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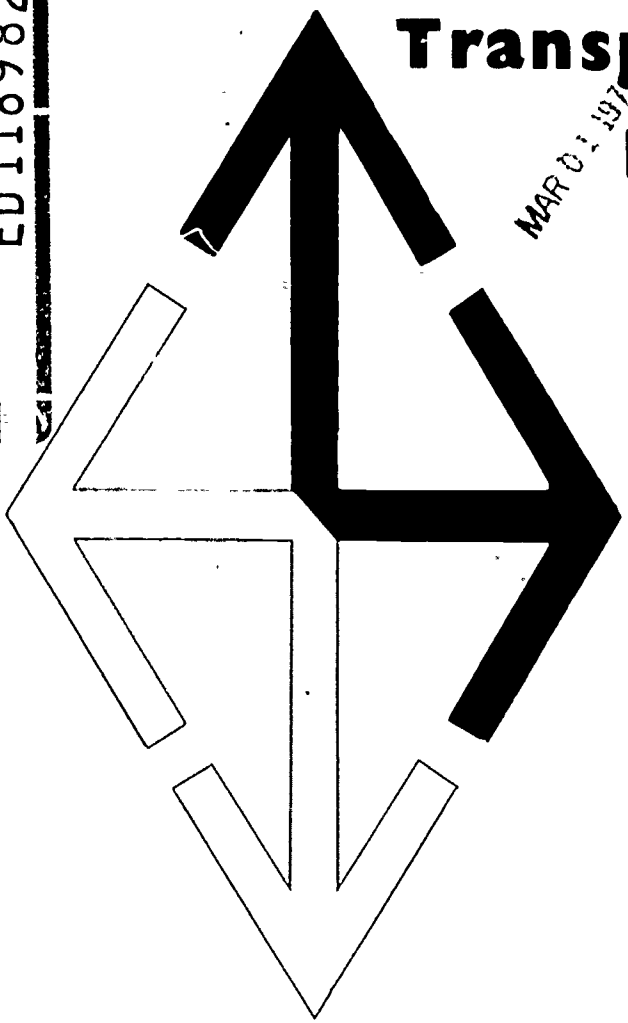
ABSTRACT

The document offers texts of papers presented at a multi-disciplinary and multi-audience transportation seminar conducted by the Department of Transportation and Logistics of the University of Northern Florida. An understanding of transportation career opportunities and manpower requirements was sought by those attending: career counselors, curriculum planners, students, industry representatives, and faculty. Papers are presented under the following categories: (1) The Economic, Social, and Political Significance of Transportation, with five papers discussing transportation and distribution, prices, economic development, urbanization, and political aspects; (2) Transportation Services, with four papers discussing intermodal activities, airline careers, United Parcel Service, and warehousing; (3) Government and Transportation, with four papers discussing government roles as promotor and regulator regarding Amtrak, aviation, and the Florida Public Service Commission; (4) Transportation Issues and Answers, with four papers discussing urban movement, safety, enviornmental and ecological considerations, and State transportation; (5) Transportation Career Opportunities, with six papers discussing railroad, carrier employment, service firms, industrial traffic management, public services, and education; (6) Transportation and the Curriculum, with six papers discussing historical considerations, economic development, government, social and environemental considerations, a curriculum development program, and a summary of findings and recommendations of a curriculum planning group at the seminar. (LH)

Transportation Education



United States Department of Transportation
and
Department of Transportation and Logistics, University of North Florida

These proceedings reflect the views of the various speakers. Dr. Ivy A. Smith, Dr. Assumes responsibility for the editing of their remarks. The contents do not necessarily reflect the official views or policies of the United States Department of Transportation. These proceedings do not constitute a standard, specification, or regulation.

INVOLVEMENT IN TRANSPORTATION THROUGH CAREER AND CURRICULUM PLANNING

Seminar Proceedings

University of North Florida

Jacksonville, Florida

June 18-22, 1973

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Edited by

Dr. Jay A. Smith, Jr.
Department of Transportation and Logistics
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PREFACE

This Seminar was conducted under a contract between the Office of University Research of the United States Department of Transportation and the University of North Florida. The conference was structured to bring together career counselors, curriculum planners, and students from secondary and community college levels to acquaint them with the significant role of transportation in our economy as well as the career opportunities in the field. A dual objective was to determine the essential knowledge, training, preparation, and skill requirements which can be obtained in part from secondary and community college curricula.

Transportation occupies a major role in our nation's economy. It is a dynamic and exciting industry--one with enormous growth and potential. Highly qualified people are needed to meet the transportation challenges of the future. The continuously increasing demand for transportation services will produce a concomitant need for additional human resources. Compounding the problem is the rapid rate of technological change, which demands highly prepared and constantly up-dated persons to manage and operate complex transportation systems. The need clearly exists to attract people to transportation and provide educational programs which will prepare and qualify them for responsible positions.

A basic part of the Seminar design was to inform and involve individuals who assume transportation as a given, or who fail to see its impact on their lives or the lives of their students. Providing awareness and knowledge about transportation to these people through information flow and feedback was considered essential. In their roles as citizens, voters, and members of the work force, these individuals were better informed and made more aware of transportation and its challenges through this Seminar emphasizing a broad overview of transportation.

The University of North Florida is indebted to those who participated in the Seminar, and to both the United States Department of Transportation and the Florida Department of Transportation for their strong support and enthusiasm. As a regional institution, the University of North Florida is committed to services for Northeast Florida. The conduct of this Seminar is one example of that commitment.

Thomas G. Carpenter

President
University of North Florida

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INTRODUCTION

Transportation is the totality of the vehicles, ways, terminals, supporting facilities, and personnel required to achieve the movement of people and goods within and across the borders of the nation. It comprises the institutional arrangements, the industrial complex, and the public policies by means of which the physical facilities and the manpower are brought together into an operating system. The complexity of this transport system is staggering. To the national rail, air, highway, water, and pipeline networks must be added the resources provided for the urban movement of the pedestrian, automobile, private truck, and public transit traffic. The present demand upon the transport system can be expected to increase tremendously if current predictions of growth and movement in population and output are realized. Demands for transport services will require increased efforts to train qualified personnel to meet the challenges.

Realization of the goals of the future must be founded on clear understanding of the problems of the present. Perhaps the most important understanding reached by those attending the conference was that the ability to analyze, measure, and project manpower resources into the future is essential to constructive solution of a wide range of questions and decisions related to transportation.

The Seminar brought together career counselors, curriculum planners, students, industry representatives from both the private and public sectors, and faculty of the University of North Florida. A workshop format was utilized in developing an understanding of transportation career opportunities and manpower requirements. By-products of this conference were an insight into the current and future regional manpower requirements for the private and public sectors, as well as a more complete knowledge of how the educational counseling process operates.

This Seminar was one of five multi-disciplinary and multi-audience transportation seminars conducted by the Department of Transportation and Logistics of the University of North Florida. As a part of the contract between the United States Department of Transportation, Office of University Research, and the University, the program served as a catalyst in marshalling present and future manpower resources for the resolution of transportation problems and stimulated applied research.

The Seminar was inspired by the fact that many individuals employed in transportation tended to "drift" into their career positions, rather than specifically preparing for their occupations. Recognizing that secondary and community college career counselors exercise profound influence upon the career choices of students, and that these same counselors have only a slight awareness of the diversity and nature of transportation careers,

the Seminar planners felt that this opportunity for exposure to industry and governmental personnel would provide an excellent chance to identify potential opportunities for students and counselors. The benefits to both industry personnel and conference registrants were evident, as an excellent backdrop of the academic environment provided objective discussion. A most significant result was the realization of transportation potential by the participants.

WHAT IS TRANSPORTATION/DISTRIBUTION

Dr. Warren Rose, Chairman, Department of Transportation and Logistics, University of North Florida.

Transportation is having your own car. Transportation is driving a truck. Transportation is getting a taxi, or flying to Miami. These are the common responses to the question of what is transportation. They are correct answers, but the view is a limiting one. Like consolidated government, the subject area is a broader one.

The formal definition of transportation is a brief one. Transportation is that element of economic activity which accomplishes the movement of persons and goods from one place to another. Any movement of people and things can be considered transportation. The function of transportation is to bring together productive resources and to provide access to the markets for these products. Overcoming time and distance barriers is a task of transportation.

Some examples can assist us in understanding the broad aspects of transportation. Transportation is moving hundreds of thousands of people from the suburbs to the city and back again. Transportation is moving watermelons from Central Florida to the midwest. Transportation is receiving Toyotas from Japan through Jacksonville to North Carolina. Transportation is building freeways, controlling air traffic, dredging harbors, regulating railroads, constructing pipelines, maintaining our nation's defenses, moving household effects, promoting culture, overcoming geographical boundaries, locating Offshore Power Systems, and influencing prices. In short, transportation exercises a profound effect on economic, social, cultural, historical, and political events.

The broad nature of transportation also can be understood by looking at the total economy of a nation or region. We can examine the manufacturing, mining, farming, and distributing activities of Florida and see the dependence on transportation, both for inbound and outbound products by shippers and receivers. We can observe the various transport modes -- rail, motor, water, pipeline, and air -- that perform transport service. We can also see the auxiliary services of warehouses, REA Express, United Parcel Service, package bus service, and parcel post. This view acquaints us with carrier management. Finally, we note the significant influence of government in planning facilities, regulating the carriers, promoting transportation, and protecting the nation. Thus, we can approach transportation in terms of the users of transport services, the providers of this service, and the regulators and planners of transportation. Already, we have gained an appreciation of the pervasiveness of transportation.

We also can gain a feel of transportation by introducing some of the issues facing the nation. For example, should Jacksonville develop a rapid transit system? How can we minimize the number of trucks on the highways? Should

we continue the Cross Florida Barge Canal or the supersonic transport? How can we overcome the bottleneck of the Atlanta airport? How can we prepare people to fill the many positions required to meet transportation's future needs?

By now your perspective has been expanded. Throughout this seminar you will see the broadness of transportation. You will observe transportation carriers at work. You will hear state and local government representatives discuss their transportation roles. You will learn about the activities of industrial traffic people. You will become acquainted with the thousands of jobs in transportation. You will meet transportation people.

One concluding comment on transportation is appropriate. The growth and success of any nation is related directly to the quality of its transportation system. The history of the United States serves as an excellent example. Productivity, utilization of resources, product distribution, geographical expansion, national defense, income, and employment are all dependent on transportation. Truly, transportation is all of these things.

PRICES AND TRANSPORTATION

Dr. Ronald L. Sparling, Associate Professor, Department of Transportation and Logistics, University of North Florida.

How does transportation relate to the prices of things such as those which you and I buy in the grocery store and in the department and drug stores of the nation? For an answer to this question, let's assume that the cost of transportation is somehow made cheaper. (This may be a little difficult in these days when prices seem to continually rise.)

Now, it really doesn't matter whether we are putting ourselves at the point in time when the wheel was invented so that man's capacity to move his goods was significantly increased over that which his own two feet provided, or whether we think in terms of the opening of the Erie Canal, or in terms of the invention of the motor carrier or the development of super-capacity aircraft or ocean vessels. All these developments served to increase the productivity of the resources devoted to providing transportation for people and their trappings, thus lowering the costs of transportation. Transportation costs are included in all prices of the things we buy. Thus, if the costs of transportation are reduced, then the prices of the things we buy should also be reduced. But this is not all. Goods and products should also become more freely available. Some prices will become less volatile, and more stable. Other prices will tend to become equalized over geographic areas because central markets will have been encouraged as a result of the lower transportation costs. The price of wheat is a world market price because of good transportation.

While it is easy to say that all prices have some transportation costs included in them and that through lowering transportation costs, the price of the commodities in the market place will be reduced, it is something else to readily see how the reduced transportation costs will affect commodity prices or prices in the market place. Were I to ask you to list the ways that reduced transportation costs would lower costs of products in the market place, you would very likely quickly list two, and after a few minutes reflection, two or three more that are less obvious. Let's look at the ways.

First, the cost of transportation of the goods from producers to consumers will be reduced. Secondly, reduced transportation costs will lower the costs of assembling raw materials needed in the manufacturing processes. Transportation costs, here, are costs of production, and anything which tends to reduce this cost will tend to reduce the price of the manufactured product.

A third, but less obvious way by which lowered costs of transportation reduce prices, is by encouraging the development of territorial division of labor. This simply means that a system of production in which each geographical area specializes will be encouraged. Such is the foundation upon which the world's trade has been carried out through the centuries. The ancient Athenians traded their olive oil throughout the ancient world for other necessities of life. Today, the rich Salinas Valley in California

is devoted to the growing of lettuce and other produce, rather than beef cattle, which thrive on less fertile soil and in different climates.

A fourth way in which lower transportation costs serve to reduce prices is through encouraging large-scale production. A prime example may be found in automobile manufacturing. Henry Ford's mass production techniques, which enabled the market to be flooded with cheap model T's,could not have occurred without the support of long distance transportation, both for the accumulation of raw materials, and for the delivery of the finished product.

The fifth way that reduced transportation costs will reduce prices of goods is through permitting more distant suppliers to compete in markets. The effect of increased competition will tend to reduce prices. An example might be the price of oranges in New York. Transport carriers have structured their prices so that California oranges may be delivered in New York for the same transportation cost as Florida oranges. The effect of the competition and increased supply of oranges is reduced prices to the New York orange consumer. Put somewhat differently, the lower transportation costs will reduce the reliance of a given market upon single or nearby sources of supply, and thus reduce the effects of monopoly in the market.

The prices of the goods we buy are therefore influenced by transportation costs in five ways. the cost of assembling raw materials, of distributing finished product, of locating various types of productive activity according to territorial specialization, of large-scale production efficiencies, and of contributing to competition. These all serve to affect the level of prices. Additionally, transportation contributes to price stability.

An example may be found from the perishable agricultural markets. Perishable commodities grown in what were once considered to be extremely remote areas can now be transported fairly cheaply to major markets. This has the effect of breaking the reliance of major markets on a limited number of supply sources. Lettuce, for example, can be grown in several areas which have growing seasons that occur during different calendar periods. Thus, with cheap transportation, lettuce can virtually be made available in produce markets throughout the United States without significant variation in price.

Let's conclude our discussion of transportation and prices by concentrating on examples.

First, let's consider lettuce and look at the average share of the price of a head of lettuce in the local super market that is attributable to transportation. And, secondly, let's look at some other examples of commodities and the average share of their wholesale price which is accounted for by transportation costs.

In a normal year a lettuce farmer in California will invest nearly $500 an acre in seed, soil preparation, planting, insecticides, fertilizers, etc. By the time the lettuce is ripe in the field and ready for picking, he will have $500 per acre invested and expect an average yield per acre of

about 500 cases. Each case or carton will contain about 24 to 30 heads of lettuce. At the time of harvest in the field the average value per head is therefore about 4¢. The labor to pick and pack the lettuce costs about 50¢ per carton; the carton itself costs about 30¢, and trucking to the railhead adds about an additional 30¢ per carton. From the railhead, transportation by rail to the East Coast adds about $1.60 per carton. Final delivery to the super markets on the East Coast adds another 50¢ or 60¢ a carton, thus making a total transportation cost from the West to the East Coast of about $2.50 per carton, or 10¢ per head of lettuce. This is roughly 25% of the delivered price of 39¢ that you and I will pay in the super market. The share is similar for other items of produce, such as carrots, onions, etc., that might also be grown in California and moved to the East Coast.

There is a wide range of differences among commodities and share of the price of those commodities accounted for by costs of transportation. The differences are accounted for by a variety of factors, not the least of which are differences in the value of the commodity. For example, one would not expect the share of the delivered price of a commodity such as an IBM computer to contain nearly as high an element of transportation cost as the delivered price on a low value commodity such as gravel, sand, or bituminous coal. A study done about ten years ago will illustrate: The figures are for 1959 and relate railroad freight revenues to the average wholesale price of the commodities at destination. For gravel and sand the share of transportation costs to price at destination was over 57%; for bituminous coal almost 42%; for cabbage 38%; common brick almost 28%; lettuce 27%; oranges and grapefruit 23%; flour (that is, wheat flour) about 7-1/2%; automobiles about 5% (this was before costs were reduced materially by the introduction of bi-level and tri-level racked cars and the newer forms of transporting automobiles to market). Transportation costs in cigarettes accounted for about 1%; for IBM type business and office machines--typewriters, etc.--roughly 1/2%.

There are at least two conclusions that we may draw from this data. One is that obviously the transportation costs associated with the transportation of high value items is not a very significant determinant of the price that you and I or business would pay for these goods. Secondly, the price proportion accounted for by transportation in perishable items such as the produce that we buy in the stores is a significant portion--between 20 and 35%. Twenty to twenty-five percent of the cost of many building materials such as plywood, brick, etc., also is accounted for by transportation costs. Many low value items such as coal and other fuels for power supply may have much larger transportation costs incorporated in the delivered prices.

Thus, we can conclude: all prices have transport costs included, and transportation promotes price stability, competition, and thus lower prices.

ECONOMIC DEVELOPMENT AND TRANSPORTATION

Mr. Donald K. Graham, Career Advisor, Department of Transportation and Logistics, University of North Florida.

As a lead into the idea of economic development and transportation, I would like for you to think about a movie plot which is as old as the movies themselves. It involves a man who always had a thin mustache and wore a black hat. He usually wore a black, frock coat and a string tie. He seemed to spend most of his time playing cards at a saloon.

It always happened, however, that shortly after his arrival, strange things began occurring at the local ranches -- things which caused the ranchers to want to sell out quickly (and cheaply) and leave the country. Soon it became known that this stranger was buying up all of the ranches, particularly those west of town between Dry Gluch and Slippery Rock. Why does this man, the townspeople wonder, have an interest in that particular land, seemingly of little value?

Well, sooner or later, usually in the last reel, someone discovers, and announces with great excitement, that the railroad is coming through west of town instead of over by Broken Creek. That seems to explain everything.

Why? Why does "the railroad coming through" make otherwise empty land worth "gunning down the heroine's rancher father" or "bushwacking the Eastern Surveyor"? Why, in 1880, did the land along an eighty-mile strip of the Union Pacific increase in value by over $152 million -- an increase attributed solely to the existence of the railroad?

The land of the just described movie plot and of the Union Pacific of 1880 -- the American West of the last century -- was a developing land. Development -- economic development -- was something that everyone in those days wanted and were willing to work hard and spend heavily toward. It meant good things to the people of those days. To many Americans and to most other people of the world, development still means good things -- new and better jobs, more money and more things to spend it on, improved education, better health care, more and better food.

This development, however, did not and does not come easily. It demands a lot -- skilled workers; trained planners and managers; raw materials; ideas; energy; physical protection and safety; and people to trade with, to buy from, and to sell to.

But the world's resources -- the workers, materials, ideas, markets, etc. -- are not evenly distributed; they are not available to everyone in the same quantities or qualities. For example, Texas has oil, while Oregon has forests, Minnesota has iron ore, Kansas wheat, Maine lobsters, and Florida oranges. The Texans, however, cannot eat their oil, nor the Kansans drive their wheat. And we Floridians cannot build homes with our Oranges.

We -- mankind -- have overcome this unequal distribution of resources through something called specialization. We have found that if each worker, each community, each nation concentrates its talents, energy, and resources on doing what it can do best, the lot of everyone is improved. We Floridians can devote our full energies to producing golden, sun-ripened oranges, knowing full well that our needs for bread will be met by the people of Kansas, who know full well that their needs for oranges are being cared for. And the total amount of bread and oranges produced in this manner will be greater in quantity and quality than would be possible if each people had to devote their energies to producing both products. Extending this idea of specialization to include all goods and services which a people need is economic development.

But what does transportation have to do with economic development? Well, transportation contributes to economic development in three ways. The first should be obvious from the example of the bread and oranges. The bread is in Kansas and the oranges in Florida. In order for the excess oranges in Florida to be traded for the excess bread in Kansas, they must be sent to Kansas -- and it to Florida. Thus, because of regional specialization, there is for most products a distance barrier between their production point and their consumption point. This barrier must be overcome if specialization is going to work. Transportation overcomes the distance barrier

Think of the hundreds of thousands of automobiles in Detroit. Most of those cars are useless in Detroit. They do not become worthwhile until they are in Los Angeles, or Houston, or Jacksonville. Transportation makes them worthwhile. Or consider our Florida sunshine. Of what value is it beyond a nice tan for us Floridians? Can we package it and sell it nationally? Of course not! But we can "package" consumers and bring them to the sunshine. Transporation also does this.

Thus, a most basic contribution of transportation to economic development is the movement of resources to their most productive point and the movement of products to their most useful point.

A second contribution of transportation to economic development is through the provision of political unity on a geographic basis. A transportation system facilitates the movement and exchange of ideas and feelings as well as of goods and services. A people sharing ideas and feelings are more likely to unify politically. This has the following economic benefits:

1. More economic resources become available as the area of political unity increases. This is because the larger geographic area is more likely to hold more physical resources and because the political unity itself would probably mean fewer artificial trade barriers.

2. The extent of political unity would cover the people with greater personal safety. This would free their concerns from defense to production.

3. The larger political area also would mean more markets for trading, again with fewer trade barriers.

The third contribution of transportation to economic development is in transportation itself being subject to specialization. As transportation companies develop, the production companies are freed from much of their distribution concerns and allowed to place more energy into their productive specialization. The results are greater economic development.

Historically, transportation has preceded economic development into an area. Transportation can exist without economic development, at least for a time, because governments and individuals are willing to speculate that an area with available transportation will develop. Economic development as we know it, however, cannot exist -- indeed, it cannot come into being -- without adequate transportation. Thus, while transportation alone may not be sufficient for economic development to occur, it is absolutely necessary for successful development.

While we should not approve of the methods of the movie badman, we can surely appreciate his motives.

URBANIZATION AND TRANSPORTATION

Mr. Donald G. Ingram, Executive Director, Downtown Development Authority

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The process of urbanization is the concentration of population in cities--probably the most remarkable social phenomenon of this century. While it is a most remarkable phenomenon, urbanization has brought the most critical problem--the urban crisis. Our challenge is there--to find a solution to the negative aspects of urbanization.

Mobility--both social and spatial--is fundamental for a successful urbanization process. That is, good transportation is basic; it provides spatial mobility. But what about the social? What does each of us want out of life? There are two important goals that most people are seeking.

First, we want to have self-esteem in doing well that which we can and want to do. Unlike our parents, most of us want more than just "steady work."

Second, we want affluence. Most young people do not bear the scars of the depression that their parents or grandparents bore. They have grown up in affluent families and want to continue to enjoy the comforts they have come to take for granted. That is one of their demands, and it puts a pressure on our society. Inflation and urban problems have made the pressure painful. Years ago the young family lived in the inner city in an old neighborhood to get their start--in apartments. Now, where do they want to live? In luxury accomodations in the suburbs. To live there requires money, because houses, condominiums, and apartments are expensive. The pressure also includes the desire for larger and costlier status symbols--the newer the house or apartment, the more powerful (maybe smaller) car, etc.--and creates a materialism that can be supported only by a rapid rise through the employment hierarchy to where the higher incomes are.

Pressure is also applied by the many young people who were not raised within the affluent family but because of education and material values held before them since childhood, want the "good life." The "good life," job, status and income are offered in the metropolitan centers.

If the young person does not achieve self-esteem in one job, he will move to another, perhaps in another city. Loyalty to one's employer may not be as great as grandad's or dad's.

Ladies and gentlemen, we bring about urbanization! It is the desires and aspirations of people just like us, and including us, that have created the metropolitan centers, with all their costly problems--water supply, waste disposal, goods transport, traffic congestion, air pollution, crime, racial tension, under-utilization of land and natural and human resources.

What are the characteristics of our urban centers today that give us insight to solving problems of the future: Within this system when the whole is too large for the individual to comprehend, he seeks to minimize disorder by living in a neighborhood in which his life is comprehensible and social relations predictable. He moves out if he can no longer predict the consequences of a particular pattern of behavior. This is a factor, experts say, which leads to one of the most pervasive features of urbanization today and that is segregation--of land uses, activity centers, of income groups, family types, and ethnic and racial minorities.

It is the transportation systems which tie all of these elements together including everything from airports, railways, and waterways, to expressways, streets, and sidewalks. In general, the movement requirements for people and goods are the requirements of transportation. Atlanta and Jacksonville, for example, would not exist without the railroad which permitted the linkage of business, commerce, and people.

Centralization of population, the movement of people from the farm to the city has been going on for years. We now find that this is being counterbalanced by a reverse thrust of decentralization. You have seen this in the growth of suburban shopping centers and office parks and housing developments. In some of our larger cities, this may extend a hundred miles from the center of the city. Isn't it ironic that today in most metropolitan areas the black and poor whites live in the heart of the city and must daily pass the white businessman going the opposite direction as each goes to his work. Sometimes I think "how stupid we are to pay such fantastic costs for such a transport system!"

Downtown revitalization is crucial to the health of the cities and the suburbs. Part of the success of downtown revitalization involves bringing middle and upper income people back to live as well as work in the heart of the city. Time limits further comment on this subject--one of great importance to the future of urban centers.

What is the future of urbanization? Present trends suggest, according to some, a super-metropolitan America. That is, a few giant megalopolises of 10-50 million people will ultimately contain most of the population. This probably means horrendous transportation problems and a change in our basic social behavior. Some European cities are successful metropolitan centers. London and Paris are, and they have efficient transportation systems. However, they do not suffer from the same pressures of affluence as the American metropolitan centers.

Yet another possible way to accommodate man's need for urbanization is through regional growth centers. Experts feel that a concentrated decentralization or a growth-centers program would do more and cost less than letting present trends continue. This may mean a policy for revitalization of rural towns and creation of new towns (some of which are established). If this system of "growth centers" is to be successful, major governmental direction will be required.

Whatever the solution, it will not be a job for government only; it will

require a major joint effort between private free enterprise and government. Today's young people will be very much involved in creating solutions.

The young person is developing new values and attitudes which offer hope for solving problems of urbanization because he is concerned about: (1) quality of life--including purposes as individuals in a society, (2) regard for the individual, (3) his self-esteem in relation to his fellow man and to institutions, (4) exhibited impatience with economic hardships and social injustice, (5) acceptance of the idea of leisure as a legitimate activity, (6) the role of authority for accomplishing society's purposes, and (7) the need for furtherance of diversity of choice--from the products he buys to the place he lives.

The challenge is there for us, whether we follow the public or private route for employment. As students or counselors, you are needed in developing solutions to the problems of the cities.

THE POLITICAL CONTRIBUTIONS OF TRANSPORTATION

Mr. Edward A. Mueller, Executive Director, Jacksonville Transportation Authority.

It's a pleasure to be here with you today, and I hope to tell you something about the political contributions to transportation. Perhaps we should really understand the reverse, however: what transportation contributes to politics--especially around election time. That seems to be a rather sensitive subject in the state of Florida, and hopefully that sensitivity will be minimized as more and more people begin to understand the need for rational decision-making in transportation and voting. We shall try to discuss some of the historical developments and problems that are faced by decision-makers in transportation. It is first necessary for you to understand that transportation is only a part of man's basic desire to communicate in the involvement of others. There has always been, and always will be, a need for mobility and the desire for betterment of man. Transportation accomplishes this need for mobility and geographical specialization that has resulted in the improved life style of all of us.

Transportation is really part of a collective action on the part of many sets within the society to achieve the balance of involvement so necessary for better life styles. Transportation requires a great deal of involvement and--as you have already found out--you must participate as a part of a group or individual decisions that are made will not necessarily be to your best interest. Transportation involves three basic elements:

First, we have the guideway, the man, and finally the vehicle which moves along the guideway or travelway to accomplish the purpose of moving the man from one point to the other point. It is those decisions that are experienced at all levels of government--national, state, and local--that affect not only the man and the guideway, but also the nature of the vehicle and its ability to move along that guideway and transport that man to where he wishes to go. Since our government is one of participation at all levels, it is necessary that you understand that for a logical and rational decision to be reached, we must interact with the best interest of society. There is extreme difficulty, however, in defining and getting everyone to agree as to exactly what is the best interest of society and who should, at what level of government, direct that best interest.

I have noticed on your topics to be covered in this seminar that you have discussions about Transportation and Government Involvement, Career Opportunities and Curriculum Planning--possibly dealing with the economic and financial constraints and challenges, environmental constraints, all coming together in regional transportation planning activities. As we have noted at the beginning of this talk, transportation is basically people getting moved and political considerations or the interests of people getting moved, when we are discussing transportation and politics.

Frankly, we need to talk a little bit more about the personality constraints, political and otherwise. For those of you who have already worked in government, you know exactly what I'm talking about--that is, the ever-present problem of dealing with people and understanding what their needs

are. For those of you in academics, and particularly some of the students, you may not have experienced that very critical, overriding, political personality problem. We are beginning to develop in Jacksonville some pretty good local approaches to transportation problem-solving. We are even beginning to plan and organize on more than a day-to-day basis, giving due consideration to many forms of transportation, not only expressways. What does it do, however, to have a well-organized approach, and a local transportation authority of some type or the other, when political personality constraints exist? What happens when the visibility, credibility, and integrity of the personalities involved--particularly political--are possibly not above reproach, and possibly not as pure in their purposes, directives, personal goals and objectives as all of the other people who are involved?

Political and personality constraints are the most difficult overriding problem in the accomplishment of local, regional, and state transportation goals and objectives. Keep in mind that some of these personality constraints are not strictly those of politicians or elected officials. We have a number of those within the ranks of the local, regional, and state staff--people who are so wrapped up in their own egos or so wrapped up in their next promotion or their next elevation that they become obstacles to the accomplishment of any real work toward transportation goals and objectives.

There are those in this room who have spent more time in the past few years on political and personality conflicts than on any element of transportation--technical, professional, or otherwise. It is a very serious dilemma. We must emphasize the political contributions and restraints, since they seriously inhibit any problem solution that arises on the transportation scene. We work more hours in resolving political and personality problems than we do technical and professional problems.

Students particularly need to learn about political and personality problems. Engineering, transportation, public administration, and all other students need to learn how to overcome them. As they define the kind of world they want to live in, and as they take over activities, they should see not only the advantages, but the absolute requirements for a professional, technical, and managerial approach to the achievement of goals, as opposed to a political and personality oriented world.

The answer is more professional and technical expertise, involvement, motivation, and productivity. I advocate professional, not political expertise. I recommend technical, not personality expertise. Every day I can see the progress in various local agencies as we begin to move toward professional and technical expertise. However, there is a particular carryover from previous days which still haunts us and does not allow for the professional and technical people to arrive at a solution that would be the best transportation system for the city of Jacksonville. I have seen what a continuous, concentrated, professional, and technical effort can accomplish, despite the political and personality problems. I have a strong feeling that the professional and technical side of this problem is going to win out. The only real problem is the element of time. The professional and technical people can overcome the political and personality people, but it is going to take considerable numbers of years to accomplish the work; i. e., it will take 20 years instead of 10 to

accomplish 10 years of work.

If we can somehow accelerate the elimination of the political aspects of problem-solving while accelerating the viability and effectiveness of professional and technical solutions, we can begin to address ourselves to the dynamic rate of change that is occurring in Jacksonville and in Florida. That change is going to happen, and you know it.

Many of you are involved in programs that are at the beginning of the change in the technical and professional world, and in society generally. How fast we can eliminate one and accelerate the other in some effective relationship is a necessary goal that we all must work for.

The Transportation Authority is trying to set some philosophical goals and objectives. We are developing deep, abiding personal philosophies and trying to relate future needs so that we will be able to manage growth and provide the transportation services so necessary for the improvement of quality of life in Jacksonville. Our plan is to be positive, objective, dependable, and successful. We have a professional and technical staff that is capable of understanding the transportation relationships that exist in the Jacksonville community, hopefully making presentations and reports, as well as recommendations, that will improve the quality of transportation for all of us.

We have had to spend more time on federal legislation and funding than ever before. Congress may make a law in maybe 30 words, or perhaps two pages, but it takes a 30-page memorandum to explain just what those 30 words mean. Many times it takes not only the 30-page memorandum, a court case, and other professional intervention, but the response of state and regional level authorities to get an interpretation of just what is meant. However, this is the kind of price you pay to get the federal funding so necessary to improve the quality of transportation in Jacksonville. You must spend a great deal of your time going through the procedures and mechanisms so that the funds will be forthcoming.

A problem that has risen with understanding of transportation and political intervention is the laws relating to the funding of projects. Most of you do not understand that there is little taxation on those who use the inland waterways. This is because the work is principally done by the federal government, not by state governments. It is, in fact, a subsidation where the facility or the waterway, which is one element of your transportation, is provided and "free." There is recent research to start charging inland waterway users as taxation; this has been very bitterly resented and opposed by the inland waterway people, as you might guess. There are some benefits, however, to taxation, the general notion that our country has developed of "let those who use it pay for it." In defense of their position, there is the view that the salvation of a river does help to control floods and provide recreational benefits to the general population. We are faced with a political problem of understanding just whose needs and whose costs and revenues will be affected. Again, if we have political input, the waters become very muddy. It is a requirement that a professional and technical aspect be examined so that the facts relating to taxation and usage can be properly ascertained and presented to the voters.

If we examine the railroads we find that at one time they were subsidized, and any time you opened up a railroad, the state governments granted--along with the federal government--large blocks of land in order to develop the territory for the functions of rail. Over many years, these rail holdings are still beneficial to the railroad carriers; however, there is some indication that the blocks of land and the resulting oil and other mineral findings off the land have more than been sufficient reward for the development of rail networks. Most of the initial investers have been out of the rail system one way or the other, and the rail industry is characterized by an unbelievable amount of red tape; it also has some union problems. In attempting to raise new capital to meet the transportation problems that arise for the need of people to move from one point in the United States to the other quickly, on surface, by rail, is almost a thing of the past. In fact, passenger movement by rail, until the intervention of Amtrak, was going to be extinct by 1975.

Perhaps some of the best intervention of transport industries into the political arena can be seen by trucking and aviation. In the trucking industry you have very strong organizations at the state and national levels that speak very loudly for the trucking interest. You have an extremely strong labor union in trucking that makes its voice heard in the halls of Congress and in the various State Capitals. A third segment in the trucking industry is the contractors and construction people who benefit from the building of highways, as well as the manufacturers of equipment and fuel oil producers, who also wield a great deal of political power in getting their particular point of view across. To underestimate the political influence of the trucking industry would be one of the gravest errors that any politician or individual citizen in this country could undertake. Aviation presents a subsidized industry that was from its beginning developed as an infant industry. Airlines have been almost completely subsidized as far as their terminal facilities, the provision of the air space, or that guideway of which I originally spoke, and their operating deficits. Aviation is still very glamorous and a thrill for everyone. Every town wanted, and still does want, an airport, and was willing to do about anything they had to, to get one. This included the donation of land, provision of the runways and terminal facilities, as well as subsidation of the operating expenses of the individual airlines serving that town. Obviously the import of the political decision upon the transportation placement of those services, and the subsidation of those services by the airlines to small towns upon those of us who are in larger cities in air corridors is of significant importance to understand the problems of air transportation and quality of life.

There is, and has been, a need for a strong government professional and technical policy, divorced of political input, to understand the need of transportation air services to the respective communities. In fact, we find that the small towns are not paying their fair share of the cost of air service, and the burden is being placed on the rest of us. In fact, that burden is substantial when you consider the provision of federal funds to support highly questionable air feeder services into towns that do not generate sufficient volume to warrant an economic free enterprise carrier making a fair profit. Then you begin to understand the donation of federal funds to nonproductive sectors of the state.

In urban mass transit, we now have a system that employ very large government grants, and I will tell you that the paper work is a monster. It took us three months to get a one-day bus specification approved. We know of agencies who won't even answer their mail in the federal government; we believe that this is a direct influence of soft policies on the part of the federal government regarding unions. You can't do anything in running a transit system, for example, in Jacksonville that will hurt unions, literally. When purchasing a bus company, you must respect people over all union agreements that are in effect at that time. The federal government does provide sums of money in capital grants, but does not provide operating subsidies; that is up to the local agencies to provide. The future will hold a direct question of subsidies here in Jacksonville, and you will hear a lot more agruments as we start to get our system--including all the new buses we need, and other types of transit vehicles--up to standards. The improvement of our hardware--not only buses but potential transit rail vehicles--is a fundamental problem that the Transportation Authority is facing, and you must face that problem with the federal government in mind.

This is a very unique system of government we have in this country--unique in that we have three levels--the federal, state, and local. What one cannot do, the other does, and by adroitly working through these layers of government, hiring all the people as you move through the circles, there are a tremendous number of jobs for many people. In fact, many people look at these jobs as political "plums."

Fortunately, there is just no other place as dynamic as Jacksonville. We have been through a consolidation; we have a new charter; and we have been through a governmental reorganization. We have acquired a bus company and revitalized the Transportation Authority. Included in that revitalization is new people, new programs, new leadership, and new direction. We continue to make progress. We are working with new tools, techniques, and approaches for decision-making. We're putting them all together into a system that will provide better transportation and life style for the citizens of Duval County. We have conducted studies concerning many aspects of transportation, such as senior citizens programs, the Spirit of '76 buses, and "nooners" and other techniques of improving Jacksonville's transportation systems. We have stressed the conservation of energy and have provided an increased flow pattern of cars moving over the bridge, and have attempted to assist through Regency and other shopping center specials to conserve energy by providing direct, special buses to the downtown areas.

We are making tremendous progress in providing new and improved urban transit systems and planning for even greater improvements. There will be a feasible people mover system in downtown Jacksonville. Some mini-buses are in operation, and more will be added in the next few years while the system is being designed and built. It is anticipated to extend for two miles at a cost of $27 million. This people mover system in downtown Jacksonville will be interrelated, to the maximum degree possible, with the regional transportation system. It can be done!

But we don't have any transportation constituency and, therefore, we don't have any transportation commitment. We have a lot of divergence, a lot of

dispute. There is no commitment to transportation because there is no constituency that can be so identified, and without commitment and constituency you don't have funding. You don't have reason. You don't have implementation or results. The final basic goal and objectives in the Jacksonville Transportation Authority's planning program is a basic commitment to transportation.

In summary, we feel we have a good program ongoing, providing adequate and improving transport service to the citizenry of Jacksonville. We have attempted to meet the objectives of the grants from the Federal Department of Transportation and HUD, by providing new and improved bus service. We have interfaced with the Florida Department of Transportation for the providing of people movers, mini-buses, and a number of programs, including fare reduction to the elderly, so that we can improve the quality of transportation and life in Jacksonville. We have attempted to get participation of different groups at different levels, including those of students, educators, so that we can develop a dialogue that will let us understand your needs and obtain your support in providing a better transportation system for you.

INTERMODAL ACTIVITIES

Mr. E.W. Thomas, Director of Intermodal Services,
Seaboard Coast Line Railroad.

In spite of the importance of coordinated transportation, progress has been slow. We are but at the threshold of the economies to be realized through unit load systems which exploit the inherent advantages of each mode and which could advance efficient distribution in the market. Shippers, receivers, and carriers alike stand to gain. The nation's economy and its defense can be better served through more coordinated systems.

The compelling forces towards coordination include technical developments in containers, conveyors, vehicle and warehouse designs, marketing developments (especially in the area of physical distribution management), and rapid increase in handling costs since World War II. The hope is that the formidable obstacles which exist will erode.

There are many complications involved in promoting use of coordinated systems of transportation. Who stands to gain the most from progress in this area?

It is understandable that the motor field does not feel quite as concerned about this development as some of the other modes of transport because motor carriers are in a postion to give a complete transportation service, while others generally are not. This is a matter of economic reality. No matter how far we go in coordinated transport involving other modes of transport, we are destined to have a major motor carrier industry that is independent to some degree, especially within continental areas.

The economic length of operation of an independent motor carrier has many variables but they always will constitute a very large segment of carrier operation. Those of us who are investigating the potentials of a coordinated system believe that most shippers will have two choices, i.e., coordinated transportation and the motor carrier. No matter how rapidly progress comes in this coordinated service, motor carrier service will not be likely to decline. Statistics show that motor carrier service has increased, despite piggyback. Motor carriers have been growing at a steady pace and well ahead of GNP since 1950. Of Class I, II, and III Interstate Commerce Commission regulated common carriers, over 95% are independent motor carriers.

Piggyback is creating some new traffic that otherwise would not move at all. However, much of the piggyback traffic has been taken from rail box cars. This traffic is being carried under different revenue and freight rate scales. There may be a gain or loss in the end, probably a gain to the rails.

There will be an economic impact on GNP if transportation through greater efficiency reaches a more favorable balance in the economy. There will be trade-offs in each form of transportation. We would be more encouraged to transport things and we would expect that the historic relations between transportation and GNP would be continued or improved in favor of

transportation.

There is a substantial contribution to the shopper's interest in the form in which goods are moved. The shipper is really the purchaser of transportation. He wants better service, which containerization will provide--a system improved in terms of speed, safety, and dependability of delivery. He is the one who will gain most by increased efficiency. More efficient means of transportation may bring traffic back to common carriers which they have lost to contract and private carriers.

There is another aspect in the over-all importance of a coordinated system -- not just to individuals and individual groups, but to the nation as a whole. Manufacturers are pricing themselves out of markets abroad and at home. Foreign manufactured goods are capable of being sold competitively with home goods. This results in an unfavorable balance of payments. If we can get transportation costs down, we can help our own shippers to get and hold their markets. Those who have studied shipping are often told that American exporters get in trouble abroad because our packaging is inferior to that of foreigners. Containerization would help U.S. shippers to overcome such complaints.

The total cost of distribution is too great. Coordinated transportation offers another point in the shipper's interest. An excellent early example of control over the whole distribution system is the flow system of distribution which Sears Roebuck set up for their South American stores.

There is a stronger trend to greater use of trucks than to piggyback or anything else. The trucking industry includes, in the broader sense, private carriers. This is an important force because the private carrier sees the immediacy of impact of the systems approach. He can take action himself, and is therefore a natural leader in this.

Common carriers may be able to compete with the private carrier by offering a more competitive expedited service. Shipper cooperatives that in effect become private carriers is a kind of development which is not having much impact as yet. A private carrier thrives chiefly because he is unregulated. This has an impact not only on common carrier trucks but also on railroads.

For over thirty years some carriers have experimented with containers generally in respect to intracarrier operation. Many experimental intermodal operations in barge-truck operation have not been successful. However, Sea-Train and Sea-Land Service have proved successful in deep-sea trailership operation. Following extensive operations research involving use of computers and model building, the Matson Steamship Line has developed an extensive seagoing offshore container ship service. The railroad TOFC service remains the most extensive operation of intermodal coordination. However, its potential is far from being realized.

We need a greater recognition of the inherent advantages of the separate segments of transportation. Basic in the case for coordination in transportation is the assumption that there are inherent advantages of each mode of transportation which will never be realized without coordinated systems. Systems research should therefore be directed at determining where these advantages are.

Many different agencies have found that developing coordinated systems is a necessity. The economic values and military values may separate at some points--roll-on/roll-off versus containership--but that does not mean that what is done will not make a contribution to this area. Barge roll-on/roll-off may become widely used in river transportation. It is an obvious development because of the speed of loading and unloading it permits. No tie-on is necessary. There will be some places where roll-on/roll-off will be of use, even if lift-on/lift-off prevails for most normal commercial seagoing and rail service.

Operations research should be particularly fruitful. The systems are so complex that they cannot be adequately researched without use of a computer. Operations research in the broadest sense requires that you look at the whole system. You cannot just look at the problem and try to adapt the problem to your research technique. In making a machine analysis you may forget to look at what is happening to the market. One of the problems we have is the tendency of a research contractor to adapt the research program to some of his particular procedures of model building. If your problem does not fit into his procedure, you are in trouble. You are letting the engineer tell you what you want to do. Computer research is only a tool, and must be adapted to the job.

There is a shortage of people who can talk to a computer and talk intelligently to management. How should we go about training people for the establishment and operation of coordinated systems?

Engineering, economics, market analysis and management expertise must be joined in advancing the potentials of coordination. Market and distribution analysts working with the engineers can explore the need for and potential of a coordinated service or system. The engineer can formulate the problems and set plans for the physical execution by making generous use of systems analysis aided by computer operations. Then, and only then, can those in charge of the analysis make valid recommendations to top management.

Is present documentation a handicap to coordination? Container operations can make a contribution to simplification in documentation. This advantage is not getting the consideration it should have as regards intermodal activities. It is just as important to have a system of documentation that will cover your goods for A to Z as to have a container system that will carry them.

At the end of the 19th century and beginning of this century, it was common for rails to use a through bill of lading for shipment through ocean ports. The rails had to have men at the ports to see that the transfer was effected. The rails then had financial interest in shipping lines. In 1914 the Panama Canal Act prevented this type of coordination. Congress thought the rail-water carrier relationship was resulting in rail monopoly. Competition worked against use of the through bill of lading. Though it is still common on the West Coast, the express company alone uses a through bill of lading on all coasts. This is an important attraction to the shipper of express shipments.

There are many technical obstacles to coordination. The interface concept outlines broadly the difficult job to be done in coordination because it

has to do with the variations in the flow according to size of units and methods of operation. For example, to fill one ship you have hundreds of trucks and freight cars driving in freight over a period of say 10 days, which is to be loaded within one or two days. This presents an interface problem of getting goods from the transit shed platform into the ship's hold, which in terms of ship capacity is a spoonful-by-spoonful operation. We have transport interface problems between carrier and shop and between warehouse and the hold of a ship.

A technical fact of importance is the variation of container equipment. The use of international containers is handicapped by types of equipment and lack of standardization. It is a technical reality that we have existing facilities. There are market barriers to adaptation of container service. There are general cargoes not suitable for containerization. We cannot escape the need of adaptation to new types of facilities.

There are no technical problems that cannot be solved. But government regulation presents an institutional problem which for the moment seems insolvable. One obstacle in shipping is the rate structure. We need a single rate on a container. What difference does it make what is in a container. This is an institutional problem as well as an economic problem.

If rates were based only on per-ton-mile cost, since the commodities would have different values, some could not move. Different rates are established so that they will move. This is not matching cost against cost but cost against value. If you have a rate below cost to carry a commodity in your vehicle, then you should not be carrying it. If they knew their exact costs, carriers would tend to charge according to cost plus a reasonable profit. A carrier's success would depend on how able it is to devise new techniques. If a carrier is not able to make a reasonable profit at a reasonable rate it should let someone else do it. One of the things that bothers economists has been the assumption that a ton-mile of service is fundamentally the same regardless of mode. A ton-mile of service itself is not the same thing in terms of either demand or supply. The demand side of a ton-mile of service is only a part of the demand and supply of the market for the commodity.

In rate theory, from the carrier's point of view, he must consider what his operation is. He had to deal in his rate policy with the fact that each carrier has its own market, its own demand and supply curve. Transportation economists have come to recognize this fully. There used to be economists who held that if we had perfect competition we would have rates based only on cost. But the many motor carriers operating between Philadelphia and New York experience terrific competition and yet have differentials in rates on commodities carried. There is no lack of competition, but the reality is market demand and its operational effect on commodities, on traffic and its buyer. There is a difference in time and place utility. What should be considered in container rates is a compromise. The rate on a less-carload container would be a compromise between two realities--shipping costs and value.

We ought also to recognize that there are not only regulatory problems in rates but size and weight regulations in states which have limited the size

of containers. This is always going to have an effect. The same thing applies internationally. There are variations in government requirements and standards, in carriers and equipment.

How much improvement can we expect? It is a fact that regulation was established primarily to protect shippers and receivers. The emphasis now is to protect individual carriers and modes. It is in the public interest that the Commission should be protecting efficient types of carrier service but not an uneconomic carrier in any type of service. The preamble of the Transportation Act implies that it is desirable to protect the inherent advantages of each mode, i.e., the economic carrier in every type of service. Protection of a type of service or carrier by protecting company efficiency is a contradiction to inherent advantage principle.

There are other institutional barriers also. Lack of education and training is one--general apathy of top management to train its people in transportation coordination. This subject has too often been dealt with by private groups with private axes to grind. These workshops are significant and unique because in a university program we can examine the problems and prospects without bias. We need to establish a basis for policy. Unless we look ahead future policy will not be any more effective than past policy has been.

We must recognize that the desirability of broad application of containerization and coordinated transportation up to now has favored concentration of cargo traffic in major ports. The ship cannot stop for 400 or 500 tons as before-it may make just one port of call. Small ports will just have to remain outports, unless trucks, hydrofoils and deck barges are used to deliver general cargo to and from them. In the recent period of port development, every port is trying to get a place in the sun.

Piggyback and land transport consolidation has brought a more mature approach to labor problems. If labor is induced to take a realistic and mature approach, agreements will have to be worked out with labor to avoid displacement of present workers. There is a posibility that it can be done economically by a rapid education, by offering the opportunity to train man for better types of jobs.

What degree of standardization is required for coordinated transportation? Economics and other changes could, in time, determine the standards. Success of coordinated transportation does not hinge on getting standardization first. Lines of research and experimentation should be emphasized.

More emphasis is needed on the system concept--the design of a system as opposed to the design of equipment. A lot of work is going into hardware but little into organization of the system itself. That is where the payoff is in the long run. Until recently there have not been research systems to be studied. That is no longer true, but little is being done. However, it should be done in both places. There is no general solution to the problem. Each carrier has to devise its own best system. It is difficult to bring about when the national climate is not receptive. One handicap is that there is no available research clearing house for transportation as a whole. There should be a continuing transportation research forum to discuss coordination problems. A University, by acting as a catalyst with government support, might get industries together to do something.

Lines of experimentation must be laid out. Emphasis should be placed on developing and testing-out systems. Regulatory obstacles to such experimentation is reflected in a recent decision of the Interstate Commerce Commission in regard to a proposed experimentation in coordinated rail and barge operation involving the John I. Hay Co.

Should we encourage experimentation by all modes? Should government engage in such experimentation? The armed services have done so. The government is paying for model building but not for actual experimentation, although it is giving support to the development of some of the problems.

One government agency may support a shipping line to provide competition while another arm of government permits a railroad to cut rates to destroy the competition. There is a need for better coordination in government departments. There is need for a better climate to advance coordinated transportation.

THE WONDERFUL WORLD OF TRANSPORTATION . . . WHAT IT CAN AND WILL DO

Mr. O. H. Hill, District Sales Manager, National Air Lines

It is one of today's ironies that the more "computerized" the nation's airlines become, the more manpower they require.

This is because the airlines are a fast-moving industry -- indeed, one of the fastest -- and if they didn't take advantage of advances in technology, their personnel needs would be overwhelming.

For the past decade, airline "hires" have averaged about 25,000 a year. In 1968, for example, employment in the U. S. scheduled airline industry came to above 300,000, representing a gain of nearly ten per cent over the 276,000 airline employees the previous year and an increase of more than 100 per cent in a decade.

The airlines offer interesting and rewarding career opportunities in many fields. The education, skills and experience requirements vary widely, since jobs range from one as non-technical as a baggage handler or a file clerk to an occupation as complex as flying a big jet, tearing down and reassembling a turbine engine, operating a sophisticated computer system, or determining budgetary controls for a $500 million company.

Because airlines are a progressive and rapidly-expanding business, they have a continuing need for men and women who have specialized in economics, accounting, statistics, research, finance -- in short, most phases of business education.

A job as lucrative as it is highly skilled is that of a pilot. The hours are attractive -- 70 to 85 flying hours per month -- and the pay is good; average annual pilot salary is about $25,000. Airlines hire only pilots with (at least) a commercial license (and) who have logged many hours of flying on multi-engine aircraft.

From 8,000 to 10,000 new stewardess trainees are needed each year just to replace those who leave the profession -- usually because of age or marriage. All airlines require their stewardesses to have at least a high school diploma and usually two years of college or equivalent experience. Monetary benefits can run to $400-$750 a month. Most airlines do their own stewardess recruiting and training.

Airliners receive routine mechanical checks or attention every day they fly, and all must undergo periodic maintenance and overhaul. For these duties, the airlines employ a large corps of mechanics. Certain specialized maintenance jobs require mechanics with an airframe and powerplant license issued by the Federal Aviation Administration (FAA). Pay for an experienced airline mechanic comes to about $5.00 an hour.

In addition to the pilots who fly the planes, the cabin crews who take care of the passengers' needs, the mechanics, inspectors and ground servicemen who keep the flight equipment in top operating condition, and the management specialists in the general offices, airlines require

tens of thousands of other workers.

At the airport, for example, they need ticket agents, station agents, customer service people, flight dispatchers, weather experts, teletype and radio operators, ramp agents and many others. Most require at least a high school diploma and some typing ability.

Agents are nearly always in demand at downtown ticket offices and airline reservations centers, and these positions offer opportunity for advancement to sales and customer/passenger service positions.

The airlines offer hundreds of thousands of seats for sale each day, and every unsold seat is flown at a loss. Hence marketing has become a major airline function. Marketing departments involve specialists in advertising and the graphic arts, personnel who handle joint programs with other airlines, salesmen who call on major travel accounts and travel agents, persons who plan and promote tours for sale to the traveling public, and numerous other categories of personnel. A person with the right background and motivation can do well in airline sales or marketing. Closely allied to marketing is public relations. Education and personality are important here, and journalistic or writing experience are important attributes.

Those to whom an airline career appeals should start early to prepare for it. The time and effort spent in acquiring the necessary education or skills will be time well spent. While the educational requirements for airline careers vary with the job, airline personnel officers state without exception that a student interested in an airline career should understand how important to his later success is a good high school education. A student will increase his value to an airline in any job he may seek by taking history, geography, economics and political science courses -- all subjects that will help him understand how transportation systems have developed to date and how they might develop in the future.

Correct and forceful expression in writing and in speaking is important in the airline business, because so many jobs bring one into contact with the public. Especially is this true in public relations and in sales and service jobs. Those seeking a career in these areas would do well to take courses in English, composition and public speaking.

It should be remembered too, that the airplane is a product of science. Science spends tireless efforts in the development of aircraft and related equipment. To understand the tools of the airline industry, appropriate courses in the physical sciences are advisable. Mathematics is the language of science. For one aspiring to be an aeronautical engineer, courses in high school mathematics are mandatory.

Airline salaries and benefits are among the most attractive in industry. For example, the average annual salary was $9,700 in 1968, up more than 60% over salaries a decade ago. Airlines offer liberal insurance programs and other fringe benefits, one of the most attractive of which is free and reduced-rate transportation privileges for employees, and in some cases, members of their immediate families.

Airline employment is especially attractive because of the training opportunities and the job security it offers. The U. S. airline industry is one of the major training organizations in the world. The airlines are spending tens of millions of dollars annually on pre-employment training, transition training, refresher courses and upgrading programs -- all aimed at enabling the willing and capable employee to better himself and do a better job for his company.

UNITED PARCEL SERVICE

Mr. E. Larry Raulerson, Jacksonville PM Sort Manager, United Parcel Service

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United Parcel Service's product for the market is fast, efficient service, at a fair and reasonable rate, competitive with its chief competitors.

United Parcel Service places itself in the common carrier area of business. U.P.S. has several features which characterize their operation.

1) A weight limit of fifty (50) pounds on each package;
2) The package be less than 108 inches in length and girth;
3) U.P.S. can't ship more than one hundred (100) pounds to each consignee per day; and
4) They service only forty-one (41) complete states and parts (intrastate service) in seven (7) others.

U.P.S. now has a forty-eight (48) state petition before the I.C.C. which is still pending. The last expansion that U.P.S. has had was the addition of a three (3) state area (1) New Mexico, (2) Wyoming, and (3) Colorado.

I mentioned the I.C.C. and the role it plays in the granting of new states to the company. This area would be dealing with the "environmental set" of the firm and the interfaces that occur. Besides the government intervention there is also state regulation that must be met. Another area would be labor unions. United Parcel Service has approximately 43,800 teamster jobs out of an approximate total employment of 55,000. The only real large competitive firm that the company has to worry about is the Parcel Post Section of the Post Office; they are the chief competitors. The other area in this section would be the customers themselves. Since the customers are the single most important thing to the company, then a lot of effort, time, money, etc., is put into making the service to them the very best. The Jacksonville HUB has four full time customer service representatives that deal with customer complaints and try to smooth out the differences.

A typical U.P.S. shipper would give the package driver an average of two packages per day, which would weigh approximately twelve (12) pounds. This results in approximately one and a half million delivery stops per day on a national level and 4,000 per day on a local level. The company has approximately 270,000 common carrier shippers and 3,000 retail store shippers in the nation. Out of these 273,000 shippers approximately 200 or more thousand of these shippers ship five or less packages per day. Since the individual shipper who may only use their service once or twice a year makes up a large total of their overall customers then you can see the importance of customer service representatives.

Estimates for year ending 1973 have a total national volume of over 730 million packages with 18,500,000 of it to be delivered and sorted in the State. These packages move over the road, the rails, and by air to their destination. On a typical day on the PM Sort, which is one of three shifts in the HUB operation, you will see 85,000 packages being inbounded.

These packages will arrive by road movement and rail movement. On an average day they will have seventeen 40 foot drop frames, six 40 foot flat beds, two 45 foot flat beds, and thirty-five T.O.F.C.'s that bring the volume to them. Jacksonville is a rarity in that it receives approximately 65% of its volume by rail where as the national average is only 8% by rail. The company has a very large ground feeder operation which uses large T.F.C. employees only. There are approximately 4,300 feeder drivers who pull these road movements. The average per T.O.F.C. cost for the company is somewhere around $275. In Jacksonville they have an average cost of $130 for T.O.F.C.'s in the State and $200 for T.O.F.C.'s outside of the State.

Of this 85,000 packages that Jacksonville receives for further delivery approximately 4,700 stay in Jacksonville for the center operation to deliver . The rest is sent to the various sections of the State. To deliver these 4,700 packages the center has forty-four (44) package car drivers who drive a combination of P-600 and P-800 delivery vehicles to deliver the packages. These same drivers also pick up on a daily basis 6,500 packages for delivery. Over-the-counter operations at the HUB result in 150 packages for delivery a day. The remaining 80,300 packages, to be sent to various parts of the State, are processed through 18 unload positions, 10 extenlos and 8 nashville unloaders, to 100 outbound load positions. Of these 100 load positions, 33 are fed directly off of cannon loaders, the remaining 67 are manual pull positions. The total system has an unload area, a primary sort area, two secondary sort areas, which each have five run-out belts, and three primary run-out belts. All of these positions are filled by part-time students.

Some of the largest problems facing the company are in the area of the season changes in volume. Although the average daily volume at present is 85,000,at Christmastime it may reach 130,000 plus. There are certain times during the year when the volume will rise for a short period of time. This results in additional feeder runs and additional package car runs to deliver the packages on time. To give you an idea of the seasonality of the operations take the over-the-counter operation for Jacksonville for instance. On an average they take in 150 packages for delivery. On one day during the Christmas rush period they took in 1,100 packages.

Another big problem that faces them is the times that must be met on the feeder runs. Since most all of the feeder runs out of Jacksonville are on a tight run schedule it is important that the feeders leave here on time. Delays, as a result of late groundings at the rail yard, have been a big problem in the past.

FUNCTIONS OF WAREHOUSING

Mr. Thomas A. Duke, Vice President, Laney and Duke Terminal Warehouse Co.

There is an old misnomer about warehousing in general -- that is a dusty, old, dim-lighted facility with pianos, trunks, and furniture collecting dust and waiting for someone to reclaim them.

Today's warehouses occupy modern, clean, even attractive buildings, with security-minded management. The three main categories of warehousing are (1) private warehousing, (2) mini-warehousing, and (3) public warehousing. A warehouse may be thought of as a bank or an information center.

Functions of Public Warehousing:

The public warehouse is in position to provide services for an account or shipper which would otherwise require tremendous capital outlay in comparison. The warehouse service offers an account the flexibility to move and relocate to meet changing market conditions. Using warehousing service provides the account with local delivery service and consolidation of shipments. There is also the advantage of utilizing the warehouse computer system, which would be much more expensive to the private user. Getting his goods to his customers more quickly, being closer to the market, is another advantage of using warehousing facilities. The account gets his money more quickly also, since there is more turnover on merchandise.

The large warehouse operation is better equipped than the private smaller account to handle the incidents of strike and other labor negotiations, contributing to a more smooth operation.

It is a fact that all warehouses, public and private, have to rely on common motor carriers and railroads for moving the merchandise. In the past very few warehouses have had their own trucking operations, and even then they were limited as to how far they could go.

Freight forwarding and consolidations play an important role in the warehouseman's program. Rising costs from carriers, plus their wanting the full truckload for long haul shipments brought about some changes that grew into consolidation. There was an interest in public warehousing and in transporting goods faster and more economically. All of this resulted in the establishment of traffic departments within warehousing operations.

In California, for example, warehousing is really not profitable in itself, and just breaks even. Their trucking operations are the only profitable part of their business.

In Jacksonville the trend is that warehouses can make reasonable profits by providing extensive transportation services to their customers. There has been a definite trend toward outside warehousing in the past several years, and providing transportation and trucking operations beyond the local zones is an important area, from both the service and economic points of view, that many warehouses have already done and others are seeking. But there must be that level of sophistication and knowledge of transportation in order to do the job properly.

GOVERNMENT AS A PROMOTER AND REGULATOR

Mr. Herman Fauss, Jr., District Supervisor, Interstate Commerce Commission, Jacksonville, Florida.

The purpose of my discussion today is to explain - and answer your questions about the Interstate Commerce Commission and its functions.

Before we get too far along it might be well - and wise on my part - to tell you a little something of the history and present day functions of the ICC.

In the year 1829, the President of the United States, Andrew Jackson, received the following letter from Martin Van Buren, who was then Governor of the State of New York:

"Dear Mr. President:

"The canal system of this country is being threatened by the spread of a new form of transportation known as railroads. The Federal Government must preserve the canals for the following reasons:
(1) If the canal boats are supplanted by railroads, serious unemployment will result. Captains, cooks, drivers, hostlers, repairmen, and lock-tenders will be left without means of livelihood, not to mention the numerous farmers now employed in growing hay for horses. (2) Boat builders would suffer and towline, whip, and harness-makers would be left destitute. (3) Canal boats are absolutely essential to the defense of the United States. In the event of expected trouble with England, the Erie Canal would be the only means by which we would ever move supplies so vital to waging the modern war.

"For the above mentioned reasons, the Government should create an Interstate Commerce Commission to protect the American people from the evils of the railroads and to preserve the canals for posterity.

"As you may know, Mr. President, railroad carriages are pulled at enormous speeds of fifteen miles per hour by engines, which, in addition to endangering the life and limb of passengers, roar and snort their way through the countryside, setting fire to the crops, scaring the livestock, and frightening women and children. The Almighty certainly never intended that people should travel at such breakneck speed."

Congress finally got the message and in 1887 established the Interstate Commerce Commission through passage of the Interstate Commerce Act. The original statute was brief, of less than ten pages. It was confined to the regulation of interstate commerce by railroad, or partly by railroad and partly by water. The main objective was to remove discrimination, preference, and prejudice in localities, services, rates, fares, and charges. Today, after over 200 amendments, the 1887 statute and related laws administered by the Interstate Commerce Commission fill more than 425 printed pages. All of these pages relate to regulation of rail carriers, motor carriers, water carriers, and freight forwarders. The Interstate Commerce Commission does not, in any sense, "control" the carriers. Its role is to regulate. As an example of "regulation" vs.

"control" motor carriers are not told how many vehicles to operate nor are they required to operate on any fixed schedule. Carrier may run as many vehicles as it chooses on as many runs per day as its business warrants.

Carrier management can hire and fire, enter into contracts with the unions, and build new terminal facilities.

The ICC does not interfere with those areas which should properly be left to managerial discretion under our free enterprise system.

The ICC does not regulate all transportation. Jurisdiction over transportation within a single state and not part of an interstate or foreign movement is reserved to the State government. While the ICC and the State Commissions have very clearly defined areas of responsibilities, our offices work in close harmony and often with coordinated efforts to achieve a given goal.

The Federal Power Commission regulates pipeline movement of artificial or natural gas; the Civil Aeronautics Board and the Federal Aviation Agency have jurisdiction over air transportation, while American ships in foreign service are under the Federal Maritime Commission and the Maritime Administration.

The ICC does not have economic regulatory authority over interstate trucks carrying certain agricultural products, water carriers transporting certain bulk commodities, and motor or water carriers which are engaged in private operations (not selling transportation to the public).

The ICC's activities are directed by 11 Commissioners, each appointed by the President of the United States and confirmed by the Senate. The President now names the Chairmen. The Commissioners' seven-year terms are staggered so that no more than two expire in any one year, thus assuring continuity. Only six Commissioners may be of the same political party.

The operating policy of the ICC is prescribed by Congress in the Interstate Commerce Act and is defined in the "National Transportation Policy" enacted by the Congress in 1940. I believe this National Transportation Policy is worthy of quotation at this time.

"It is hereby declared to be the national transportation policy of the Congress to provide for fair and impartial regulation of all modes of transportation subject to the provisions of this Act, so administered as to recognize and preserve the inherent advantage of each, to promote safe, adequate, economical and efficient service and foster sound economic conditions in transportation and among the several carriers, to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices, to cooperate with the several States and the duly authorized officials thereof, and to encourage fair wages and equitable working conditions - all to the end of developing, coordinating, and preserving a national transportation

system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the postal service, and of the national defense. All of the provisions of this Act shall be administered and enforced with a view to carrying out the above declaration of policy."

The ICC's role in all of this as promoter, umpire, and policeman, is not an easy one. There are thousands of carriers and the primary goal of each is to maximize profits.

Competition among carriers for the most lucrative traffic is keen and in respect of such traffic the activities of the Commission are usually confined to formal casework. However, in the case of so-called undesirable traffic, the informal, as well as formal, activities of the Commission are very intense.

The Commission, despite a modest budget, seeks to maintain service representatives in every State of the Union. Our field investigators, totaling slightly more than 100, have a staggering workload and it is their job to provide assistance to shippers, consignees, carriers or any member of the public who needs help in the area of interstate surface transportation.

If these few employees were not available, what other public official would seek to relieve the plight of the small shipper? Moreover, if general merchandise carriers were not required to hold a license obligating them to serve all shippers, would the tendency of carriers to avoid "less attractive" traffic come to an end? By what means would the carriers be required to take the good with the "bad"? Would service to small towns and remote communities be continued? Would damage-prone or light and bulky traffic be transported hundreds of miles? Could a shipper or consignee still call the ICC for help and, if so, what kind of help would be available?

This should give you a pretty good picture of what the ICC is and what it does.

GOVERNMENT AS PROMOTER AND REGULATOR AS IT APPLIES TO AMTRAK

Mr. B. C. Miller, Manager Station Services, Amtrak, Jacksonville, Florida

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In order to see the relationship between Government Regulation and the National Railroad Passenger Corporation, it is necessary to review events leading up to the legislation that created it.

The enormous expansion and development of the railroads of the United States in the half century following the Civil War, brought into existence, by its very nature, a vast monopoly. The Iron Horse was so much more efficient than any means of transportation yet developed that the location of railroads determined where towns might be built, and the service given them determined which ones would prosper. Interior America moved away from the rivers and developed the open country. Virtually every one who travelled had some experience with trains.

It became apparent by 1887 that the power of the railroad over public welfare was too great to be left to the unrestrained judgment of railroad management, and the Interstate Commerce Act was passed by Congress, to require uniformity of rates and service - and this was a good thing. This regulation of railroads, included control of the operation of passenger trains - the aspect (of the matter) we are considering. The Act required that railroads must secure consent from regulatory bodies to curtail or eliminate any passenger train, if a private citizen pretested that his interests would be adversely affected. This restriction was no great problem during the years up to and including the First World War, because growing America used its best available means of transportation, the passenger train.

In the 20 years after World War I, the development of the automobile assembly line, and the construction of a network of national highways brought an end to many things, including the need for the local (short haul) passenger train. In the same two decades commercial aviation came of age, and while the percentage of intercity travel by air was very small, it was growing significantly.

In the meantime, back at the regulatory authorities, there was a pronounced reluctance to permit the discontinuance of passenger trains that ceased to be profitable to their owners. At the State level particularly, politics was always a factor, as the Railroad Commission member(s) who was up for re-election was often more sensitive to the wishes of his constituents than he was to the financial plight of the railroads. It was very easy to take the position that the railroads were making enough money on freight to afford their passenger trail losses. Thus, the philosophy of "Public Interest" was confirmed. Passenger service that was declared to be in the public interest was subsidized by freight revenues without regard for the ultimate result, higher freight rates that were passed on to the "public," with the basic objective of re-electing a Commissioner. Obviously, the ability to arrange freight

rate structures to compensate for passenger losses was extremely complicated, and frequently unsuccessful, as railroad bankruptcies indicate.

After World War II, when Detroit got back into private automobile production, while Lockheed, Boeing, and others adapted military aviation technology to commercial use, the cry of the railroads for relief from passenger train losses was heard throughout the land. Railroads spent many millions of their wartime earnings for the best engineered equipment that could be produced - diesel powered streamliners, with reclining seat leg rest coaches, sleeping cars with private facilities in each room, slumber coaches, dome observation cars, and the like became the standard for name trains throughout the Country. These were money makers for a while. Equipment from these trains is the Amtrak Fleet of today, all of it built between 1947 and '51, except for the Metroliners, and few Turbos. Ever increasing super highways, crowded with the products of Detroit, and super jet-ports, reduced revenues of passenger trains to the point that railroads were not capable of replacing equipment for the few areas that appeared to have a profit potential.

In October 1970, with very little publicity, Congress passed an Act creating the National Railroad Passenger Corporation, as a quasi-public organization, charged with the responsibility of establishing a national passenger train requirement level, determining what train service could be expected to become profitable. The service designated by this study would become the responsibility of the Corporation, soon called Amtrak, and the railroads that participated in the program as contract carriers, could discontinue all other passenger trains.

Amtrak purchased from the railroads about 1,500 units of the best equipment available and began to take over passenger stations, ticket offices, reservation functions, and on-train services. The 13 contracting railroads provide the tracks, operational systems, and train crews, billing Amtrak for those costs that are directly attributable to the operation of Amtrak trains. Amtrak receives all revenues from passenger fares and services. The deficit, between the cost of the operation and the revenues, is made up by Congressional appropriation. In short, the cost of passenger trains declared to be in the "Public Interest" is being guaranteed by public money (rather than through freight rates).

Government as the promoter and regulator is very much in evidence in the pursuit of Amtrak's objectives. Obviously, then Amtrak must go back to Congress every two years with an accounting of expenditures, and a justification for further appropriations needed; the personal interests of individuals will be out. Newspapers have cited the insistence for a train between Washington and Parkersburg, West Virginia, as being more political than profitable, and there have been some other instances in which service was requested by Congress with an extremely long range profit expectation.

The Amtrak Chartering Act removes it from the jurisdiction of the Interstate Commerce Commission, for all matters other than (for) safety

requirements, so rates, schedules, and incidental services are controlled entirely by Amtrak, subject to review by Congress. This enables Amtrak management to adjust fares, establish family plan and group fares, and anything else that might be beneficial. Former regional differences are blended into one nationwide network, with uniform advertising, a single timetable, a computerized reservation system, and a standard working arrangement with travel agents. Plans are being made for the next generation of passenger cars. The present equipment is, of course, receiving a thorough refurbishing and renewing, to serve the present need. Experiments are being conducted with some French built Turbo equipment, that has been made available this summer, and is being used between Milwaukee and St. Louis.

Developments that have occurred since the creation of Amtrak confirm the wisdom of the Act. Fuel shortages, real or otherwise, pollution, congestion of highways and airports, all point to the need for the United States to secure maximum use of its resources, including the existing railroad network. Technology will never cease to develop new modes of transportation, but in the meantime, the best use of what we have must be our national policy. There is a market for good passenger train service. The demand is increasing now, under somewhat less than perfect conditions.

The net loss for Amtrak's operation for the fiscal year just ending is quoted as $124,000,000.00, down 18% from the previous 12 month period. This is a substantial sum of money, even by Government standards, but when you consider that all forms of transportation, whether by expressway, airport or waterway, cost the tax payer more than he will ever know, do not be surprised if the only mode for which a true price is available is the best bargain of all, for the tax payer.

GOVERNMENT AS PROMOTER AND REGULATOR AS IT APPLIES TO AVIATION

Mr. James A. Brown, Flight Operations Inspector/Accident Prevention Specialist, Federal Aviation Agency.

A Bit of History

Before 1926, the federal government had no special machinery to assist or promote aviation. Except for scattered state or local instances, there were no safety regulations or navigational aids.

In 1926, congress passed the air commerce act which placed the responsibility of fostering and regulating civil aeronautics in the Department of Commerce. This was just in time, because in May 1926 Lindbergh's flight awakened this nation and the entire world to the potential of flight.

In one year, student pilot numbers jumped from 600 to 10,000. The number of certificated aircraft went up from 2,700 to 9,800 in three years.

The growth of aviation has been dynamic ever since, causing growing pains within commerce and in 1934 the Bureau of Air Commerce was formed to take over this infant giant. By the time four more years had passed, field activities had become extensive enough to require regional offices and the growth of commercial aviation had made new legislation necessary.

Realizing the need for combining the dispersed aeronautical responsibilities into one independent agency, congress passed the Civil Aeronautics Act of 1938 which created the Civil Aeronautics Authority.

Responsibilities were grouped into three major components:
1) A five-member board for regulating commercial activities and safety.
2) An administrator to establish civil airways and to install and maintain navigational aids and to control traffic using these airways and aids.
3) A three-man air safety board to investigate accidents and recommend preventive measures.

In 1940, the authority was converted in the Civil Aeronautics Board (CAB) and the Civil Aeronautics Administration (CAA).

The CAB as an independent organization was given the accident investigation functions and the safety/rule making function. In other words, the CAB wrote the rules and the CAA enforced them.

World War II caused aviation to come of age with as many as 95,000 aircraft--mostly military--to be manufactured in a single year and as 1945 ended, there were 300,000 civilian pilots.

In 1948, a President's air coordinating committee, primarily concerned with the necessity of a strong and viable aircraft industry (in other words, the promotional aspects of the government's responsibilities) saw problems

ahead and warned that our air transportation system was marginal even by pre-war standards.

It took another nine years and a real crisis dramatized by two mid-air collisions involving military aircraft and civil air carriers in which 61 lives were lost, to focus attention on the urgent needs for a common military and civil aviation control system and a complete reorganization of federal machinery for the control of aviation.

Congress acted promptly, and in 1958 President Eisenhower signed the Federal Aviation Act into law, which has endured these last fifteen years and is legal basis for our authority to govern aviation.

This act gave the Federal Aviation Agency (FAA) full authority over the certification of aircraft and airmen, safety rule-making (formerly a function of the CAB), the operation of navigational aids; the allocation of airspace and the management of civil and military air traffic.

The Civil Aeronautics Board continued as a sister agency (completely separate from the FAA). It continued to regulate airline rates, routes, and airline business in general and to investigate aircraft accidents and determine the probable cause of all accidents.

It is interesting to note the CAB continued to hold the accident probable cause responsibility to eliminate any possible conflict of interest of involvement that might have arisen if FAA were to determine the probable cause of an accident, that FAA's own safety regulation was designed to prevent.

The most recent change in the administration of aviation occurred in 1967 when the Department of Transportation (DOT) was established. The FAA with its 51,000 employees is the largest of the seven administrations which constitute the DOT.

Under the DOT, a national transportation safety board, NTSB, was established, which absorbed the CAB accident investigation responsibilities and determined their probable cause and continued its economic regulations of airline routes and rates.

To make FAA more responsive to the aeronautical needs of communities, the FAA has decentralized its organizational structure from Washington to nine regional offices within the continental U. S. Four new regions were established to conform to government's standard regional concept which called for uniform boundaries and headquarter cities for most of the various federal agencies.

Mr. Alexander Butterfield, recently appointed as administrator of the FAA--and who is incidentally a native of Pensacola, Florida--in his oath of office, restated the FAA responsibilities to promote and regulate aviation in the public interest as follows:

A. The Legulation of air commerce in such a manner as to best promote its development and safety and fulfill the requirements of national defense.

B. The promotion, encouragement, and development of civil aeronautics.
C. The control of the use of the navigable airspace and the regulation of both civil and military operations in such airspace and in the interest of the safety and efficiency of both.
D. The consolidation of research and development with respect to air navigation facilities, as well as the installation and operation thereof.
E. The development and operation of a common system of air traffic control and navigation for both military and civil aircraft.

FLORIDA PUBLIC SERVICE COMMISSION

Mr. James E. Hill, Safety Supervisor, Florida Public Service Commission

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The Florida Railroad Commission was created by the State Legislature in 1887. Since that date, there have been several name changes, the first being the Florida Railroad and Public Utilities Commission, later, the Public Service Commission.

When the Commission was originally created, the main direction of its jurisdiction dealt with the railroad companies, as this was the major mode of transportation in the state.

The Legislature provided for three commissioners who would be elected in a statewide election, and they would serve four-year terms. Two are elected during the same year and the third is elected in the next general election, thus ensuring at least one commissioner not being involved in an election while the others are so occupied.

The three present commissioners are Chairman Bill Bevis, Commissioner Billy Mayo, and the newest member, Commissioner Paula Hawkins who took her seat this past January.

The Commission's powers are quasi-legislative and quasi-judicial. This occurs by the nature of the Commission's functions, simply, the Commission makes rules,then enforces the rules that it has made.

The Commission's primary function, as charged by the legislative mandate, is to insure adequate and safe standards of service, also fair and reasonable rates for such service to the public.

The Commission regulates the following privately-owned or privately invested economic enterprises within the state. Motor Transportation companies, including bus and motor truck carriers, Transportation Brokers, Taxicabs and Limousine services, Railroads, including express and pullman companies, including the railroad passenger and freight terminal facilities, Ferries, Toll Bridges and Canal Companies, private Wire Services; Natural Gas utilities, Electric Power utilities, privately-owner Water and Sewer companies (in certain counties), Telephone and Telegraph companies.

The Commission regulates these companies by performing the following functions:

1) Conducts public hearings and enforces resulting decisions.
2) Makes rules and regulations applicable to economic activity.
3) Polices highways to prevent unlawful motor transportation operations.
4) Conducts safety checks of vehicles operating on highways.
5) Inspects and investigates utility and carrier operations to insure compliance with Commission rules and regulations.
6) The Commission functions to protect or further the interest of Florida before Federal regulatory agencies in matters affecting the population or geography of the state.

URBAN MOVEMENT OF PEOPLE AND GOODS

Mr. Balraj K. Mehta, Head of the Advanced Planning Division, Jacksonville Area Planning Board.

The increase in population, personal income, education, technology, and productivity have brought about increased interaction and mobility resulting in increased travel. Concentration of more and more people and activities in a relatively small number of (urban) areas has created transportation problems in these areas.

Approximately 70% of the total population of the United States is located within the urban areas of our country. Most of the transportation facility needs are in these urban areas and as our urban population grows, a transportation system assuring smooth movement of people and goods within and between urban areas becomes increasingly essential. In fact, not only the future growth and expansion, but the very existence and survival of many urban areas depends upon the availability of efficient, convenient and comfortable transportation system helps to attract investment, increase employment, invigorate economy and thereby insures the expansion and growth of the area. Poor and inadequate transportation facilities, on the other hand, act as a deterrent to further growth and, in fact, may become a causal factor for the decline of the area.

Studies and analyses done for the Jacksonville area have revealed that over the last ten years, vehicular traffic in the city has increased at a much faster rate than any other single element.

Whereas the population of the City increased by only 16.2%, from 455,000 in 1960 to 528,800 in 1970, the number of automobiles jumped from just over 139,000 to 248,000 during the same period; i. e., an increase of 78.5%! The number of Average Daily Trips (ADT) registered an increase of 117.5%, from 551,745 in 1960 to over 1,200,000 in 1970, and the Central Business District (CBD) witnessed an increase from 66,235 to almost 150,000 ADT; i. e., 127% increase!

The number of automobiles is projected to increase to 425,000 by 1990 and the average daily trips in the city are forecasted to increase to over 2,243,000 by the same year.

As traffic (congestion) increases, the accessibility and provision of vehicular-parking becomes difficult. The people, businesses and commerce start moving out to new and more convenient locations in the suburbs, resulting in the disintegration of the CBD and creation of slums and blight at the core. Provision of costly toll roads and paid parking facilities to improve the situation in the CBD, actually enhances the trend of suburban sprawl increasing the cost of public services and reducing the revenue base of the central city.

Whereas private transportation in cities is suffering from greater demand and lack of supply of facilities, public transportation (mass transit) is suffering from lack of demand and cannot generate enough

revenues to meet the operating expenses. The total number of revenue transit passengers in Jacksonville has dropped from 15,370,000 in 1961 to 13,630,000 in 1969.

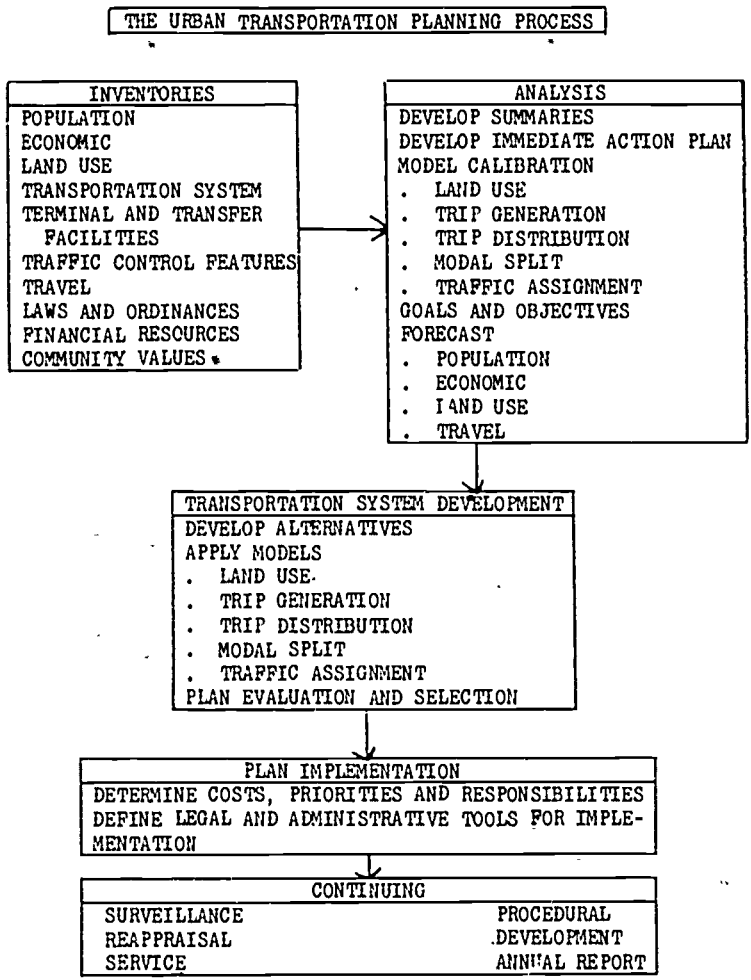
This is a situation typical of every metropolitan area in the United States; yet there is an imperative need to maintain and encourage the use of mass-transit in urban areas to:

1. relieve traffic congestion on the highways
2. discourage low-density suburban sprawl
3. encourage development of a strong unified and cohesive CBD
4. reduce environmental pollution caused by exhaust fumes, dust and noise of automobiles
5. reduce the land area under streets, highways and public parking and put valuable land to better uses, generating income to the local government, and
6. provide inexpensive and convenient transportation to underage, overage and disadvantaged persons; i. e., captive transit users.

To provide suitable and adequate transportation facilities in an urban area, it is imperative to establish a comprehensive transportation planning process encompassing all modes of transportation.

Travel demand and need for transportation facilities is a function of various types of activities, their location intensity and distribution in the area. To determine existing as well as future transportation needs, it therefore becomes imperative that the process include detailed studies of population, its distribution and socio-economic characteristics, employment, land use and other systems in the urban area.

The process in the form of a flow sheet diagram is shown on the following page.



As will be seen, the process includes a detailed inventory and analysis of various systems in an urban area. Most of the data is collected manually through various types of surveys. This requires familiarity with sampling and survey techniques. Expansion of existing data and formulation of future projections for socio-economic and demographic factors requires skills of experiences and qualified professionals. Transformation of this data into land-use plan again demands professionals trained in physical planning techniques. Most of the travel demand analysis and forecasting of future trips is accomplished with the help of computers. Personnel with skill in coding data files and computer programming conduct this aspect of the process. Knowledge of urban economics, geography, environmental factor evaluation is helpful in evaluation and selection of alternative plans, choice of modes and facility location.

SAFETY CONSIDERATION

Mr. P. J. McCue, Safety Officer, Florida Department of Transportation.

Introduction

The Legislative Charter for the State of Florida, Department of Transportation, assigns the following missions or goals:

1. Develop, revise, and maintain a comprehensive master plan for transportation development.

2. Develop programs to foster efficient, economical and safe systems of:

   a. Highways and urban streets

   b. Public transportation (including mass transit and commuter operations), and

   c. Air routes, airports and allied facilities

3. License and regulate said system to the extent provided by law.

4. Require necessary assistance and data from all departments, divisions, boards, authorities and commissions of the state.

Since the adoption of that charter in 1969, the Legislature has further expanded the Department's transportation role to include certain regulatory controls over the railroads operating in the state. The Department now specifies signals and control devices at rail-highway crossings, regulates the opening and closing of crossings, and establishes speed limits on the track.

As transportation safety engineer for the Department, my responsibility is to assure that all transportation facilities are conceived, designed, constructed, maintained, and operated in a manner which is safe for the traveling public.

In order to meet this broad responsibility and to assure that safety engineers are afforded full cooperation and support throughout the Department, with freedom to express views and take positions which may be in conflict with those of operating personnel, the State Safety Engineer reports directly to top management. Consequently, the temptation to make certain concessions or compromises in transportation systems for the sake of expedience or economy is avoided.

The four subsections which comprise the transportation safety office are Highway Safety, Railroad Safety, Mass Transit Safety, and Accident Records and Research. In this presentation I would like to briefly describe some of the Department's major activities in these areas.

I. HIGHWAY SAFETY

The greatest impetus to highway safety in the United States, in my opinion, was the passage of the Federal Highway Safety Act of 1966. This sweeping legislation established minimum national standards in the areas of motor vehicle inspection and registration, driver education, driver licensing, traffic engineering services, highway design, construction and maintenance, pedestrian safety, identification and surveillance of accident locations, traffic laws, emergency medical services, and numerous other areas. Following passage of this federal legislation, the Florida Department of Transportation established its first independent highway safety program.

The highway safety engineer directs professional engineers in each of the district offices and a team of 25 engineers and technicians in the accident records and research office in the analysis of accident data, the identification of hazardous locations or conditions on the highway, and in the development of plans and recommendations for safety improvements. A number of examples will help to illustrate the safety activities carried on by these people.

A. In order to prevent any potential hazards from being incorporated into new highways, every set of construction plans is reviewed by District safety engineers before final approval in Tallahassee. The Department has adopted the American Association of State Highway Officials' Handbook of Highway Safety Design and Operating Practices and it is the safety engineer's responsibility to see that the recommendations contained therein are incorporated in the design plans. This handbook includes specifications for clear roadside recovery area, appropriate location of signing and breakaway posts for sign support, design and erection of guardrail and median barrier, bridges, culverts, and drainage facilities, energy-absorbing barrier systems, and many other safety features now standard on new construction projects.

B. Safety engineers attend pre-construction conferences and act as advisors to project engineers throughout construction operations to assure that barricades and warning signs are properly placed, detours and temporary roadway facilities are properly constructed and maintained while they are in use, flashers and lights are visible and operating properly for nighttime delineation of construction limits, and generally safe construction procedures are followed for the protection of the traveling public.

C. A program recently implemented uses computer analysis to pinpoint hazardous locations, to identify factors causing or contributing to highway accidents, and to allocate funds to insure the greatest return (in terms of accident reduction) for each dollar spent on highway safety improvements.

> 80 separate items of information about every accident occurring on the state road system are stored in the DOT's computers.

Through the use of complex but reliable statistical programs, we are able to analyze the accident experience on every section of roadway and compare it with all similar sections on the 19,000 mile state road system. In effect, the computer asks the question, "Is the accident rate on this section normal for this particular type of location, or is it different from what we would expect?" The machine then prints a "safety rating" for each section, spotlighting those sections where the accident rate is abnormally high. In this manner, we identify hazardous spots, intersections and sections of roadway.

The computer also provides us with a complete analysis of each accident that occurred at the location as well as a summary and analysis of all accidents at the location by accident cause, accident type, weather conditions, roadway conditions, driver violations, and many other variables associated with the accidents. In addition to this, the computer provides complete and up-to-date information on the roadway itself at each accident location. This data includes lane width and type, shoulder width and type, alignment, surface condition, date of last construction, current traffic volume, type of traffic control devices at the location, and summary of the recommendations made by our review team after their last annual evaluation.

Professional engineers are employed in each of the districts around the state to take this information provided by the computer and to investigate each of the hazardous locations for engineering deficiencies. These district safety engineers determine what improvements are necessary to eliminate the chief causes of accidents at the location as identified by the computer. They redesign the section, develop a cost estimate for the improvement, and submit the data to the safety office in Tallahassee.

In Tallahassee, we combine the data submitted by all of the district safety engineers and enter it into more computer programs which do three things:

1. They develop accident forecasts at each location and predict the number of accidents (based on projected traffic volumes) which can be expected to occur with and without the proposed safety improvement.

2. They translate accident costs into economic terms by applying average loss figures established by the National Safety Council for various types of accidents. The total cost of all accidents to be prevented by the proposed safety improvement is then taken to be the economic benefit of the project.

3. Economic benefits are compared against right-of-way, engineering, and construction costs for each project and the computer generates a list of projects which will maximize economic savings and the number of accidents prevented for the amount of money to be spent on the program.

The recommended projects are then placed in our construction or maintenance program to be carried out. Maintenance projects receive immediate attention. Construction projects are placed in our five-year budget for the earliest construction date commensurate with the preparation of plans and acquisition of right-of-way (if required). $3,000,000 worth of safety projects are budgeted annually under this program.

D. The Department presently operates several programs jointly with the Florida Highway Patrol. We provide all of our computer and engineering data on high accident locations to the Patrol for their selective enforcement and accident investigation programs. In this way, the patrol is able to assign its men at the locations where they are most needed and our engineering programs are supplemented by increased enforcement activity.

We are also conducting a pilot project in several West Florida counties. A mutual investigation of all fatal accidents is being made by Florida Highway Patrol homicide investigators and Department of Transportation safety engineers. All evaluations and observations are shared by the two departments and joint recommendations are made for law enforcement and engineering improvements at these accident locations. If the results of this pilot study support the team approach to accident investigation, the program will be expanded to include more state highways.

E. Our Interstate Safety Program, which incorporates the most comprehensive safety specifications ever required on a highway system, is well underway. Interstate highways can truly be called the finest roadways ever constructed. Accident and fatality rates on the system are less than half that experienced on even the best of primary roads.

Yet our accident surveillance programs and the improved safety standards incorporated in the 1966 National Highway Safety Act indicate that many modifications must be made in the system to remove existing hazards. Break-away sign posts, additional guardrail of a better design, revised drainage structures, gore areas free from obstructions, and other features are still required.

In order to complete the safety improvements on existing interstate to coincide with the completion of new construction in the late 70's, we are allocating $3,000,000 of safety funds annually for this work. This will assure a uniformly safe system throughout Florida.

RAILROAD SAFETY

Of 249,227 highway accidents in Florida last year, 469 were at rail-highway grade crossings. 2300 motorists died on Florida highways while 77 died at rail crossings.

On the other hand, the consequences of grade crossing accidents are usually devastating and they are often preventable. Recognizing this fact, the Department strongly supports a program to signalize all

dangerous crossings. Over the years, we have signalized 2/3 of the crossings on our state primary system. An additional 135 were scheduled for installation during fiscal years 1972, 73, and 74. Consequently, the accident problem at state primary crossings is now pretty well in hand.

This is not the case for the remaining 6000 crossings on secondary roads, city streets, and county roads. Only about one out of five of these grade crossings that were under local governmental control until July, 1972, have automatic protection devices. Furthermore, many hazardous conditions exist at these crossings, including some that are signalized. This is one of the reasons the 1972 Florida Legislature saw fit to assign regulatory authority over all grade crossings to DOT. The purpose of this legislation was to expand the DOT's safety program to include all crossings in the state.

Railroad signal requirements are determined by a formula devised by the Department called a "safety index." The safety index is based on a sophisticated computer program that predicts the accident potential of each grade crossing. The index was developed after lengthy comparisons of the many variables found at grade crossings and correlations with their past accident history.

With an accident prediction at each crossing, the computer can indicate the type of protective devices which will be most effective in preventing the predicted accidents. A safety engineer then inspects the crossing, reviews the computer analysis, and determines the devices to be installed. Funding sources are then determined, the improvements are budgeted and turned over to the railroads for signal design and installation.

In order to calculate the safety index and determine signal requirements, a field investigation of each crossing must be made. Since no data was available for the 6000 crossings off the state system when regulatory authority was transferred to DOT, the Department immediately made plans to conduct an inventory of all grade crossings in Florida, jointly with the railroad companies, using their track and riding high-rail cars.

Florida DOT and the railroads began their inventory January 29, 1973, the first state in the country to start the project. The inventory was completed last month. Computer analysis of the data is now underway.

We are now in a position to apply for a "lion's share" of federal grade crossing improvement funds and this is how we plan to use them:

> Of the 6500 public rail-highway grade crossings in Florida, approximately 4000 do not have train activated protection. Our established goal is to reduce accidents at grade crossings from approximately 400 per year to under 200 per year and to reduce the number of fatalities by at least 60%. This will be accomplished by the closing of 400 grade crossings, construction

of 15 grade separations, and the installation of automatic protection devices at 2000 crossings. The public benefits of this program will amount to over $300 million over a 20-year period. Costs are anticipated at $10 million per year for the first five years (1972 thru 1977), $5 million for signals and $5 million for grade separations and other improvements, and $5 million annually for the following five years (1978 thru 1982) to be applied to signals only. All of this, of course, is contingent upon availability of federal funds, which finance 100% of the cost of signals and 95% of the cost of grade separations.

In accordance with DOT's authority to specify signal requirements at grade crossings, all new crossings in Florida will be required to have automatic protection devices as specified by the Department's safety index with the cost being borne by the requesting organization or by the Department.

As an interim measure, prior to automatic protection being installed, special signing will be installed at certain grade crossings with sight restrictions that require the motorist to slow down. Train speed restrictions may also be imposed. The Department is presently developing guidelines to establish uniform track speeds throughout the state.

III. ACCIDENT RECORDS AND RESEARCH

In discussing the highway safety and railroad safety programs, I mentioned the computer programs which provide the basis for our analyses. Accident studies provide data essential to our engineering activities, and computer analysis is a necessary tool for handling large volumes of information. For example, the Florida Highway Safety Information System Data Bank, which contains extensive details concerning traffic accidents, traffic violations, vehicle registration and inspection, driver licensing and highway design and environmental features, is one of the largest data banks in existence. By comparison, this information system dwarfs the better known Apollo System which made possible our astronauts' voyage to the moon.

Professional analysis of this data not only identifies operational problems on existing facilities, but also assists greatly in the development of improved designs for the future. Reports of all roadway, rail, and air accidents are transmitted by investigating officials or agencies to the Department for entry into our accident research file. Properly handled, the accident files not only tell us what has happened historically, but also reveal probable future occurrences. It is the accident analyst's job to determine the causes of occurrences and actions to be taken to prevent or modify those predicted occurrences. For this purpose, we employ a staff of professional accident research engineers and technicians, statisticians, and computer programmers. Research and analysis is a continuing function of DOT, with results and conclusions being recycled to planning, design, construction, maintenance and operations personnel for use in their ongoing activities.

IV. MASS TRANSIT SAFETY

Although there are as yet no rapid transit systems operating in Florida, the Department's mass transit division is actively involved in the development of several futuristic systems for the state's more populous areas, and the safety office is responsible for evaluation of equipment and operational practices for these systems. Two such projects are the Dade County Rapid Transit System and a proposed high speed turbo-train connection from Tampa airport to Disneyworld.

We have conducted feasibility studies for the operation of hydrofoils, monorails, helicopters, and aircraft capable of vertical take-off and landing, as well as more conventional bus and mini-bus services. Safety is a prime consideration in these and other mass transit developments, particularly in view of the fact that many of the concepts are new and relatively untested. Costly accidents such as the one recently experienced with the "Bart" system in San Francisco remind us that we must take unusual precautions to assure the safe arrival of passengers using these unconventional travel modes.

Consequently, we have developed safety guidelines, policies, and operational practices for airport inspection, high speed ground and rail transportation, public bus systems, and public water conveyances. The Department is responsible for licensing airports and heliports and the safety office is responsible for assuring that these facilities are suitably located and operated. We maintain files of all air accidents in Florida and are presently investigating the feasibility of conducting an air accident investigation and research program cooperatively with the Federal Aviation Administration and the Florida Highway Patrol.

Mass transit is a rapidly developing field and we fully intend to see that our policies and procedures for safe operation keep pace with technological developments.

CONCLUSION

Transportation safety is a demanding, exciting, and growing field. Imagination and technical competence are prerequisites for those interested in participating. The chief benefit of participation in the field is the satisfaction that comes from providing an important public service and the opportunity to be personally involved with a variety of projects that directly affect and improve the quality of life of every member of our society. When someone asks me what I do for a living, I say, "I save lives." Any young person interested in a challenging and rewarding profession should find that a worthwhile commitment.

ENVIRONMENTAL AND ECOLOGICAL CONSIDERATIONS

Mr. William E. Kirksey, Environmental Specialist under the Environmental Administrator, Bureau of Planning, Department of Transportation, Tallahassee, Florida.

It is obvious that in recent years people in this country have become aware of the need to more fully consider environmental factors in all aspects of planning the nation's future. The field of transportation is certainly no exception to this and the administrators and planners of the Florida Department of Transportation are now and have been taking steps to insure that these concerns are addressed. In many ways, Florida has been a leader among the states in developing environmental awareness. This is due, at least in part, to the fact that Florida has a unique and sensitive environment and a widespread concern among the citizens of the state with preserving the quality of that environment. The Florida Department of Transportation has responded to this concern by taking environmental factors into account in its planning process and construction and maintenance procedures. The policies and procedures of the state in this regard are outlined in the DOT's "Environmental Action Plan." This plan was prepared in response to Federal guidelines which seek to insure that each state is giving full consideration to the economic, social, and environmental effects of highway projects. The purpose of this paper will be to discuss the Action Plan as a means of indicating the Florida Department of Transportation's environmental activities and to provide vehicle for discussion of career possibilities in transportation related environmental activities.

The Action Plan provides the means for carrying out four fundamentals of environmental action. They are: identification, interdisciplinary approach, involvement, and alternatives. In order to carry out the fundamental of identification, the Florida Department of Transportation is developing competency in identifying and objectively studying the economic, social, and environmental impacts of a highway project. This competency will be accomplished by programs to raise the overall level of environmental awareness within the Department and by the utilization of Departmental environmental professionals or outside experts or consultants. Means are now being established to insure that the information collected upon which environmental impact determinations are made will be clear, concise, and well organized and that once the identification has been completed, the procedure will exist to evaluate the magnitude of the act so that a determination can be made as to the solution of the problem.

To aid in these activities, the Department has established an Environmental Statistics Section whose primary responsibility is the development of an environmental data base. The information is being accumulated in four categories; primarily from several federal, state, and local agencies. Those categories are: population, socio-economic information, land use, and miscellaneous information provided by the Department's Remote Sensing Section. Monitoring and updating of the

quality of this data base is accomplished at both regularly scheduled intervals and when specific information becomes available in the Environmental Statistics Section. The Department is also developing an identification manual which will be used as an aid in carrying out these activities. It will be employed by personnel involved in the planning or preliminary design phases in an attempt to reduce the omission of important environmental considerations.

The second fundamental is the interdisciplinary approach. The Florida Department of Transportation will solicit perspectives of various disciplines in the development of highway projects from early systems planning to final design. Since not all the impacts and problems involved in a highway plan are exclusively of an engineering nature, the Department of Transportation has over fifty (50) people with various types of environmental backgrounds. In addition to this expertise, we can use outside consultants, other agencies or other arrangements to gain input to a problem from any particular specialty we may need. It is the continuing goal of the Department to insure that the required knowledge from all necessary disciplines is utilized in decision making as well as the routine operations of the Department.

The third principle is involvement. Other agencies and the public must be involved in the planning, location, and design of a highway project. It is the Department's policy to provide optimum opportunity for public involvement in transportation planning and to insure the widespread dissemination of information concerning transportation systems and to inform and involve the public in the planning and development of projects throughout the systems planning, location, and design phases. As a basis for carrying out this portion of the program, the Department of Transportation has developed a new position to become a part of the Environmental Section in each district office. This position will be the Community Values Analyst. It will be the purpose of this section to assess the socio-economic impacts of transportation projects on the communities involved and to advise the DOT management, the public, and other interested agencies of the results of the analysis. This section will actively initiate the public involvement process rather than merely passively responding to requests for information. This section will respond to the public need for information by developing and implementing procedures to insure the ample general information concerning the DOT operations and projects is communicated to the public and that specific public questions are answered by appropriate sections of the DOT. This section will further serve to determine public desires and opinions and communicate these to the DOT decision makers.

The fourth and final principle is alternatives. Every highway study must investigate alternative means of obtaining the objective. This provision guarantees that the DOT will consider possible alternatives and evaluate the pros and cons of each and insures the public an opportunity to judge the options, rather than being presented with a single solution. Consideration of alternatives allows an agency and public to compare the cost benefits of taking a particular action versus the decision not to build. Here are generally four distinct categories based on alternatives which may be considered on a project.

A. The no project or no facility alternate.

B. The highway facility alternative. This alternative in turn has several corollary alternatives in that between any two termini there exist several possible corridors or alignments. There also are alternative types and scale highway improvements.

C. Other modes alternative. This alternative includes consideration of various forms of public transportation and other means of increasing the capacity of a corrider without building a new or larger highway.

D. Corridor control alternatives. If the decision is made to construct a highway in a corridor, there are alternatives in the design of that facility. These alternatives include such things as general geometric standards, proposed zoning, and green belts, which will be important in influencing the characteristics of the area through which the highway passes.

In addition to the procedures for carrying out the four fundamentals of the Action Plan, the Florida Department of Transportation is implementing several environmental programs to aid in preserving a high quality environment. They include such things as the environmental quality control program which consists of a system of specifications and special provisions for protecting the environment during construction and maintenance activities, including inspections of work in progress.

The environmental correction program which consists of a program to identify and correct completed projects which are or have become environmentally damaging;

The environmental information program which is designed to maintain up-to-date information on all recent developments in environmental control and management and communicate that information to the proper Department personnel; and

The environmental training program which consists of various forms of continuing education, both on and off the job for Florida DOT employees and training for other agencies and the public so that they will be better able to interact with the Department on environmental matters.

This generally is an overview of the Department's Action Plan and the current status of the Department's activities in environmental management. The question then that we must answer in conclusion is "what does this type of philosophy and approach mean in relation to careers in the transportation industry?" As is indicated by the Action Plan, we need a wide variety of disciplines and skills. Specialties ranging from the engineer to the biologist to the sociologist are required as well as more generalized disciplines such as management and planning. But an important

part of the Action Plan philosophy is that the Department's environmental competence does not consist of a small group of reviewing experts but consists of what the entire Department knows. Therefore, we feel that our professionals of whatever discipline should have at least a general understanding of environmental problems and what the Department is doing about them. Environmental problems will not be solved by an environmental impact statement tacked on to the end of the project. These problems must be considered from the beginning and solutions incorporated in the initial planning.

Keeping this in mind, we would hope that one considering a career with the Department of Transportation whether or not it would be in one of the environmental disciplines, will consider carefully the relationships between transportation and the environment. It is important that we find ways of making them compatible.

GOVERNMENT POSTURE - STATE TRANSPORTATION

Mr. J. V. Sollohub, Research Engineer, Division of Planning,
Florida Department of Transportation.

Last November, the Florida Department of Transportation learned of the plan of the University of North Florida to apply for a research grant from the U. S. Department of Transportation to permit the University to conduct a series of seminars with the objective of improving transportation, education, management, and planning. The Florida Department of Transportation's interest in this proposal was reflected in a letter from Mr. Ray G. L'Amoreaux, Director of the Division of Planning and Programming of the Florida Department of Transportation (DOT) to Dr. Carpenter, President of the University of North Florida as follows:

"Your proposal to study 'improved transportation planning through education, application, and coordination' would serve to motivate an interdisciplinary approach to the solution of transportation problems by faculty and students in your colleges of Business Administration, Arts and Sciences, and Education and so attract the best talents to address our national transportation problems. This could provide a source of competent professionals to the transportation field. Hopefully, it would lead to research in improving the relationships between transportation systems and the social environment to gain increased public involvement and support in developing fast, safe, efficient, and convenient transportation at the lowest cost consistent with our national objectives including efficient utilization and conservation of the nation's resources and the protection of social and economic community values."

The presence of DOT representatives at this first of a series of seminars is a further confirmation of our interest in the program.

It is a great privilege for the Florida Department of Transportation to be able to address this seminar for guidance counselors and curriculum planners whose objective is "to identify the training, preparation and skills required in various transportation areas." Certainly, this week's exposure to the variety of transportation interests including carrier management, shipper management, government services and so forth will reveal to you the wide scope of the transportation field which is so vital to our economy as well as to the social structure of our nation. It will make you aware of what Professor Gilbert, my economics instructor at the California Institute of Technology described as the difference between our highly sophisticated and productive way of life and the situation in the more primitive areas of the world -- the massive public works program of roads, railroads, airports, canals, and pipelines which are absent in the essentially manually oriented primitive economies.

While the Florida Department of Transportation is oriented particularly to the facilities for transportation including roads and airports which are primarily engineering operations, we hope that our discussion will reveal some of the skills required which extend beyond the engineering

discipline only. Mr. McCue's discussion of our safety programs as well as Mr. Kirksey's explanation of our concern for the natural environment and public involvement in our planning and programming both have told you a little of the many disciplines which must contribute to the solution of our transportation facility problems. Not only must we have the engineers who represent 1/3 to 1/2 of the 10,000 people in the State Department of Transportation, but also we must provide the biologists, geologists, physicists, and other physical scientists who contribute to the solution of our problems as well as the urban planners, geographers, and other social scientists who insure that human and community needs are recognized as well. The great variety of administrative support skills include personnel, purchasing, contracting, public relations, labor relations, accounting, computer systems operation, law, secretarial and clerical, together with the janitorial, equipment operation and maintenance and manual labor support so essential to our operation. Truly, the responsibility for planning, programming, designing, constructing, operating and maintaining transportation facilities is a completely interdisciplinary activity requiring almost all kinds of professional, technical, and manual skills. Admittedly the majority of DOT's personnel are engineer-related but we do need representatives of most professional disciplines and all administrative supporting services. In addition, transportation sections of city, county, and regional planning organizations require these specialists.

In order to give you a visual presentation of the breadth of activities encompassed by the State Department of Transportation (DOT), I wish to present to you now a short film prepared for the Florida's DOT entitled "The Moving Challenge." I trust it will be a fitting introduction to the remarks to follow on our state transportation activities.

Fifteen minute film "The Moving Challenge".

I believe that the movie you just saw has impressed upon you that we in the State Department of Transportation are really thinking in terms of providing transportation services in the most effective, efficient, and desirable fashion. We recognize the "love affair" between the American people and the automobile which is reflected in the fact that 90% of our travel is still on highways with 94% of our fuel consumption in automobiles. We also recognize that we must improve the wasteful "anachronism" of one rider per large vehicle which is wasteful of fuel and contributes so much to our problems of congestion, air and noise pollution as well as damages to our social and natural environment. Significantly, while the trend on the use of public transit continues to go down, there is the hope for a reversal of this trend in the fact that governmental contributions to mass transit within the last three years have more than tripled in recognition of the need to provide these transportation services to the community.

Let us look now at the subject of transportation under the headings of the subject matter for this seminar. We are to examine the economic, political, legal, and social aspects of transportation and consider the problems of the transportation system and present and future employment opportunities together with the needed educational training requirements for various job classifications in transportation.

First, let us consider transportation as an economic issue. It has been

aptly stated that transportation is the life blood of a nation's economy with its contribution to movement of raw materials and delivery of finished products. At the same time, it must be recognized that transportation facilities are very expensive in first costs and these costs continue in the operation and maintenance of the roads, railroads, airports, canals, pipelines, and conveyors which provide our transportation services. Furthermore, the transportation equipment - trucks, autos, planes, railcars, ships, barges, etc. - are major investments. Twenty-five percent of our annual energy budget is for fuel for transportation. If we add the energy requirements for construction of transportation facilities and manufacture of transportation equipment, the "energy bill" goes up to 41%.

When we recognize that the amount of fuel used to move a ton of goods one mile by airplane would move it almost 16 miles by truck, 51 miles by railroad, 67 miles by waterway, and 81 miles by pipeline, we can see that we must have a balanced system for transportation of goods to avoid fuel waste. Similarly, a bus can carry nine passengers one mile on the same fuel which would be reflected also in reduced pollution and congestion and would provide transportation to the disadvantaged--the old, the young, the handicapped, the poor. We must convince a greater number of people who move by automobile that they must provide transit service and be served by it. This change will require not only a changed attitude but also a great deal of money to provide public transit service and improved technology to assure services which meet the transportation needs.

In examining the relationship between politics and transportation, we must consider the goals and objectives which are established by elected officials and the people who elect them. What do we want for our community, state and nation? I do not believe that we would be satisfied with the idyllic simplicity of Thoreau's Walden Pond, but if we want our central heat and air conditioning, television, electrical appliances, easy mobility and all the other conveniences we take for granted, we must recognize that these depend on transportation. Instead of being served by our own manual efforts, we are demanding services which require an energy usage per person which represents some 700 times one individual's manual work capability. Do we want high rise condominiums or sprawling suburbs of small individual homes or do we want planned integrated towns like Reston, Virginia, or Columbia, Maryland with homes within walking distance of employment sites? These political decisions influence transportation facilities which must be tailored to meet them. Suffice to say it is essential that there be public involvement in making political decisions just as was stated by Mr. Kirksey this morning and we need the help of you educators and guidance councelors to alert the people to this responsibility.

Legal considerations affecting transportation were the third element to be discussed. Certainly laws passed by the Congress and Legislatures affect the availability of funds for transportation, the restrictions under which transportation facilities can be designed and constructed, the rules and regulations for securing right-of-way for transportation facilities and for relocating people and businesses that may be displaced. The administration of design and construction contracts, the handling of claims for and against the government, and the legal review of proposed actions in transportation matters all are questions to be considered by

lawyers. The National Environmental Policy Act also requires that our planning design and construction of transportation facilities be conducted in a manner that will safeguard our social and natural environment for the benefit of all.

The fourth element to be considered in the transportation picture is the social effect of transportation activities. These effects tie in with the political goals but are broader. How can we provide the mobility that people want, their ability to go to work, to play, to school, to shop, to hospitals, to visit, and all the other destinations by providing roads and other transportation facilities and at the same time avoid damage to neighborhoods from noise and air pollution and interference with people's ability to go to church or school or to your friendly neighbor? Again, we find a dire need for public involvement in providing guidance to the people who provide transportation facilities. Most people are conservative and do not want to change the situation in which they are living but they do want easy convenient travel and consequently must make their desires and needs known to the transportation planners.

Consideration of the economic, political, legal, and social significances of transportation is a principal responsibility and activity of the Florida Department of Transportation. It is reflected in transportation planning and programming which are needing even greater attention. In simplest terms, we inventory the transportation facilities and requirements we have today and project these to transportation needs for the future. We strive to maximize community and individual benefits by providing the most convenient and cheapest transportation services possible while concurrently projecting and improving the natural and social environment.

First let us consider the problem of inventorying our transportation facilities and the population vehicles, industry and resources they serve. We must then project population trends and land and vehicle use which are the principal bases for estimating future transportation needs. The difference between the transportation facilities we need and what we have must be programmed for design and construction to meet our community transportation requirements.

It is obvious that this analysis is just not an engineering study but one which uses engineers together with sociologists for population projections, geographers and urban planners for land use forecasts, mathematicians and computer specialists for mathematical models, and a variety of clerical, drafting, and administrative support personnel.

In estimating our future requirements for transportation services, we conduct studies of prospective movement of people and goods. These studies include interviews with people in the area to determine where trips originate and terminate in number and time. This includes the travel to work, to school, to play, to shop, to visit, to church, to the doctor, and to as many purposes as we can identify as recurring trips. We use origin-destination questionnaires to explore trip purposes in order to project future travel demands based on current and past experience. We record the number of vehicles owned in the area being studied, the use to which the land is put for residential, industry, etc. and then try to make.

projections of what the land use will be with the accompanying population and vehicle changes and other influences which will affect our traffic projections. We conduct counts of traffic into and out of areas to check the mathematical models which are used to develop estimates of future travel. We study the accident rates, traffic congestion problems, areas of natural and social environmental sensitivity, and other factors which will affect transportation facilities development. We seek public involvement in securing this information and in identifying what the people of the community want in the way of transportation facilities support. From this wealth of information we then develop alternate means of meeting the projected travel requirements including consideration of mass transit, modified roads, new roads, or possibly recommendations for modifications of projected land use for the area to meet transportation capabilities. All these planning studies require not only interdisciplinary approaches by professionals, technicians, and support personnel, but also strong public interest and involvement which we are constantly seeking.

The design and construction and later the operation and maintenance of transportation facilities require the full support of engineers, biologists, geologists, attorneys, and other professionals in the procurement of right-of-way clearing and grading, the providing of drainage, pavement, bridges, and all of the structures needed to support private and public transportation.

These engineering operations require inspection and administrative support including communications, personnel management, public relations, purchasing, accounting, inspecting and supervising to insure a timely completion of needed construction.

One major responsibility of the Florida DOT which has not been identified to date is the problem of coordinating the planning, financing, and completion of transportation facilities with local, county, regional, and state agencies as well as the federal agencies of the U. S. Department of Transportation and other United States agencies which become involved in transportation activities. These include the Departments of Housing and Urban Development, Interior, Agriculture, Defense, Health, Education, and Welfare, and the Environmental Protection Agency, and especially the Federal Highway Administration, Federal Aviation Administration, and Urban Mass Transit Administration of the U. S. Department of Transportation.

One of the major problems we are facing and in which we seek your assistance is getting increased public involvement and interest in planning needed transportation facilities and assuring their timely development. You guidance counselors, curriculum planners, and career planners can assist us most by insuring that students not only understand as prospective employees in transportation the great variety of professional and specialist skills we need in providing transportation facilities, but even more that all students as future citizens understand the importance of personal interest and involvement in the transportation systems and projects planning which will be so vital to the development of their community, county, state, or nation. Only if they become aware of the importance of transportation facilities to their personal and community well being will they contribute the direction and support needed to assure that transportation

needs are provided. Certainly, this is the principal contribution that you leaders of the educational system can make.

Another area which requires a great deal of attention is the development of an efficient mass transit or personal rapid transit system which will convince people to travel by public conveyance and reduce the use of the "anachronism" shown in the film - "The Large Vehicle with One Passenger" which contributes so much to congestion and pollution in our downtown areas. We need an effective public transit system also to care for the "transportation disadvantaged"--the old, the young, the poor, the handicapped who cannot provide their own transportation. Even while we observe the need to replace the excessive number of private vehicles by an effective public transit system, we see that the transit organizations are going broke and their passenger numbers continue to decline.

Mass transit has been likened to space travel in requiring new technology, in being very expensive and in searching for riders. Only in New York and Chicago and possibly in Philadelphia and Boston has public transit obtained a semblance of effective profitable performance. In most other communities, private systems have had to be subsidized and in many cases have become public systems providing transportation as a utility service with tax support.

A great deal of research is being devoted to prototype mass transit and personal rapid transit systems with such innovations as tracked air cushion, magnetic leviation, gas turbine and linear induction motored vehicles as well as "dial a ride" "park and ride" separate bus lanes, and subsidized car pools as possible solutions to the problem of providing effective public transportation. The problems remain - developing a proper prototype with new technology providing for the heavy financial burden of a transit system and converting travellers to this mode of transportation. The Department of Transportation continues to seek solutions to these problems which have held back public transit in the past.

Another transportation problem is the high rate at which the transportation facilities use energy and especially fossil fuels which are becoming increasingly short. It was mentioned previously that we must seek means of developing a balanced transportation system which uses increasingly the types of transportation which are less energy-intensive - waterways, railroad, pipelines, and conveyors for goods and buses and rail for passengers while at the same time looking for new sources of fuel and energy to continue providing the needed transportation services.

We have attempted to explain to you guidance counselors, curriculum planners, and career planners that the fascinating transportation industry has continuing requirements for a great variety of professional, technical, and administrative personnel. In addition to the approximately 10,000 employees in the Florida Department of Transportation, the transportation function also needs public employees in community, city, county, and regional planning offices who are involved in transportation activities. Moreover, the transportation construction industry requires people with construction skills as well as the executive, management, and support personnel to provide not only the transportation facilities but also the

equipment that will operate on the roads, railroads, canals, pipelines, etc.

In conclusion, I should like to challenge those of you who are guidance counselors, curriculum planners, and career planners to inspire in those with whom you are associated into a greater interest and understanding for transportation needs. Not only should you seek to encourage the most talented individuals to seek employment in the transportation industry, but also you should motivate all people to a greater understanding of the problems and importance of transportation so that, as knowledgeable citizens, they can contribute to the proper solution of these transportation problems to the benefit of the entire community, county, state, and nation.

RAILROADS ARE ON THE JOB

Mr. Ralph Harbeson, Special Representative, Personnel and Labor Relations Department; Seaboard Coast Line Railroad.

Introduction

Somewhere in the United States this morning a man woke to the ringing of his alarm clock. He stumbled in the darkness until he switched on the electric lights. Perhaps he was cold and turned up the heat. Perhaps he was warm and turned up the air conditioning. He showered, dressed, then sat down to a breakfast of ham and eggs. He read his morning newspaper while he ate. Then he got in his car and drove to work.

Chances are he never thought about the railroads during all this time--not even once. He didn't need to. There was no reason. But if his lights hadn't gone on . . . or if the heat hadn't worked . . . or if he had had no ham and eggs to eat . . . or if his paper hadn't been at the front door . . . or if he had had no car . . . he might have thought of the railroads then--because the absence of these everyday, taken-for-granted things would have meant the railroads weren't on the job.

America's railroads are on the job, of course. And they'll stay on the job--now and in the years ahead. More than that, the railroads are doing everything they can to see to it that this greatest of all rail systems in the world not only survives as a private enterprise but also grows and improves.

There's a lot of nostalgic romance associated with railroading, and railroaders are proud of their industry's history. But the purpose of this brochure is to give you some insight into the romance and dynamics of modern railroading--of railroads NOW!

America's railroads today:

- Serve 45,000 communities on 206,000 miles of line.
- Have a national fleet of nearly 1.8 million freight cars--enough to form a solid train that would span the continent five times.
- Move their trains with 29,000 locomotives that generate a total power capability of more than 50 million horsepower.
- Employ almost 600,000 persons, with annual wages and fringe benefits in excess of $6.5 billion.
- Make annual purchases totaling more than $4 billion.
- Pay yearly taxes--in addition to payroll-related ones--amounting to about $500 million.
- Maintain a "plant" that represents an investment value--after allowing for depreciation--of $28 billion. But if the present railroad system had to be rebuilt from scratch, it would cost about three times that much.

The '70s: A Transportation Challenge

In the decade of the '70s, all of America's transportation modes--but especially the railroads--will face a challenge of fantastic proportions.

It is estimated the U.S. population will total something like 230 million by 1980. But that's only part of the story--because our unparalleled standard of living has, in recent years, produced a freight load that has grown at three times the rate of the population increase. And the trend is likely to continue. America's railroads in 1970 hauled 770 billion ton-miles of freight. That's 3,763 ton-miles for every person and more than was hauled by all the trucks, airplanes and barges combined. A ton-mile, incidentally, is one ton moved one mile.

By 1980, the railroads expect to be called on to move about 1.4 trillion ton-miles of freight annually. That will be more than 4,700 ton-miles for every man, woman and child likely to be alive then. This is the big job of the railroads that is noticed least--the job of hauling huge volumes of freight over long distances, quickly and at low cost. But, of course, the job of moving people will grow too, and the railroads' role in the future of this is in the process of redefinition.

The railroads in particular--among the several forms of transportation--will be challenged by new considerations of growing significance in American life. They alone have a capacity that is not fully utilized and therefore a potential for growth that will not add materially to ecological problems. America's railroads accept the challenge. Indeed, they are totally committed to beginning NOW to build for the "second America" that will be necessary to accommodate its burgeoning population.

New Directions in Service

A long freight train--loaded with coal or grain or automobiles--is such a familiar sight today that most people don't give it a second thought. Those that do might--or might not--notice the innovations in equipment. But far less apparent would be the innovations in service that imaginative railroaders have used to win business--and, not so incidentally, to keep costs down on many consumer items. Few of these innovations show. Most of them are in the form of ideas--ideas that make rail service more efficient and economical.

Time lost in railroad yards has been a frequent target of railroad "brainstorming" efforts. Modern computerized yard operations help, of course, but how much better to avoid classification yards altogether. This line of reasoning has led to "run through" trains and unit trains. "Run through" service--which often requires the cooperation of two railroads--is an operation in which a train by-passes intermediate yards as it speeds between two distantly separated points, thus greatly reducing transit time. Unit trains, while also designed to operate without the need for intermediate yard switching, employ a different concept--and find value in a different area. A "run through" train carries a variety of commodities. A unit train carries a single product to a single destination, then returns empty for another load. Basically a shuttle service, unit trains are ideal for specialized jobs, such as keeping electric generating plants supplied with coal. Despite traveling empty half the time, unit trains have yielded great economy because of their efficient utilization of rolling stock.

Piggyback is another example of a service concept that has found wide-spread acceptance among shippers looking for the best way of moving things. And it

has a first cousin worth knowing about--containerization. Piggyback is the movement of truck trailers on specially designed flatcars. Containerization is similar--but the "trailers" don't have wheels. Although begun by some railroads as early as 1926, piggyback service didn't achieve real volume until the '50s. Its advantages are obvious. It combines the long-haul efficiency of rail transport with the door-to-door flexibility of trucking. Thus, it offers economy, security and ease of handling.

Containerization boasts the same advantages, plus an extra measure of flexibility. To a shipper, this extra means that these "trailers-without-wheels" can travel by sea, in the air, over highways or on rails--or by any combination of these modes. They can be easily and quickly transferred from one mode to another--and needn't be opened until they reach their final destination. The popularity of piggybacking and containerization on the railroads can be seen in their growth--more than 40 percent since 1964. And they offer a bonus to motorists: It would take 200 trucks to carry the same amount of freight as one 100-car piggyback or container train. Of course, the purpose of piggybacking--or any other new rail service concept--is not to put trucks out of business. The nation needs all its transportation modes operating at full efficiency. And that--the need for transport efficiency--is the purpose of the new directions in railroad service.

The World We Live In

When America was very young, the American Dream was a simple thing. It could be summed up in a few words. One of those words was "freedom." Another was "plenty." And there was plenty of land, plenty of natural resources, plenty of everything to be used--and, in some cases, abused.

Now Americans--though their country is still not old, as nations go--are giving thought to the fact that even "plenty" is not inexhaustible. There are still abundant natural resources, but the need for products made from them is increasing. So thought must be given to using resources--such as fuels--efficiently. There is still plenty of land in America, but the population is growing fast, too. So wasteful uses of land must be curbed. And overcrowding--or congestion--must be avoided.

Americans are becoming increasingly concerned about their environment--and the environment they will leave for their sons and daughters. They want their children to breathe good air and drink clean water. But they want no lessening of the widespread abundance they take for granted in America. In all of this, the steel wheel on the steel rail is their ally. Railroads pollute the air less--in relation to loads carried--than do most other modes of transportation. And they conserve fuel better. Railroads move three times as much freight traffic per gallon of fuel as big trucks and 125 times as much as cargo aircraft. A railroad doesn't need a vast amount of land on which to operate. One double-track railroad can accommodate the traffic of a 20-lane super-highway.

Going shopping? To the supermarket? Or just about any place, for that matter? There may be no railroad track in sight, but it's still a good time to think about railroads--no matter what you think about the prices you pay. The prices of retail items--whether food or manufactured products--are based on a number of factors. One of the most important is the cost of

transportation. And, for most commodities, rail transportation is the most economical way to go.

The reason for this is the inherent advantage enjoyed by the rail mode in moving large volumes over great distances. The more volume carried--that is, the more tons per freight mile, the more cars per train, the more trains per day--the lower the cost of hauling each shipment. Lower unit costs mean lower charges to railroad users--and, in turn, lower prices for consumers than they would otherwise have to pay.

Indeed, some commodities used by manufacturers in great volumes would not be shipped at all were it not for the railroads' ability to carry them at low cost. Railroads thus are doubly vital to the nation's consumers. They bring them most of the things they need and want, but they do it as economically as possible.

CARRIER EMPLOYMENT OPPORTUNITIES

Mr. Warren K. Anderson, Pricing Manager, South Atlantic/North Europe Division, Sea-Land Service, Inc.

A large daily newspaper ran this ad in its classified section:

> Wanted: Top executive from 22-28, to sit with feet on desk from 10:00 to 4:30 to watch other people work. Must be willing to play golf every other afternoon. Salary: $1,000 a week. We don't have this job open; we just wanted to see in print what everybody else is applying for.

That kind of struck me, because I was a little bit nervous, since I'm a little outside my realm in personnel work. I've been a trucking man and a shipping man for about twenty years, but I'm not a personnel man per se. After we get people, then I get involved with them, but in selecting these people the only opportunity I have had in the past is to interview some of them and make a decision as to whether I think they might go or not.

I went to work for Mr. Allen's company in the earlier years as a management trainee--a program that Great Southern Trucking and eventually Ryder had--and went through the training program and worked my way up as a college graduate, and have followed this program pretty closely throughout my career in the freight business. While Sea-Land has the same kind of jobs that most transportation agencies have, you will excuse me if I give you a little bit of Sea-Land's management program today. I'm going to make it short and sweet and that will be an advantage to you.

On Monday, and I guess on your trip Tuesday, some of you saw some ships. You saw a film on containerization, which no doubt disturbed the imagination as to who could think of and produce the idea and plan to make such a company so successful. Sea-Land is in the business of moving the goods anywhere in the world, and this is why we can offer trainees a whole world of jobs--jobs that are careers and can make the world a better place to live.

The transportation field employs more people than any other industry outside of agriculture. The growth and size of Sea-Land makes possible unlimited advancement opportunities for the people who can turn challenges into accomplishments. Besides the area of skilled labor and clerical labor, we must develop people to be able to manage our company. Our most successful source of managers comes from our Administrative Training Program. Each year we select some 200 college graduates for our program. These young men and women come from all walks of life, have a variety of backgrounds, and yet when given the proper training and direction work together to develop the dynamics toward leadership that today's business world demands.

The Sea-Land Basic Training Program is organized in four phases. The schedule takes about sixteen weeks and covers operations, administration, and sales training. Being a shirt-sleeve company, we believe you have to know the fundamentals of transportation to be able to move the world.

Trainees are assigned to port terminals such as Jacksonville, Miami, Charleston, Baltimore, Portsmouth, New Orleans, Houston, Long Beach, Oakland, and Seattle. Once on the job, a trainee is assigned to marine operations, where he or she learns to stow a ship, into the shop for a week or two of briefs, two weeks in the warehouse handling freight, two weeks dispatching, in the office to prepare way bills, collect freight charges, equipment controls, interlines, and the fundamentals of transportation.

Upon completion of the basic program, the trainee goes to our corporate headquarters in Elizabeth, New Jersey, for a two-week study of staff departments, such as traffic, accounting, claims, insurance, information systems, as well as being able to meet corporate executives, learning about the organization, the history of Sea-Land, and about future prospects. A decision is then made by the trainee as to his interest and he is assigned to possibly advance training in sales or operations. Or maybe a staff assignment. Those demonstrating an aptitude for selling may go into the advanced sales training program. In this four-week period program, candidates learn the intricacies of traffic, marketing, sales control, customer relations, and sales technique.

Winding up in an assignment, the candidate is all on his own. His career depends on him. Opportunities become of his own making. Our philosophy as stated by our President in this brochure which I am going to hope each one of you will take, is that the pace of progress in the transportation of goods throughout the world is so rapid that to meet competition a company must have a clear view of the future -- a precise perception of coming markets -- and to survive a company must have the people who will take charge of the company's future. Employees who have astute, original minds and a high degree of drive, initiative, and self-reliance. This is why Sea-Land is dedicated to the development of its employees.

Lastly, our salaries compete in all fields, starting at the $10,000 level and moving up with the progress and relocation that the trainee goes through. There are many benefits in the company.

That's all there is to it. If you have any questions, I'll be happy to try and answer them.

As pricing manager I am responsible for the rates and tariffs for the particular division I am in -- that is moving cargo in trade lanes from the South Atlantic to North Europe -- to make sure that our division puts all the cargo necessary to fill the ship and prices it properly to where we can make a profit. It is a very interesting job. I have been in it for only a few months.

EMPLOYMENT OPPORTUNITIES WITH A SERVICE FIRM

Godfrey G. Bennett, Jr., Vice President-Employee Relations, Sav-A-Stop, Incorporated.

We're sort of proud of what we've got at Sav-A-Stop and what we've done. I think you probably got the impact from a transportation and a logistical standpoint, what it takes to get a 39¢ can of deodorant from the manufacturer to the consumer. Out of that building which you saw with 85,000 square feet of bad housekeeping, safety problems, and lack of adequate space, you saw about 350 people working in that 85,000 square feet. We'll do about $52,000,000 this year out of that building and we can consider that our unit price is something like 39¢ or 59¢ or whatever. That's a lot of deodorant.

I hope you found your tour interesting, and I hope you got enough exposure to recognize some of the problems that people like us encounter in moving merchandise.

Before we talk about some career opportunities--some employment opportunities--let me make an observation. Profits make things happen, and we need your cooperation to tell your students that this is what it's all about--that's what we're all working for, helping our companies make more profits so we can increase wages and salaries, so that we can increase employee benefits, so that we can have money for capital expansion.

Sometimes I feel that the high schools and the colleges allow themselves to get out of touch with reality, and I have been particularly pleased with the attitude of the people here at the University of North Florida, in that they have gone into the Jacksonville community and sought out people to come to the campus and tell their students and talk to their faculty about what is going on in the business world. I believe most of you are from the Jacksonville area, and you've got a tremendous amount of resources here in Jacksonville, a tremendous number of companies that will be more willing to make their people available to talk to your students directly about what is going on in business. I hope you will avail yourselves of this opportunity, because I think we have a message to get over to the students--whether they be high school or college--and that is that the free enterprise system works.

In Transportation and Logistics there are many career opportunities available. Let's talk about some that we have at Sav-A-Stop. Warehouse supervision. I really don't like to use the word warehouse because I don't think, with the facilities we have now, that really covers the sphere of activities. To me the term warehouse denotes storage and, as you saw the other day, we really don't store anything in our warehouse, or our distribution center. As you remember, we receive the merchandise at one end and it goes through various processing, and then it is shipped out the other end. So we would like to call our activity a distribution center, and I think that more appropriately describes the activity.

So let's talk about distribution centers as a form of opportunity. We continue to have an unending need for qualified people to manage people in our

distribution center. You know this business of managing--the classic definition of management, I think, is getting things through other people--sounds awfully easy, but it's not that easy, and in these days of high fault it's the skilled supervisor, the skilled manager, that can make a great deal of difference in the success of an enterprise. Jacksonville right now has 1.9% unemployment. That's the lowest for a city this size in the country. Sure, we're proud of it; we're glad; but it makes it awfully difficult to get people, and in order to retain people we need qualified management in the distribution centers.

So in counseling your students I certainly recommend that everybody participating in college take some psychology courses. Some may be facetious and say they may be ready to take abnormal psychology. I think it's important to understand why people react the way they do. How do you motivate people?

The American Management Association spends weeks upon weeks every year trying to teach management how to motivate. This is important, and this is a real career opportunity. The individual who can motivate another individual toward carrying out a desired task can be successful in whatever field he wants to go into. So that's one area of employment opportunity--management in the distribution center.

Another area at Sav-A-Stop is that we have a need always for management of our trucking fleet. You probably recall seeing the tractor-trailer units at Sav-A-Stop when you were over there the other day. I think you visited Ryder, and I know you saw a large trucking operation. But this is a complex business--getting the merchandise to the place where you want it, at the right time.

Let me explain to you a little bit about what we go through at Sav-A-Stop. Our units leave, let's say, tonight at midnight for Miami. When they get to Miami, the merchandise is dropped at a sub-warehouse. Order books for the salesmen who work in the Miami area are waiting for that unit to bring the orders back to Jacksonville. Our data processing people are keyed to begin work on those orders the instant they arrive in Jacksonville. If that unit breaks down or the driver doesn't maintain his schedule, then that throws data processing back so the orders cannot be run on the computer. If that's late, we may have 100 warehouse employees waiting to fill those orders, so you can see it has a domino effect. If one thing doesn't happen right, then it means that a lot of things don't happen right. A schedule in our kind of business and in many wholesale/retail operations is keyed on timing. The schedule has to be there; if the logistics don't work properly, then our whole work effort is delayed.

Tied in with the supervision of a trucking fleet and scheduling is also the supervision of the drivers. Supervising truck drivers is another world in itself, in that these are unique people. These are very valuable people--the drivers, the open road drivers. They perform a great service, but they are unique individuals, and they require a very special type of treatment. Here again is another opportunity to use the people skills, and I keep coming back to that. In my estimation, this is a very important part of a career opporunity of any kind--the skilled people getting things done through other people.

Still another opportunity that a company like Sav-A-Stop would have is a traffic manager. We receive our merchandise--as do many companies--by common carrier. It might be any one of 35 or 40 trucklines that we receive merchandise from. The traffic manager keeps up with the shipments that are coming in, in order to schedule them, so we don't have 5 to 10 units sitting out in the receiving area, waiting to be unloaded. If we had a shipment coming from Johnson & Johnson in New Brunswick, New Jersey, we need to know exactly when that shipment will be there so that (1) we will have space for the unit to back up to the receiving area, (2) we will have receiving clerks ready to handle that shipment, and (3) we will have some space to stack the merchandise. Here again, getting back to the situation of logistics, everything has to fall in place or we may wind up with a unit load of bandages that will have to sit in the unit for several days until we have a space, and that's expensive storage.

In our kind of business--and in most retail and wholesale businesses--the profit margin is very low, so in order to make profit at all we've got to churn that merchandise out. It has to be kept moving all the time, and any time an item sits in our warehouse very long it begins to cost us a lot more money than we will ever make in profits.

I think the job opportunities in a manufacturing concern are much the same as ours. One of the most important things is the people skills. How do you train individuals to skills? We have a man at Sav-A-Stop on my staff who is responsible for management development. He has developed some supervisor training programs that we put on. We are using a new type of testing too that I call a predicted index which gives us a little bit of insight into: can B work for A if A reacts certain ways to certain situations? This is a real question for industry. How do you find people who have people skills? How do you identify them? How do you develop them, and then how do you keep them with your company? This is an important thing. We talk about career opportunities. Every time we hire someone at Sav-A-Stop, we hope we are hiring an individual for a career, but if we don't pay the man properly, if we don't motivate him properly, if we don't help him learn so that he can advance his career, he'll go elsewhere, particularly with the job market as it is now. So every company has this responsibility, I feel, to its people--not to just take a person and say, "You're a manager," and this is it. We have a responsibility to develop our people so that they can progress and find a sense of achievement.

The area of Traffic Management, in my opinion, is going to be one of the foremost areas to develop in the years to come. We hear about railroads having trouble, but one of our requirements for a new distribution center is that we have a rail siding. The reason is that we can then receive merchandise in carload lots and get a break from the manufacturer on quantity shipments. So I think rail transportation is going to become more important, particularly with companies like us. As the profit margin gets squeezed tighter and tighter, companies are going to look for more and more ways to buy in volume, to move in volume. I haven't seen one (maybe some of you have), but there is a warehouse in New Jersey that is totally computerized. They ship by case lot only, and when they get an order they just mash buttons and a computerized withdrawal system of some sort goes out, pulls the merchandise off, and wheels it around to the shipping area. A human doesn't touch it.

As you noticed in our operation, we are what we call a "onesy-twosy" operation. We will fill an order for one tooth brush from a Mom & Pop corner grocery store. People have asked us, "Why don't you stop that, and why don't you just ship cases of merchandise?" Our answer to this point has been that these people helped us when we got started--the Mom & Pop stores--and these are the people we're going to continue to serve. Sure, we like to get big orders; sure, we like to ship in case lots; but we also recognize that there is a need for a merchandising service to the small neighborhood grocery store.

Another area that I would recommend you carry back to your students, if they are going to get into this field of transportation, is considerable involvement in statistics. I was interviewing an industrial engineering applicant this morning and we were talking about courses that he just slaughtered in college. He said statistics was the one he disliked the most, and I did too. I'm sorry I did, because I have suffered for it since. But this is an important thing. The more complex business gets--and I really don't think business is going to get less complex--the more an individual has to have a working knowledge and appreciation of statistics.

Another area is some understanding of these things we call computers. Computers are so hard-headed you can't live with them or without them. But we might as well face it--we are now a computerized society and it's going to get a lot worse. Any manager who understands what a computer will do for him will be far ahead of a manager who does not understand it. I'm not talking about that it is necessary for an individual to have a working knowledge of how to program, or that he be able to write a program, but he needs to know what a computer can do, and he needs to be able to explain it to a data processing technician so that technician can put the program on the air. This is a really important thing, and we see this more and more at Sav-A-Stop every day. Did you all tour the data processing area as you came through? We are highly computerized, and we couldn't do anywhere the volume we're doing today without this high degree of computerization. Computers are here to stay, and there will be more and more computerization as the years go on.

If I had to summarize what a student would want to do to prepare himself for a career in Transportation and Logistics, I would summarize this way:

Expose himself to as many industries as possible while he is in high school, while he is in college. I think you would be surprised how many people in industry would be willing to talk with you, if you just ask--that's all it takes. So, learn what's goingon in the business world. Get an appreciation of what business is. Don't get in a vacuum -- learn what's going on in the business world. Then work toward developing people skills.

If there is any one thing that torpedoes a manager, at Sav-A-Stop or any other company--no matter how technically or academically qualified a person might be--it's people skills, and there are some occupations that don't develop people skills. Their training is not tuned in to people skills.

We recently hired two new graduates in systems science from the University of West Florida. These are the first new graduates we have hired that have majored in a computer-oriented course, and I will be interested to see what

people skills they have. I have an idea, but we will just have to see, because their whole training has been aimed at mechanization and we can't mechanize people. So that's another area of people skills. Statistics and the understanding of the computer is an important area--what it can do for you, how you can use it to your best advantage.

INDUSTRIAL TRAFFIC MANAGEMENT AND THE INGREDIENTS OF A CAREER

Mr. David E. Hodges, Corporate Traffic Manager, Hudson Pulp and Paper Corporation.

These career-ideas are aimed mainly at persons outside the profession of traffic management: young people, most likely, who have not entered the business world or who, if they have, do not feel that they have "found" themselves--either in a specific field, or perhaps in the business environment as a whole. But they are also aimed at persons already in the field, with the thought that they may gain a new and broader perspective: a broader view of the opportunities, challenges and rewards that await the professional, career-minded man or woman.

Let's start by admitting that young persons regard the business world with mixed emotions. This is not too surprising, because so did many of their parents and even some of their grandparents. If contemporary television and literature have their share of villainous and venal businessmen, the older generations had Sinclair Lewis and Ida Tarbell and Lincoln Steffens and Frank Norris, to name just a few of the "anti-establishment" writers of their day. And in real life business itself is far from perfect--which in an imperfect world should hardly come as a surprise.

But the inexorable fact is that progress is made by people who are dissatisfied with something the way it is, and set about to improve it. And nobody will argue that the business world couldn't stand improvement... which will be achieved by those people who decide to get involved and do something about it.

Nor should we overlook the common notion held by many young people that business requires a kind of reprehensible conformity. It's true that suits and ties--and shoes--will probably be worn in the business environment for some time to come, and to this extent there will be a requirement for conformity. But there is no need for a conformity of ideas; successful businesses and successful businessmen got that way by innovating, not by confirming. There's a difference, of course, between conformity and discipline; and the chances are that the nonconformist who can channel or discipline his energies and ideas will get a lot further in the business world than he will outside it.

A Galaxy of Jobs

Even to the young person not beset by these doubts there is a good deal about the business world that is confusing. There are jobs today that didn't exist five years ago, even industries that have come into being and grown to maturity since the present crop of college graduates entered high school. The young person graduating from high school today is aware that he has an almost limitless choice of careers, many requiring college but a good many which do not. Some of the job opportunities are more glamorous than others, naturally. Or at least they seem that way. The

help-wanted pages of a major metropolitan daily may carry a dozen or more pages of ads for exotic careers, and cheek-in-jowl with such ads there are usually quite a few ads for schools offering training in the exotic specialties.

Some of this advertising is factually true, of course, and some clearly exaggerates both the glamor and the nature of the rewards in a given field. And the same is true to some degree of the "recruiters" who visit both the high schools and college campuses. If nothing else, it proves that business is indeed interested in young people, and the competition between firms and individual fields of specialization is keen.

The Ingredients of a Career

What may not occur to the young graduate, however, is that there is a vast difference between a job--even a glamorous speciality--and a career. A job is a prescribed task which the individual performs a certain number of hours daily, but a career is the interaction of the individual with the job. A specialty that might be a career to one man would always be a job to another, and vice versa, for no two persons react in the same way; perhaps the worst recommendation for a given field is that a friend or acquaintance is "happy in his work." For the friend's career requirements are unique unto him, just as his tastes in food and clothing and women and politics are his own.

But there are some measures that can be applied to a field of endeavor to determine whether it will provide the continuing interest, challenges and rewards that an individual seeks in a career that is, after all, going to occupy most of his days--and some of his nights--and is going to be the cornerstone of his whole way of life during his relatively brief stay on earth. A few such measures are listed below:

I. Importance of the job;
   1. As a social or economic contribution.
   2. In the immediate business environment, i.e., the firm.
   3. In the social environment, friends, relatives, etc.

II. Challenge of the job
   1. Problems to be solved.
   2. Variety of situations to be coped with.
   3. Competition.

III. Environment of the job:
   1. Location.
   2. Co-workers.
   3. Stature of the job in the company.

IV. Rewards of the job:
   1. Economic.
   2. Recognition.
   3. Authority.

V. Incidental or "fringe" benefits:
   1. Travel.
   2. Business contacts.

The list could be lengthened, but it contains most of the "ingredients" that go to make up a career. Each individual will give these ingredients a slightly different flavor and weight. But at the very least he should measure every job or career opportunity against them.

Careers in Traffic Management

How does a career in traffic management measure up against these standards? It is up to the individual to decide, but some basic information about the field set against the background of these measures may help him decide whether it is for him...or whether he should be looking elsewhere.

First of all, what is traffic management? The term, sometimes prefaced by the word "industrial," refers broadly to the responsibility for planning and purchasing the transportation services required by the company. the raw materials that move into the company from suppliers, the finished products that move from the company's plants to its markets all over the country and the world. Quite often it also involves responsibility for arranging all personnel travel-- a sizable item by itself--and control of the company's aircraft and other transportation equipment. Since transportation is largely regulated at both the State and Federal levels, the industrial traffic management function also involves responsibility for dealing with regulatory bodies in the firm's interest. In the larger U.S. firms, transportation purchased by the traffic department may exceed $100 million a year, even in smaller firms a budget of $2 or $3 million is not uncommon. For transportation is common to all manufacturing and producing businesses, and it is costly enough that its efficient management is a major undertaking in the firm...

...but let's measure the industrial traffic management function against the career guideposts that have been set up.

Importance of the Job

The sheer magnitude of transportation itself should give some idea of the importance of the traffic management job. Transportation provides jobs for some nine million people. It accounts for one out of every six dollars being spent in this economy. A family of four with an income of $10,000 spends more on transportation than on anything else but food--and everything that the family has or will have comes to it by some form of transportation, or a combination of forms of transportation. Billions of dollars are invested in the transportation plant, just to keep pace with the economic growth of the country and the ever-increasing amounts of goods that are manufactured, the transportation plant will have to double its capacity in less than twenty years.

Is transportation important? It's the lifeblood of the unique American economy, an economy which is based on highly advanced industrialization... and without the constant flow of raw materials and supplies into its plants, the average firm could hardly continue to operate more than a few days or weeks at the most; without the flow of finished goods to stores and retail outlets, in a short while shelves would be bare of both the necessities of life--food and clothing--and the luxuries as well.

At the heart of this essential flow of goods is the man who plans and controls it, the industrial manager. He and his counterparts form a select and relatively small group. In all, there are roughly 12,000 industrial traffic managers in the whole country. By contrast, there are some 300,000 doctors, more than 100,000 dentists, 275,000 lawyers, and close to two million teachers. It has been estimated that some 85 to 90 per cent of all freight transportation is purchased by professional traffic men--and we are talking about purchases amounting to some eight billion dollars a year! In round figures, this means that the typical traffic manager spends an average of six million dollars a year for the purchase of transportation!

The career criteria listed importance of the job as a "social or economic contribution"--and there should be little question on either score about a job that underlies the employment of some nine million people, provides the goods of life to the entire population...and pumps $22 million a day into the economy!

How important is the job in the individual company! It's been pointed out that transportation keeps the wheels of the economy turning, and the individual company is by and large a smaller model of the economy. Without raw materials to feed its machines, the company cannot operate, and few companies are located so close to their raw materials that they can operate without transportation. Without a means for moving their goods to markets, the same companies would soon be out of business, because it is the sale of goods in the marketplace that pumps money back into the company to enable it to keep operating. And because transportation is often the third highest expenditure by the company--coming only after raw materials and labor--the skill with which it is purchased has an important bearing, just as the same skill has an important bearing on the company's competitive success in the marketplace.

In the scheme of things, then, industrial traffic management is an important job important as a social and economic contribution, important within the framework of the individual company.

Challenge of the Job

Most career-minded young people quite naturally seek a job that will contain challenges--challenges that will test and enlarge their skills, challenges that will provide an important sense of achievement and reward when they are overcome. For a job without challenges can hardly ever be more than a job, and certainly not a career.

And industrial traffic management provides a multitude of the challenges that give life and vitality to a career.

Finally, there is the challenge of competition. Other companies have traffic managers, too, and they are seeking the best competitive advantage for their companies. Planning transportation is in effect planning strategy, planning a strategy that is better and more successful than the competition's. And it is no easy task. Skilled traffic management has enabled many a company to enter and capture an entirely new market before the competition knew what was going on. Similarly, skilled traffic management has enabled many

a company to compete in both price and customer service in remote markets, much to the surprise of competitors already on the scene! And of course there is competition for the job itself. Not everybody can be a traffic manager, but those who thrive on the competition of skills and ability will rise to this competition--and they will quickly learn that there are always good jobs in industrial traffic management for the skilled manager who can meet the competition, whatever form it may take.

Environment of the Job

What kind of environment does the industrial traffic manager enjoy... or suffer? Actually, he can pretty much take his choice between regions of the country, as he can between major cities and smaller towns, for the firms that employ traffic managers--and this includes every major U. S. manufacturing or producing firm--are located throughout the country.

But environment goes also to the conditions of the job, the people he will be working with most closely, and the stature of the job in the company.

First, it can be said that the physical surroundings for the traffic manager are comparable to those enjoyed by any other manager. They vary from company to company, of course...and not every traffic manager's office has a carpet on the floor, although a good many do! In fact, because traffic management is frequently a headquarters function, the top traffic executive in a company and the members of his staff may even fare a little better than their counterparts in other functions because they will be located in the firm's main offices, which are frequently a show-case of sorts.

Because transportation takes many forms and has a highly complex structure, the traffic manager usually has an infinite number of choices open to him in determining the best ways to move his company's products. In comparison to the "anatomy" of the transportation system, the anatomy of the human body, complex as it is, often seems quite simple. Under a regulatory system designed to provide the American people with the benefits of competition and transportation services equally available to small and large companies, companies in large cities and companies in small towns, a vast network of interconnecting and competitive transportation companies has grown up--and the man who is spending two million dollars a year to move his company's goods through that system has a constant challenge to find a better and more economical way of doing it.

The management challenge is the challenge of organization of rearranging the multitude of elements in the system so that the vast machine of transportation will function more efficiently and more economically. And this is really a challenge! Considering the fact that the present transportation system has taken more than a hundred years to develop, its capacity now must be doubled in less than twenty years! This is a challenge underscored by the critical realities that major breakthroughs are going to have to be achieved just to keep the transportation plant abreast of the economy...and it's certain that they will be made by men and women who are looking for BIG challenges.

Even with such major challenges facing the industrial traffic manager, the everyday question of "Is the job interesting?" remains to be answered, and it can be answered with a strong Yes. There is nothing humdrum or routine about the traffic manager's job. Each day contains its share of surprises, of situations that have to be resolved by decisive action on the traffic manager's part. Each day brings numerous personal contacts with all types of persons in the company and other companies. Seldom does much time go by without travel to other cities, sometimes other countries. The challenge is always present to meet each new situation and resolve it in the way that will most improve the company's position--and profits.

Beyond the physical environment, the people the industrial traffic manager works most closely with are largely professionals like himself. They speak his language and he speaks theirs. They have a specialty that is little understood by others in the company, and they have intense loyalty. the manager to his employees, and the employees to their manager. Turnover in traffic departments is somewhat lower than in other fields, and there is considerable stability in the job. The traffic department is a smooth-functioning team whose members are all aware of the challenges that must be met and resolved daily.

Because of the highly specialized nature of the work, the traffic department enjoys a unique position in the company. Major decisions in Engineering, Purchasing, Manufacturing and Marketing require consultation with Traffic. Locations for the firm's new plants, distribution centers and satellite warehouses cannot be determined without the skills of the traffic manager and his staff. In fact, as one traffic manager has said, "Traffic management is a thread which is woven through the entire fabric of the company."

Rewards of the Job

The rewards of a career are measurable both in the tangible, economic benefits and in the more intangible benefits associated with recognition by family and friends as well as by other managers in the company... and of course in the weight and authority of the job itself.

Certainly, on an economic basis alone traffic management measures up well, even in beginning salaries. Salaries are comparable with other management jobs of similar responsibility and scope, and tenure and stability of employment are somewhat better. Since the usual benefits of hospitalization, vacations and retirement are generally the same throughout industry, it follows that these, too, are comparable for traffic management.

An additional benefit of industrial traffic management is that it is a good route to a vice presidency, either of Traffic itself or of the broad field of distribution management. With more and more companies adopting the "distribution concept," in the majority of companies the top job has gone to a former traffic manager, because indeed many traffic managers have been performing the physical distribution function without calling it that. handling not only transportation, but also

such activities as warehouse management, industrial packaging, and material handling engineering, to name only a few.

Less tangible, but equally important, are the rewards of doing a job that is vital and important, a job that gains recognition both within industry and on the governmental level. A number of industrial traffic managers today are in the Defense Transportation Reserve, a special corps which is prepared to swing into action and manage the nation's transportation system in time of crisis or national emergency. Others have served as special advisors to the Department of Commerce and the Department of Transportation, and even to the White House itself.

Important, too, is the recognition of family and friends, and it is a natural consequence of the authority the industrial traffic manager carries in his own company.

A Few Incidental Benefits

Of lesser importance, but certainly worth considering, are such incidental benefits of the traffic manager's career as the opportunity for travel, which is frequently a basic part of the job, particularly in multi-plant, multi-warehouse companies. And, since the traffic manager who travels by air is usually a customer of the airline for both freight and other passenger travel he is responsible for, he is usually accorded "V.I.P." status and membership in the various airline organizations like the Ambassadors' Club, the Admirals' Club and others.

And the traffic management career is particularly rewarding for the individual who enjoys meeting a variety of people through his business contacts. The industrial traffic manager is in almost daily contact with personnel of the transportation companies he uses, ranging from the sales representative who calls on him (and often takes him to lunch!) all the way to the top management people in motor carriers, railroads, water carriers and airlines. After all, the traffic manager is a pretty important man to all these people, and they treat him accordingly--and it is certainly far from unpleasant to receive the kind of attention the traffic manager gets from his carriers! What is more, he will find them pleasant people to deal with, and he will find that they and their families will be included in many of his social activities, as he will in theirs.

PUBLIC SERVICE OPPORTUNITIES

Mr. James E. Pound, Chief of Jacksonville Air Route Control Center, FAA-DOT.

I feel most pleased and honored to be asked to participate in your seminar, "Involvement in Transportation through Career and Curriculum Planning." I am sure you have had some very interesting sessions this week and heard from a lot of experts in the transportation field. You know the definition of an expert is anyone more than 20 miles from home with a briefcase. Let me establish right now that I'm not an expert. I live only about 7 or 8 miles from here and I don't even have a briefcase with me.

Since almost all of my work experience during the past 30 years has been in the field of aviation, I do want to give you a few facts about the role of aviation in our national and international transportation system today.

Last October, our then FAA Administrator, John Shaffer, addressed the University Aviation Association meeting in Hollywood, Florida. Mr. Alexander Butterfield is the present FAA Administrator. To quote from Mr. Shaffer's remarks, "Here we are on the brink of a fantastic new air age and the general public is only faintly aware of it. And if people are not thinking about aviation, how are we going to attract them into aviation careers? If the public is not educated with regard to the values of aviation, how are we going to get their permission to build and expand those airports we desperately need? We have the money, but we can't spend it unless the local communities say they want a new airport or they want their current ones expanded. If we are to prepare for the coming air age, we are going to need the public's understanding and its support . . . we don't need any more misguided restrictions or rebuffs from communities who do not understand the values of aviation." Mr. Shaffer concluded his remarks by saying, "The Secretary of Transportation has been given a mandate. President Nixon has wisely determined that this nation is to have an all-pervasive transportation system -- both air and surface -- within the decade of the seventies. And we must if we are to remain a nation that is socially, culturally, and economically strong. But believe me if we are to build this great system, and this is particularly true of the National Aviation System, American industry and your government are going to need all the professional help they can get."

Some of you may have heard the story about the French skeptic who witnessed history's second balloon launching near Paris in the summer of 1783. Unimpressed by the demonstration, he turned to another spectator, Benjamin Franklin, and asked in a belligerant tone: "What's the use of the balloon?"

Franklin, who was then 78 years old, remained unruffled. He peered at the Frenchman for a moment through his tiny square-rimmed glasses and then posed a question of his own, "Of what use is a newborn baby?"

With the benefit of hindsight, we can laugh today at the Frenchman's lack of foresight. But ask yourself this question: "If we had been present

on that summer day in 1783, would we have been as wise as Benjamin Franklin?"

Predicting the future is always a risky undertaking. This certainly has always been true in aviation. In recent years particularly, the potential of aviation has consistently been under-rated. Skeptics have always far outnumbered the visionaries.

The Wright Brothers' first four flights on that chilly December day at Kitty Hawk in 1903 received little notice in the press. In fact, there is no indication that the Wright Brothers themselves were aware of the enormity of their achievement.

Yet in just 70 years from the Wright Brothers' first flight . . . with one man moving just a few feet off the ground for 120 feet . . . aviation has exploded into a giant transportation and communications system. In 70 years the airplane -- and the entire aviation environment -- have gone through a complete transformation in size, performance, and capability. But the engines of flight are just revving up.

About fifteen years ago, fewer than twenty-five per cent of all Americans had ever traveled by air. Today the figure is over 50%. Now the swing to air travel is occurring faster than our population growth. A decade ago, there were fewer than 50 million airline passengers in this country each year. There are now over 200 million and over 5 billion ton miles of freight carried each year. In the decade to come, this figure will again triple. Air passengers will soon exceed <u>one million each day of the year</u>!

How small the world has become because of aviation. In May, 1927, Lindberg's flight New York-Paris took 33½ hours. Today requiring 6½-7 hours. Miami-London about 9 hours.

Today during any given hour there are more than 20,000 persons in the sky as passengers and crew members. During peak hour periods over 100,000 at a time.
Over 131,000 general aviation aircraft
About 3,000 air carriers -- or airline fleet aircraft
Thousands of military aircraft

How is this vast growing air armada handled or controlled?

Control towers -- almost 400 throughout the U. S.

Centers -- 27 including San Juan P. R. and Balboa C. Z.

Flight service stations -- over 330

Approximately 51,000 FAA employees with about 40,000 assigned to air traffic control duties.

Center has common boundaries with Miami, Houston, Atlanta, Washington and

New York oceanic centers. Personnel in center 520 ATC -- 110 AF electronic engineers and technicians.

Equipment

4 long range radar sites
Over 100 air ground radio frequencies
Computer installation -- Over $20 million in Jax ARTCC
Relieve controllers from routine clerical functions to devote more time to control. Pilot national enroute automation program at Jacksonville center.

Why need

2 Jets head on 600 MPH -- rate closure 1200 MPH or 20 miles in minute or 1¼ miles in 3 3/4 seconds or last ½ mile in 1½ seconds.

Control both Civil and Military Traffic
Exception Military in Restricted and Warning Areas

I'm sure we are all aware, one of the greatest problems facing our 1973 world and society today is communications. The same problem exists in industry, education and government alike.

Recently the ecologists and environmentalist have been more and more giving aviation a hard time. Please let's communicate now and don't get me wrong. I'm all for protecting our environment and am just as much for the broad principle of the ecologists as anyone. Sometimes though, the environmentalists and ecologists forget that people are a most important part of the ecology too.

The economics of the entire country is fantastically tied to the aviation industry.

Examples:

Annually more than 350,000,000 checks are air mailed or air freighted from New York clearing houses, thus saving of interest of over $37,000,000 per year. Without this air service, our prime interest rate, as high as it is, could well be twice or more higher.

Billions of dollars of inventory in almost any business or organization that can be named is not required as on the shelf replacement stock because spare parts and replacements can be obtained direct from the factories or distribution centers in a matter of hours by air freight. For this reason, the costs of almost all of our goods and services would be far greater today without air freight.

Noise Contamination Ecologists

These people have, during recent months, started strong movements to close airports between the hours of 11 pm and 6 am. Example -- Los Angeles and Atlanta airports among many others. If these well meaning people had

their way, because of the time differential between EST and PST there would be only 3 hours a day either passengers or freight could depart L. A. for Atlanta or Atlanta for L. A. This sort of thing could wreck not only our transportation system but our national economy as well.

The T&T airport in the Everglades. The snakes and alligators are more important to the well meaning ecologists than enhancing the safety of thousands of passengers and air crew members that must daily use the soon to be over-crowded Miami International Airport.

SST (Super Sonic Transport)

We have all recently read about our foreign trade deficit and how the value of our dollar is continually going down on the international money markets. Many of you have traveled by air abroad since WW II and flown on foreign air carriers. The chances are about 9 out of 10 that you flew on an American-U. S. made air carrier. Our U. S. airplane and aviation manufacturers since WW II have exported many billions of dollars worth of planes and parts and associated aviation equipment. We have long been the world leader in aviation products.

The normal next big step forward in aviation is the SST. The English/French and Russians have been flying their versions of the SST for some time now. In spite of the tragic accident by the Russian SST in Paris recently they are way ahead of us now in SST development.

We had already taken numerous orders for our American-U. S. SST at around $100,000,000. Actual deposits or earnest money was paid for priority delivery. A copy from the Germans, Japanese and numerous other foreign countries. Do you realize one American made and exported SST at $100,000,000 a copy would provide a balance of foreign trade dollars for 50,000 Volkswagens or Toyotas @ $2,000 each.

(These are personal opinions and not official government policy.)

I personally strongly feel we cannot afford not to build an American SST. The rest of the world likes to go with the proven leader in any field. If we are not soon able to resume our research and construction of the SST, we will no longer enjoy our international position of aviation leadership. I hate to think what our balance of foreign trade situation would be today, as bad as it is, without the millions upon millions of American dollars our aviation manufacturers have annually brought back from foreign countries for us.

These last few thoughts may be a little off the main theme of the seminar but I do think they are most important to both transportation and our national economy, so, please think about these things even if you don't completely agree with me.

Thank you. I see I have used up my time, but in case any of you would like to discuss anything I have said in more depth with me I will stay as long as you want me to after this session.

EDUCATION AND CAREER OPPORTUNITIES IN TRANSPORTATION

Panel Moderator: Dr. Jay A. Smith, Jr., Associate Professor, Department of Transportation and Logistics, University of North Florida.

Any appraisal of transportation activities, current or future, demands a consideration of the personnel who are needed to staff the requirements of the system. Throughout this Seminar, the objective was to identify the various skill levels necessary to meet the needs of transportation activities. Transportation requires individuals with a wide range of outlooks, capabilities, and backgrounds. The complexity of transportation activities demands individuals with a high degree of intellectual and professional attainment, as well as skill levels which are primarily vocational/technical in nature.

In considering the career opportunities and the role of career counselors in assisting students to attain a better preparation for transportation opportunities, the group was concerned with the following issues.

- A need to reduce the cost and/or to improve the quality of transportation to society and the individual, through better and more sufficient preparation of individuals seeking careers in transportation;
- The ways and means of informing students about the career opportunities in transportation/distribution;
- An identification of specific skill requirements from industry sources as to their needs for future employees;
- An awareness of the value of transportation to the society, the economy, and the nation by developing a sound basic understanding of the role of transportation; and
- An understanding of the role and problems faced by career counselors in advising students concerning career opportunities in transportation and related fields, thereby gaining some understanding of how students viewed their experiences with career advisement and how effective were counselors.

The first session was devoted to exploring the particular employment opportunities and skill levels of the carrier and industrial traffic management positions. Speakers from rail, water, air, and motor discussed the managerial opportunities as well as requirements for vocational/technical skill levels. It was noted that transportation employment did not offer strong inducements to any appreciable number of young people having or desiring to attain a high degree of professional sophistication. As a result, the carrier industry has probably obtained less than its share of such people. The speakers informed the registrants as to specific programs underway to improve that profile. Additionally, some transportation activities have acquired an unfortunate reputation in the use of professional manpower; i. e., underemployment of professionally trained individuals. Detailed

questions and answers pointed out specific needs that speakers felt would be evidenced in the future. It was pointed out that in certain professions the slack demand by one mode has been taken up by another mode. For instance, the need for civil engineers by railroads is no longer sufficient to justify more than only a few university courses; however, other modes and the government agencies have enlarged their basic demand for these professionals.

The demand for some of the newer skills or competence levels is small, but growing. This is due in part to the carriers not forming groups that can successfully employ a large number of individuals possessing these skills. However, it was felt that the techniques of operations analysis and mathematical model-building show promise for the solution of transportation problems, and that there would be an increasing need for individuals with these capabilities.

Speaker consensus was that the nature of emerging problems of complex and interrelated systems brought on by carrier mergers would call for:

- Individuals who are prepared to understand the broad perspective of managerial decision-making in transportation, not only within the view of an individual component or mode of transport;
- Individuals would have to become aware of the environmental considerations of transportation employment;
- Individuals will need a specialized skill or base of understanding to progress up the managerial ranks to executive decision-making positions; and
- Transportation carriers need to find better means of using the talents of existing employees to greater advantage.

The second session was devoted to a discussion of employment opportunities in the service/warehousing industry and manpower requirements of government and public service organizations. These groups opined that transportation would benefit substantially from the transfusion of competent personnel from other fields. This transfusion would have a multiple effect in that it would provide much needed "newer" skill levels that have already been learned in the other fields, and that it would sharpen the specialized capabilities in the various transport organizations. Most of the registrants considered this transference a short-lived phenomenon, and that many industries needed to develop in-house capabilities for career and educational guidance. A certain lack of in-service training or in-house skill level development on a formal basis was offered by only a small percentage of the number of transportation organizations represented at the Seminar.

The counselors felt that in-house education programs for transportation personnel would serve two general purposes. First, these programs could assist in developing the specialized skills necessary at all levels for effective internal control and direction of the transportation activities.

Second, short courses, workshops, and seminars dealing with the newer skill levels and expanded technology; e. g., design and use of data-processing systems, application of cost accounting theory, and other management decision-making tools, would assist the transportation organizations in meeting their manpower requirements. Only five of the companies represented by the speakers had tuition refund plans for formal education beyond the high school level.

The last two sessions involved the registrants in an active role. Discussion centered around how career advisors could better assist the student in planning for the exploration of career goals. The previous four days allowed the participants to obtain a better insight into job requirements and necessary skill levels for a variety of opportunities in transportation/distribution.

The group concluded that there was considerable need for in-service education of advisors. There were at least three broad areas in which career counselors should receive in-service education:

1. working with industry groups to determine current and future job requirements,

2. observing and learning first hand the specific functions to a particular set of occupations in transportation/distribution, and

3. making additional insights into the mutual problems of career advisement.

Both speakers and registrants agreed that any consideration of education for transportation must include the need for formal training programs at the vocational/technical levels. Several of the counselors felt that there was a definite need to address this training requirement at an earlier educational level, such as the 7th, 8th, 9th grade levels (junior high school). There was not total agreement of this point, however, raising the substantial question of effectiveness of counselors to assist students in pursuing career goals.

A lively discussion developed concerning the basic problems of career counseling. Most educators recognized that academic advisement and career counseling were important parts of the total educational process. At several of the secondary schools represented by participants at this Seminar, these tasks were conducted by complementary "mixed" systems involving instructing and counseling. Many of the trained counselors, being interested in personal counseling, have neglected academic and career advisement. Furthermore, in some educational environments, the counseling center has become stigmatized as a place where only "sick" or "bad" students go. This situation was particularly acute with black counselors handling black students. As a result of this reputation, the counselor's effectiveness was greatly reduced. Disciplinary problems rather than career selection problems were attacked.

Some of the basic problems in the various systems identified in this session were as follows:

- Counselors are selected who are not interested or trained to handle the specific problems of career counseling;
- Counselors do not always have the time or skill levels to advise or receive training in career counseling;
- School systems that consider academic and career advisement as separate functions are far less effective in career counseling;
- Counselors do not have adequate contact with other instructors in the areas in which they are advising;
- Counselors are not always available during the summer months when time could be spent with students to advise about job opportunities;
- Counselors are not completely informed of the skill levels and educational requirements for current and future occupational requirements; and
- Counselors attempt to direct rather than counsel students concerning career choices.

The following suggestions are based upon the comments of the participants in the workshop session:

- Career counselors should work actively with the industry toward the development of skills and knowledge levels required for employment opportunities in transportation.

The group expressed that this conference was the first time they had had the opportunity to see a "total" manpower picture for an industry. They were impressed with the important role that transportation plays in our economy and amazed by the fact that few counselors knew of the aggregate manpower requirements. All had previously viewed employment opportunities in transportation in terms of a series of independent requirements for lesser skill levels than actually required. The group acknowledged that they have acted in a "passive" manner in the development of manpower requirements in any field. In addition, they had not actively participated with the transportation industry in the past. For instance, no counselor had assisted in the preparation or modification of job requirements. All saw themselves, prior to this Seminar, as merely "brokers" and not developers of career opportunities for their students.

Industry should work more closely with career counselors

The seminar revealed that there was a substantial lack of specific knowledge concerning transportation employment requirements and opportunities. Industry could benefit measurably by preparing and distributing items such as job notices, job descriptions, and manpower requirements to career counselors on a regular basis. These actions facilitate the counselors' knowledge base and assist them in matching skill levels of students with industry requirements. Indications are that the career advisement techniques do not

achieve satisfactory levels of performance when considering transportation career opportunities. Regular and frequent communications should be established between firms and counselors.

Additional workshops should be established for both career counselors and students.

Traditional approaches of career advisement need to be re-examined and improved in order to establish effective counseling programs that can assist in meeting future transportation manpower requirements. Industry and public agencies are becoming aware that the dynamic character of transportation requires changes in skills, outlooks, and capabilities of employees at all levels. There is a definite need to bring together industry and government representatives with career counselors on a regular basis to improve communications concerning this vital area of transportation activity. Model workshops could be established at two levels. One could adopt the format of this Seminar, and the other could be directed toward detailing specific career opportunities with students, i. e., information regarding career opportunities as well as preparing applications, interviewing techniques, and projecting future skill requirements in transportation.

TRANSPORTATION SUBJECT MATTER FOR CURRICULUM INCLUSION
HISTORICAL CONSIDERATIONS

Dr. Ronald L. Sparling, Associate Professor, Department of Transportation and Logistics, University of North Florida.

Transportation is pervasive. In terms of the national economy, one-fifth of the gross national product annually has been accounted for by transportation. This does not mean that we could eliminate this important element of our economic life and only be 20% worse off, however, for to do so would propel us backward instantaneously to the state of first man--but with much company. The mobility provided by the automobile has tended to cause Americans to become as much alike as the new highways we drive on. The jet plane has served further to compress our society together and to lead to increasing contact among peoples of the globe. On the negative side, increased mobility has contributed to increased insecurity among our peoples in a manner as described by Allen Tofler in Future Shock. Relationships and our social anchors tend to become transitory. But how did we get to this point?

In order to effectively squeeze the history of transportation into a discussion that would take no more than an hour and fifteen minutes, one must settle for a few of the highspots. Many, many of the rich details that combine to make up the rich, long, and fascinating history of transportation simply must be left out. Since our purpose is to consider transportation history insofar as it might contribute to the curricula of high schools and junior colleges, it seems appropriate to concentrate on the broad sweep of transportation development, giving passing attention to contemporaneous economic influences along the way. Secondly, we must of necessity focus more upon recent developments with a view toward gaining an appreciation for likely scenes of the future.

As good a place as any for us to focus attention initially is upon the point that Necessity is the Mother of Invention. If it were not necessary or somehow desirable to move people and their trappings from one place to another, there would simply be minimal growth of transportation technology Transportation technology seems to derive from some social requirement or opportunity, and, having derived therefrom, has social consequences. The acculturating and agglomerating kinds of impacts that transportation has upon cultures and upon society have been well documented through time and will be covered elsewhere in the conference in more detail. For our present purposes, we will focus upon the historical development of transportation technology.

Historical Pervasiveness of Transportation - a Potpourri

Historians and Anthropologists, examining the development of civilizations, have identified at least five broad trends and relationships involving transportation. First, transportation has been a necessary activity of mankind from the very beginnings of society and has played an essential role in the origins of civilization itself. Second, transportation technology has been one of the most significant factors in locating civilization

by determining man's use of resources. Third, transportation has helped to determine the centers of power within civilization. Fourth, transportation defines the limits and character of societies, both past and present. Finally, transportation technology develops along with, and aids and abets, development of other technologies. The following potpourri will serve to illustrate these five assertions.

Dr. Raymond Dart, an anthropologist studying the development of civilization in Africa, has claimed that civilization developing during the 5,000 years before Christ depended in large part upon the development of water vehicles, boats, and floats. He claims that animal domestication and agriculture both arose from fishing. His argument is that early man needed to take advantage of the unlimited food supply in the water so as to replace the rather precarious hunting with nutritional security. In order to do this, man had to follow the fish into the water. This fishing called boats into existence and then required the formation of communities from isolated family groups. Dart noted that the earliest religious beliefs had been fashioned by boatmen and by fishermen rather than by farmers or hunters. Boats had not only caused movement but had molded mythologies of mankind, thus playing an important part in the development of civilization.

The first important means of transportation other than "Shank's Mare" was undoubtedly by water. The first urban and civilized communities grew up in river valleys and along the edges of waterways. Urbanization has been intimately connected with transportation from the beginning, but urban centers have become completely dependent upon transportation. At minimum, food has to be transported to urban areas in order for them to survive. The great cities of the world have usually been ports and located on waterways. Even in the Midwest and Eastern sections of the United States, there are very few cities of any significance that are not on navigable waterways, or on waterways that were navigable during the age of the city's conception.

Cities in the interior West, however, were dependent upon other developments in transportation, and relative economics of operations. Before railroads, stage coaches could stop anywhere without lowering efficiency, and this consequently led to a development of many small towns in the Midwest and West United States. The construction of Railroads, however, consumed large amounts of capital, and efficient operations called for relatively infrequent stops. Railroad division points, where the changes of engines, crews, car inspections, and these kinds of activities were required, grew into towns, and many of these subsequently grew into cities. The point here is that the growth of cities and urbanization was dependent upon transportation. The character of city growth will be discussed at a later point in this discussion.

Early civilization thus was dependent upon transportation, leading to city location centering upon rivers and seacoasts. These urban areas could utilize resources drawn from all over, and permitted a base in which man could develop his institutions and culture, and from which he could spread his influence throughout the entire world. That is, transportation has helped locate civilization by determining man's use

of resources. Ecology, then, in the sense of man's relationship with his total environment, is determined in part by transportation technology. The major function of transportation is to move persons and their trappings from one place to another. This movement necessarily alters the relation of population to land use and the ecology of Man.

While the foregoing serves to illustrate the pervasiveness of transportation, the following will attempt to focus upon technology and economics of transportation development.

The railroad locomotives, which did so much to revolutionize industry and which contributed so much to the growth of the industrial revolution, did not spring up full-blown. First, the steam engine was developed. Its original purpose was to pump water from mines. It was almost half a centruy from the development of the steam engine before anyone thought to put it on a moveable platform and make a locomotive.

Even the basic idea of the steam engine itself can be traced back to ancient times, but without a need or other incentive to apply the idea, nothing much was done with the original idea of a steam bellows. Attitudes toward economic development and activity in general were neutral to negative before the Industrial Revolution. In the thirteenth century, Albert the Great illustrated the regard for the principle of the steam bellows, as he tells us. ". . . to take a strong earthen vessel with two holes in it. Fill it with water, plug the holes tightly and set it near a hot fire. Soon the steam will burst the plugged holes and spray hot water over the surroundings. For this reason such a vessel is called a sufflator, or blower, and it is usually made in the form of a man."

While it is amusing to note what medical man obviously thought of the nature of Man, as evidenced by the shape of the blowers, the significance to transportation development stems from the fact that the steam engine could not be built for the lack of the necessary metallurgical and machine-tool development.

The idea of flight had also been conceived at a very early stage in history. Icarus and Daedalus of Greek mythology are illustrative, but Leonardo and others made contributions to the development of the idea of flight and even to the science of aeronautics. Klansburg notes that Sir George Cayley (1773-1857) made model gliders to test his ideas of flight and may be identified as the father of the science of aeronautics. But while Cayley could invent the science, he could not invent the airplane because that technological step had to wait until progress in other fields had been accomplished. The development of a light weight engine presented the major hurdle, and plagued the Wright brothers, as well. They had to build their own engine before succeeding at Kitty Hawk.

While the ideas of some of today's well-developed technologies are ancient, the application and growth of transportation technology moved slowly through time. For example, the world had to wait until the ninth century for the horse collar, which provided a major power revolution for the age. Prior to the development of the horse collar, a yoke similar to

that used by oxen had to be hitched to the horse in order to transfer horse power to the wheels of the wagon or carriage, or chariot. This meant that much of the pulling force and pressure was placed upon the horse's neck so that the poor beast couldn't pull a very large load without choking himself to death. Additionally, the yoke arrangement placed pressure upon the animal's jugular vein and cut off the supply of blood to the brain. Application of the horse collar caused the load to be pulled to be distributed around the horse's powerful shoulders rather than the neck. Experiments have shown that the pulling power of a team of horses was increased five-fold as a result of the horsecollar.

The horse did much to characterize society through much of history. From Roman chariots up to the Iowa plow, the horse has played a central role. The invention of the stirrup . . . joined man and steed into a fighting organism" by the tenth century and contributed to the strengthening of the feudal system. The feudal system was dependent upon the ability of the knights of the period to defend their holdings and to serve their Lords. The term "horsepower" became the standard of power measurement. The development of the plow and the horseshoe facilitated strides in agriculture. This, in turn, provided incentives and produce for increasing trade, which in turn called for improved transportation.

There is little evidence to suggest that the compass was known to navigators of the Western World before the 13th century. Consequently, very little sailing was done out of sight of land. Mariners were not only afraid of getting lost but of falling off the edge of the earth. The voyage of Columbus and consequent discovery of America had to wait for the appropriate navigational aids.

Much of man's movement and the movement of his goods is for the purpose of making use of resources more effectively and efficiently. The growth of the use of the horse provides an illustration of the extremely important economic factor associated with transportation technology and technological development. In Roman times before the horseshoe and horse collar were used, bulky goods doubled in price about every hundred miles of carriage overland, but by the 13th century after the introduction of these devices, the cost of grain -- a bulky product -- was increased only about 30% for each hundred miles. Another more recent example of man's pursuit of economy is the Erie Canal. Prior to opening of the Erie Canal in 1927, it cost $100 to move a ton of freight from Buffalo to New York and required 20 days. After the canal was opened, the cost was $10 and 8 days. No wonder the Erie was soon jammed with traffic!

One major characteristic of the industrial revolution has been in the development and use of power. At least three power revolutions can be discerned during the period of rapid industrial growth since 1800. All of these soon found application in Transport, thus providing the means of opening up the west and providing more efficient linkages among buyers and sellers. There is little question about the development of the steam engine and its role as a key ingredient in the genesis of the

industrial revolution. The second power development is the internal combustion engine. The automobile manufacturers became active around the turn of the century, and the Wright Brothers achieved their feat at Kitty Hawk in 1903, thus kicking off the age of the airplane as well as of the automobile. Applications of electric power and electricity began to supplant steam power around the turn of the twentieth century, as well. Ignoring many minor developments and refinements brings us down to date in terms of power, whereas we are now moving into the age of electronics and nuclear energy. Electronics is largely applicable to control and guidance devices necessary to minimize the risks of human error and machine breakdown in an age of precision. For an illustration, simply consider the rather lengthy and highly detailed count-down procedure for sending a rocket into space.

A recent notable characteristic of the relation of transport technology and other technologies and developments may be described as the increasing dependence of transportation upon scientific developments. While scientific advance seems now to be the primary engine of growth in all technologies, it is certainly apparent in the field of transportation. For example, the development of light alloys by metallurgists combined with an improvement in fuels coming from the research of chemists, the navigational devices from application of electronics and mathematics have all led to the advancement of aviation technology. Were it not for these scientific developments, it is questionable whether aviation would be any further along than it was 50 years ago. Looking ahead, a problem for the immediate future will be the adaptation of nuclear power to aircraft. Means have already been discovered to harness solar energy and perhaps the next major technological advancement in air transportation will result from an accommodation of this stride.

Another example of relationships among technologies may be found in our modern system of highway transportation, where several technologies have been combined. The invention of powerful light-weight engines, introduction of petroleum as a fuel source, development of pneumatic tires, use of concrete and bituminous materials for highway construction, and the development of vehicle suspension systems involving steel springs rather than leather straps have all contributed to making travel by road more comfortable and rapid.

Newer forms of transportation technology tend to make the older transportation forms obsolete. In the early part of the nineteenth century, Great Britain was blessed with a fairly well-developed road system for the times, and had good highways for the needs of the period. But with the advent of the railroad, the road system in Britain was allowed to decay. Similarly in the United States, transport by water on available navigable rivers abounded. The introduction of railroads led very quickly to a decline in this traffic. Today, the market share of the nation's railroads is under attack by a revitalized system of inland water transportation, a powerful motor carrier form of transportation using the interstate system of highways, and by an increasingly potent contender, the air carriers. It would be contrary to the lessons history offers to suggest that any of today's growing forms will not be challenged

in the future by an even more efficient contender. One can expect change to be a notable feature in the future if the past is viewed in light of the continuous long, broad sweep of historical developments.

In this context, one would have difficulty comprehending the reaction of the railroads to early motor carrier developments. Early in the course of motor carrier industry development, the railroads were encouraged to get involved -- that is, to use the trucks as a way to become transportation companies. Railway management looked at the puny little trucks that were then becoming common, the poor roads of the period, and the costs of trucking relative to the costs of transportation by rail, and concluded that the best possible use that these trucks could .er have would be in pick-up and delivery service feeding railroads. Some independent service might be developed in the short-haul market, as well. (Today, some of the most profitable motor carriers have average hauls of over 1000 miles!) In short, the threat of the motor carrier development simply was shrugged off by the railroads. Railway management is attributed to have expressed the attitude in the latter part of the 1920's that they did not wish to be in the transportation business. They were in the railroad business. One can't help but wonder what the course of transportation development in the United States might have been had management's viewpoint been somewhat more enlightened.

Development is not a one-way street. Development of one technology often finds application in others. For example , the development of the airplane has led to its use in warfare to scout the enemy's position. It has been used for aerial mapping services, for forest fire patrol and for patrol of pipelines. The ubiquitous helicopter is frequently employed as a traffic control device in urban areas. Crops are sprayed from the air. Scientific research into the nature of hurricanes and for seeding clouds are other examples of the application of air transportation technology. The construction of the Panama Canal had as an unexpected spillover the conquest of yellow fever and malaria through the discovery of the mosquitto as the carrier. Necessity is indeed the mother of invention!

The development of the internal combustion engine has not only led to the automobile revolution with which we are so familiar, but it also revolutionized farming technology through its application to tractors. The tractor has so revolutionized the farming techniques in the United States that in a recently compiled list of agricultural commodities made by the Interstate Commerce Commission, nowhere will you find mention of the horse. It simply is no longer regarded as a domesticated farm animal in the United States. Such technological developments help explain the tremendous productivity of agriculture today.

Transportation technology can be, and is being used to help open underdeveloped areas of the world. Transportation facilities have been long recognized as a necessary ingredient to economic development and economic growth. But, for all the available historical perspective, occasionally the importance and the ability of transportation to raise an underdeveloped area out of its apparent squalor has been over-emphasized.

Large investments have been made unwisely in economically depressed areas in misguided efforts to raise the level of economic activity of those areas. An example may be found in the Appalachian region of the United States where a billion or more dollars has been allocated to construction of a highway for the purpose of increasing trade and commerce in the area. Many who are familiar with the area have concluded that the most likely result of the investment will be to provide a way for those residents who are able to out-migrate. The real problem here illustrated is related to definition of relationships of solutions and problems. If the purpose of investment is to increase economic activity in an under-developed area, then attention must be given to all those factors that stimulate economic growth -- that is, all technologies, and available resources for development. In short, while transportation development is a necessary ingredient, it is not the cause of economic development, taken alone. This seems to be such an obvious truth, yet is so much overlooked.

Let us generalize, momentarily, upon the requirements for development of transportation modes. In addition to the willingness to invest intellectual and physical capital, some sort of pathway is needed for a mode of transportation. For railroads, obviously tracks are needed, for motor carrier transportation, a highway is necessary. Secondly, some sort of specialized vehicle is necessary, such as the locomotive and boxcar or the tractor-trailor combination. Finally, if a transport system is to perform optimally, there should be no artificially imposed advantages or disadvantages.

During much of the past century and one-half's development of transportation, however, the record is replete with examples of artificial prods and impediments to either spur or hinder the development of a particular mode or transportation project. Much is characteristic of man's propensity to resist change, but much of the opposition as well as promotion was motivated by economic factors. Some examples would include the following. The British railways, in the middle of the 1800's, opposed the development of the steam automobile, and succeeded in obtaining a law requiring that someone would walk ahead of the auto carrying a lantern and waving a flag. Teamsters, who had developed a thriving business hauling barrels of oil out of the Titusville, Pennsylvania oil fields in the early 1860's, would set fire to tanks of oil accumulated for shipment by a new experimental pipeline. Teamsters would either break the new pipelines apart with pickaxes or fasten log chains around the pipes and pull them apart with horses. One week saw, however, 1500 teamsters pick up and leave the area, for the pipelines proved to reduce transport costs to less than one-third that of the teamsters. Other examples illustrating this point are discussed later, in connection with the development of transportation in the United States. However, it may be concluded that even today, some modes of transportation enjoy virtually no artificial advantages.

U. S. Transportation Development

Turning attention to the history of transportation development in the United States, let us summarize first, the period of development of

transportation just before the railroads, secondly, the coming of the railroads, thirdly, the construction of the American railway system, looking at government help, promotors, construction companies, and results. One noteworthy thread that will be amplified in the following is the point that the United States had a rather unique set of goals and incentives for transportation development than did other contemporary nations on the continent or in Britain. The reason was simply that the United States was an underdeveloped country, representing the frontiers of civilization's westward march.

Before railroads, the horse, or even "Shank's Mare" were primarily forms of transportation for movement of people. The cost of moving goods was extremely high. One estimate of the capital investment in a mule train of twenty wagons, with ten mules to the wagon, was $25,000 in 1870. On top of this was added the cost of labor. Farmers in Pennsylvania at one time distilled their grain because the value per pound of the distilled spirits was considerably greater than the grain itself.

In the early days of the development of the nation, the original colonies had to stick to the Atlantic Coastline because of (1) the mountains, and (2) the lack of transportation. The colonies had to rely upon water transportation largely and that was limited to the fall line so that little overland travel resulted prior to the development of the railroads. However, there was considerable investment in turnpikes during the period of 1800 to about 1840. One British observer commented that the turnpikes for the period were very good and provided a very good start for the settlers that were beginning to move westward. But the "good" roads of the age weren't good enough to provide the most comfortable ride in the leather-sprung stagecoaches or in the Conestoga Wagons of the period.

It was very clear that the waterway was the important means of transportation, and that whoever developed the waterway to the west over the Appalachians or around the Appalachians would profit immensely. Thus was an age of canal fever ushered in. The Erie Canal was opened in 1825 through the Mohawk valley north to Buffalo, and paid off in seven years. Philadelphians realized that the best way to get goods inland or to get any products of the west or midwest to Philadelphia was by using the Erie Canal, and that the Erie threatened Philadelphia's prospects for continuing to develop as a major trade center. A similar awareness developed in Baltimore and Washington. None of these communities wanted to witness their own decline and watch New York develop as the major gateway to the rest of the world, and looked for ways to open the West to themselves. Baltimore decided to open the West by building a railroad. The Baltimore and Ohio Railroad was founded and construction began in 1827. Philadelphia promoted a system of canals, portages, and railroad in the Pennsylvania Department of Public Works. This combination system was opened in 1834 and is now a part of the Penn-Central railroad. Washington planned to canalize the Potomac, and Boston planned a railroad.

Thus, there was a curious combination of civic pride, economic incentive, and public investment that developed in the wake of the Erie Canal's

success story. Other states seeing that the Erie Canal paid off its total investment in seven years, thought that the lesson was clear. the way to economic and perhaps political well-being was through extensive investment in internal improvements -- to be translated as transportation. For example, the State of Indiana was caught up in this kind of dream. By the year 1836 the State had planned an extensive system of canals and railroads for the State's yet-to-be developed commerce. Part of the plan was a canal from Terre Haute, in the Southwest of Indiana, near the Ohio River to Lake Erie. Part of the route of the canal would follow the bed of the Wabash River and other existing streams in the State. The evidence of the faith of the State in the proposed system is to be found in the extent of the commitment to the projects. In 1836, the total revenue of the State from all sources was $33,000. The planned expansion in Indiana was estimated to cost $26 million. $33,000 would hardly pay the interest! Indiana went broke building the Wabash and Erie Canal, and bankrupted some financing firms along the way when the State repudiated its debts acquired for construction purposes. The results are still in evidence, for the State of Indiana still has a prohibition of State debt provision in the state constitution. Several other states experienced similar fates with over-ebullient improvement programs during the age of canal fever.

The early railroads were envisioned to be feeders to canals and rivers. Nobody really envisioned a system of railroads being developed in 1827 when work began on the B & O. The early construction pattern, therefore, developed several short railways which simply connected towns to river and water transportation.

The general attitudes toward the new technology of the railroads may perhaps be illustrated by pointing out some differences in attitudes prevailing in Britain and those concurrent in the United States during the period of early railroad development. In Great Britain, there was a great deal of opposition to the railway. Britain already had a transport system. There was quite an extensive system of roads and canals, and people and commerce were adjusted to these means of transportation. Thus, for a new technology to be introduced, it would have to be proven on the basis of its return on investment and contribution to increased economic efficiency. It would cost a great deal in terms of displacement of existing technology to invest in the new technology of the Iron Horse in an already developed country. Consequently, the many vested interests in Britain opposed the coming of the railways.

Some of the vested interests included the inkeepers who catered to stagecoach traffic, and didn't wish to see the business of the coaches diverted to the rails. The stagecoach operators themselves were threatened, blacksmiths who made their living shoeing horses didn't visualize a future of shoeing Iron Horses. even fox hunters numbered among protestors. They complained that the noise and smoke of the railroads would cause foxes not to whelp.

By contrast, in the United States, there was eager acceptance of the railroad. There was a great need for transportation in the United States.

We were simply crying for a system, which the railroads seemed to offer. Railroads appeared to be a relatively low cost and flexible means of transportation. We had magnificent distances to overcome. The United States had vast depths of unsettled lands to open up, and had a relatively poor river system. That is, the rivers simply were not suited for east-west development. Thus, the need was tremendous, and there was no strong vested interest group against the construction of railroads in the United States. Construction was begun in earnest in the mid-19th century.

But there were growing pains. Tremendous amount of capital for construction was neeessary. Necessity again proved to be the mother of invention and application of the corporate form of organization to railroad organization provided an important aid to railway construction. Railway construction has a voraeious appetite for funds. Consequently, it was difficult for individuals to amass enough eapital to build a railroad. The corporate form permitted distribution of shares of ownership and aided materially in the necessary amalgamation of capital for railroad construction. Another comparison with Great Britain in the light of the needs of the twocountries will illustrate the relative standards of construction of the times. In Britain, since the necessity was not so great, there was pressure for building to the highest available standards of the time. As subsequent history has evolved, the British built to the highest standards of the times and got stuck with them. By contrast, we needed the railroads built in America in a hurry, and consequently built the best we could the quickest way possible. The initial result was to open up the land, improvements in the railways had to wait. The major purpose of construction in the United States was to open the country, to develop it, to tie it together, to promote economic development rather than to provide an economic return to the nation and its investors.

The United States Government aided in the construction of the railways in several ways. Perhaps most notable were the land grants, which have been variously hailed and condemned. A typical land grant involved the deeding of alternate sections of land for a distance of five or ten miles either side of the centerline of the proposed railroad. The railroad would then sell much of the grant property, thereby raising capital for construction purposes. Of course, the land would immediately jump in value when the grant was made because of the speculative and developmental impact of the coming of the railroad. Whereas, much of the land was priced for $1.25 per acre before the grant, it jumped to $2.50 per acre after the grant. Thus, in effect, the federal lands were given away at no cost, since the public retained every other section of land having a 100% higher value.

In addition to the retained government lands doubling in value, the government also received free transportation for government goods. Since the right-of-way was given to the railroads together with all the extra land for development purposes, that the government should get reimbursement. This was to be accomplished through requiring government traffic to move at half the cost of other traffic.

Promotors and construction companies not only did much to aid and abet the growth of the railways in America, but did much to develop them badly.

Promotors practiced the gentle art of playing communities off one against another, so that railroad lines were laid out more like snakes than like arrows. This was done by convincing the townspeople of every small town that the railroad would be built to another town nearby unless the towns contribute generously to the railroad. As a result, towns kicked in tax concessions, bought bonds and stocks, and aided in other ways in order not to be bypassed by the railroads.

The construction company device also helped the railways to be built faster. These were of two kinds. "inside" and legitimate. Basically, the construction company device was a means of reducing the risk attendant to purchase common stock at initial issue. For example, if a railroad issued stock of $100 par value to a buyer for $70 per share, the buyer as first holder could be held liable in case of the company's default so long as he owned the stock. His limit of liability, however, was only to the extent of the difference between par and the price he paid, or $30 in this example. However, holders, in due course, are not subject to liability for the default of the corporation, regardless of the price paid for the stock. A holder, in due course, is any buyer of the shares other than the first buyer. Even though the railways were sorely needed, they were a high-risk investment. Consequently, few investors were willing to pay par value for a share of railway stock. The railroad companies turned to the construction company device as a way of making railway shares more attractive to investors. Railway stock would be issued at par value to the construction company in exchange for the contractual obligation to build railroad. The construction company would then sell the stock for whatever the market would bear, which usually was significantly less than par value. The purchasers of railroad stock, who bought from the construction companies, then became holders in due course. The most at risk to such purchasers was their original investment. In effect, the construction companies stood between the railroad and holders of railroad stock in due course. The funds received by the construction companies from the sale of railroad stock were then used to build the railroad, and any funds not so spent became the construction company's profits.

The "inside" construction company, however, offered too rich an opportunity for men of avarice to pass up. This type of construction company was founded by the men who were incorporators and board members of the railroad company. Thus, the men responsible for developing and operating the railroad as an enterprise were the same men who could reap the profits from construction. It was natural that the cheapest construction methods were followed so as to maximize the residual profits to be divided among the promotors.

The results of the nineteenth century railroad building binge in the United States include. the nation was unified with transcontinental railroad routes, economic and social development was aided and hastened; however, the railroad system was overbuilt and overcapitalized. The western lands were thus opened for settlement, and National mobility was gained.

The Development of Cities and Relation to Transportation

As previously indicated, the location of cities was determined by external transportation availability. At the intersection of waterways and the seacoast, one could expect to find the largest city of an area. As one moved up the river, cities would become successively smaller, because the size of a city was related to the size of hinterland which it could tap for its support. The cities on the seacoast tended to be largest simply because they could tap two hinterlands for their needs. All the resources upriver were readily available, and the trade of foreign lands provided the second "hinterland" available to the seacoast city. Cities located where tributaries ran into rivers and were also conceived where rivers were crossed by caravan or other inland trade routes. Economic exchange tended to take place where transportation routes intersected. Such activity tended to provide opportunity for trade and services to develop and for growth of social and political intercourse.

Internal mobility has always been important in city growth. Without a means of transportation, virtually everything must be within walking distance. Analysis of the City of London reveals that the city is a conglomerate of formerly fairly self-sufficient central places, all small with minimal separation of activity centers. A means to move about in the central city is necessary, and the better this means, the larger the city tends to become.

The medieval city existed in a fragmented, feudal society devoted to protection, self-sufficiency, and little social and economic intercourse. Life centered upon the feudal Manor, and the "city" may have been walled. Perhaps a series of parallel walls may be observed as the "city" grew and expanded, up to the point in time when gunpowder and artillery became available. The notable point which may be observed is that little planning for city growth is evident in the medieval city. In a later stage of development, however, the city tended to become more planned. The medieval king, may have planned two characteristics into his city. First, he wanted to be in the center of activities. Secondly, he wanted to be able to show his power in a manner similar to the Russian Military Display in the Kremlin. The result is the city with straight boulevards leading to and from the center of power.

The modern industrial city, however, was largely dependent upon public transportation during its developmental stages. Hence, it was shaped largely by industry and transportation. The streetcar has been regarded as the shaper of modern American cities. Early in the development of the industrial revolution, housing tended to be jammed near factories, so the workers could easily walk to work. Until a form of public transportation was developed, man was forced to live near his work. The first form of public transportation was the omnibus. The first of these vehicles was developed and operated by Pascal in about 1660. Originally, rides were free, but when costs became inescapable and Pascal began to charge, riders protested strenuously -- in a fashion similar to any proposed rate or toll increase made today. The horsecar was put on tracks shortly after its development, and the horse-drawn streetcar began commuter service roughly coincident to construction of Steam Railways during the 1830's. Some rather unique problems occurred with the horsecar that were not shared by successor electric streetcars. Occasionally, various and sundry diseases

would attack the livery as an epidemic and simply wipe out much of the motive power. Horses were also in need of rest and rather frequent "maintenance" periods. A noteworthy effort to mechanize public transportation in urban areas was made by Andrew Hallidie, in San Francisco after the War Between the States, and resulted in the cable car. Hallidie was a manufacturer of wire rope, or cable, and saw a new market for his product if a grip of some sort could be developed to engage a cable buried in a channel under the street surface. The cable could be guided over a set of pulleys, and powered by a stationary steam engine. The cable car was relatively expensive to build, and consequently required rather dense traffic to justify its construction.

The Electric Streetcar was developed around 1800-1890, and has been identified as a major cause of city development. The streetcar, with its higher average speeds, pushed the limits of the city out to a new dimension. City size and transportation may be related through man's use of time. It may be generalized that man does not wish to live more than thirty minutes' transportation time away from his work. Thus, the distance a man would be willing to live from his job if limited to walking at three miles per hour would be about one and one-half miles. Hence, if all jobs are located near the center of the city, the effective city radius will be one and one-half miles. The horse might have pushed this limit to three miles or so, the cable car to four or five miles. The streetcar, with its average speeds of fifteen to twenty miles per hour, or more, effectively pushed the radius to eight or ten miles. This resulted in cities taking on a starfish shape, with population moving out to and settling along the car lines. Superimposing the railroads, which began to offer commuter service in the latter half of the century as a means of gaining extra revenue, amplified the growth of the starfish pattern, led to nodal developments even further out from the center city. This nodal development stemmed from the economies of railway operations, which tends to call for less frequent stops than smaller vehicles such as the streetcar.

Some developments also attributable to the streetcar occurred in the character of the city. As streetcars became electrified, strip shopping streets developed along the routes. More affluent residents along the streetcar routes didn't like the noise and flashings of the streetcars, and simply moved away -- either out near the end of the line, or at least to a street two or three blocks away. As a consequence, land values immediately on the car line decreased for residential purposes, and the former homes became used as stores catering to the car riders. City sub-centers tended to develop where car lines intersected. Slums tended to develop in these areas and along the cross-town lines, as well. Poor people needed to live where they had one-line access between their homes and jobs, for the early streetcar lines developed under several independent ownerships, and did not provide for transfers. As cities expanded, streetcar companies consolidated and began to establish cross-town lines and to offer transfers. Affluent persons tended to move out, leaving the areas around the car lines to begin the process of decay and deterioration into slums.

The sudden, unexpected arrival of the autmobile concluded the development of cities to date. The automobile, completely versatile as to time and route, superimposed upon prior developments, filled in the areas between the points in the old starfish pattern, and pushed the city boundaries out seemingly limitlessly. The suburbs have been a notable result. Located almost indiscriminately, the suburbs have caused the modern city to take on a physical shape which may be appropriately characterized as formless. City character and meaning tend to be wrapped up in the term "Slurbs" which has been used to describe the homogeneous suburban developments of the 20th century.

The problem of the day is the automobile insofar as urban mobility is concerned. Not only can the automobile, which the American has elevated to a pedestal among gods to love and worship, get us there, but it leads to the demise of over 50,000 of us every year. In short, the automobile which has been a decided boon in our search for mobility, has led us to a problem of immobility in our cities. What will we do with the automobile in the city of tomorrow?

By way of conclusion in this potpourri of transportation history, perhaps this concise capsule is appropriate: A student wrote on an examination that the history of transportation has developed from the point when man moved all his trappings on foot up to the point where a Boy Scout receives a Merit Badge for walking a mile.

TRANSPORTATION AND ECONOMIC DEVELOPMENT

An exchange session with Secondary Curriculum planners. Donald K. Graham, Instructor, Department of Transportation and Logistics, University of North Florida.

We are to spend a short while this morning talking about transportation and economic development. But before we get into the discussion itself, I would like to make two suggestions. First, this morning, and throughout the seminar, continue to ask yourself, "So what?" And second, wonder "Why?" Here I am talking with you about economic development--and other people talking with you about transportation in other areas. We're telling you something about transportation, but you must wonder "Why?" Take this back to your classroom. "What does this (transportation) mean to me, to my class, and why is it that way?"

Now, to our discussion. One thing that has impressed me about our society is the extent of our dependence upon this thing we call transportation. I was glad to hear that some of you are English teachers. As an ex-English major I was doubly interested in a passage I found in one of our texts--partly interested because of the Old English phrasing in which it was written, and partly because of what it says about a society's dependence on transportation. The passage is from an old English law about paying debts to transportation people. I'm not going to read the entire passage for you, but it says in effect that a person who is ". . . entrusted to carry goods is charged against all events but acts of God and enemies of the King, for though the force be ever so great, as if an irresistible multitude of people should rob him, nevertheless he is chargeable." Now, why should somebody be chargeable if ". . . an irresistible multitude of people should rob him . . ."?

The idea I am after here is found in the words "entrusted to carry." We people--whether as manufacturers or consumers--entrust our goods to someone else for transportation. We give our goods to this someone and they have complete control over those goods. Then, if something happens to the goods, we are lost-- in some cases, utterly and completely. So regardless, except in war or acts of God, the carrier, or teamster, of old England was responsible. This, I think, is a vivid example of one people's recognition of their extreme dependence on transportation.

Monday I talked to you a few minutes about transportation and economic development. An economy, especially a young economy, has two basic ways in which it may develop. It can be self-sufficient by making or producing everything that its people need, or it can go into the thing I mentioned Monday--specialization. And what about our economy? As a people, are we self-sufficient?--or are we specializing? Well, we're specializing, and this has an effect upon our relationship with the other peoples of the world. We become more and more dependent on other people. And since two people--we and those we're dependent upon--cannot be in the same place at the same time, we're more and more dependent upon something to reach between ourselves and the rest of the world. That is where transportation comes in.

You'll recall from our discussion on Monday that there are two reasons for specialization developing. First, there is the unequal distribution of the earth's riches; different parts of the earth have different quantities (including zero) of what people want. Second, specialization appears to be the best way for the most people to share in what the earth offers; to overcome this unequal distribution.

But where does transportation come in? Well, transportation is the "thing" that allows specialization to happen. People's desire for the better life is what makes specialization develop; but it is transportation that allows the specialized functions to operate.

Production is one of these specialized functions of which I'm speaking. What is production: "It's turning or making natural resources--turning them into consumable goods."

(All following quotations are responses from seminar registrants:

OK, conversion, or transformation, or something like that? This conversion is often referred to as making something useful out of something unuseful. Iron ore is not useful as a hunk of rock. But converted into iron, it becomes something with great usefulness. It has had its degree of usefulness increased by having its form transformed. It has been given form utility.

But our discussion is on transportation. What does form utility have to do with transportation?

"It has everything to do with it! The natural resources have to be gathered into the places of production . . . and then you have to get them to a distribution point and ultimately to the consumer."

"Yes, and you also have to get labor in." "And getting the people to the place where they're going to buy it!" Very good. Transportation, as you quickly pointed out, gets "it" where it's supposed to be, which is quite true. But there is another dimension here which also is important in production and is dependent upon transportation. Productive utilities not only have to be gotten where they are needed, they also must be gotten there at the right time. Thus, transportation might be said to provide the time and place utilities which allow the productive facilities to perform their form creation.

I happen to have read in Time this morning about a production experiment which is planned for Skylab --making ball bearings in space. It seems that bearings made on earth are never perfectly round because of the influence of gravity. The N.A.S.A. scientists feel that the zero gravity environment of Skylab will allow the production of perfect ball bearings. Now, suppose production in space becomes realistic. What is the real problem to be faced? "Getting the natural resourses there." That's right. It's not so much the production process up there as the transportation process between here and there. This is something that should excite students, possibly in two ways: what will I, as a student, be able to do with this new productive idea; and, particularily for the social science people, how is this process going to affect me . . . what effect is it going to have on

me as a participant in society?

Let's take a slightly different tact now. We've talked a little about labor specialization -- people doing what they do best so that all of us can enjoy more of life's riches. There is another kind of specialization, it's called territorial div sion of labor, which is related to the variances in the location of land resourses. We allow the land to specialize also, which contributes additionally to the riches we all enjoy. And again, transportation is what makes it, allows it, to work.

Now, you recognized very quickly and jumped right on to the idea of transportation and production being so important in getting materials in. But is this the end of this process? "Gotta' get them back to the consumers!" "There would be no economic value whatsoever to producti if you couldn't get back to the consumers!"

O.K. So what you're telling me then is that transportation makes jun, if you will, rocks, valuable by taking them someplace to be processed into something useful. And you are further telling me that this in itself is not enough -- that even the processed rock would still be junk unless it could transported to where it is available to consumers.

What would happen to some thousands of automobiles, for example, if there were no railroad between Detroit and Los Angeles? Without that type of transportation between these two cities Los Angeles could not be considered a market to the auto makers in Detroit. As far as the people in Detroit would be concerned the eight or nine million folks in Los Angeles would not exist. Now this is a somewhat far fetched example of the idea that transportation can create a market. But the people of Los Angeles want automobiles, and without transportation they are no real market -- it's just as if they did not exist at all. Transportation may not be the sole creator of the Los Angeles market, but that market could not exist without transportation.

Dr. Sparling mentioned to you last Monday, and again this morning, something about transportation costs and the extent, or size, of a market. When we buy something the price includes not only the production costs, but also the costs of transporting the item. A broad generalization is that the further something travels to reach the consumer, the more it is going to cost. An automobile might be made in Detroit for $2000 and sold in Memphis for $2300, in Jacksonville for $2500, and in Puerto Rico for $3000. So what happens to the manufacturers in Detroit if we folks in Jacksonville decide we'd rather pump a bicycle than pay $2500 for a car?

"I think somebody is going to figure out how to make that transportation cost less."

Exactly. The first thing we're facing is that Detroit has a smaller market that they would like to have because all the wealthy people in Jacksonville are too tight to spend that extra money. So if the car makers can cut the transportation bill in half, well, we'd all be glad to spend $2400 for a brand new, big Chevrolet.

Now if you'll think about it for a minute, we've been talking about market

creation and transportation from the manufacturer's point-of view. But few people in here, or in your classes back a school, are manufacturers. From our point-of view, the effect of transportation on market creation is the other side of the coin which is the market which we are able to enter and make our purchases. Again, something which should be very important to the modern student, especially as a consumer. But do you talk about the effect of transportation on costs and the effect of those costs on our lifes?

"Well, I think today the people who get in such an uproar about the price of food -- and I think that anybody who goes to the supermarket does -- I don't think they take into consideration how much transportation cost is built into a loaf of bread, or a head of lettuce. And I've had numerous people say to me, 'I don't understand, if the farmer only gets that for a pound of beef, why am I paying . . .?' And they forget the labor along the line, the transportation that is a tremendously costly product."

And this another example of why a consideration at least of transportation or distribution -- storage, handling, packaging, inventory, movement, all of these things -- that they do effect everyone very directly. It is very important for the non-business interested, for a future liberal arts major or a future mathematician to be aware, if nothing else, as a consumer. You mentioned the tremendous impact of transportation on consumer goods -- our food, the very things that we live on. Is this a reasonable impact from society's point-of-view? Isn't this something that a social science course should be willing to look at?

"Well, I think beyond that, one of the things I see that we ought to do in education is develop intelligent decision makers, in voting, for instance. And I think where you have people planning to run for office -- and this is important to our new eighteen year old voters -- and they say 'I'll settle inflation' and they don't realize how complicated this is and they don't realize how complicated this is and that one man isn't going to do all of these things. And they cannot vote intelligently until they understand how our system works, which includes this distribution system."

You have just led back, I think, to the word which I mentioned earlier as representing transportation's position in our society -- dependence. Some of us talked a little about this Monday morning during the break. Think for a short period of time, especially about the big cities of the Northeast -- picture yourself up there. You live in New York and you wake up one morning and the radio announcer on the news broadcast says that all trucks have stopped running; there will be no more trucks into or out of New York. It is my feeling that within three or four days that city would be dead.

'I don't know that you can confine that to New York. How about Jacksonville? We might be dead too!" Do you suppose Congress will ever allow a national rail strike? "I rather doubt it, unless they are determined to destroy the whole thing. I think they someday may nationalize the railroads."

Do you ever talk about this in class?

"Not really."

GOVERNMENT AND TRANSPORTATION

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Introduction

Our discussion for this hour shall deal with the agencies of regulation that government in the United States uses to deal with the complex problems arising in connection with the control of activities of transportation undertakings under private enterprise. We shall not discuss other aspects of public policy, such as promotion of transportation, public aid, government construction of transportation facilities, and many technical matters of supervision that may be necessary. These issues have been or will be dealt with in other sections of our seminar.

Law and Economic Life

It is a task of law, as it is concerned with economic policy for private business, to develop formal controls or rules that will set the limits within which private enterprise can be left free to use its own discretion. Law is said to be that body of rules of conduct which is backed up by the coercive power of the state or the body politic. It consists of those rules which are recognized, interpreted, and applied to particular situations by the courts of the land. In the final analysis, law at any given time is what the courts say it is, but to have effect it must be supported by the power of the state to require compliance with the decrees of the courts. Thus law, particularly law regulating transportation endeavors, constitutes those rules of behavior prescribed by the courts and enforced or supported by the agencies established for that purpose. Finally law or government is coercive; obedience is required, or penalties are suffered accordingly.

Although the law ultimately is coercive and implies compulsion, it is not a purely negative arrangement. It not only prescribes rules of conduct by saying what must not be done, but it also may be set forth as to what may be done. It is both prohibitive and permissive, and although it embodies rules of behavior, it does not encompass all of them. Although from a strictly legalistic point of view the state is a supreme authority, the law through which it acts is faced with definite limitations. It cannot persistently flount customary patterns of behavior because, to maintain the continuity which is characteristic of the law, it must be deeply rooted in those customs.

Whenever the rule of law characterizes political institution, the courts play a major role in the development of public policy. They not only interpret the constitution and legislative acts, but also legalize custom. The very nature of the judicial process, however, makes for a somewhat gradual development of the law. Legislative action may speed it up, but even this is likely to be a more or less gradual procedure.

Nature of the Common Law

The origin and basis of regulation in this country are to be found in the common law under which certain rules governing the conduct of business in general, and the obligations of common carriers, grew up. The common law is the foundation of the legal system of the United States. It is one of the two great legal systems of the Western World and prevails in England and most English-speaking countries.

There are two aspects of the common law which are important in regulation. The first of these is the common law as a body of rules. Common law refers to that part of the law of the land which has grown up without benefit of legislation and which can be found only in court decisions. As a body of rules, it designates that part of the law, in countries having the common-law system, which is traditional in form. Substantively, it embraces those rules of the law which developed out of the customs that have been incorporated into court precedents. In this respect, common law is distinct from Statute law and may be referred to as the traditional part of the law of the land. When one wishes to ascertain what the law is on a particular topic, he must search through court decisions to determine what the court has said the law is. Their interpretation depends upon the issues in a particular case or the customs which have prevailed under certain circumstances in the past.

The second aspect of common law is that which relates to the way the law takes form. The common-law system involves a distinct method of procedure in developing the law of the land. This is accomplished by the continuous process of court interpretation in specific cases of the legal issues which arise, the accumulation of decisions giving meaning to the law. It is the function of the courts to give the authoritative interpretation of the law. When this is done for a particular legal issue, the ruling becomes a precedent for subsequent court rulings. It is by adherence to precedent that the law gains its continuity and stability. This method of developing the law is so deeply ingrained in our political and legal structure that it will probably persist in the United States for an indefinite future. Two things are likely to make the common law, as a system, an enduring basis for American law: its technique of finding the law through judicial experience and its conception of rights and duties as involved in or incident to relations.

Emergence of Common Law Control

Until comparatively recent times, the regulation of private business practices was a matter of common law. Indeed, down to the latter part of the 19th century, the use of statute law for this purpose was comparatively rare. Although the common law antedates the development of private business by many centuries, the development of common-law principles relating to the regulation of business came with the breakdown of the medieval system.

In the evolution of common-law basis for control of business, four principles or doctrines emerged. These were: (1) Restraint of trade, (2) Conspiracy to monopolize, (3) Unfair competiton, and (4) The right to

regulate. The first three furnished the legal rules of conduct for competitive business. The fourth provided the legal basis in the United States for the regulation of prices, as well as other aspects of what came to be known as industries affecting the public interest.

Control of business through the common law was totally inadequate for the structure that grew up in this country during the period following Civil War. Although it provided the basis upon which foundations of regulation were erected, the common law was too simple in structure and lacked adequate means of application to meet the new situations which arose. Apart from other limitations, the common law was confined to states. Regulation by the federal government of practices that might be dealt with at the state level through the common law could be carried out only by means of federal statutes.

The Right to Regulate

The fourth common doctrine which was to become of prime importance in the regulation of business was the right of the states to regulate. Regulation in this setting referred to the idea of restricted price and profit controls and accompanying limitations on the scope of private discretion. Since the Civil War, this has become one of the most significant controversies in the constitutional history of the United States.

The Meaning of Regulation

The term "Regulation of Business" has three different meanings. In the broadest sense, it covers all the laws which govern the activities of business. From this point of view, all business is regulated, since it is subject to rules of conduct prescribed by the state. The second meaning arises from the imposition of rules of conduct by legislative action described to limit the freedom of activity of business enterprise. These regulations arise because competition is not perfect and because economic forces, working without legislative guidance or restriction, are independent means of achieving social objectives. Such regulations are designed to channel economic motivation by establishing conditions designed to maintain competition and to eliminate monopoly power as far as it is feasible. The third and narrowest meaning is used to describe the controls which have been developed to deal with industries such as transportation, public utilities, and communications. Regulation in this sense means the positive direction of business practices through control of the prices which are charged for services, possible limitations of profit, restriction of the right of entry and withdrawal, or other devices considered necessary to implement the primary objectives of public policy. It is this restrictive definition of regulation which gives rise to the distinction commonly made between transportation which is regulated and that which is not.

Regulation presupposes private business and economic activity independent of the government. It also assumes the decentralization of responsibility for guidance of economic life and the allocation of economic resources to various uses. It prescribes rules of conduct under which, however, enforcement agencies are allowed considerable discretion.

Regulation also frequently involves an element of deliberate direction which, at times, creates the problem of distinguishing between regulation and management. This is particularly true in the case of transportation industries. The laws governing the regulation of transportation impose many more duties on the commissions than are encompassed by the control of competition, the pricing process, regulation of securities, and services, all of which may be considered as an essential part of public policy that provides a substitute for competition or limits it. Public service commissions are also charged with the duty of setting technical standards of performance and of supervising innumerable technical aspects of operation. Thus, for example, the Interstate Commerce Commission is required to supervise railroad car service and formerly safety activities; it was also authorized to prescribe rules and regulations on matters of operating safety of common, contract, and private carriers engaged in interstate commerce, including qualifications and maximum hours of service of employees of the carriers. These and other administrative functions have been transferred to the new department of federal transportation.

Regulation Under Federal Government

As we all know, the United States is governed under what has been traditionally called the federal form of government. It is the result of uniting a number of more or less independent states into a union in which each member retains a large degree of sovereignty. Because of its origin, this form of government requires a written constitution, which is the basic framework of government for the federal union. It sets forth the restrictive powers of a central and local government, and provides means whereby the general framework may be modified to meet the need arising from changing conditions.

The Constitution and Regulation

There are two distinct features of the Constitution of the United States which are important to the regulation of industry. The first of these relates to the location of the authority for regulation, the Constitution setting forth the respective powers of state and federal governments. Under this provision, the basic responsibilities of the executive, judicial, and legislative branches of government are distinctly spelled out, with their responsibilities and corresponding authorities denoted. Governmental action, therefore, requires the sanction and cooperation of all three branches of government. This means that in the matter of regulation of industry, the legislative, executive, and judicial viewpoints must function together, but that each division must act strictly within its own sphere of competence. Because of constantly changing conditions, adjustments among these three divisions is a continuous process, often very delicately balanced. As we all recognize in the contemporary press, we see in Watergate that delicate balance somewhat disturbed.

The second distinct and unique feature of the Constitution which is important from the standpoint of regulation is the Bill of Rights. The Constitution places special emphasis on the importance of property and individual freedom on economic matters as the basis of liberty. It contains guarantees for the protection of life, liberty, and property. These

guarantees are not necessarily an inherent part of a written Constitution or of the federal form of government; however, they have become so interwoven with other aspects of our constitutional development that to separate the Bill of Rights and its direction would be infeasible.

The Independent Regulatory Commission

The Independent Regulatory Commission is literally an "invention" of the United States and one of this country's "unique" contributions to the regulation of private industry. It may be said to have begun with the laws enacted in the late 1800's by the states of Illinois, Iowa, Wisconsin, and Minnesota to control the rates charged by railroads and ancilliary agencies. The Interstate Commerce Commission was the first one to be established by the federal government in 1887. Initially the Commission was only given limited powers over rates and services, but during the present century its scope and authority have been extended, so that today it stands as one of the most powerful commissions in the country. The commission form of regulation has been extended into other spheres of federal control during the last half century with the establishment of the Federal Trade Commission, the Federal Power Commission, the Federal Communications Commission, the Securities and Exchange Commission, and the Civil Aeronautics Board.

The Nature of Regulatory Commissions

The theory underlying the function and organization of an Independent Regulatory Commission is that it is an expert body, composed of individuals appointed for the purpose of providing a continuity of business regulation that neither the courts nor the legislatures can supply. The courts were unable to do this because they act only on the basis of litigation and only on the issues brought before them. They cannot act on their own initiative. Legislatures, by their very nature, are unable to act in an administrative capacity and are unable to supply the day-to-day and individualized regulation that modern business requires.

The Regulatory Commission is supposed to be a non-political agency administering the law, within the framework of the Constitution, according to the intent of Congress, as expressed in the governing statutes. It is for this reason that it is considered essential that such a commission enjoy independent status. Again, outside of the bailiwick of transportation. we all recognize the problem of political intervention into independent regulatory commissions as we have witnessed in the scandal within the S.E.C.

The Regulatory Commission is regarded as an arm of the legislature and judicial branches of the government and is free from control of the executive. In other words, it occupies a dual position, which has been characterized as quasi-legislative and quasi-judicial. This means that it acts in a legislative capacity when it fills out legislation by promulgating rules or enumerating details envisaged in the legislation. Congress may prescribe broad standards to carry out its purposes, such as requiring that rates be just and reasonable or prohibiting unfair methods of competition. Congress, however, can seldom lay down detailed

rules to carry out these standards, because this would be too rigid for effective regulation. The Commission does this task. When it interprets the law or issues orders for compliance with the rules it has established, it then acts in a judicial capacity. In this capacity it is predominantly a fact-finding body, by which activity it provides the basis upon which detailed regulations may be issued and public policy developed. Most of the statutes under which the commission operates specify that commission findings as to fact shall be conclusive if supported by adequate evidence.

In addition to performing their functions as regulatory agencies, commissions may also act as fact-finding bodies for the purpose of securing information that may be used as a basis for formulation of public policy toward business and for recommendations to Congress for legislative action. The investigations may be made by staff under commission direction, or they may be made by members of the commission holding hearings like a congressional committee. Investigations are usually confined to the field over which the commission has regulatory authority.

The Interstate Commerce Commission

The Interstate Commerce Commission consists of eleven members appointed by the President of the United States by the advice and consent of the Senate. These members are appointed for a period of seven years and may be reappointed.

Scope of Authority

The Commission has been vested with the authority to regulate various types of surface transportation in interstate and foreign commerce. The scope of this authority is briefly as follows:

1. Issue certificates of public convenience and necessity for construction, extension, and abandonment of lines of railroads.

2. Certificates of public convenience and necessity for establishment or extension of motor common carrier operations.

3. Issuance of permits for institution and extension of motor contract carrier operations, water contract carrier operations, and freight forwarders.

4. Require that rates and practices of all common carriers subject to this act be just, reasonable, and nondiscriminatory, and that such rates be published and on file.

5. To pass upon the unification, mergers, and common control of two or more carriers under the commission's direction.

6. To regulate the issuance of securities by railroads and motor carriers and other financial matters pertaining to these carriers.

7. To investigate alleged violations, prosecute in court, and assist the Department of Justice in pursuing civil and criminal proceedings arising under all parts of the act and related acts.

Civil Aeronautics Board

The Civil Aeronautics Board is an independent regulatory commission patterned after the Interstate Commerce Commission, although it possesses much less comprehensive responsibility, its activities being confined to air transportation. It consists of five members, appointed to six years by the President. The scope of the Board's statutory authority is summarized as follows:

1. Regulation of economic aspects of domestic and international United States air carrier operations and of common carrier operations of foreign air carriers to and from the United States.

2. Investigation and analysis of civil aircraft accidents.

3. Adjudication of refusals of the administrator of the federal aviation agency to issue airman certificates and of appeals from orders of the administrators affecting air safety certificates and participation in the administration's safety rule making proceedings.

Government Objectives in Transportation

Transportation presents a unique problem for the nation because of its intimate relation to community life. In fact, the idea of a unified community or body politic is impossible in the absence of adequate means of transportation. In other words, without an adequate transportation system, this would not be these United States. Throughout the history of the world, it has been found necessary for national sovereignty to have an adequate supply of transportation facilities. Even in a country where the utmost possible development of private enterprise prevails, public participation has been necessary, especially under modern conditions. It has never been feasible to divorce transportation from community concerns or interests, because it literally forms the basic framework of a community, and it constitutes the arteries by which the community's life blood flows. Transportation routes are decisive factors in the location of economic activities. All we have to do, sitting in our classroom, is to look at Jacksonville and its location and the reason for its growing importance, even the inclusion of a new industry such as Offshore Power Systems.

Transportation companies are obligated to use public facilities. Water transport must utilize the inland waterways, coastal waters, and harbors

of the country, and these cannot be left solely to private exploitation or development. Navigational aids cannot satisfactorily be provided by private enterprise alone, nor left to complete reliance on competitive forces, or our airways would be a horror. Railroads must be permitted to exercise power of eminent domain, a procedure which directly or indirectly requires use of governmental powers. Motor transport must be able to use the highways, the provision of which also entails resort to powers of eminent domain. In other words, transportation, unlike most other economic activity, needs the aid of the government in securing the necessary route facilities, whether the services can be supplied by public or private enterprise.

But the participation by government does not stop at this point. Public investment is unavoidable. No feasible means for supplying streets and highways -- to say nothing of water and air navigational aids -- by which complete reliance can be placed on private enterprise, has yet been developed in any nation of the world over any time period. Public investment in the routes over which most of our transport takes place is inescapable. Thus transportation, even in a private enterprise economy such as ours, constitutes a mixed system of ownership and investment. It is necessary to your understanding of the transportation industry that this is the way our system and most systems of transportation and communication have been developed. It is also the unavoidability of this mixed system that is one of the reasons why economic allocation and utilization of resources in transportation constitute such a complex problem. Transportation presents the unique problem in that the shippers also constitute a group of industry, some of whose services are readily substitutable for each other, while some are not readily substitutable or are even specific to that particular mode. This would not present any particular difficulties if the modes had similar economic characteristics and therefore were amenable to the same type of regulation or control. Obviously this is not the case, as railroads and pipelines are somewhat natural monopolies, while motor, air, and water carriers are comparatively competitive in nature. Furthermore, a large amount of transport service is not for hire; it is supplied by the owners of the facilities for themselves. Much of this transportation is readily substitutable for services which are sold by public transportation, and much of the for-hire traffic can move into the private category if for any reason for-hire service is unsatisfactory. In other words, Winn-Dixie can move its own goods in its own trucks if service offered by the public carrier, such as Ryder or Sea-Land or National Airlines, is not satisfactory to Winn-Dixie. Government must give recognition to this diversity and cannot proceed successfully on the theory that a single type of regulation is applicable to all modes and to all users in any given mode.

Another unique problem in transportation arises in connection with the role of the common carrier. Although this concept has been with us from earliest days, present law relating to common carriers and the responsibilities they must discharge is largely the product of railroad regulation. As a consequence, the idea has developed that transportation for hire is presumed to fall into the common carrier category, unless there are compelling reasons to the contrary, and that those engaging in the business of a common carrier should be restricted to this type of under-

taking. So far there has been no basic departure from this theory, despite the impact of new technology. In other words, it is the problem of government and its regulation of the modes that government be receptive enough to recognize and promulgate rules such as intermodal activities that would allow the common carriers to take unimpeded advantage of improved transportation technologies and techniques.

The need for common carriage and public imposition are the obligations that arise from the nature of much of the transportation for hire. Shippers transfer physical possession of goods they ship to the enterprise (carriers) that transport them, with the expectation that they will be delivered at destination in the condition in which they were received. Shippers and receivers may be different people and, in addition, more than one transport firm may be involved. The practical impossibility of every shipper entering into a specific contract for every shipment he makes and then being forced to undertake individual suit for redress if the conditions of the contract are not fulfilled, makes a general law for common carriage with the stipulated obligations and, over a wide range, almost automatic enforcement, a necessity for an effective transport system. At the federal level, at least, the law must be a matter of legislation, and even at the state level the common law itself is inadequate.

The type of regulation which is necessary to insure the continuance of common carrier service and obligations is a matter of marked difference of opinion at the present time. Some even doubt the relevance of the common carrier concept to modern conditions. Analysis of the considerations which must be weighed in the development of public policy requires evaluation of the role of competition in transportation today.

The Changing Nature of the Problem

Government intervention through transportation policy has been developed within the framework of monopoly theory. As a result, restrictions have been placed on freedom of decision by management, prices have been regulated in a comprehensive manner, and competition has been limited by severe control over conditions of entry. Limitations on competition have been imposed on the premise that competition in transportation can be ruinous, with harmful results to the carriers as well as the consumers. Moreover, the common carriers have supported restricted entry, once they have obtained permission to operate, although all of them seek authorization to compete effectively against rival modes at the very time that they endeavor to limit the rival's privilege of doing the same thing.

The complexities surrounding the competition among the various carriers arise primarily from the totally different economic structures among them. Purely competitive or purely monopoly theory is inadequate for transportation as a whole, and so is oligopoly. Public policy, as well as the behavior of carriers, must accommodate themselves to both competition and monopoly, because neither can be eliminated.

The problem is further complicated by the inescapability of public ownership. Whereas, in the period of railroad supremacy, regulation was a definite alternative to public ownership, today the latter is inescapable

for a large part of the investment in transport. This poses the new issue of criteria for public investment and criteria for user charges. We, in the city of Jacksonville, may see this dilemma within the expressway and rapid transit systems serving our city. This is distinct from the problem of regulation and independent of it. Furthermore, public ownership can no longer comprehend the entire inland transport system and would not resolve the basic problems of economic allocation and utilization of resources.

Problems of transportation have occupied the attention of the legislative and executive branches of the federal government from the very beginning of this country as a nation. They have been concerned with the promotion and development of different elements of the transport system from time to time, and with the regulation of various modes. Down to 1920, the focal point of regulation was the railroad; since then the other carriers and the relationship of those modes to the railroads has become increasingly important. Over the years, the center of attention of national policy has been on regulation and public control. At the same time, there has been a great deal of activity in the promotion of transport, other than railroad, but until recently little consideration has been given to the coordination of promotional activities with policy; and to date scant recognition of the need of this and the implications of it have been afforded by government authorities.

The enormous investment -- both public and private -- in transport today and the prospective requirements for the immediately ensuing decades, call for an enunciation of general objectives of public policy and government involvement in transportation. In strictly economic terms, this can be set forth rather simply by saying that public policy requires the economic allocation and utilization of economic resources for the transport system as a whole, and among the modes which make up that system. What this means is that the transport that is considered necessary for the country should be obtained at the lowest economic cost and utilized in the most efficient manner.

To meet the economic objectives of an efficient transport system, public policy must see to it that tax burdens, user charges, public aid, and labor legislation are administered so as to eliminate, as far as possible, handicaps on any of the carriers. Public investment in transportation should be scrutinized in the light of the public need as measured by the best economic gauges possible. Even if an economic transport system were obtained by applying the foregoing criteria, there would remain the problem of national defense. The transport problems of national defense will enlarge in any country. These cannot be gauged in the marketplace, and what is necessary to develop an adequate inland system for this purpose must be the result of the appraisal of military as well as other needs. Nevertheless, it is still incumbent upon these governmental policies to obtain in the most economical way what is deemed necessary for the defense of the nation.

The monopoly position of railroad transportation led to the growth of comprehensive control over rates and the rate level that today characterizes our regulatory policy. An effective program for limiting profits to those which are fair also requires control of the costs which enter into the

calculation of these profits. The costs which are competitively determined can be accepted as reasonable or fair. What is a fair wage for a strategically organized labor, however, is another matter; and so far, we have lacked adequate criteria by which to measure this. The impact of changing technology on labor relations remains to be seen. Technology has re.olutionized transportation in the last few years; competition has now become the order of the day, and even though labor organizations have been able to maintain monopolistic positions in some segments, they no longer deal with management that enjoys the same powers to any significant degree. Consequently, if transportation remains in private hands and if it cannot depend upon the government for subsidy, labor costs in transportation will have to conform to general competitive conditions. This may make it possible for labor problems to be settled through the medium of collective bargaining, and it may also make it possible to develop means of adjusting labor disputes other than by strikes. Radical revision of existing labor legislation for transportation is necessary, however, if this is to take place.

Summary Statement. A balanced and efficiently functioning system of transportation is essential to the public welfare. Adequate transportation enhances the political, social, and cultural unity of a country, state, county, or city, and is an integral part of the production and distribution of goods and services. Government has a responsibility to promote or provide for the development and maintenance of systems of transportation to meet the demands of its people. Transportation goals are subordinate to other public and private goals, and should not be considered as ends in themselves. But because of the great power of transport to shape human activities, it requires special attention. The goal of government in transportation should be:

To facilitate social, economic, cultural, and recreation interaction.

Overall Goal: Optimize the Movement of People and Goods

How to achieve this goal through statement of objectives:

1. Provide transportation that satisfies transport requirements:
   a. Convenience
   b. Safety for the user
   c. Promote economy
2. Promote efficiency
   a. Provide an economical system
   b. Provide coordination between modes
   c. Provide coordination between transportation and other activities
3. Promote social well-being
   a. Provide accessibility to all educational, religious, cultural, recreational, medical, and other needed facilities
   b. Maintain a healthy business climate
   c. Promote desirable distribution activity
4. Protect people and their environment
   a. Provide maximum safety
   b. Achieve maximum environmental sensitivity
   c. Minimize disruption of communities

SOCIAL AND ENVIRONMENTAL CONSIDERATIONS IN TRANSPORTATION

Dr. Warren Rose, Chairman, Department of Transportation and Logistics, College of Business Administration, University of North Florida.

How does transportation impact upon social and environmental considerations? What are the benefits and costs of transportation as they relate to these factors? How can we incorporate some subject matter covering these areas into our curriculum? These are some of the questions we want to explore in this session.

Our objectives during this period are two-fold. First, we want to examine the impact of transportation upon social and environmental issues. Second, we would like to offer some subject matter for possible use by students at the senior high and community college levels.

The social significance of transportation is best understood by identifying the attendant benefits and costs. On the plus side, the unification of people is an important social factor. One nation, one people, one goal. We are not divisible. The exhibit at Disneyland, "It's a Small World After All," exemplifies the unity concept.

The rise and growth of cities, made possible by improved transportation, carry social benefits. These include. cultural interchange, like meeting like, modern city living, and exchange of ideas. For example, a person interested in a symphony in the 19th century would have been able to realize this dream. Today, symphonies are a way of life available to almost everyone. The cultural traditions of religion, food, behavior, and beliefs today are available to use. Without transportation, we would be unaware of them or unable to practice them.

The factor of mobility also deserves notice. The ability to travel, to see, to visit, and to touch is a reality because of transportation. We can travel almost anywhere in the world for special events, cultural observations, or relaxation. No distance barriers retard our mobility.

Finally, transportation can be thought of as a status symbol, important to some of us. Whether it be a Mercedes Benz, Chris Craft, or a small Cessna, possession of it immediately stamps us as having risen above the group. Like it or not, ownership of these goods clearly gives us status.

The social considerations of transportation also pose some critical problems to us. Over 55,000 people annually are killed on the highways -- a serious loss of our population, and also the suffering and anguish of relatives and friends is highly disturbing. The occasional air crash and rail catastrophe further add to the total. A very serious problem, and one in which we have not made notable progress.

The decay of cities and highways also is a social evil. Transportation has altered communities, and literally destroyed some of them. The new interstate highway may be the last word in highway engineering, but the social impact of older highways and streets is often dehabilitating to residents.

Similarly, abandoned rail terminals, warehouses, and freight yards do not add much to the social progress of people. Indeed, these infrastructures often contribute to the moral decay of people.

The act of hijacking -- either aircraft or trailer -- does little for our social posture. The concern, fear, and danger of these events have affected all of us, and we are unclear as to how to cope with them. Why transportation facilities for these hijackings? Obviously, the quick get-away, the big payback, the limited risk of capture, and the dramatics of the attempts make transportation a likely target. After all, who could get excited about a warehouse robbery, and how would you stop a football game? At any rate, the social consequences of hijackings are not undesirable.

Thus, we can see the positive and negative social values attached to transportation. We are not asked to make judgments but, rather, to note the significance of transportation in the social environment. Transportation clearly is widely encompassing -- economically, socially, and politically.

In recent years, the environmental aspects of transportation have appeared front and center stage. The economists refer to them as social costs. These costs affect many persons in indirect ways, and total society must bear the burden of the activities. Because transportation is so broad, there are several social costs arising from the providing of movement services.

Air pollution is clearly a social cost. Most vehicles are powered by an internal combustion engine, resulting in some serious discharge problems of air pollution. Carbon monoxide, gaseous hydrocarbons, and nitrogen oxide compounds are illustrative of the wastes.

Water pollution also results from transportation. Oil spills and land spills occasionally occur, causing extensive damage to wildlife, fish, and waterways. You probably can remember the destruction in the Santa Barbara Channell off California when an oil tanker exploded, destroying life in its wake. Similarly, pipeline breaks can contaminate waterways.

Noise pollution also is evident to those of us who live near airports or highways. The din of the city, the jarring incessancy of airport activity, and the ceaseless traffic of the freeway all affect the quality of life. Although silencers have been placed on aircraft and zoning restrictions have been applied near airports, the noise aspect is still with us.

What is being done? Until recently, nothing would be the correct answer. Or, actions taken have been a local basis. The 1970's, however, have witnessed a number of changes. Emission control devices on vehicles will be required on new models by 1975 on a national level. Lead-free gasoline is now available. Tighter legislation of safety factors has passed regarding refining, extracting, and distributing of fuels. Billboard prohibitions on interstate highways are imposed. Each day legislators are closely examining transportation activities in terms of pollution.

The big issue, though, is cost. Controversy exists over who will pay the cost of decreasing the noise level or reducing air pollution. Do the

benefits of the transportation system outstrip its costs? These are hard questions we must face in the future. Can we afford progress at the expense of the environment? Are you personally willing to pay higher prices and taxes for this protection?

TRANSPORTATION EDUCATION: THE RACINE EXPERIENCE

Mr. Peter E. Mogensen, Former National Director of Education, Delta Nu Alpha Transportation Fraternity.

As a concept, Transportation is a natural theme around which specific curricular activities can be generated to stimulate the student's increasing development of his thinking skills and processes. Students of any school age, including teachers, counselors, administrators, have personally experienced various means, methods and linkages of transportation systems. These experiences are tangible and have been encountered in personally meaningful ways. Many locally available materials and resources are accessible for the teacher to help focus upon this critical concept of human social living. As transportation is a critical reality in both the individual's own life, and to others in his community, it truly lends itself to relevant, direct involvement acquiring an awareness of the influence of transportation on society.

Racine Unified recognized that emphasis upon transportation could be attempted by identifying some of the basic concepts and generalizations from the social science disciplines. The material developed was supplemental to complement the social science curriculum in the elementary grades known as "The World in Which we Work."

The original objective of Racine Unified social science department was development of materials for grades one through twelve, sequenced and becoming more sophisticated. This would be accomplished by developing new materials such as transportation teaching manuals for elementary grades. The secondary grades would include a transportation "readings book," bibliography of transportation materials such as audio-visual, pamphlets, books and trade magazines. Racine Unified is currently using manuals written for grade three and four. The focus of these manuals is toward specific thinking skills for the student through particular activities. These activities involve teacher and student, stressing participation of the student as an individual who raises questions, synthesizes new knowledge with existing personal knowledge and discovers new insights. The teacher role is predominately one of supporting and contributing to the student processes.

General Objectives:

1. Provide learning experiences that will aid in building attitudes, skills and understanding essential to personal growth;
2. Help each student to function as a responsible member of a group and to gain a sense of civic responsibility;
3. Aid each student to become independent in problem solving;
4. Provide activities that will enable the student to achieve definite goals and to express himself through creative work;
5. Help the student to recognize the diversity of jobs in transportation as well as the relationships among the various modes of transportation;
6. Stimulate esthetic expression through music, art and language arts.

7. Develop an awareness of how transportation affects the student, his community and nation.
8. Offer continuous learning experience (planning by improvisation by teacher/counselor).

The Racine Unified Fourth Grade social studies curriculum centers around the study of the City of Racine and the State with some comparisons made between other regions of the world. The second part of this manual contains specific teaching activities which teachers use to develop the concepts and generalizations identified. A biography of transportation books is included with a listing of transportation museums, exhibits and transportation markers within the State.

The third and fourth grade manuals are included in a social studies kit available to all teachers upon their request from the Instructional Materials Center. Sufficient reproductions of these transportation materials was made by Racine Unified. The Third Grade manual includes 35mm film strips and tapes titled "Let's Visit a Trucking Company", and "Let's Visit a Railroad."

The Fourth Grade material includes transparencies of the City, State, Region, and Country for tracing expansion of the transportation concept. Also included are 35mm color slides showing familiar local streets, highways, automobiles, trucks by comparison--titled "Then and Now." A transparency for vehicle registration (various) is also included.

Seven activities are included in the Fourth Grade manual. The Third Grade manual includes five activities with additional activities such as field trips, classroom guests and displays. Matching curricular experiences in transportation with other learnings include Language Arts, Mathematics, Physical Education, Playground, Reading, Science and Spelling.

It should be noted, this is one approach to "transportation education" K through 12. With approaches and methods to education being challenged, and in many areas changed by today's established values tumbling about, a balance between avocational and vocational transportation education should be considered for the student.

TRANSPORTATION SUBJECT MATTER AND CURRICULUM PLANNING SECTION

Panel Moderator. Dr. Warren Rose, Chairman, Department of Transportation and Logistics, University of North Florida.

The first part of the Seminar was devoted to acquainting the registrants with the significance and pervasiveness of transportation. Following this broad orientation, the attendees were divided into two groups. One group learned about career opportunities, while the second group examined transportation subject matter for possible inclusion in secondary school curricula.

This section summarizes the findings and recommendations of the curriculum group.

The objectives of the session were as follows.

- suggest and present transportation subject matter for inclusion in high school curricula in terms of historical, economic, political, and social considerations;
- identify transportation information sources for use by teachers.
- review the experiences of other school districts in terms of teaching transportation, in order to discover how to incorporate transportation material in high school curricula and to identify the inherent curricula restraints.

The session was balanced in the sense of giving and receiving information. Speaker resources from the University presented subject matter relationships, while the registrants suggested ways for including transportation material in the curricula.

The first session was designed for the purpose of presenting subject matter in transportation which could be used in the classroom. Four professors from the Department of Transportation from UNF attempted to expand the knowledge base of the registrants regarding transportation.

The second session examined and identified information resources in transportation. Texts, publications, periodicals, audio-visual aids, associations, government agencies, firms, and individuals were included in the presentation. In addition to the original information packet given to all registrants at the beginning of the seminar, two additional lists were prepared and distributed to the curriculum persons.

The experiences of other school districts in the nation regarding transportation were reviewed. Although these pioneering efforts were confined largely to the lower grades, the work of Racine (Wisconsin), the State of New Jersey, Miami-Dade (Florida), and Minneapolis (Minnesota) were cited. The thrust of all of these programs was the creation of an awareness of transportation, with employment opportunities receiving only limited

attention. Unfortunately, curriculum development at the secondary level was viewed as minimal or even non-existent.

The third session involved the registrants in an active role. They cited the communications program package of the Bell Telephone System and the health services project by U. S. Public Health Service as examples of how special project programs can be developed. The group further opined that transportation had to be developed as an interdisciplinary subject, rather than as an independent or special interest subject. Curriculum time restraints were noted, along with the need for involvement with transportation through employment. In summary, the academic environment of the high school was reviewed, and recommendations for subject matter development were made.

The fourth session was devoted to the development of a unit of instruction in transportation. Directed by a faculty person in secondary education, the group proceeded to construct a small instructional package for urban transit. The procedures flowed as follows:

1. Perception of major ideas and concepts presented during the Seminar;
2. Selection of one idea or concept and development of sub-concepts;
3. Identification of unit objectives;
4. Development of activities to teach the concept of urban transit;
5. Selection and utilization of teaching aids and resources; and
6. Presentation of the topic of urban transit.

The group decided that urban transportation would be the best topic to interest and inform Jacksonville high school students about transportation. The congestion of the city, the development of additional bridges across the St. Johns River, the experiences and knowledge of the students, and the need for transport planning all contributed to topic selection. Viewing transportation as a contemporary issue or problem was seen to be the most effective method of subject introduction and discussion.

A summary of the curriculum section program of the Seminar indicated two major divisions. The initial part consisted of expanding the knowledge base of the registrants through possible subject matter inclusion, information sources, and the experiences of other school districts. The final phase of the program combined the new transportation knowledge base of the participants with their experience in student and curriculum development in order to develop a viable transportation unit for use in the secondary schools.

This section of the Seminar produced significant dialogue and knowledge exchange. Based on the comments of the participants, the following recommendations for involving people in transportation are made:

Transportation needs greater public relations and information dissemination.

The group was amazed to discover how significant transportation is in an

economy as well as the number of organizations and activities related to transportation. The Seminar reconfirmed the thoughts of many of us relating to the need for informing more people about transportation. We talk among ourselves without recognizing the need for sharing our information with others. Whether it be for purposes of employment, an enlightened citizenry, or for resolving transport issues, the need to involve more people is critical.

Instructional units about transportation are needed for secondary school curricula.

Other than historical developments of transport modes and facilities, there are no available curriculum modules about transportation. The registrants indicated a willingness to use material if it was available. Research on information sources revealed valuable information on a segmented basis, but no package or unit of instruction was identified.

The group expressed a strong preference for approaching transportation on a local environment and contemporary issue basis. By having the students being able to relate to something they have seen or experienced, the topic immediately has relevance. The development of a written module on either of these topics, combined with a list of human resources and possible student projects, would be welcomed and utilized.

An additional recommendation for this project included a joint effort between the transportation specialist and a high school text writer. The need for professional and technical information written in a secondary school style was recognized in order to gain student acceptance.

Career opportunities and requirements in transportation are needed by vocational-technical teachers and occupational specialists.

These individuals are willing and happy to incorporate transportation careers in their kit bag if someone would identify the career possibilities and requirements. For example, they would like to see job descriptions written on rating and billing clerks, dispatchers, truck and engine maintenance people, etc. Although many of the positions are identified in other categories, these teachers feel that there are some unique transportation positions which should be categorized separately in addition to driving a truck.

The role of women in transportation needs to be identified.

Most of the attendees were females who inevitably asked the speakers about career opportunities. Similarly, the matter of creating interest in transportation issues among women was a compelling one. The responses by speakers were polite, but the failure to identify specific careers was evident. It was equally difficult to elicit female interest in general transportation matters.

Both the private and public sectors of the economy must develop employment positions as well as information about these positions. Other than the traditional office skills, computer programming, or customer service

representative, the place of women in transportation is unclear. The Seminar clearly has indicated that manpower needs regarding women have not been established.

Additional seminars are needed to assess the results of a proposed transportation unit in high school curricula.

A most rewarding task would be to develop an instructional unit about transportation for secondary school curricula, to experiment with the unit at selected high schools, and to evaluate the learning experiences. The group attending this Seminar expressed a desire to use transportation material and, in fact, suggested some of the instructional techniques to be employed. They also expressed a willingness to have a UNF faculty member present the material over a one- or two-hour time frame.