

1947

Economic Planning and Control in Air Transportation

Hal E. Nourse

Recommended Citation

Hal E. Nourse, *Economic Planning and Control in Air Transportation*, 14 J. AIR L. & COM. 436 (1947)
<https://scholar.smu.edu/jalc/vol14/iss4/2>

This Article is brought to you for free and open access by the Law Journals at SMU Scholar. It has been accepted for inclusion in Journal of Air Law and Commerce by an authorized administrator of SMU Scholar. For more information, please visit <http://digitalrepository.smu.edu>.

ECONOMIC PLANNING AND CONTROL IN AIR TRANSPORTATION

By HAL E. NOURSE

Vice-President—Economic Controls, United Air Lines, Chicago, Illinois; Washington State College, A.B., 1927; Harvard Business School, special training, 1944. Lecturer on air transportation at Northwestern and other major universities. Author of several papers on air transport economics before the Society of Automotive Engineers, American Management Association, Institute of Aeronautical Sciences, etc. Co-author of the Nourse-Mentzer direct cost formulae in air transportation, widely used in aviation circles the world over.

THIS article concerns itself with a new and progressive concept of centralized planning and control for top management. The concept has developed into a going affair as a result of an obvious need in the growing industry of air transportation with its far-flung geographical ramifications. Although this specific plan, as it is described below, is peculiar to one airline (United Air Lines), it is firmly believed that several of the aspects of the plan are applicable to any transportation business whose operations take place over a wide area, but more particularly to air transportation.

Reasons for Centralized Planning

A large, modern airplane, with its great speed, is capable of generating almost as many seat miles as a streamlined train or sixteen highway buses. Many times, this capacity is spread out in a long, thin line, stretching from tide water to tide water. Within the confines of this thin line must be fitted, just so, all the services offered to a number of ground points in a surprisingly short period of time. The fundamental nature of the business therefore requires *highly coordinated planning processes* and the *standardization of these processes* becomes vital to a widespread operation.

Not only does the operation have geographical ramifications but volume of traffic moving over these route segments has expanded and will expand. This type of expansion alone will continue to mean that present practices and methods of handling this increased volume will become obsolete more rapidly than they will in an operation which has passed the dynamic stage.

Air transportation is unlike many businesses which may operate as a separate entity, independently manufacturing a different product than other plants of the same corporation. Air transportation is composed of a multiplicity of small, widely separated plants (stations) but linked by swift transportation (the airplane), traveling person-

nel (the crew), and much exchange of information and communication about the same things (the payload).

As a result of gigantic global problems involving swift air transport, both the Army and Navy, during the war, recognized the need and set up central planning and control agencies. Certainly the peculiar global nature of the war, with its widely separated operations, pointed up to the Services the need for central planning much as it has done, in a much lesser way, of course, to the management of United Air Lines. United Air Lines' program started several years before World War II.

In the various planning functions, there is considerable overlapping or "twilight zone." It is definitely efficient to have such a situation organized under one head instead of spreading these functions out across the organization chart under several bosses of equal organization status.

Broad Functions of Airline Management and Operation

Regardless of the organization for operation, a commercial airline will be faced with major management planning functions as follows: Planning to maintain and fly its airplanes properly, to sell its services, to handle its payload, and to account for its operations. These major objectives break down into numerous "packages" and no two airlines break these responsibilities down in exactly the same manner. No matter how or what shape the organization for operation may take, each segment or division has certain economic planning and control functions common to all.

The following arrangement of airline functions vs. organization elements indicates how one major airline is organized to carry out these basic operations of airline management.

<i>Organization Element</i>	<i>Function</i>
Top Management*	Policy, administration, and coordination.
Economic Controls	Economic planning with technical control.
Operations	Maintain and fly airplanes and handle payload.
Passenger Service	Passenger service planning with technical control for quality, quantity, etc. Handle food service.
Traffic and Sales	Sell passenger and cargo services, etc. Tariffs.
Finance and Property	Account for operations; custodian of properties.
Personnel	Planning and technical control—personnel problems.
Public Relations	Sell services through good will.
Law	Legal planning and technical control.
Medical	Medical planning and technical control.

* Includes President, Secretary of Corporation (who is also President's assistant), and Vice President-Administration.

Cost Aspects

The cost of this planning technique, at the present time, amounts to about six-tenths of one per cent of the total operating cost of

United Air Lines. It is easy to develop almost astronomical dollar economies on paper with fair logic behind them when considering a scientific approach to planning problems. In actual practice, these sums often become ridiculous and do not stand up well. It is not the intention to make such boasts for the program described in this outline. By the same token, it would be equally ridiculous to assume that the economies inherent in this program would be less than the cost of the program. At the present time, United Air Lines has between 11,000 and 12,000 employees on its payroll. As the company grows, it is anticipated that the cost of this program will be reduced to less than one-half of one per cent of the total operating expense since the planning functions will not have to be expanded greatly as this growth takes place.

Economic Planning and Control — Centralized

This planning concept segregates a number of the "common-to-all functions" and sets them up in one place under one head to provide a plan and a service to all segments of the organization. It is distinctly important to remember that the process to be described contemplates no operating functions in the field—activities are restricted simply to planning with technical or functional control; the administration and implementation of the plans remain with the line organization. As such, the entire planning staff remains domiciled at headquarters, though many of its members do travel and work with others in carrying out various assignments.

Line Organization — Assistance

In those fields of activity where a great deal of study and research are required to formulate plans and policies, permanent part-time or even full-time help is assigned from the line organizations to assist the centralized group. This is particularly true in such areas as job analysis and evaluation, standards setting, methods work, airplane schedule planning, etc. After the plan evolved is adopted, these assigned experts remain with the line organization for implementation and follow-through purposes. They become the central planning group's men in the field for further advances in use of the techniques established.

Training Aspects

The centralized planning group, furthermore, is used as a training spot for individuals not only in certain highly specialized areas but also for young men with high potentials for supervisory and executive work. Nowhere in the organization does an individual get as concentrated a dose of business and operations problems in air transportation as he does in this work. Novices start, with good formal education only, to learn the planning techniques and later are chosen for either operations and functional supervisors or to carry on the work they have learned at headquarters in some highly specialized field at the operating level.

Development of the Planning Organization

For air transportation, a relatively young industry, the development period of this management planning organization has been a long and healthy one. By virtue of this fact, its roots are deep and well placed. The development started fifteen years ago when the present president of the company had the foresight to see some of the "growing pains" which the industry was to face and moved to be in a better position to meet the situation. It reached its present stage only during 1945. It has taken on new planning functions only as organization size and complication have justified such expansion. Because of this gradual growth, it has expanded without causing internal friction or morale problems, assuming each new responsibility at the opportune time. The concept and the outline for the entire program was conceived and drawn up years ago, and it is still to be completed.

I. ORGANIZATION AND OPERATION OF THE PLANNING UNITS

Functions

The "common-to-all" management planning functions selected for better airline management are as follows:

Organization and job planning.

Budgets and economic research (short and long range planning).

Work analysis or methods and facility planning.

Airplane schedule planning.

Weight-space planning.

Company regulations.

Organization and Job Planning

The central organization is divided into three small operational units:

- | | |
|--------------------------|-------------|
| 1. Organization Planning | } 11 people |
| 2. Job Analysis | |
| 3. Job Evaluation | |

Air transportation has been an expanding industry, having increased from 10,509 personnel in 1939 to approximately 68,616 today. Organization and division of responsibilities for 2,000 employees becomes completely inadequate for 12,000 employees. It becomes necessary in such a situation to move up behind oneself to bring the new horizons continually into view and plan accordingly. It has been found that organization study and planning, which fit new jobs and new responsibilities into the scheme of things, are co-partners. If one sets down job content, he also cumulatively defines and sets the limits of responsibility in organization. Job analysis is the constituency of organization. Based on this logic, organization planning and job work operate within United Air Lines under a superintendent of organization planning. This division is concerned with comprehensive organization planning and the establishment of a sound organization structure which will facilitate the effective management and operation of the company. Through the use of organization charts and text

material, this division defines the functions and responsibilities of organization elements, limits of authority, correct title, and the relationships between various parts of the company, for the crystallization of duties and responsibilities is one of the principal means of realizing a coordinated company organization.

Budgetary Control and Economic Research

The central organization of this department is divided into four operational groups, all located at general headquarters:

- | | |
|-----------------------------------|-------------|
| 1. Forecasting and Planning | } 37 people |
| 2. Budgetary Control | |
| 3. Route Research and Development | |
| 4. Economic Research Library | |

Combined in this organization are several closely allied functions, all pertaining to the current planning of future market, economic, and financial aspects of company operations.

The objective of the Forecasting and Planning Section is to develop forecasting techniques and to provide periodic physical and financial projections of company activities. These projections include estimates of general economic activity, industry and company traffic volumes, physical facility requirements, profit and loss, cash position and financial requirements. Sales quotas and detailed planning statistics are prepared for use by the line organization and by the Budgetary Control Division in implementing the work standards program developed by the Work Analysis Division. Estimates of daily revenues, expenses, and income are also the responsibility of this section.

The objective of the Budgetary Control is efficient management of expenditures. The two major functions of this division are performed by the Budgetary Development Section, which develops techniques and procedures for effective budgetary control, and the Budget Operations Section, which carries on the day-to-day work of the division.

The development group, a research body, provides the basic cost relationships, the processes and the measuring sticks which comprise the kit of tools which the operations group uses, in cooperation with the budget men in the line organization, in building the budget. Included in this function is the pricing of personnel requirements calculated by the Forecasting Section, which then becomes a major constituent of the expense budget.

The operations unit prepares agendas, gathers information, and presides over meetings of the Budget Committee (composed of top officers of the corporation). It also keeps records and minutes of these important meetings, assists the line organization in the preparation and revision of their operating budgets, etc.

The Route Research and Development Section has as its objective the organization and presentation of factual data for the use of management and for the use of government regulatory bodies in matters

affecting the economic expansion and development of the company. This section conducts research and presents recommendations to the Route Development Committee relative to company position and action before federal and state regulatory bodies. It prepares and presents factual exhibits and testimony before such bodies. It provides information to management relative to regulatory developments in the industry and maintains complete company files of official route expansion and regulatory documents.

The Economic Research Library maintains an extensive working file of reports, publications, pamphlets and clippings for the use of the personnel of the department.

Work Analysis and Facility Planning

The central organization is divided into four small working units:

- | | |
|---------------------------------|-------------|
| 1. Facility and Layout Planning | } 23 people |
| 2. Work Standards Group | |
| 3. Forms and Reports Control | |
| 4. Special Projects Unit | |

The objective of work analysis and facility planning in air transportation is to foster and accomplish efficient work methods, including efficient design of work spaces in buildings, offices, hangars, etc.

The Work Analysis staff is a group of highly specialized technicians but small in number. In an expanding air transportation, needs of this type of work are so great that the staff furnishes technical direction, planning, and work guidance to the staffs of the line administrations or departments concerned, who cooperate to furnish qualified individuals to accomplish the desired results.

The Facility and Layout Planning Unit is responsible for the development of efficient work layouts in all new and remodeled work spaces in offices, buildings, and hangars.

The Standards-Setting Unit is responsible for development of standard time allowed for accomplishing all routine tasks necessary in the operation of the airline. It develops the forms and the "know how" in standard-setting, which are the tools used by supervisors in charge of the many work groups and the Budgetary Control people to determine allowed and budgeted manpower load.

The Forms and Reports Control Unit is responsible for developing standards as to size, design, and paper stock quality, as well as quantity, of all paper forms necessary in recording the action and conduct of the airline. All forms, new and revised, must be checked and approved by this unit before they are used. It is also responsible for designing and controlling (eliminating duplication of data and information) all routine reports necessary for the efficient operation of the airline.

The Special Projects Unit is responsible for carrying out special studies and assignments, where there is an acute need, and as directed by Management.

When the scope of an assigned project is too great to be handled by the Special Projects staff, or qualified staff men in the line organization are not available, outside industrial firms may be called in to furnish manpower; and the work is coordinated by the Special Projects staff. This makes it unnecessary to staff this group on a "fire house" basis.

Airplane Schedule Planning

This little central planning group is composed of seven specialists and its work breaks down into three principal functions:

1. Current Schedule Planning—next schedule change.
2. Long Range Schedule Projects—including a four months' forecast every month.
3. Weight-Space Planning—next schedule change.

The objective of this work is to coordinate with all interested departments, finally developing a system airplane schedule and space-weight plan satisfactory to all; and to produce and distribute these plans as a basis of scheduled operation for the airline. Inasmuch as the airplane schedule pattern is the "jig" upon which the product, air transportation, is fabricated; this division, though small in numbers, performs extremely important work.

The current schedule planning is carried on through the Schedule Committee, chairmanned by the planning office, and composed of one member from each interested administration or department. Recommendations for schedule changes are discussed, all problems affecting each department are brought to light, trip load factors, payload, and market statistics are scrutinized, and final decisions are made. These decisions are checked with the Vice President-Economic Controls and with the President's office, if necessary, for policy. After this clearance, the time table is printed and distributed to all operational elements concerned.

The person assigned to planning is responsible for developing and publishing tentative schedule patterns for each type of equipment several months in advance. This schedule forecast is used by station supervisors in planning workloads in advance and in accordance with the work standards set by the Work Analysis Division.

The space-weight group is responsible for planning, through study of records and anticipated factors, the amount of carrying capacity which may be sold in advance, for passengers, mail, express, and freight. This is done by station, and charts are produced reflecting this planning which are distributed to all supervisors and stations concerned. This set of charts becomes the forward planning "Bible" on each trip out of each station for the entire operation.

Regulations Planning

The Regulations Planning Group is centralized and its work breaks down into two units:

- | | |
|---------------|------------|
| 1. Editorial | } 8 people |
| 2. Production | |

The regulations of any organization contain its operating philosophy, policies, and rules of conduct. The Regulations Section is really the part of the Economic Planning and Control Group which is responsible for putting in company legal form many of the plans evolved by other planning groups discussed previously. In addition to this, however, this group of writers and typists relieves the entire organization of editing and production details. This group is responsible for seeing that duplication of ideas and material is eliminated and that form and treatment of content are standardized. The editors work with staff men in the line organization, take rough drafts and ideas, re-edit, rewrite, and obtain proper approvals before turning the regulation material over to the production group, which is responsible for final production and distribution of regulations material throughout the organization.

II. COORDINATION IN CENTRAL PLANNING

Twilight Zone

The several divisions of the Economic Planning and Control Administration must coordinate and work closely with each other to accomplish the overall planning responsibility assigned to it. It is utterly impossible for the Work Analysis Division to complete a methods study or a procedural study without getting into an organization planning problem. Organization and methods work, therefore, mesh these two divisions of the group. The Budgetary Control responsibility cannot be completed without coordination with the Standards-Setting Unit in Work Analysis. Budget puts the price tag on the work standards. The short term budget forecasts must start with a market appraisal of the longer range planning unit in Economic Research. The Schedule Planning Group cannot do its work properly without consultation with Work Analysis on station time, airplane turnaround time, etc., nor without consultation with Economic Research on markets.

An Example of Coordination

The business problem is the consideration, purchase, and putting into service of a fleet of new airplanes.

1. Economic and Market Research starts out with a cooperative effort with the Airplane Design Section of the Engineering Department (not a part of central planning) to determine type of equipment which may be available. Equipment size and type have a definite bearing on the market to be expected.
2. Market Research forecasts the market at assumed tariff levels.
3. The Schedule Division lays out the schedule pattern with the airplane type or types to be available. This determines the number

of airplanes to be procured if all other factors, including net income, are favorable.

4. The Budget Group then converts all into a physical and financial projection including physical factors (load factors, tonnage—bricks and mortar), net income, cash, expected balance sheet items, etc.
5. At this point, all is ready for top management's consideration. Of course, to this point, top management has been kept advised and the planning group has received policy guidance.
6. The decision is favorable to proceed with projected equipment program, and contracts are negotiated for purchase and delivery of equipment from airplane manufacturers. Also, at this point, the expansion planning program is used in developing a financing program with a group of banks and underwriters. The key members of the Economic Planning Group (as a planning service group) coordinate with the Vice President-Finance and the underwriters.
7. The Airplane Schedule Division again checks with Market Research after airplane delivery schedule from factory is available and again begins to plan the utilization of the fleet. This is a continuing process because delivery schedules are subject to great change and so are market potentials.
8. When the new service is imminent, its effect on organization and jobs is scrutinized by the Organization Planning Group. This process continues, also, through the initial use period of the new fleet. Some experience is usually necessary before the real impact on jobs and organization is known.
9. As soon as possible after the fleet is put into operation, the Methods and Work Standards Units begin their work; and then, last but not least, the results of this work are taken by the Development Group in Budgetary Control for use in budget development. Also, new and changed regulations are necessary, coincident with the operation of the new, faster, larger airplanes.

The example just cited was chosen because the whole process involved a period of over two years and an expansion program of over \$75,000,000, a large portion of which came from other than the company's own operation. It involved the recent financing program of United Air Lines. The central planning group has devoted a tremendous amount of time and skill to this planning project. It is not yet completed, Point 9 still being in process.