other records are filed according to the Weather Bureau's decimal classification system.

In 1939, most of these government agencies were moved to La Guardia Field in New York City. All airline facilities were suspended at the Newark Airport, and at the present time the City of Newark is negotiating for the reopening of the Newark Airport.

DIRECTORY OF NEW JERSEY COLLEGES AND UNIVERSITIES

2 (16)

DIRECTORY OF NEW JERSEY COLLEGES AND UNIVERSITIES  
1940-1941

Universities and Colleges

<u>Name of Institution</u>	<u>Location</u>	<u>Chief Administrative Officer</u>
<u>Alma White College</u>	Zarephath	Rev. Arthur K. White, President
Division of Arts and Sciences	"	Rev. Gertrude Wolfram, Dean
Bible Seminary	"	Rev. Ray B. White, Dean
<u>College of Saint Elizabeth</u>	Convent Station	Sister Marie Jose Byrne, President
<u>Don Bosco College</u>	Newton	Rev. Alvin M. Fedrigotti, President
<u>Drew University</u>	Madison	Arlo Ayres Brown, President
Brothers College	"	Frank Glenn Lankard, Dean
Theological Seminary	"	Lynn Harold Hough, Dean
<u>Georgian Court College</u>	Lakewood	Mother Mary John, President
<u>Institute for Advanced Study</u>	Princeton	Frank Aydelotte, Director
<u>Princeton University</u>	Princeton	Harold Willis Dodds, President
College of Arts and Sciences	"	Christian Gauss, Dean
Graduate School	"	Luther P. Eisenhart, Dean
School of Architecture	"	Sherley Warner Morgan, Director
School of Engineering	"	Kenneth H. Condit, Dean
School of Public and International Affairs	"	Dana G. Munro, Director
<u>Rutgers University</u>	New Brunswick	Robert C. Clothier, President
College of Arts and Sciences	"	Walter Taylor Marvin, Dean
New Jersey College for Women	"	Margaret T. Corwin, Dean
New Jersey College of Pharmacy	Newark	Ernest Little, Dean
School of Education	New Brunswick	Clarence E. Partch, Dean
College of Agriculture	"	William H. Martin, Dean
College of Engineering	"	Parker H. Daggett, Dean
School of Chemistry	"	William Thornton Read, Dean
University College	"	Norman C. Miller, Director
<u>St. Joseph's College</u>	Princeton	Rev. Arthur DeC. Hamilton, President

<u>St. Peter's College</u>	Jersey City	Rev. Dennis J. Comey, President
Hudson College (Div. of Commerce)	"	Rev. E. Vincent O'Brien, Acting Dean
Division of Arts and Sciences	"	Rev. Thomas I. O'Malley, Dean
<u>Seton Hall College</u>	South Orange	Rev. James F. Kelley, President
Urban Division	Newark	Rev. P. Francis Guterl, Dean
School of Education	"	Rev. Daniel R. Hodgdon, Director
School of Nursing Education	"	Anne M. Murphy, Director
School of Business	"	John C. Lackas, Director
<u>University of Newark</u>	Newark	George H. Black, President
College of Arts and Sciences	"	Edward Hodnett, Dean
School of Business Administration	"	George R. Esterly, Dean
Law School	"	George S. Harris, Dean
<u>Upsala College</u>	East Orange	Evald B. Lawson, President

Professional and Technological Schools

<u>Name of Institution</u>	<u>Location</u>	<u>Chief Administrative Officer</u>
<u>Bloomfield College and Seminary</u>	Bloomfield	Rev. Joseph Hunter, President
<u>College of South Jersey</u>	Camden	Arthur E. Armitage, President
Law School	"	Edward L. Platt, Dean
Division of Arts and Sciences	"	Charles L. Maurer, Dean
<u>John Marshal College</u>	Jersey City	Alexander F. Ormsby, Dean
Pre-Legal Dept. and Law School		
<u>Immaculate Conception Seminary</u>	Ramsey	Most Rev. Thomas A. Boland, President
<u>Newark College of Engineering</u>	Newark	Allan R. Cullimore, President
<u>New Brunswick Theological Seminary</u>	New Brunswick	John W. Beardslee, Jr., President
<u>Panzer College of Physical Education and Hygiene</u>	East Orange	Margaret C. Brown, President
<u>Princeton Theological Seminary</u>	Princeton	John A. MacKay, President

<u>Rider College</u>	Trenton	Franklin Frazee Moore, President
<u>Stevens Institute Of Technology</u>	Hoboken	Harvey Nathaniel Davis, President
<u>Westminster Choir College</u>	Princeton	John Finley Williamson, President

#### State Teachers Colleges

State Teachers College	Glassboro	Edgar F. Bunce, President
State Teachers College	Jersey City	Chris C. Rossey, President
State Teachers College	Montclair	Harry A. Sprague, President
State Teachers College	Newark	Roy L. Shaffer, President
State Teachers College	Paterson	Clair S. Wightman, President
State Teachers College	Trenton	Roscoe L. West, President

#### Junior Colleges

Centenary Junior College	Hackettstown	Robert J. Trevorrow, President
College of Paterson(1)	Paterson	Herbert Spencer Robinson, President
Bergen Junior College	Teaneck	Charles L. Littel, President
Middlesex Junior College(2)	Perth Amboy	Ladd Lukats, Dean
Monmouth Junior College	Long Branch	Edward G. Schlaefer, President
Morris Junior College	Morristown	Arthur Scott Platt, President
Union Junior College	Roselle	Charles G. Cole, Dean
Essex Junior College (1)	Newark	Adolph M. Koch, Dean
King's College(1)	Belmar	Rev. Percy B. Crawford, President
Newark Junior College(1)	Newark	David Bucharest, President

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- (1) Privately owned and controlled. No application has been made to the State for accreditation
- (2) Operated by the Works Progress Administration
- (3) Affiliated with the public schools.

LIST OF VOCATIONAL SCHOOLS IN NEW JERSEY

( \* marks schools with aviation courses )

Atlantic City Boys' Vocational School, 41 N. Illinois Avenue, Atlantic City, N.J.

Atlantic City Girls' Vocational School, Monterey & Texas Avenues, Atlantic City, N.J.

Atlantic City Girls' Vocational School, Indiana & Baltic Avenues, Atlantic City, N.J.

Bayonne Vocational and Technical High School, 30th Street & Avenue A, Bayonne, N.J.

New Jersey Manual Training School, Bordentown, N.J.

Dover Township High School, Toms River, N.J.

Thomas A. Edison Vocational & Technical High School, Summer St., Elizabeth, N.J.

Jersey City Vocational School, 12th Street, Jersey City, N.J.

Orange Vocational School, Central School, 1110 Cleveland St., Orange, N.J.

Passaic Vocational School, Myrtle Avenue & Madison Street, Passaic N.J.

Paterson Vocational School, Summer & Ellison Streets, Paterson, N.J.

Camden County Vocational School, Browning Road, Merchantville, N.J.

Essex County Vocational Schools, Central Office - Essex County Hall of Records,  
High Street, Newark, New Jersey

\* Essex County Boys' Vocational School (Bloomfield Unit) 209 Franklin Street  
Bloomfield, N.J.

Essex County Boys' Vocational School (Irvington Unit) University Place & Myrtle  
Ave., Irvington, N.J.

Essex County Boys' Vocational School (Newark Unit) Sussex Ave. & First St., Newark

Essex County Vocational School, 294 Norfolk St., Newark, N.J.

Essex County Girls' Vocational School, 300 North 13th Street, Newark, N.J.

Essex County Girls' Vocational School Annex, 145 West Market St., Newark, N.J.

Middlesex County Vocational Schools, Central Office, School #1, Easton Avenue  
New Brunswick, New Jersey

Middlesex County Vocational School #1, Easton Avenue, New Brunswick, N.J.

Middlesex County Vocational School #2, 618 New Brunswick Ave., Perth Amboy, N.J.

Middlesex County Girls Vocational School, Convery Boulevard, Woodbridge, N.J.

## AVIATION FOR THE CITIZEN

The advent of the biplane, light airplane, and motorized new machines has provided us with a new means of transportation, technical or mechanical, capable of conquering air transportation.

Now aircraft are becoming a part of life in the world, but in America they are becoming a part of private commercial operations and aviation among the people. Operating light airplanes, enjoying the delights and advantages of air transportation, and in many ways leading Americans to fly. These include pilots and flyers of all ages and the pioneers of the aviation of tomorrow.

Aviation flying today has changed with the days of living, for it is not only a sport, but a means of transportation. The average daily driver in fly is a car, but the average citizen's transport of the air, for it is the most reliable and the most economical way, at least the way of a better personal car, with elementary flying lessons shown in our good nature. One of these light planes are so easy to handle, you really pull the steering wheel toward you to take off, turn it to right or left as you would steer an automobile for curves and to come down, just push the wheel from you. This lighter type of airplane, costing about \$1,000 to \$1,500, has a small motor of approximately 10 horsepower. It is anticipated that in a very few years, the popularity and use of this type of airplane will be such that the demand for light planes will be on a scale similar to the early days of automobile production. The rising popularity of the "flying" plane will mean that the aviation industry will be a part of the country by air as well as on the ground in transportation.

## AVIATION FOR THE CITIZEN

The advent of the inexpensive, light airplane has created new horizons for private or citizen flyers, and there is now no technical or financial obstacle to universal air transportation.

Few aircraft are privately owned elsewhere in the world, but in America there are thousands of private commercial operators and citizen owners and flyers, operating light airplanes, spreading the delights and advantages of air transportation, and in many cases teaching Americans to fly. These private pilots and flyers of today are pioneers of the aviation of tomorrow.

Citizen flying today has changed many of our ways of living, for it is now safe and easy and relatively inexpensive to satisfy the average man's desire to fly -- to take active part in civilization's conquest of the air, for it is now possible to buy an airplane for personal use, at about the cost of a medium priced car, with elementary flying lessons thrown in for good measure. Some of these light planes are so easy to handle, you merely pull the steering wheel toward you to take off, turn it to right or left as you would steer an automobile for turns; and to come down, just push the wheel from you. This lighter type of airplane, costing around \$1500. to \$1800., uses a small motor of approximately 50 horsepower. It is anticipated that in a very few years, the popularity and prevalence of citizen flying and the demand for light planes will increase on a scale similar to the early days of auto production. The rising popularity of the "flivver" plane will soon find vacationists traveling over the country by air as well as on the roads in auto-trailers.

Facilities for landing, servicing, parking and storing light planes will rapidly expand, and aviation authorities predict that golf clubs, beach resorts, fishing camps, tourist camps, dude ranches and resort hotels will soon be installing accommodations for the use of Mr. and Mrs. Citizen Flyer traveling overland in the light plane.

There are now approximately 10,000 owners of light planes, compared with only 322 commercial planes operating on scheduled air lines. Flying is real sport, and there will be more and more of it as production and demand increases and as servicing facilities and airports or landing fields are developed; however, not as a sport but as a utility, is unscheduled flight due for its greatest development. Even now, privately flown planes are being utilized in many fields and for numerous commercial purposes.

Citizen aviation has already gained popularity in the rural sections of New Jersey. Crop dusting or spraying is being done most efficiently by light airplanes. They are used to feed and count game animals in winter or to stock trout in inaccessible lakes and even scatter tree seeds on barren mountain slopes. Flying, in good weather or bad, has become constantly easier and safer as science and technic in construction and operation have been developed. Planes are being used to aid mining, prospecting, ranching, agriculture, surveying and mapping, forest conservation and fire fighting, advertising, photography, inspection and patrol of fisheries and game preserves, pipe line operations, marine facilities and in other numerous emergencies of varied nature. These light planes continue to return greater revenue in proportion to cost, and the club plan of ownership is in effect at numerous fields. Thus, for utility, aviation is offered its greatest development opportunities and the creation of more community or local airports should be included in

any development plan in order to promote more citizen flying and plane ownership.

There may be plenty of room in the air, but not enough safe places to land. More numerous landing field accommodations will make it possible for private planes to venture further from home base and obtain birdseye views of more distant country. In the private or local flights, lies the prosperity of the community airport, or landing field, encouraging more student training, greater interest in citizen flying, bringing enjoyment to thousands who have never experienced the thrill of flight.

Restriction of airports to certain classes of aircraft, operations and activity is necessary. It would be uneconomic, and certainly not in the interests of safety, to combine all types of traffic in a few central airport terminals. Commercial traffic on scheduled time requires synchronized operations, approached<sup>5</sup>/<sub>6</sub> landings, servicing and take-offs. Operations at a terminal airport obviously do not safely permit slow moving student training ships which require frequent practice take-offs and landings or the practice flights of private flyers who wish to perfect their landing technic. It is readily apparent that the requirements of commercial aircraft are vastly different from those of private flyers, and that facilities must be provided for each, if the interests of aviation development are to be served to the best advantage. Runway length may be less important than width; sodded runways may serve as efficiently as concrete; shop facilities, and servicing needs differ widely according to the type of aircraft being used; therefore the development of private, community and municipal airports is needed in order to promote greater safety and prevent interference between private flying and scheduled operations. Proper airport classification

and segregation of operations based upon actual requirements will provide ample facilities for all concerned, and will allow unhampered development in each direction, for every airport, large or small, whether commercial or private, has national defense value and is therefore of public interest and concern.

Annually, more than one thousand resident pilots and student pilots use New Jersey airports and airways. They fly every known type of aircraft under all conditions of weather. They burn more than seven million gallons of aviation fuel and carry an estimated quarter of a million passengers.

New Jersey has many fine airports, landing fields and seaplane bases, but it could wisely provide more. It has seventy-four factories which manufacture airplanes, parts, accessories and other aeronautical equipment, employing thousands of engineers, mechanics and other skilled workers. Much of the civil and military equipment used in present day aviation is powered by motors manufactured in New Jersey, one factory alone employing approximately eighteen thousand workers, but there is plenty of room for <sup>^</sup>further expansion.

To encourage development of aviation in New Jersey, no fees are levied on pilots, planes, fields or any other element of aviation, and the present tax on aviation gasoline is refunded. It is reported that a total of \$300,000 per year is returned to users of aviation gas as a refund. This money could well be used in airfield development and thereby be of distinct benefit to the citizen pilots of New Jersey, just as automobile users enjoy the use of good roads from taxes collected.

An educational program for aeronautic instruction and enlightenment is highly desirable. In New Jersey aviation authorities have maintained close contact and cooperation with Junior and <sup>Senior</sup> High schools, where, by exhibits, lectures and vocational guidance information they have assisted hundreds of young people to secure desired knowledge on aviation subjects. Great numbers of boys belong to model aero clubs and are avid students of the mechanics of flight. 2

Glider clubs present another form of aviation interest which is encouraged in New Jersey along with prize contests in model building and gliding, all of which are necessary parts in a well-planned program of public education in aeronautics, designed to increase interest in citizen flying and further the development of aviation in New Jersey.

During 1940, 25,000 young Americans learned to fly under the Government's civilian pilot training program, and ten colleges and universities throughout New Jersey had a big part in this worthwhile endeavor, giving courses to students, many of whom will be the private plane owners and flyers of tomorrow. In this civilian pilot training program, which went into operation at the beginning of the college year in 1939, thousands of students enrolled in the standardized course of instruction under competent and experienced pilots who were re-rated as instructors and charged with the responsibility of training this vast group of American youth. The course requires seventy-two hours of class-room instruction and approximately thirty-five hours of flying by each student. Seven per cent of such students to be trained are chosen from non-collegiate groups.

At Teaneck High School, a complete course of aviation and pilot instruction has been a regular part of that school's class instruction program for several years, it being the first school in the United States to provide such a course using its own plane for flight instruction. A considerable number of graduates of this high school are now licensed pilots.

In the vocational school field, instruction courses in aviation have been established to prepare youth for gainful employment in the aviation industry, such as the Essex County Boys' Vocational School at Newark.

Numerous trade schools have been established in New Jersey to provide skilled labor for aviation development, expansion and manufacturing requirements. Outstanding among these is the Casey Jones School of Aeronautics at Newark, which occupies the old city market building, covering an entire square block and built by the city of Newark at a cost of five million dollars. This private school, established about ten years ago, has grown rapidly and is now rated the leader in its field. It was awarded top honors by the Bureau of Aeronautics of the Department of Commerce in its ratings list of Aviation Mechanic Schools of the United States and was one of the first in the country to be selected by the Army Air Corps, when that body adopted the policy of training air mechanics.

The Casey Jones School maintains a thoroughly experienced staff of engineers and licensed mechanics, training young men in all details of aeronautical engineering and practical mechanics of the construction, repair and servicing of airplanes, engines and accessories. Their staff instructors constantly maintain industrial contacts, always keeping abreast of the latest methods and developments in manufacturing and maintenance.

An employment system for graduates, maintained by the school, has proven most successful, for there are few of the leading airlines and manufacturers of airplanes, parts or accessories, which do not include in its personnel, graduates of the Casey Jones School of Aeronautics.

In New Jersey, State Aviation authorities have assisted various municipalities in developing airports through relief projects, if in their opinion such airports fitted into the logical plan and offered the necessary opportunities for future expansion. Private aero clubs have also been assisted in locating suitable sites for safe landing and operating facilities.

Another phase of aviation offering great opportunity for development in New Jersey is the seaplane base, requiring smaller investment in land and operating facilities, and more desirable from safety and utility viewpoints, in a State such as New Jersey which is almost surrounded by water. Use of seaplane bases is gradually increasing, and the light airplane is splendidly adapted to such use. Many students are taking primary training in this type of aviation activity in New Jersey.

Air fields or seaplane bases, operated by local government (municipal), can actually be made into profitable investments and become business magnets about which to build and develop other groups of allied or collateral industries. It is to be hoped that the privately owned fields, municipal airports and seaplane bases of New Jersey will be further improved and developed for community benefit and convenience and for promoting aviation and industrial expansion as well as proving a most necessary unit in any national defense program.

An intensified, planned program of aviation and airport development will also stimulate advancement in aeronautic research and experiment, and thus further aviation progress.

THE NEW JERSEY STATE DEPARTMENT OF AVIATION

## THE NEW JERSEY STATE DEPARTMENT OF AVIATION

The first law pertaining to aviation appearing on the statute books of New Jersey was passed in 1913. This act, pamphlet laws 1913, chapter 50, page 84, provided that no person was to drive an airplane in any exhibition or contest over that portion of the grounds reserved for spectators. Between 1913 and 1931 attempts at regulatory legislation were made, but no single important act was passed which sought to encompass the entire field of aeronautics. In 1929, the uniform aeronautics law, pamphlet laws 1929, chapter 311, page 721, was passed. This act had, as its general purpose, an aim to make uniform the laws of those states which enacted it, and to harmonize with Federal laws on the subject of aeronautics. This statute has been incorporated into the revised statutes of 1937, R.S. 6:2-1 to 12.

It was not until 1931, however, that a real effort was made to coordinate Federal laws and regulations and the state laws pertaining to aviation.

The New Jersey State Department of Aviation was created by the State Legislature in 1931. This department, the State Aviation Commission and a State Director of Aviation, were provided for in the pamphlet laws for 1931, chapter 190, page 475. The title of this act reads as follows:

"An Act to establish a department of aviation, to provide for the appointment of a State Aviation Commission and a State Director of Aviation, the licensing of aircraft and airmen and the supervision and regulation of aircraft and air traffic in and over the State."

The 1931 act, section 4, provided that the 5 members of the Commission be citizens of New Jersey, and at least 3 of them be actively engaged in the aviation industry. The members were to be appointed by the Governor by and with the consent of the Senate to take office on the 1st of April, 1931, or on the date after the passage of the act, and to serve terms as follows:

1 member for 1 year

1 " " 2 years

1 " " 3 "

1 " " 4 "

1 " " 5 years

Thereafter all appointments were for 5 years.

Section 5 provided for the appointment of a Director of Aviation by the Governor with the consent of the Senate for a term of 5 years and until his successor is appointed and qualified. The director was required to be an airman holding a valid pilot's license issued by the U. S. government.

Section 6 provided for the organization and procedure of the commission.

Section 7 enumerated the powers and duties of the commission. These are similar to those in R.S. 6:1-9.

Section 8 enumerated the powers and duties of the director. These are similar to those in R.S. 6:1-10.

Section 9 was amended by Laws 1932 chapter 51, page 74 as hereinafter set forth.

Section 10 gave the chairman of the commission power to subpoena witnesses and administer oaths, and is similar to R.S. 6:1-11.

Section 11 stated the salary of the director was to be fixed by the Governor, but was not to exceed \$5000. The members of the commission were to be reimbursed for actual expenses.

Section 12 provided that the State House Commission find suitable quarters in or near the State Capitol buildings at Trenton for the Department of Aviation.

Section 13 provided for an appropriation of \$8000 for the use of the department for the fiscal year next ensuing the passage of the 1931 act. This appropriation was made in Laws 1932, page 410.

In 1932 the title of the 1931 act was amended by pamphlet laws 1932, chapter 51, page 74 to read as follows:

"An act to establish a department of aviation; providing for the appointment of a State Aviation Commission and a State Director of Aviation; the licensing of aircraft and airmen; the supervision and regulations of aircraft and air traffic in and over the State, and fixing penalties for violations of the provisions hereof."

Section 2 of the 1931 act was also amended, enlarging the definitions. Section 9 was amended by the 1932 act making it mandatory to obtain a license for each aircraft from the Department of Commerce of the United States and to register said craft with the Commerce Department. All pilots were required to obtain a license by section 9-A, which license was to be carried by the licensee according to the provisions of section 9-B. Under section 9-C all airports were required to have a license issued by the N.J. Aviation Commission before they could be operated. Section 9-D made it unlawful for any but licensed airports to bear a circle mark on the landing field. Nor

could a standard cross marker be used unless permission was first obtained from the N.J. Aviation Commission. Section 9-E prohibits the operation of air exhibitions, meets or races with <sup>out?</sup> permission. Section 9-F declared it unlawful for any owner or pilot to carry passengers in any aircraft (for hire or reward) from any airport in N.J. unless said airport had been granted a permit from the N.J. Aviation Department, Sections 9 to 9-F correspond to R.S. 6:1-12 to 19. ?

Although the Department of Aviation was created in 1931, no appropriation was evidently made until 1932, when an allowance was given by pamphlet laws 1932, chapter 193, page 410, sections K20, to the department as follows:

Salaries	\$6,680.00
Other miscellaneous expenses	<u>2,650.00</u>
Total	\$9,330.00

The revised statutes, sections 6:1-1 to 6:1-17 are derived from pamphlet laws 1931, chapter 190, pages 475-480, sections 1-12, as amended by laws 1932, chapter 51, page 74, and laws 1933, chapter 453, page 1259. These acts provided for the regulation of aircraft and airports, and continued the State Department of Aviation, the State Aviation Commission and the office of State Director of Aviation as previously created and established.

Part of the act of 1931 was held invalid in State vs. Larson, 160 A. 556, 10 N.J. Miscellaneous 384, because it referred to the Federal Air Commerce Act of 1926 for a standard of guidance, without incorporating the provisions of the Federal Act therein. This was held to be an unconstitutional incorporation by reference in violation of the New Jersey Constitution, Article 4, section 7, paragraph 4.

The Legislature in 1938, pamphlet laws 1938, chapter 48, page 126, enacted a new act regulating aeronautics over and within the State. While the act of 1931 is not expressly repealed, the subject matter thereof would seem to be substantially covered by the act of 1938, except the provision relating to the display of the circle or cross markers on airports or landing fields as contained in revised statutes 6:1-16.

The requirements of the Director of Aviation were increased by the act of 1938. In addition to a valid pilot's license, the Director was required to have at least 10 years' experience in the aeronautical industry, and at least 3000 certified flying hours as a pilot. The maximum salary for the Director was also increased to a ceiling of \$7500. The appropriation for the Department of Aviation for 1940 lists his salary as \$6000.

An itemized account of the annual appropriations for the years 1933 to 1940 inclusive follows:

1933 Appropriation

P.L. 1933, C231, p. 536 Section D18

Salaries	\$6680.00	2
Materials and Supplies etc.	2500.00	
	<u>\$9180.00</u>	

1934 Appropriation

P.L. 1934, C232, p. 581 Section D18

Salaries	\$6680.00	2
Materials, Supplies etc.	3200.00	
	<u>\$9880.00</u>	

1935 Appropriation

P.L. 1935, C239, p. 657 Section D18

Salaries	\$6680.00	2
Materials, etc.	3200.00	
	<u>\$9880.00</u>	

1936 Appropriation

P.L. 1936, C220, p. 611 Section D18

Salaries: Director	\$5000.00
Senior Clerk-Stenographer	1680.00
Aviation Mechanic	900.00
	<u>\$7580.00</u>
Materials, etc.	4100.00
	<u>\$11680.00</u>

1937 Appropriation

P.L. 1937, C177, p. 485 Section D18

Salaries: Director	\$5000.00
Compensation of other employees,	
present, \$3480; new, \$2760.	6240.00
	<u>\$11240.00</u>

Materials and supplies etc.	900.00
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Miscellaneous expenses:

Travel	\$3500	
Telephone	200	
Advertisement	100	
Subscription	<u>80</u>	
		3880.00

Additions and improvements:

All-wave radio	200.00
Total	<u>\$16220.00</u>

1938 Appropriation

P.L. 1938, C313, p. 739 Section D18

Salaries: Director	\$6000
Other personnel \$6020	\$12020.00
Materials etc.	800.00
Services other than personal	4500.00
Two parachutes	450.00
	<u>\$17770.00</u>

1939 Appropriation

P.L. 1939, C102, p. 283 Section D18

Salaries: Director	\$6000	
Compensation other employees	<u>6020</u>	\$12020.00
Material and supplies	\$400	
Replacement of office equipment	50	
Other materials and supplies	<u>400</u>	\$ 850.00
Services other than personal		
Traveling	\$4000	
Telephone	300	
Other miscellaneous expense	<u>300</u>	\$ 4600.00
		<u>\$17470.00</u>

1940 Appropriation

P.L. 1940, C158, p. 408 Section D18

Salaries: Director	\$6000	
Others	6140	
Inspector (seasonal)	<u>750</u>	\$12890.00
Materials and supplies:		
Stationery etc.	\$ 300	
Maintenance of aircraft	1200	
Other supplies	<u>145</u>	\$ 1645.00
Services other than personal:		
Traveling	\$2470	
Miscellaneous	<u>400</u>	\$ 2870.00
Additions and improvements:		
Light aircraft	\$3600	\$ 3600.00
		<u>\$21005.00</u>

Recapitulation:

1933	\$ 9,180.00
1934	9,880.00
1935	9,880.00
1936	11,680.00
1937	16,220.00
1938	17,770.00
1939	17,470.00
1940	21,005.00

The Federal government appropriates to itself jurisdiction over so much of the navigable space of the territory of the United States as is necessary for carrying on interstate commerce and the activities of the national defense system. The Federal government establishes standards of airworthiness for aircraft and airmen operating in interstate commerce, or using the facilities of the Federal airways at terminal establishments.

The standards established for airmen and aircraft cannot be made effective in intrastate operations without the participation and cooperation of the State in making them effective. This the State of New Jersey has striven to accomplish by the legislative enactments referred to above. Through the Department of Aviation the State has shown the importance of proper regulatory legislation. One need only note the absence of passenger fatalities in New Jersey in recent years to come to a full realization of this truth.

A UNIFORM SET OF MAPS OF PRINCIPAL AIRPORTS  
IN NEW JERSEY TO FOLLOW HERE.

Include map of  
airport development  
with explanation  
of 2 or 3 pages