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STRATEGIC PLANNING FOR FREIGHT: ISSUES AND RESEARCH NEEDS

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The Program Agenda

By W. Bruce Allen
Professor of Public Policy and Management
Regional Science, and Transportation
Director, The Wharton Transportation Program
The Wharton School
University of Pennsylvania
Chairman, Section B-Freight Transportation

The TRB's program for strategic planning for freight transportation focused on several issues in the 2 1/2 day conference. A "food for thought report from the field" session opened the conference on Monday morning. Five speakers formed a panel in which each gave a short presentation followed by discussion and questions from the audience.

The five panelists were:

Edwin G. McKeever, Manager, Office of Strategic Planning, The Port Authority of New York and New Jersey

Henry H. Livingston, Vice President-Research, Kidder, Peabody and Company

Roy B. Opitz, Assistant Vice President, Corporate Planning, Conrail

William J. O'Neill, Jr., Executive Vice President, Leaseway Transportation Corporation

James R. Mann, Director, Transportation Planning and Policy, U.S. Grocery Products, The Quaker Oats Company.

The panel represented a cross section of experts from the quasi-public sector, the financial community, the rail industry, the motor carrier industry, and the shipper/receiver industry. Their discussion centered on the definition of strategic planning from their perspective and their use of strategic planning in their transportation related activities.

The afternoon session followed with a second "food for thought" session relating to how to develop key issues in the strategic planning context for use by the participating committees for the topic areas over which they have domain. This focussing on key issues was developed by lessons from their own experience. This panel was assembled and moderated by Kathleen Stein-Hudson (Deputy Director of Transportation, New York City Planning Department) and consisted of:

Robert E. Heightchew, Director of Marketing, Greenhorne and O'Mara, Inc.

Bruce D. McDowell, Senior Analyst, Advisory Commission on Intergovernmental Relations

George T. Lathrop, Assistant Director, Department of Transportation, City of Charlotte, NC

Philip C. Anderson, Colorado Department of Highways

Tuesday morning continued the presentations with a discussion by Robert Dienes, Deputy Special Assistant for Transportation Engineering of the Military Traffic Management Command at the Department of Defense on the Defense Needs for a Freight Transportation Network. His presentation gave the views of the nation's largest shipper. An international perspective was given by Claude Morin, Administrator, Road Transport Research Program, Organization for Economic Cooperation and Development.

The remainder of Tuesday morning and Tuesday afternoon were occupied with committee meetings for the seven participating committees. The committees identified the issues and research needs in the committee's domain and developed a committee action plan to implement their research needs. Other committee business was also transacted.

On Wednesday morning, representatives of each committee formed a panel which addressed the whole meeting with the agenda of research needs which had been generated by their committee meetings. These ideas and general freight planning ideas were discussed at this open meeting.

This circular summarizes the presentations and outputs of the committees' work on statements and needs.

INTRODUCTION

By W. Bruce Allen

Investigating strategic planning (also called corporate planning and long range planning) for the conference, I read a number of books and articles on the subject. I had often worked with people who were in strategic planning positions and had strategic planning in their titles and had always thought that they did interesting things--but nothing that I would regard as unusual because I would do the same things myself. We would forecast future traffic demands, play "what if" scenarios, and attempt to come up with logical plans for action given hosts of unknowns. But I never had read the strategic planning literature. I merely assumed that the people that I worked with were trained just as I was.

After reading the literature, I became more convinced that what was being presented as a discipline area-strategic planning-was nothing more than "old wine in new bottles." This does not mean that the new bottles are unimportant, for as any good market manager knows, a repackaging, some new advertising, and the right breaks can take a product which was doing poorly and make the same basic product into a winner.

From my base discipline, economics, I saw the strategic planning literature as nothing more than what I learned in short run and long run economics and strategy from game theory. However, since implementation is the name of the game and since the economists didn't receive a lot of recognition from managers, the new bottle of strategic planning has enabled the concepts to get some good "play" in the business

world and I believe that the firms are better off as a result.

Strategic planning can be defined as the process of deciding on the objectives of the organization, on changes in those objectives, on the resources to be used to attain those objectives, and on the politics that are to govern the acquisition, use, and, disposition of those resources. Since our economic, political, and natural environment is so turbulent and since the givens of yesterday--stable economic growth, low energy prices, greater certainty due to regulation, etc.,--no longer seem given, it behooves the intelligent market participant to plan for contingencies. The literature also identifies several types of strategic planning: extrapolative, business, and portfolio. Extrapolative planning is mostly financial, e.g., given the financial constraints on the firm, what growth opportunities are available? This type of planning does recognize that other constraints exist, e.g., competitors' actions; consumer preference changes; new products; changes in business, labor, and political environments; etc., but views these constraints as they impact on the actions allowable by the financial constraints.

Business planning is personified perhaps by the Boston Consulting Group's famous matrix of cash cows, dogs, question marks, stars, etc.

Portfolio planning investigates various business positionings within a total corporate context so as to assess the firm's overall exposure to risk. It asks (and answers) the questions as to where the firm's money, people, and assets should be deployed and where should they come from so as to maximize the overall firm? It is more of a "systems" viewpoint which seeks for why and how do things fit into a whole.

Obviously, the good planner searches for the variables he/she can control and asks the questions; how to control them and in what amounts so as to attain the objective? Strategy versus other competitors and versus exogenous forces is important. Good planning entails offensive strategies and defensive strategies versus competitors. It also entails planning for changes in the rules of the game. Most of the motor carriers which have done best in the deregulated environment since the Motor Carrier Act of 1980 were planning either actively or passively on the assumption of less regulation and greater market opportunities from 1977 on. Good planning is continuous and involves redefining objectives and constraints as the circumstances change. To coin the often overused phrase from football--you have got to have a game plan in today's environment.

While redefinition implies a plan that is flexible, it is also important that the long run objectives of the entity are set so that a stable operating structure exists in order for the entity to have a direction. The redefinitions are perturbations from the objective or a recognition of a loosening or tightening of a constraint. But the objectives perservere.

Perhaps most important is a need to develop a strategic "style" in the company that allows the breaking down of barriers to the implementation of the plan. As mentioned above, the concept is old wine in new bottles. The non-recognition of these concepts previously was caused by inflexibility in organizational style; and obsolescence in some executives; a parochialism in some lines of business or geographic areas; a too strong attachment to values, style, tradition for their own sake and not because they would help the entity; and a quest for power but not for the objectives. An attitude must be established within the firm that such planning is important and respected. Too many transportation firms have been dominated by operations in the past and have a difficult time recognizing the relevance of something that can not be directly seen as having a direct connection to the bottom line. To protect its future, a firm must be prepared to respond actively to developments in its environment that could create new opportunities and/or lessen negative impacts. It is difficult to act rapidly, forcefully, and knowledgeably without a plan. A knowledgeable actor can also "make the future happen" since he/she has knowledge of the control variables and what to do with them.

The teacher of strategic planning at Wharton is Peter Lorange. Lorange notes that there has been considerable attention to strategic planning in the last few decades evidenced by the fact that many resources are devoted to it. However, Lorange emphasizes that the effectiveness is not higher than its weakest link. He states that the major tasks of strategic planning (read its weakest link today) are in implementation, whereas the conceptualization aspects seem to be better developed.

As mentioned above, the operations orientation of the carriers seemed to create a difficulty of implementation in the transportation field. The pre-1977 rails and motor carriers seemed to be interested in "toting freight" while other energies were spent dealing with regulators in Washington. Today, with a much smaller regulatory scope, literally anyone can tote anyone else's freight. Thus only the carriers that can plan in an uncertain, highly competitive world are likely to be successful.

STRATEGIC PLANNING AT THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

By Edwin G. McKeever
Manager Office of Strategic Planning
The Port Authority of New York and New Jersey

Strategic planning places a heavy emphasis on systematic approaches but in so doing, must avoid the bureaucratic, the cumbersome and the burdensome. To be successful, strategic planning must be seen as relevant and practical -- it must simplify, not complicate. In light of these requirements, it is important to realize that planning is a skill and not a function -- a skill to be practiced by all levels of management, but specially the top executive group and senior operating officers. Likewise, it is a blend of art and of science. The major challenge to the planner is to provide a framework for a systematic and rigorous analysis without the framework becoming cumbersome. At the same time, the challenge to the operating executive is to recognize that systematic and rigorous planning is

essential to improving the likelihood that future endeavors will be successful. The Port Authority sees a need for strategic planning as never before because of the rapid changes taking place in the operating environment. As the audience is well aware, deregulation of transportation is a good example of the kind of change requiring a strategic response.

To facilitate planning for its future actions in this turbulent environment, an Office of Strategic Planning has been established at the Port Authority. Prior to this, a temporary Committee on the Future was energized consisting of 80 people working for about a year examining the outlook for the region and the agency to discern threats and opportunities so that the Port Authority could begin to think about how it should adapt to the changing needs of the region it serves. The work of the Committee on the Future was conducted during 1978.

The Committee on the Future began its work against an historical backdrop in which during the first fifty years of the Port Authority's existence, the Port region grew at a more or less steady pace. As the economy grew and there were increased demands for transportation and terminal links, the Port Authority stood ready and able to respond with capital project solutions to these clear needs. During this time, there was little debate over the mission of the agency or the generally capital intensive solutions it proposed. However, when the pace of economic growth was abruptly halted in the early 1970's and simultaneously there were sharp changes in society's values concerning the impact of large capital projects on the environment, as well as a beginning of the realignment of responsibility within our structure of federalism, there resulted less certainty on where to apply Port Authority resources consistent with the priorities of the States, and hence, a greater need for strategic planning. For the Port Authority, this major discontinuity in its environment gave rise to the Committee on the Future effort that marked the beginning of formal strategic planning in the agency. Stated in broader terms, two key things have occurred to make strategic planning an essential activity in the Port Authority, most corporate organizations and in a growing number of other public sector organizations. The first is a faster changing environment, while the second is the existence of more complex issues. Together, these factors can operate to produce major discontinuity for almost any organization -- private or public.

While the degree of turbulence has increased significantly in the decade, the world has been growing more complex for a long time. In this regard, decisionmakers have long sensed a need to be less myopic. In response, the 1950's saw the introduction of the concept of "performance budgeting." This process focused on the annual budget and the functional activities that were lines in the budget. Budgets were allocated, usually, on the basis of an extension or contraction (by some rule) of the past budget, and performance was judged by how close the line came to performing within the budget.

In the 1960's, "long range planning" was introduced. This took planning beyond the annual budget. Emphasis was placed on predicting the future, usually by extrapolation of past trends. The idea was to plan for growth, to perform multiyear forecasts and to do some environmental analysis.

By the late 1960's and early 1970's, the terms strategic planning and/or corporate planning were being utilized. The emphasis of that phase was to think strategically. It entailed a systematic look at the external environment and an acceptance of discontinuity in the organization's environment as "normal." Where as resource allocation was static under long range planning, it was viewed as dynamic in this period. The emphasis was on a search for strategic alternatives that maximized trade-off values.

In the 1980's, strategic planning evolved to strategic management. The goal here is to integrate planning with all management fuctions and to solve the past problems of partial or no implementation of strategic plans. The planning process is to be flexible and creative. Importantly, it recognizes that planning is a continuous process and that to be successful, it must be interwoven with all management systems.

The job of strategic management is to develop plans to make the most of future opportunities and to counteract the adverse effects of future changes. It is a results oriented process to anticipate change and to guide an organization's adaptation to such changes. Perhaps the simpliest definition of the process is that it is a systematic application of common sense.

The approach to strategic planning is basically the same whether it is being performed in the private or public sector. What differs is the relative emphasis placed on particular factors. The public sector tends to focus, of course, more on issues of public and legislative policy. In addition, more attention seems to be paid to problems in the public sector rather than opportunities, which tend to consume much of the effort in the private sector. This may be because the public sector operates so much in a fish bowl.

Whether applied to the public or private sectors, there are eight major components to the systematic process of strategic planning: (1) scanning the environment; (2) defining mission, objectives, and goals; (3) undertaking situational analysis; (4) determining "critical strategic issues"; (5) developing alternative strategies; (6) selecting a strategy; (7) implementing strategy; and (8) tracking for corrective action.

Let us examine these components. Over the past two years, the Port Authority has invested considerable energy in developing its environmental scanning process. We have done this in the belief that identifying emerging change in the external environment at the earliest possible point is the kind of intelligence that separates the successful organization from the less-successful in today's rapidly changing environment. We currently have in-house panels of staff experts tracking economic, demographic and social change, including change in the

international economy; change in the relative competitive position of our Port region vis-a-vis other regions with whom we believe we compete for jobs and investment; and we also have a panel whose charter is to look at the long term future to try to identify a range of probable Port Authority futures.

Perhaps the most difficult component of a strategic planning process is that of focusing on mission, objectives, and goals. It is often difficult to measure targets and aspirations in the public sector, partially because public initiatives cannot always be defined in dollars and cents and frequently do not lend themselves to easy quantification. In addition, the mere act of defining mission and goals carries with it an implicit limiting of horizons in the minds of some chief executives.

Somewhat easier to deal with is the situational analysis which views the current and future position and outlook for each business line. It keys on the markets served and the changing needs of patrons or users. It looks at the services provided by the organization as well as the services offered by other providers -- both against the strengths and weaknesses of the entity and those of the other providers. In the context of examining the situation in each business unit, in the Port Authority, we ask each business to make a statement of measurable goals.

Determining the critical strategic issues is the key next step. Although critical issues can relate to internal factors, they most frequently involve a change in the external environment. The critical issue(s) becomes a focusing device for strategy development. In this regard, we have found that when the critical condition or pressure requiring attention can be succinctly and crisply stated, the chances of getting creative thinking creatively is enhanced.

The result desired from the creative examination of the alternatives available for dealing with the critical issues is a strategy. A strategy can be thought of as a broad course of action selected from alternatives as the optimal way to attain major objectives consistent with current policies in light of anticipated competitor actions.

The development of alternative strategies is stressed so that real options (not paper alternatives) are produced. This is regarded as an important discipline to ensure that all trade-offs are covered. Experience demonstrates that it adds creatively to the planning process.

Implementing the strategy requires a plan of its own. This step links strategic planning with the capital and operating budget. However, this should not be seen as a discrete "phase II" activity -- planning, execution and tracking for early corrective action should be a continuous process that is interwoven with all management systems.

This is the process which we follow at the Port Authority -- some components are more developed than others -- but this is our planning road map.

FUTURE DIRECTIONS FOR FREIGHT TRANSPORTATION

by Henry H. Livingston
Vice President-Research
Kidder, Peabody and Co. Incorporated

It is important to stress the linkages between financial inputs and strategic planning. In determining a strategic management plan, one must generally have financial resources to undertake the plan and in many cases, one must be cognizant of the cash flow (i.e., financial impacts) generated by the plan.

Strategic planning has become more important and hence more difficult in recent years because the financial markets themselves are in turmoil. As an example, the security previously associated with equipment trust certificates has gone away both because of court decisions and because of a glut of equipment on the market. From the perspective of the financial markets, turmoil has been created because the need for some external funding has gone away because of the ability to generate cash internally both through tax write-offs and generally improving profits.

Perhaps the most important advice from the financial community to strategic planners is to pay attention to the "ifs" in financial markets rather than to the "givens." This is a ramification of the increased turmoil in the financial markets.

In general, deregulation has been a good event for freight transportation both from the carrier and shipper/receiver points of view (some individual units excepted). This is because the fallout and rationalization has eliminated inefficient firms and inefficient units within firms.

The motor carrier industry has seen and will continue to see consolidation into larger corporate units. Those remaining in the industry will survive not because they could cut rates but because they had a cost structure which allowed such rates to be sustainable or could cut costs and still have sustainable rates. In addition, they were able to provide existing or improved service at such rates.

What has happened in the industry is that the firms which could provide high quality service efficiently (accomplished by following a policy of cost control) have and will continue to survive.

A casualty of deregulation, which has made the job of analyzing the industry more difficult from the perspective of the financial community, has been publically collected data. This makes it more difficult to analyze where the industry has been and to predict where it's going. Since much of the data previously publically collected is still collected by the individual firms, theoretically, the data is available. However, the firms will not release the data because it is believed to be proprietary. While this view may seem to be myopic, if a lack of data makes the industry seem more uncertain than it truly is, capital costs will increase for the industry. A neutral collector of the data, e.g., the modal trade association, could alleviate this problem.

The Association of American Railroads is moving in this direction and it would behoove the American Trucking Associations and the Air Transportation Association to do the same.

While there are many issues which can be raised for the future, six issues should be brought forward here.

(1) boxcar deregulation
(2) rail mergers
(3) transportation statistics
(4) accounting
(5) research and development
(6) labor

Boxcar deregulation pits the owners versus the lessors. The glut of cars has been caused by a decrease in demand relative to the expansion of supply caused by incentive per diem. Under such circumstances, railroads turned to their own cars rather than those of the lessors. New traffic potential as well as the retirement of some older, railroad owned equipment will help alleviate the problem. Shifts from box car to intermodal are ongoing and will continue. It is more competitive from the shippers point of view. It is also more efficient for him, with generally faster service door-to-door. It is not likely to be more capital intensive due to the greater utilization of the intermodal equipment.

Boxcar deregulation also allows the railroads to compete for traffic with partially sunk investment equipment in need of backhaul traffic and hence increases the push to economic efficiency mentioned previously.

The Southern Pacific - Sante Fe may bring an end to a long chain of rail mergers. The net result of the merged rail system to date is to increase intermodal and intramodal competition. Non merged carriers seek to have their competitive positions preserved via trackage rights, but it remains to be seen how the ICC, the courts or even Congress will decide on this issue.

The role of statistics was discussed above. Accounting plays a major role in cash generation. Changes in the tax laws as well as application of Generally Accepted Accounting Principles (GAAP) accounting to the railroads will have an impact on carrier cash flows. Given the arbitrary definition of certain accounting items, e.g., depreciation, it's important to note that cash flow is a much more important concept (because it is tangible) than income.

As carriers diversify, it is important to note that transportation assets can become a source of cash (resources) vis-a-vis non-transportation assets. This may be good or bad from a transportation perspective.

Research and development has been and continues to be a major problem in freight transportation, especially rail. Not enough is being undertaken and what's being undertaken is not being done fast enough.

Labor in the transportation industries is in a period of turmoil and transition. Since deregulation, intermodal, intramodal, and source competition has increased tremendously. The railroads face the greatest challenge with their employees because intramodal competition has not been increased by new entrants. Nevertheless, the freedom given to motor carriers to expand their operations, the potential growth of transportation companies and source competition could put some meaningful pressure on the traditional myopic views of rail labor. Both air and motor carrier labor have felt great pressure by the entry of direct competitors into their markets. The competitors are non union, low seniority carriers with extremely flexible work rules and hence high productivity. They have forced organized labor in the air and motor fields to readjust their goals and objectives so that their employers can compete with these new entrants.

While Employee Stock Option Plans (ESOPs) have been a suggested method to capture employee support and productivity gains, they are still controversial. While an ESOP may be appropriate some situations, it is not a cure-all. Employees in a ESOP are trading off wages versus dividends. In addition, if the company fails, the stock will become worthless. Labor should weigh these considerations when contemplating an ESOP. Likewise, management should consider their relinquishment of control.

In summary, although there is talk of a capital shortfall in the transportation industries, it is my opinion that the market will provide captial for the transportation industries if these industries are competitive (in terms of financial return) with other industries. It must be remembered, however, that strategic planning & financial planning must go hand in hand.

USE OF STRATEGIC PLANNING BY A RAILROAD

By Roy B. Opitz
Assistant Vice President
Corporate Planning
Conrail

1981 was a watershed year for Conrail. The Staggers Act was passed in late 1980, allowing railroads the opportunity to be innovative in the marketplace. The Northeast Rail Services Act (NERSA) passed in 1981. Finally, Stanley Crane began his tenure at Conrail - an experienced, profit-oriented railroad executive with a track record of bottom line success.

Crane wanted a plan for a profit-making railroad. The previous planning done by USRA and later in house by Conrail and monitored by USRA had been done subject to many unknowns and a great many constraints (e.g., guaranteed long term income for many employees, required provision of commuter services). Furthermore, Conrail's planning activities in the early years were strictly monitored by USRA with an inordinate amount of attention placed on Conrail performance relative to the Final System Plan. These external constraints restricted Conrail's opportunities to achieve profitability. Performance measured against the Final System Plan was at best an academic exercise given the outdated assumptions used in that 1975 document. Mr. Crane decided simply to refocus on the issues faced by Conrail

in 1981 rather than an outdated road map.

Let us review some of the Strategic Planning processes that Conrail has successfully used as Mr. Crane led the railroad into black ink. Importantly, the NERSA Act modified the external environment in several ways so that management could focus on controlling internal and free market factors and events. The goal was clear. Earn a profit in 1982 and 1983 to establish a track record as a viable railroad. In striving to attain that goal, clear objectives were set up, including:

minimum profit levels over an initial two year period.

no more federal infusion of funding (except for pass-through of specific labor entitlements stated in the NERSA Act to be federal government responsibility, yet managed by Conrail).

wage and salary restrictions for both management and agreement people

physical plant restructuring and reduction.

continued capital investment program to increase productivity, efficiency and service.

changes in services and rates allowed by the Staggers Act.

overall responsiveness to market and economic conditions.

Much of the situational analysis necessary in a strategic planning mode had been undertaken and completed in the 1976-1981 period. Mr. Crane's emphasis has been to require his managers to act on the conclusions drawn from those background studies.

Internally, one of the first management initiatives at Conrail was to refocus Conrail's commercial activities so that pricing and marketing of services were tied directly to the assets to be used in rail service. Traditional rail rates were supplemented with new forms such as volume contracts. And the time necessary to quote competitive rates to customers was dramatically reduced.

Thus, the eight components of strategic planning described by my fellow panelist Ed McKeever were in fact incorporated in Conrail's planning process. But note the amount of lead time necessary in order to turn Conrail around from its tremendous red ink years to the current forecasted profit of $500 million (1984). And with a company as large and as regulated as Conrail, note the absolutely critical need for corrective federal legislation in order for the company to succeed.

The planning need continues at Conrail. The company cannot sit still while its competitors and shippers continue to change in the marketplace. The current goal is to return to the private sector through a sale of the stock now controlled by the federal government. Other issues replace the old problems as being more critical and deserving of management attention. For example:

Disposition of the government's ownership position and resultant effects.

A new labor contract.

Investment strategies for piggyback service in a highly competitive intermodal market.

Competitive strategies as mega-mergers take place around Conrail.

Strategies that are based on railroad service versus total transportation service.

Conrail has passed its first two tests of returning to profitability and measuring up to a Congressionally mandated profitability test period. Conrail management is aware that firms that accomplish their initial goals, and reach the top of their class face even greater tests thereafter as the competition tries to knock them off. New goals and critical self-examinations are periodically needed to stay competitive. Conrail feels that its focused approach to strategic management is an important part of that effort. The Corporate Planning function contributes to this by identifying, defining, analyzing and directly addressing the issues and their probable futurity.

USE OF STRATEGIC PLANNING BY A MOTOR CARRIER

William J. O'Neill, Jr.
Executive Vice President
Leaseway Transportation Corporation

The estimated total logistics cost in the United States in 1982 was $432 billon. Of this, $182 billion (over 40%) was attributable to motor carriers and of that share, $45 billion (almost 25%) was attributable to for-hire motor carrier transportation. It is our company's objective to continue to increase our market position in this growing business.

Leaseway is a $1.3 billion dollar revenue corporation with 16,000 employees, over 72,000 vehicles, with 400 different physical locations. The firm regards strategic planning as a starting point for developing systems to expand or contract the above system. Prior to 1978, the firm was an operating rather than an implementing company. De facto deregulation convinced the firm that good planning was required to achieve greatness. I define strategic planning as bringing the future into the present so that we can do something about it now.

A conceptual overview of how we expect to obtain our ultimate objective, i.e., maximizing of Leaseway's warranted equity value, is shown in Figure 1. This entails a mission statement, the

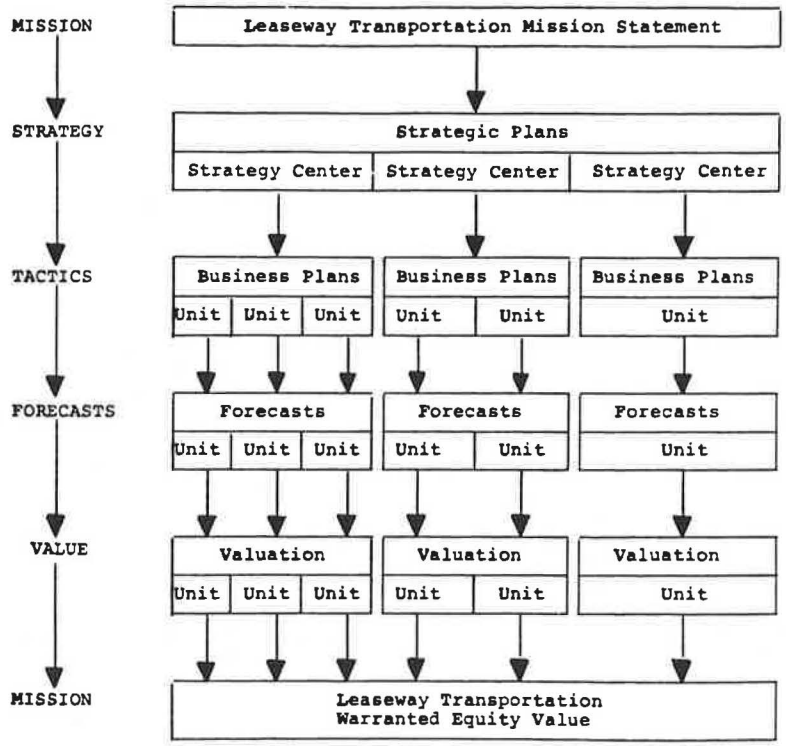


Figure 1. Conceptual Overview.

establishment of strategic plans, which are developed into business plans, which are strongly influenced by forecasts of activities and events which are not controlled by the company (e.g., the general economic conditions) and which are controlled by the company (e.g., price and service levels and the changes in market value predicated on changes in them), followed by a valuation of the likely scenarios, and an overall judgment as to which set of actions will lead to the attainment of the corporate mission.

The corporate mission statement is as follows:

> Leaseway Transportation is an aggregation of specific resources which have been organized by management to generate and sustain over time the greatest possible return for the company's shareholders.
>
> This return is achieved by producing an increasing array of high quality, cost effective physical distribution services which support the flow of materials, goods and products through time and space.
>
> These services include the individual components of highway transportation and warehousing, any combination of such components, and any other type of carriage, storage, handling or processing of goods required to achieve optimum service efficiency at lowest overall cost.
>
> Producing such services profitably, and expanding them aggressively, maximizes Leaseway Transportation's earnings growth rate and provides the basis for shareholder rewards.
>
> It is also the foundation for benefits provided to the company's customers and generates job security for the company's employees

Seventeen strategy centers exist at Leaseway. The largest such center is the automobile carriage strategy center. A description is as follows:

Automobile Carriage Strategy Center: Provides dedicated, or semi-dedicated, highway carriage of new automobiles from assembly plants, railheads or docks to dealers; also provides other physical distribution services closely related thereto. Truckload service is highly tailored to specific customers and closely integrated into customer's operations. Specialized equipment is generally employed. Principal customer is General Motors. Principal area of operations is north eastern quadrant of United States.

The center, as with the other centers, establishes a strategic plan. The typical elements of such a plan include: the size and scope of the center; its market position; the market, the internal and external environment, and the competition faced by the center; and the strengths and weaknesses of the center. The center then draws up its strategic plan statement, highlighting its key strategies for the coming period.

Each strategy center then draws up a business plan for each service line which attempts to bring the strategic plan closer to the operational stage. The typical elements of the business plan include; the current market, internal and external environment, and competitive conditions facing the service line; its key operating indicators; and the equipment, labor, monetary, and management required by the service line. This is all geared to a statement of profitability improvement which can occur via revenue growth

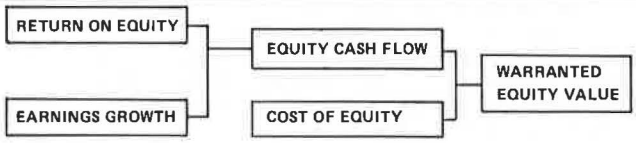
which, in turn, is predicated on more volume, higher rates, or acquisition/merger or via margin improvements which occur by raising rates or lowering costs.

The efficacy of the above plans depends on what is likely to happen in the marketplace -- some of which are not controllable by the company, some of which can be partially controlled, and others of which can be totally controlled. Forecasts are required to analyze the likely impacts of proposed actions on profitability.

These forecasts have general assumptions and some specific to the particular service of the line. In addition, some assumptions are critical to the service line. Special attention is paid to such assumptions as they can make or break the service line's performance.

The typical elements of a strategy center forecast by service line include: the capital structure of the service line; three to five year forecasts of revenues, costs, and expenses, pretax income, taxes, net income, and the balance sheet. The forecasts also yield rates of return on capital and equity; the ratios typically used in trucking and financial analysis, e.g., operation ratio, growth rates; margins; and cash flows.

The valuation methodology is related to serving the objective of managing each strategy center so that its warranted equity value (i.e., the price investors would be willing to pay for common stock if they knew management's best estimates of future equity cash flows and believed that management could attain them) is as great as possible and exceeds its book value by as much as possible. This relationship is shown below:



It should be noted that value is created when sustainable return on equity exceeds the cost of equity, i.e., positive spread, and that value is maximized when the positive spread and earnings growth are each maximized in the combination which produces the greatest value.

This value based planning calculates the present value of future equity cash flows, including terminal values, and compares this to book values. The final valuation presentation displays the warranted equity value, the book value both with and without goodwill, the ratio of warranted equity value for the financial forecast period as well as after the forecast period. The presentation then determines which strategy centers add value and how much they add as well as which strategy centers subtract value and by how much and then integrates all operations to yield the warranted equity value of the whole company.

This exercise then becomes the basis for the focus of management attention, decisionmaking, and iterative improvement in the strategic and business plans.

USE OF STRATEGIC PLANNING BY A SHIPPER/RECEIVER

James R. Mann, Director, Transportation Planning and Policy
U. S. Grocery, The Quaker Oats Company

I am pleased to have been asked to participate in this Transportation Research Board seminar addressing the subject of Strategic Planning for Freight.

Since I was to be on a panel assigned the subject of the "Use of Strategic Planning," in my case, by a shipper, I thought it might be a good idea to catch up on some of the current writings on the subject. I asked the appropriate person in my company to pull together a packet for me, and a few days later got a stack of articles about six inches thick, with a covering note saying "This may be more than you ever wanted to know about strategic planning." After reading the material, I can toss out terms like "portfolio management," "experience curves," "growth share matrix," and, of course, "cash cows, stars, question marks, and dogs." Unfortunately, I have only the vaguest idea what they mean.

One thing I noticed in the articles was a difference of opinion - not a surprise - as to the value of the strategic planning per se and as to various methods employed to do such planning.

For example, the views of Richard T. Pascale of the Stanford Graduate School of Business were quoted in the December 27, 1982 issue of Fortune magazine, as follows:

> "Very often, procedures like the annual strategic planning cycle haven't been terribly effective, partly because strategy doesn't [illegible] to be seen as a rain dance, a fire drill not to be taken seriously. The process ends up having the perverse effect of desensitizing people to strategic issues. Strategy becomes a routine exercise, rather than something expected of each person, each day."

A comment attributed to William Ellery Channing is "It is better to plan less and do more."

Many other writers of the articles I read, however, did not seem to question the value of strategic planning as such, but were offering their suggestions for better ways to go about it.

Most of the material was addressing corporate strategies, which would be appropriate today if you were a transportation company, such as a railroad or motor carrier whose business was moving freight. Quaker Oats, on the other hand is primarily a consumer products company, and the efficient distribution of its products from where they are made to where they are sold, while essential to a successful business is not its reason for being.

Quaker's annual report for fiscal 1983 states its financial objectives in rather precise terms, i.e., R.O.E. improvements, "real" earnings growth, and commensurate increase in dividends, and follows with four broad strategies to achieve these objectives. I can see, in that context, a

decision to buy a Joseph A. Bank Clothiers or a Stokely-Van Camp - which we did - or to sell a chain of Magic Pan restaurants or a chemicals division - which we also did - probably would qualify as strategic planning. But what I want to describe for you this morning are the responsibilities of the U.S. Grocery Products Distribution Department and the planning activities we engage in to carry out those responsibilities. First let me tell you a little about Quaker's grocery product business, not as a commercial, but to give you an idea of what we are dealing with.

Quaker's major product categories are hot and ready to eat cereals; cornmeal, flour and grits; table syrup; pancake flour; snacks; Gatorade thirst quencher; pork and beans and frozen waffles, pizza and pancake batter. Pet foods also represent an important part of our business. These products are produced at 15 plants around the country, none of which makes them all. To be able to offer our customers, the grocery chains and wholesale grocers, a complete mix of Quaker products in one delivery, we have established twelve full line distribution centers strategically located to provide minimal, reliable transit times for shipments to customers. We also utilize other warehouses for distribution of our frozen foods and some of our snacks.

During our current fiscal year, which ends this June 30, our total Distribution expense will be in excess of $200 million, of which about $150 million is transportation. We will have made about 40,000 rail carload shipments, 50,000 truckload shipments and 5,000 trailer-on-flat car shipments.

Please recognize that, in addition to the overall growth of our company, during the past several years, transportation costs, primarily because of the dramatic increases of 1979-80 in fuel costs, have become a much more significant percentage of our cost of goods sold, and therefore received more attention, and properly so, by senior management. But it goes a lot farther than that, as we have developed new products and acquired other companies in the grocery product business.

Our Distribution Department is headed by a Vice President. Reporting to him are four Directors with responsibilities for (1) Transportation, (2) Distribution Facilities, i.e., distribution centers, warehouses, material handling, etc., (3) Finished Goods Inventory Control and Distribution Research and, (4) Transportation Planning and Policy.

It was recognized several years ago, with the advent of transportation deregulation, and the ambitious growth plans of our company, a position within our department should be created to monitor, anticipate and evaluate foreseen future changes in the way we conduct our business. This is what I am attempting to do.

I suspect like many companies, we at Quaker are almost constantly engaged in short range - one year, one quarter, sometimes one month - corporate planning. We - all departments - first provide input in January in great detail to a plan for the following fiscal year starting July 1. By the first of June, any major changes have been made and locked in. In Distribution, these include standard variable costs for the transportation and warehousing areas for which we are responsible. Then, as the year progresses, we look at our actual versus projected costs, see the variances and make new projections for the balance of the year. This is done quarterly. Input for the initial plan comes from other departments, e.g., Marketing, and from a variety of sources we use to adjust transportation costs. (Parenthetically, warehouse costs are less volatile, usually contracted for on a longer term basis.)

In the context of this meeting however, I believe these exercises are more in the nature of "budgeting" than of "strategic planning."

We, in Distribution, also make quite detailed "contingency plans" for such things as:

Winter weather. While we obviously can't do anything about the weather, there are a number of actions which can be taken to minimize its impact, and assure our products are not out of stock.

Railroad or Motor Carrier "labor stoppages" - (we used to call them strikes).

Work stoppages at Quaker plants or distribution center.

These are contingency plans, and in the grand scheme of things may not be included as "strategic planning" in the contest of this meeting, but are necessary in the conduct of our business.

For several years our Department has generated a three year plan for Distribution activities of Quaker's U.S. Grocery Products. We are, at this time, putting together an update for our fiscal years 1985-87. In it, we describe for senior management and the several divisions and marketing areas of our Company, basic assumptions, objectives and strategies of the Distribution Department. It is organized according to the major elements of Distribution, i.e., Transportation, Operations, Inventory Control and Planning and Research. A separate section is included for Frozen Foods and certain other products because of the different physical requirements for storing and transporting refrigerated and temperature controlled products.

We first enunciate the broad objective of the Distribution Department which continues to be:

To provide salable, damage free products and efficient distribution services at a minimun cost to our company, the distributors and the ultimate consumers.

This three year plan is intended to identify objectives and strategies which will be employed to provide required distribution services efficiently and economically.

Addressing the section on transportation, which obviously covers the movement of freight, we have organized our Plan into sub-sections pertaining to Pricing and Costs; Transportation Services; Customer Service; Food Service; and proprietary trucking, including our wholly owned

subsidiary, Quality Operations, Inc.

Within each of those categories, we identify what we perceive to be our objectives. For example, in the Pricing and Costs area, our objectives are:

Control Quaker's transportation expense at a level no greater than the rate of inflation.

Avoid or mitigate carrier profit improvement type increases.

Maintain our transportation expense at a level that would give us a competitive edge over other grocery manufacturers.

Assure that transportation costs of inbound ingredients and supplies are minimized, consistent with inventory constraints and storage capacities of receiving locations.

Utilize transportation modes to maintain required customer service levels at optimum cost.

Following this, we describe the environment in which we will be operating, as we see it, and certain assumptions as to actions by carriers, regulatory agencies and other outside factors may take in that environment. Examples of this in the transportation area would obviously be the economic deregulation of railroads and motor carriers, inflation, and the I.C.C. Railroad Cost Recovery Index, to name a few.

We then identify, at some length and in some detail, the strategies, we expect to employ, given the projected environment, to meet our stated objectives. Examples of these strategies are:

Generate and insure compliance with transportation cost matrices by all shipping locations.

Reduce "premium" and "abnormal" shipments at all locations.

Negotiate contract rates.

Reduce the number of motor carriers with which we do business.

Establish Quaker/carrier cooperative programs to reduce carriers' costs and Quaker's expense.

Investigate and implement mode shifts, i.e., carload to TOFC to motor carrier and reverse.

Analyze distribution patterns to see if shifts to other shipping locations reduce costs.

And several others

Timetables for achieving results are established.

We go through the same format in other Distribution areas, i.e., warehousing, inventory management and research.

We include exhibits showing such things as freight expense for previous years projected for the next three; use of railroad transit arrangements; financial data on major carriers we use; a breakdown of past and projected transportation modes used; and a projection of numbers and types of freight cars we will need and how we plan to obtain them, e.g., purchase, lease, or obtain from the railroads. Also, the outlook for our truck fleets versus for-hire motor carriers.

In the plan we are now preparing, I would to identify several major issues facing us in the transportation area to be:

- ConRail disposition/future
- Rail labor negotiations
- Rail merger/acquisitions, e.g., Santa Fe/Denver & Rio Grand Western and Illinois Central Gulf
- Motor carrier/highway taxes
- Regulation/deregulation

While I cannot go into detail, I can see a major shift in emphasis in the area of Distribution costs. Since the Staggers Rail Act and the Motor Carrier Act of 1980, a large part of our distribution cost reductions has been inter and intramodal competition, resulting in lower freight costs to shippers - some have said to lower levels than can support the carriers. That aside, much of the "fat" has been wrung out, the past two years, in transportation costs simply by getting competing carriers to reduce their rates. While we will continue to evaluate carriers and modes we use on basis of their cost of providing service we require, I think the emphasis now is shifting to productivity improvements, for example:

better use of cube in railcars and trailers.

more loaded miles/fewer empty miles of transportation equipment.

better scheduling of shipments and deliveries by both shippers and carriers.

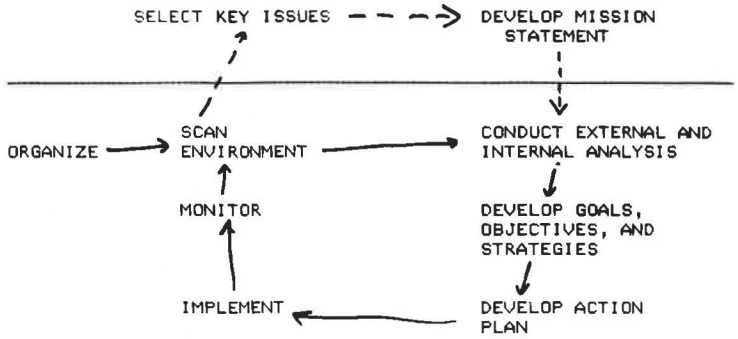
and a host of others, looking to more efficient utilization of the transportation plant.

I hope what I described is pertinent to the subject of the panel. In any event, keep in mind I am only telling you how Quaker does its Distribution strategic planning, and do not represent it as typical of other shippers, nor as the "best" way to do it. Advantages I see from the exercise are:

Making distribution people think and be aware of where we believe we are going, and how we are going to get there in the next few years; and

Letting senior marketing and operating mangement know what changes we see in that time frame and assuring them that we are, in fact proactively rather than reactively planning our distribution strategies

We do not do our planning in a vaccum. Rather, we utilize marketing forecasts, econometric models and many formal and informal



statements and opinions of others outside our company with insight into the future as it may affect Distribution. A helpful tool in putting together a transportation strategic plan is a report prepared for the National Council of Physical Distribution Management in 1982 by the firm of Temple, Barker and Sloane, Inc. titled Transportation Strategies For the Eighties. Their point of view was that the key to competitive advantage is to develop and implement well conceived transportation strategic plans, and I would commend it to you.

Panel Discussion
Moderator - Kathleen Stein-Hudson
Deputy Director of Transportation
New York City Planning Department

The question that is posed to the panel is: Strategic Planning--Where does it fit?

Remarks of Robert E. Heightchew
Director of Marketing
Greenhorne and O'Mara, Inc.

In viewing the question: what is strategic planning and what isn't and how is it different from what we've been doing, the above schematic of the planning process is presented. The topic area below the horizontal line fall into the category of traditional planning, while the two items above the line--select key issues and develop the mission statement--had not traditionally been performed by planners and are the items which make strategic planning different.

The mission statement of my firm is to obtain national prominence subject to service level and profit constraints.

In order to answer the question where does strategic planning fit, I have outlined my organization of planning activities based on the question each activity is intended to answer.

ANSWERING THIS QUESTION:	IS COMMONLY REFERRED TO AS
1. What are the values we are trying to instill, uphold, strengthen, etc.?	Advocacy . . . planners using analytical techniques to develop positions and reinforce.
2. What are the goals and objectives and milestones that will indicate how we are doing?	Leadership . . . planners sensing the direction publics wish to head and indicating the path to that end.
3. Given those values, what should be our mission?	Marketing . . . planners involved in futures forecasting, focus group and other techniques designed to coalesce a consensus and a commitment about a course of action.
4. What are the problems, challenges and opportunities associated with each course?	Long Range Planning...planners identifying future conditions and range of candidate responses that should be considered.
5. What are the alternative scenarios that will accomplish this mission?	
6. What is the Rate of Return on our social investment in each alternatives?	Financial Planning. . .planners using forecasts and estimates of these cost in a captial budgeting format.

7. How should we be organized to execute these scenarios?	Management . . . planners using psychology to allocate human resources against the challenge in pursuit of the opportunities.
8. How can we get support for our program? from internal and external constituencies?	Public Relations . . .planners using communications to pursuade
9. What are the midrange implementation decisions that need to be made and how should we go about making them.	Functional Planning . . .planners using specific skills like civil engineering to make decisions that impact only narrowly focused elements of the system under study/management.
10.What if . . .happens? How should we respond?	Tactics or Contingency Planning. . . using brainstorm and other free-wheeling techniques to imagine all manner of potential scenarios against which to test.
11.What are the short term operational actions that relate the strategies to immediate concerns	Short Range Planning...planning oriented engineers and operational types translating strategy into actions in a real time format

Undertaking strategic planning, it is important to ask many questions in each of the boxes of the schematic above. One needs to think of how type questions rather than why type questions.

Bruce D. McDowell
Senior Analyst
Advisory Commission Intergovernmental Relations

Is strategic planning "old wine in new bottles? There are two areas which set strategic planning apart:

1) Strategic planning is more narrowly focused on critical issues than and is not necessarily as comprehensive as its predecessors. In an age of reduced resources, we have less money for planning, so we focus on what's more important. The strategic planning process is more responsive to the needs of each situation.

2) Strategic planning answers the questions decisionmakers are asking, not those that the planners are asking. Thus strategic planning is "actionable," i.e., it's been designed to take action on it. There's an emphasis on time frames and controllable factors.

In the public sector, strategic planning has been turned to because there is less Federal money, so we must focus on what's most important. While the plans may not be as comprehensive, the scope of planning is broader because the Federal definitions of what a plan is or how it is constrained, e.g., by regulation, are going away. Today there's a greater freedom of alternatives which can be considered.

The following chart can be used to compare conventional and strategic planning.

TRADITIONAL OR CONVENTIONAL	STRATEGIC
SCOPE	
Comprehensive-every element relates to every other element	Focuses on specific issues
CO-OPERATIVE ASPECT	
By planners, often alone	By chief executives, sometimes without formal planning staffs but with an objective to have a large participation.
FOCUS	
Needs, problems, resources	Needs, problems, and resources but focuses on controllable parts in each list
LEVEL OF DETAIL	
Focuses on definition of end state	Focuses on actions toward ends
COST EFFECTIVENESS	
Frequently not cost effective	Quickly produces demonstrable results

RELEVANCE

Plan goes on shelf

The objectives of the private and public sectors differ and hence their planning and plans will likely differ. The public sector may strive for the greatest public benefit for the least cost, while the private sector wishes to maximize profits. The public sector participants may strive for organizational survival, while the private sector may be geared to growth.

Plan goes into implementation

The purpose of the plan produced is to educate people and to help them in carrying out its objective. The production of the plan implies a commitment to the plan. It is a communication device which drives the budget, implies teamwork, and gives the entity multiyear consistency.

Remarks of George T. Lathrop
Assistant Director
Department of Transportation
City of Charlotte, North Carolina

I was invited to assume a leadership role at the comprehensive transportation agency in Charlotte and was challenged to help focus that group on key activities. Based on that experience, I conclude:

(1) strategic planning only works if there is a clear and demonstrable commitment to strategic planning by upper management--in my case by service. town council, legislature, etc.

(2) strategic planning must be willing to view a broad range of scenarios--generally broader than is viewed today.

(3) the mission statement is the most important part of the whole planning process.

(4) a lack of information, statistics, and data makes planning difficult. Without it, it is difficult to assess where you are, to make decisions, to monitor actions, etc.

Remarks of Phillip C. Anderson
Colorado Department of Highways

Based on my experience in deriving a mission statement regarding economic development for the Colorado Department of Highways, I offer the following observations:

1. a staff member identified all past policy directives that had been issued.

2. one author developed a draft: build and maintain a system to support economic development where appropriate.

3. the statement was reviewed in comparison to actual experience. Contrasts with perspectives of private development were noted and required significant amounts of energy to resolve.

4. the group received the support of top management for a revised version.

5. finally, the group formulated an early warning and issue analysis unit to consider, for example, the impact of various new federalism initiatives.

The value of the process was that it focused on scenario development and on asking the key question; how shall we allocate scarce resources?

DEFENSE NEEDS FOR STRATEGIC TRANSPORTATION
Networks

by Robert Dienes
Deputy Special Assistant for
Transportation Engineering
Military Traffic Management Command (MTMC)
U.S. Department of Defense

In reviewing the agenda for yesterday's program, I noticed that "strategic planning" was a key item. In the present deregulated environment, I have no doubts that strategic planning is essential in the transportation world. More than ever, an acute awareness of shipper needs, traffic patterns, and the like is necessary to achieve our common objective--efficient service for the shipper and profitable operations for the carriers.

I'd like to approach the strategic planning issue from another perspective--defense needs--and our requirements for efficient multimodal strategic transportation networks in the event of mobilization or war. The DOD relies heavily on commercial transportation for peacetime and wartime moves; hence, I believe our strategic planning dovetails well with that being done in the private sector.

We've established six programs (highways, ports, railroads, pipelines, inland waterways, and Continental U.S. Air) each having the same general purpose-identify the defense-important transportation infrastructure; tell the owners and operators about our need; and keep the infrastructure in a condition ready for war.

In managing our transportation programs for national defense, we interface daily with operating directorates within MTMC and with public and private sector transportation agencies, particularly, the modal administrations of the U.S. Department of Transportation. For example, in our highways for national defense program, we interface with the Federal Highway Administration and the American Association of State Highway and Transportation Officials. Likewise, our Inland Waterways Program works with the U.S. Army Corps

of Engineers and with the Coast Guard.

As I begin my discussion of defense needs for strategic transportation networks, I'd like to emphasize the common objective of all the networks we've developed. If we consider the major combat units in the United States and their ports of embarkation and add to these locations, if you will, the ammunition plants, storage depots, major defense contractors and sources of strategic materials and petroleum, we can envision our logistical network. Men, equipment, ammunition, fuel, and resupply items--all must move to seaports or airports of embarkation.

This is a driving force in establishing our strategic transportation networks. As I discuss each of the modal programs for national defense, you will notice that each has developed an associated strategic network for planning purposes.

I'd like to begin by explaining highways for national defense and its five elements. In highway systems, we promote defense highway systems needs on a macro level. For example, we've established a 54,500-mile strategic highway corridor network (STRAHNET). We work with state and local highway authorities to ensure military needs are met under regular public highway programs just as they would be for any user. However, our defense access roads program provides a means for defense agencies to pay their "fair share" of the cost to improve or construct highways when they cause; unusual impacts such as a major expansion or road closure.

Emergency highway operations requires that we work closely with the FHWA -- as well as state highway departments and police--to ensure that military needs are met during national emergencies when civil authorities might have to regulate traffic on public highways for priority personnel and materials.

In traffic engineering we participate in the planning and analysis of traffic operations. Our traffic engineers regularly visit defense installations to solve traffic problems.

Finally, there is special defense use of the highways. Military movements on public highways, bridges, and tunnels must not exceed legal limits without prior permission from state and local authorities. Permits often must be obtained for oversize, overweight or special military movements. In some cases, DOD can certify a movement as being essential to the national defense, in which case many states will relax their permit requirements.

As I mentioned, when we speak of highway systems, we are referring to defense needs on a macro-scale. For example, we work with the FHWA and the states to promote completion of the Interstate Highway System and its maintenance standards. On the legislative front in response to Congress and the Surface Transportation Assistance Act of 1982, we worked with FHWA to establish military population as criteria for apportioning 4R (Resurfacing, Restoration, Rehabilitation, and Reconstruction) money.

In continuing my discussion of highway systems, I'd like to tell a brief story of how our interstate highway system came about.

General "Black Jack" Pershing developed a map in 1922 and presented it to the Secretary of War. It showed prioritized defense highway routes that he felt were needed. In June 1956, President Eisenhower signed the Federal-Aid Highway Act of 1956, giving birth to the national system of interstate and defense highways, one of the most massive projects this country has ever known. The system looked remarkably like that presented by General Pershing some thirty-four years earlier!

Using the Interstate System as a basis, we've added about 12,000 additional miles of defense-important routes and developed the 54,500-mile strategic highway corridor network (STRAHNET). This is the highway network we'll need to support mobilization and deployment, the industrial base, and possibly, land defense of our nation.

First, we studied the completion status of the system and focused on those uncompleted "gaps" in relation to their defense-importance and vulnerability to being deleted from the Interstate System. We found that about three-fourths of the gaps were defense-important and we worked directly with the states involved to ascertain their completion status and emphasize their priority. Interstate completion has risen from 94% in 1981 when we completed our study to 98+% today.

When the Interstate System was designed, we participated in developing defense-related criteria for its design. For example, we favor a 16-foot vertical clearance system-wide to accommodate our larger vehicles and equipment. But--as one would expect--many existing structures with inadequate clearance became part of interstate routes to avoid costly reconstruction.

Many of these inadequate structures are concentrated in urban areas, particularly in the northeast. Fortunately, alternate routes are usually available to by-pass low clearance points.

Our vertical clearance study will identify those critical "choke points" where structures should be brought up to 16-foot standards when scheduled for replacement or major reconstruction.

We have acquired an extensive multi-mode data base and have worked with military units, state highway departments, and port officials to select the best deployment routes from the installation to its designated seaport. Our STRAHNET connector evaluation focuses in on this level of detail.

Emergency highway operations is another aspect of our Highways for National Defense Program. When large volumes of military moves are occurring simultaneous with evacuation of population centers, competition for roadway space will result. Along these lines, we've established defense movement coordinators in each state to work with his civil counterparts to ensure military moves flow smoothly. The movement coordinators will plan for the flow of convoys within their state and coordinate with their counterparts in neighboring states. We recently completed a successful three-state test of this Mobilization Movement Control (MOBCON) concept and looked at three possible places for locating the coordinators. It was found that the state area

command was the best choice. These "STARCS", as they are called, are cadres of national guard members who are usually located in state capitols and work with active and reserve units during periods of mobilization.

While the MOBCON concept helps solve the military side of the question, our HEP (Highway Emergency Preparedness) task force ensured that our needs are conveyed to state officials and implemented within their emergency programs.

In addition to surveying the nationwide status of highway emergency preparedness programs, the task force was instrumental in releasing some $1.8 million through FHWA to the states to purchase much needed radio communication equipment.

Earlier in the presentation I mentioned that DOD is prepared to pay for public highway construction or improvements when defense creates an unusual impact that public highway authorities would not be expected to fund under their normal programs. For example, the opening of a new base or the major expansion of an existing one might qualify for defense access roads funding.

Major General Small, the Commander of the Military Traffic Management Command, acts for the Secretary of Defense in certifying such projects as important to the national defense.

In essence, the process works this way. The installation identifies a need for highway construction or improvement to MTMC, and the FHWA determines the validity of the need, often by field survey, and the estimated construction cost. Our Commander will certify the project as important to national defense based on our recommendations. This action releases military construction funds to the state highway departments who perform the actual construction and periodic maintenance.

A typical example is the access road serving Ft. Irwin, CA. Ft. Irwin is located in the Mojave Desert and was selected as the National Training Center. Combat units and their equipment are regularly rotated into and out of Ft. Irwin for desert warfare training. Traffic demands on the connector road to Interstate 15 was increased greatly (a doubling is our normal criterion for access road funding eligibility). Irwin Road was certified as being important to the national defense and DOD has funded approximately $9.8 million for its widening, straightening, and various safety improvements.

A rather unique element of the defense access roads program is our involvement with the Minuteman system. The Minuteman is located in 7 north central states, and the missile is periodically removed from its silo for maintenance. It is transported to the operating base over public roads by a very large transporter. We certified the Minuteman access road network as important to national defense and continue to fund about $4-5 million per year for extraordinary maintenace, regraveling, and snow removal.

We'll continue to do the same for the MX program. As you know, the current basing plan calls for installing MX in existing Minuteman silos. The heavier MX will require upgrading and parrying of Minuteman routes and we're already in touch with FHWA, the Air Force, and the highway departments of Wyoming and Nebraska to develop acceptable options for roadway improvements.

When moving oversize or overweight equipment over public highways, the military is obligated to obtain permission from the states involved. We often work directly with state DOT's to obtain permits for movements considered essential to the national defense.

In cooperation with the American Association of State Highway and Transportation Officials, we've established an AASHTO National Policy allowing a road march of tracked vehicles in the event of a defense emergency. We'll save about two days in reaching deployment seaports and conserve heavy truck assets that would otherwise be required.

The final element of highways for national defense that I'd like to discuss is traffic engineering. Our engineers regularly visit DOD installations worldwide to evaluate on-base roadway design, signalization, signing, and related matters. We've found that traffic engineering studies of on-base roadway networks to be a critical part of strategic planning, since each installation is a "node" if you will - in our strategic network models.

I'd like to discuss next our railroads for National Defense Program. As I mentioned earlier, each of our programs for National Defense has identified a defense--important network. STRACNET is a 32,500-mile strategic rail corridor network serving about 216 defense installations requiring rail service for their missions. We, the MTMC, selected the corridors and the Federal Railroad Administration selected the most viable mainlines to serve each corridor. About 5,000 miles of connector lines link up the installations to the "arterials." It is the connector lines that pose the potential problem.

The Staggers Act gave rail carriers much more flexibility in establishing rates and route structures. Consequently, many carriers chose to reduce their networks to smaller, more viable systems. The problem from a defense standpoint were those "low-density" connector lines that serve installations that have relatively low shipping volumes in peacetime but could have a large requirement in wartime. For example, heavy armor units and ammunition plants and depots.

From 1976 to 1981, the railroads filed and the ICC granted about 100 abandonments per year. In 1982 the number approached 400. The large jump in 1982 was due primarily to the expedited abandonment procedures authorized to Conrail by law and to a lesser degree by the abandonments generated by the Staggers Act. Applications filed in 1983 approached 200 and grants approximated 125.

We feel that abandonment mileage granted by the ICC has peaked and as carriers achieve higher levels of economic viability, the rate will continue to decrease. In some years miles granted exceeded miles requested. This simply reflects a carry-over of prior year requests to the ICC.

An example of how we negotiate favorable settlement of abandonments would be the Chicago

and North Western Railroad's proposal to abandon a 160-mile segment, thus cutting off Ellsworth AFB from the nearest STRACNET line. We negotiated with the carrier and obtained a two-year delay in their filing for abandonment. In addition, we asked the state to consider using state rail planning money to save the line or to pass legislation toward that same end. Eventually, the ICC denied the abandonment primarily because the carrier had failed to demonstrate that adequate truck service was available to transport grain from farms and storage areas.

The interaction of DOD with the civil sector is a matrix of negotiated preventative measures. While a low-density rail line proceeds toward abandonment through civil processes there are concurrent preventative actions that DOD can take along the way. When the potential abandonment proceeds toward reality, the DOD can employ various options.

Often, our first option i.e., explaining defense needs to the carrier, often results in their withdrawing or postponing the abandonment. Following that, the options generally result in increasing cost to DOD. The options of last resort, so to speak, are those involving direct financial assistance in the form of contracting for continued service with the abandoning carrier or a "short line" carrier, or to lease or purchase the line.

Our installation outloading capability studies are a major element of our strategic planning effort. We are examining in detail the individual installations--the "nodes" in our strategic networks. We are comparing reception and outloading capabilities to peacetime and wartime requirements. Reception is the assembling of military units from other locations, including National Guard and Reserve Units. Outloading is the shipping of units with all their equipment and supplies.

We are applying industrial engineering and operations research techniques to assure that on-installation movements of raw materials, sub-assemblies, and finished products, are being efficiently conducted.

In our strategic transportation planning, ports are the critical "end nodes" in the system. In a miitary deployment, the major portion of heavy combat equipment will move by sea, as will follow-on resupply of combat forces. Our program consists of predesignated berths, a unit deployment report, a Unit Basic Load (UBL) initiative, and port dredging.

We've predesignated berths at 24 cities, in conjunction with the Maritime Administration, for priority use by the military. Our unit deployment report,gives the full characteristics of each port for use by unit commanders and military planners. Our UBL initiative has placed approved ammunition permits at critical ports to allow certain tactical units to process through with their ammunition without delay. We have presented our port needs to the U.S. Army Corps of Engineers to ensure channels are dredged regularly and maintained in a ready status.

I'd like to next present more details on some of these initiatives.

There are the 24 ports where berth types (Break-Bulk, Roll on-Roll off, (Ro-Ro), container) have been predesignated for use in long-term resupply. The ports of Boston, New York, Philadelphia, Baltimore, Norfolk, Wilmington (N.C.), Charleston, Savannah, Jacksonville, New Orleans, Beaumont, Galveston, and Tacoma are those through which key combat units must rapidly deploy; hence, these are the ports where our Coast Guard approved ammunition loading permits have been placed. The actual units that will utilize these ports are classified, but I can say that a unit can have several deployment port options to utilize, depending on the geographic location of the contingency destination.

We've published a comprehensive report describing the facilities at all ports utilized for unit deployments. This information is used by unit commanders and military planners in developing their deployment plans and operating procedures upon arrival at the port. The type of ship that will be used will vary with commercial availability at the time of crisis; hence, we must be prepared to utilize appropriate port facilities at a moment's notice.

In addition to the movement of combat equipment, our strategic planning must take into account the movement of fuels to military installations, particularly Air Force and Navy bases. We established, for that reason, a Pipelines for National Defense Program.

The strategic pipeline network is called STRAPNET. Over 100 DOD installations are connected and about 15,000 miles of the total U.S. pipelines system are considered important to national defense.

Our pipelines report is essentially an inventory of services specifically available at each defense installation having a pipeline capability. Using this report, it is a simple matter to research fuel pipeline capacity and source, storage capacity and alternative modes of delivery at any defense installation. I might add that fuel service is an excellent example of an intermodal, systems approach to transportation--an approach that we're embracing in all our defense programs. Fuel deliveries, for example, could arrive by ship, be piped to an inland installation or storage point and delivered to the user by tank truck or railcar.

Our inland waterways program focuses on a little recognized, yet uniquely important element of strategic transportation planning--the movement of bulk strategic materials and fuels.

About 4,000 miles of our 115,000 mile national waterway network are important to national defense. We don't envision extensive use of the waterways to deploy troops and equipment for two resons. First, we feel that rail, truck, and air assets are adequate for that purpose. Secondly, most deployment movements tend to flow east to west (or vice versa), whereas the waterway network generally flows north to south. But the waterway network is vitally needed to transport defense fuels and strategic bulk materials. Consequently, work with the U.S. Army Corps of Engineers to assure continued maintenance and readiness of the system.

We're currently updating the entire program

and will reevaluate the strategic network. Our major thrusts will be to identify critical access channels and to evaluate use of inland ports as backups to coastal deep-water ports. We'll also be evaluating the adequacy of Department of Interior procedures for giving priority allocation of waterways, if necessary, to defense shippers.

The last program I'd like to discuss is our Conus (U.S. Continental Air) for National Defense Program. As you may know, military troops will deploy primarily by air, often by commercial charter service. In this effort, we've identified the critical airports to be used by active and reserve units and described the facilities at those airports for handling troops and servicing the aircraft that may be used. We've also explored integrating our airport emergency use plans with others that may be concurrently in effect. For example, certain commercial aircraft, such as those in the Civil Reserve Air Fleet (CRAF), and military aircraft are dispersed to "safer" airports in the event of escalating international tension to preclude mass losses of aircraft in a nuclear exchange. We want to ensure that our use of airports used for troop deployments does not result in competition for airport facilities being used for other emergency purposes at the same time.

As we've done for all programs, we've established a critical network (STARNET) which, for air transportation, consists of 289 city pairs needed to accommodate military moves during mobilization.

In addition to establishing a strategic air route network, we've found that scheduled commercial air service significantly exceeds our defense requirements--good news, indeed! However, we did find limited availability of ground support equipment for wide-body aircraft at "off-line", smaller cities that might be used as mobilization departure points for active or reserve units.

I'd like to conclude with a look to the future. At this time, the networks I've described are being consolidated into a transportation engineering data base that will allow it to perform network modeling and automated traffic management in peace and war. We're using traffic density models to select alternate routings, when necessary. For example, suppose two deploying units need to reach the same port. Because the density distribution along the shortest paths shows an overload, one unit may elect to use another route and split part of its traffic to another acceptable seaport.

As I've summarized today, strategic planning for transportation is a vital element of our national defense posture. The network models that we are constructing will enable us to get the most from our transportation dollar in peacetime while providing the means to identify and avoid choke points in mobilization and wartime, as well.

Our military readiness depends heavily on commercial transportation and we're taking the steps to integrate our strategic plans with those of our fellow team members!

STRATEGIC PLANNING BY OECD

By Claude Morin, Administrator
Road Transport Research Program
Organization for Economic Co-operation
and Development (OECD)

The Road Transport Research Programme was established in 1968 involoving the participation of 21 countries in North America, Europe, and Scandinavia, as well as Australia and Japan.

The Programme centers on road and road transport research, while taking into account the impacts of intermodal aspects on the road transport system as a whole. It is geared towards a technico-economic approach to solving key road transport issues identified by member countries.

By providing scientific and technical support for national and international decisions on roads and road transport, the Programme is geared towards OECD's mission to promote economic and social progress in member countries. As policy priorities have evolved throughout the OECD community, the Programme continuously adjusted its scientific and technical activities accordingly to cover a broader range of road transport problems and to address the broadening context in which member countries approach road transport.

In addition, the Programme includes the information and documentation programme (IRRD-International Road Research Documentation), a cooperative scheme that provides a mechanism for the systematic world-wide exchange of information on scientific literature and current research programmes.

In the framework of the objectives of the Committee the following scientific and technical activities have been introduced to the participants:

1. The impacts of heavy freight vehicles. The study focused on the concerns that governments have when evaluating legal limits on truck size and weights, including; protection of large public investments in highways and bridges; efficient traffic management and high network serviceability; safety; energy efficiency; environmental protection; and reduced costs for vehicles and infrastructure. The aim was to develop a technical and economic systems analysis of the impacts of heavy trucks.

   By pointing to convergent findings in member countries and indentifying important areas needing further study, this analysis narrowed the range of technical controversies. In doing so, it should help to build a political consensus and support efforts aimed at international harmonization and standardization. The study is considered by many to be one of the most important accomplishments of the Programme drawing on the whole range of expertise and scientific knowledge available in member countries. The report was published in 1983.

2. Technico-economic analysis of the role of road freight transportation. The objective of the study is to assess to a

scientific level how road and rail freight transport complement each other. The study is based on a statistical analysis of freight distribution circuits, and identifies the changes in the demand process as well as in the road freight transport sector proper including the potential of new technology likely to modify the road freight industry in the long term. The following areas will be analysed: statistical freight trends, areas of competition between surface transport modes, road freight transport growth, intermodal transport, and assessent of potential technological improvements.

The study focuses on surface transport modes, for road and rail freight transport account for 70 to 85% and 10 to 20% respectively in most member countries. Depending on the geographical situation, coastal shipping may be mentioned as a competing mode in few member countries. This activity is planned to be terminated by mid-1985.

3. Freight vehicles overloading and load measurement. This activity is considered a high priority by member countries and will begin by the end of this year.

The OECD report on Impacts of Heavy Freight Vehicles shows that in most countries overloading occurs in the range of 15 and 20 percent. The effect of excess weight plays an important role in road management. Due to extensive damage, it is necessary to consider the problem of overloading when designing roads and bridges. It is well known that road damage increases exponentially with axle load. This damage is generally assumed to increase with the 4th power of the axle load, which means that even very few overloaded vehicles can have severe consequences for maintenance, and thereby be of importance economically.

Load distribution is particularly important on bridges, and also on roads; hence, the knowledge about length and width of freight vehicles, as well as the placing of wheels, etc. is very important.

The study should focus on the methods used for instrumentation, strategy of data collection, data management, and presentation of results in relation to registration of weight vehicles. Further, standard presentation of data should be considered in order to facilitate the international exchange of information.

COMMITTEE REPORTS

The following section of this report contains the reports prepared after their panel discussions by each of the participating committees.

Freight Transportation Planning and Marketing, A1B02

Herbert Levitt, Presenter

Key Issues

1. What are the transportation problems for intercity freight?
   a. Problems should be examined separately for shippers, carriers and government and for each mode.
   b. Can strategic planning minimize such problems?
2. Which approaches could be utlized to address these problems?
   a. Analyses that have been done and could be done?
   b. Freight modeling and forecasting approaches which are useful.
3. What data are needed to help understand and resolve these problems? There is a paucity of existing data. Planners are looking forward to dependence on 1987 Census of Transportation (COT). But there is uncertainty of its achievement and whether there will be conformity with needs of industry and government planners. The goal should be better utilization than has been made of the 1977 COT.
4. How could freight services best be marketed in a given environment while utilizing the best currently available data resources?

Committee Action Plan

1. Develop a survey of members of all freight committees on the kinds of data they perceive are neede for freight planning purposes.
2. Form a task forced within this committee for above survey plan.
3. Assist the COT representative to be appointed for the creation of an optimal COT in 1987.
4. Work with government agencies to insure that a COT will be done in 1987 and promote such effort.
5. Contact industry sources to assist in promoting the effort to insure a 1987 COT.

Research Needs

1. Update the 1977 COT as best as can be done.
2. Develop new freight measurement approaches until 1987 data are available.

Summary

1. Objective is not just to secure freight data as before.
2. Instead, we should develop a plan prior to any additional data development and meanwhile promote the 1987 COT.

Pipeline Transportation Committee-A1B03

Edward Margolin, Presenter

I. Background

The Pipeline Transportation Committee is new to TRB. The scope is as follows:

> The committee is concerned with the pipeline transportation of liquids, liquid slurries, petroleum and petroleum products, liquified natural gas, and other freight cargoes, solid and potential synthetics. Its work shall include stimulating studies of the dimensions of pipeline transportation options, needs for new or improved pipeline connections with other modes and terminals, intra and intermodal competition, financing of pipeline facilities in response to changing types and pricing of energy commodity flow patterns, public and private sector participation and involvement, economic regulation/deregulation, safety, and environment issues.

Because of the broad coverage of the committee's concerns, virtually the entire gamut of the pipeline industry - a few brief notes on this industry are provided below:

Pipelines play an essential role in the supply and delivery of energy. In many respects pipeline transportation is inextricably bound with the nation's energy policy and many other national, regional, international and foreign policies and consequently has direct and often profound influences on the supply, demand, and price of energy and related materials, products and services.

Pipeline transportation also is affected by technological and synthetic fuel developments, the interrelationship of transportation and energy policies, the institutional structure of regulatory controls, and potential changes in demographic patterns. In the past several years there have been major legislative drives to deregulate oil pipeline transportation and complete the deregulation of natural gas.

Interstate pipelines are subject to economic regulation by the Federal Energy Regulatory Commission (FERC) and safety by the Department of Transportation. They are owned and operated almost solely by the energy industry. The movements of oil and gas energy commodities constitute a major portion of total national freight flows. Pipelines are the predominant mode for the transportation of oil and petroleum products and the virtually exclusive mode for gas. Recently they have been used to haul chemicals. They may be increasingly used to transport liquified petroleum gases (LPG), liquified natural gas (LNG), solid minerals (coal) suspended in a liquid medium (slurry or CO2) or gas (pneumatic) and perphaps solids in capsules. There are pipeline movements of such materials as limestone, copper concentrate, etc. There is one slurry pipeline in the U.S. (coal). Oil and gas pipelines may be used in the future to carry synthetic petroleum products and gas made from coal.

II. Strategic planning and pipelines

Strategic planning often can involve tradeoffs, as examples, between different fuels and different geographic sources, between domestic and foreign supply of one fuel, among alternate transport modes; between different levels of production, quantity, and processing stage; and between environmental costs to the producers and consumers. Thus there is need in many instances for research to develop and examine alternate strategies and to assess their consequences as well as the characteristics and performance of pipelines and transportation systems or networks.

III. Some issues, strategies, research interests and needs:

The items below are not necessarily specifically categorized or classified according to their criticality, short or long range research, or whether they would or should be conducted by the private sector, government or as joint ventures, etc.. There is, not unexpectedly, some duplication in research interests and needs.

A. Gas And Gas Pipelines

1. Analyses are needed of factors influencing natural gas deliverability and pricing. For example, investigation is needed of the recent increases in the transportation component of the delivered price of natural gas. Estimates should be made of future flow requirements of natural gas pipelines. Overall pipeline capacity may be available, but accessibility and supply-source demand region links maybe a problem; i.e., existing trunklines may not have direct access to their new supply areas.

2. The proposed Alaska National Gas Transportation System (ANGTS) is virtually at a standstill, reportedly because of financial problems. What are some feasible options? One proposed alternative would be to pipe the gas from Prudhoe Bay for export to Asian markets in liquified form (LNG). An alternative possibility suggested for the future is conversion of the gas to methanol using the existing oil pipelines to ship it when oil production from Prudhoe bay declines. Research directed toward identification of these and possible private sector choices of investment options and the impact of such choices on the supply and prices of natural gas in U.S. and foreign markets would be of value.

3. With the halting of activities on ANGTS, lower cost Canadian gas has become an increasingly attractive alternative source of gas supplies for the lower 48 States. The locations and amounts of available Canadian supplies and the Canadian and U.S. pipeline infrastructure needed to service these supply sources should be examined, as should the likely effects of these potential sources of supply upon the pricing of current and potential new U.S. gas supplies, and the capacities of existing pipelines to carry the new supplies.

4. Mexican gas presents an attractive southern source of natural gas supplies and presents similar problems regarding infrastructure development, gas pricing and impacts upon existing pipeline system capacities. Research should focus upon the kind of pipeline infrastructure necessary to support imports of Mexican gas and where the likely markets would be.

5. The Argonne National Laboratory has prepared some studies on the systems assessment of the developmental potential for natural gas trapped in tight sand reservoirs. After some findings relative to pipeline accessibility to the three tight sand gas regions, the studies further indicated that given present market conditions (1982-83), no definite conclusions can be made without a more detailed examination of future supply and demand conditions and their effect on pipeline capacity.

6. Common carriage of natural gas has emerged as one of the more controversial issues surrounding the natural gas debate. Although this issue has been studied in various aspects, a comprehensive analysis should be undertaken to determine the extent to which the gas industry's pipeline/distribution network has the necessary physical facilities to implement a mandatory common carriage policy.

7. The increased level of imports of natural gas in the form of liquified natural gas (LNG) during the late 1970's led to an interest in delivering natural gas in a liquified form rather than a gaseous form in situations where the market for gas is some distance from the reception harbor. Following that thought, a study could be initiated to determine the feasibility of transmitting LPG over long distances in special-cryogenic pipelines and to ascertain whether it is economical to transmit gas in liquid rather than gaseous form.

B. Synthetic Fuels Including Methanol

With relatively stable oil prices, the prospect of large amounts of synthetic fuels coming into the market requiring transport infrastructure is not likely to be a problem before the mid 1990's. Methanol, which may be ultimately produced from coal, is increasingly being used as a fuel additive for octane enhancement. Where derived from conventional sources (natural gas and residual oil), it presents the kind of problems that are raised when transport of synfuels are considered, i.e., whether they will be brought to market through existing pipelines or whether new capacity will be needed. For entirely new synthetic fuel products and methanol, there is a question, "can synfuels be physically transported through existing pipelines or do they present problems due to solvent or corrosive properties?"

C. Oil Pipelines

1. Deregulation - Legislation - Preliminary Department of Justice Report

Legislative proposals in the House and Senate which have received committee approval would require the Department of Transportation to study the economic feasibility and safety considerations involved in the transportation of methanol through the interstate liquid pipeline system. A private sector study of the future potential for alcohol fuels in the U.S. gasoline market is expected to be completed soon.

While the Administration has internally circulated draft oil pipeline deregulation legislation, a final version has yet to be released. Generally, the concept envisions total economic deregulation of liquid pipelines, with a saving provision providing for an administrative proceeding to determine if nominated pipelines exercise market dominance. Those that might so be found to do so under suggested criteria would continue to be regulated by the FERC.

Legislation presently before Congress proposes a more limited approach, retaining the common carrier obligation under the Interstate Commerce Act while removing the authority of the FERC to set rates. In conjunction with the Administration deregulation initiative, the Anti-trust Division of Justice has undertaken a study of competition in the industry. A preliminary report was issued by the Department in May, 1984, and comment has been invited on the draft.

Studies should be made of the effects of oil pipelines deregulation - partial or modified.

2. Mideast Crisis - Role of Pipelines in the Strategic Petroleum Reserve (SPR) Program.

A potential major issue centers on the rapid sale and deployment of SPR in the event of an oil market disruption. Oil pipelines could play a critical role in this deployment. One such oil pipeline from the SPR has been transferred to gas and another oil pipeline from a reserve facility is scheduled or partially underway to convert to a gas pipeline. In the event of need will there be sufficient oil pipeline capacity to move the oil from the SPR storage facilities?

The Department of Energy has asked the National Petroleum Council to study

distribution from the SPR.

3. Oil Pipeline Ratemaking

The FERC is reconsidering upon appeal a rulemaking proceeding to determine the appropriate ratemaking methodology and rate of return to be applied to petroleum pipelines under the Interstate Commerce Act. What will be the impact of the final decision on the oil pipeline community?

The economics of pipeline transportation in its mature phases should be researched. Potential problems arise from the joint aging of the nation's energy pipelines and the depletion of the energy resources that utilize these pipelines. If the pipelines' decrepitude proceeds the exhaustion of the energy resources, a problem of replacement or renovation occurs, as well as safety issues. If the energy resource base is depleted before that time, the pipeline throughput declines to such a low level that the unit cost of transportation becomes an issue. Analysis of these related issues of maturity would identify the period in which significant mileage of the pipeline systems would become over age and when the majority of key resource regions would become depleted.

D. Coal Slurry Pipelines

1. Coal water mixtures are viewed as a potential replacement of residual oil in utilities and major fuel burning installations but technological and environmental impact questions remain. Development of non-water slurries has not yet been proven commercially but may be an attractive alternative; some research is underway. There have been recent advances in the techniques for transporting pulverized coal in liquid carbon dioxide, CO_2. Research on the comparative economics, safety and environmental impacts of liquid CO_2 versus a water slurry medium would also be useful.

2. Continued monitoring and further research into comparisons of coal unit train costs versus pipeline costs and potential pipeline routes including comparative issues of safety and environment should be considered. Is the integrated train concept a response to the competition that has developed from recent slurry pipeline proposals? Does the concept mean that slurry pipelines need further technical development? And there is the continuing question of the opposition to the need for eminent domain for coal pipelines.

E. Advanced Technology, Computerized Control and Pipeline Safety

Advanced technology in materials used, construction and repair methods, inspection and monitoring methods, and better utilization of computers for the operations of a system have improved pipeline safety. But specific research needs to be continued. This includes internal pipeline inspection equipment (1) supervisory control and data acquisition (SCADA) systems, including computerized line balance and leak detection systems. In addition, requirements of encasement of pipelines through highway roadbeds (2) and educational programs for the public, the private sector, and the local, state and federal agencies for handling emergencies are also needed.

F. Freight Pipelines

As noted in the introductory material there is an increasing interest in freight pipelines with various aspects of domestic and international research in progress. A good deal of this activity is being conducted under the auspices of the International Symposium of Freight Pipelines and other groups. Further educational efforts appear necessary to make better known freight pipeline prospects and potentialities. The need to continue and broaden research to attain further insights and to further demonstrate freight pipelines values and performances is important.

G. Other Possible Research Items

1. Gas versus oil pipeline competition

2. Common or joint ownership of pipelines and other modes

3. Pipeline movements and distribution and their role and impact in changing transportation patterns and facilities.

4. State of the art in each major component of the pipeline industry.

IV. Committee Action Plan

1. Develop some degree of priority relative to critical issues and needs

2. Promote better awareness of existence of the TRB Pipeline Transportation Committee

3. Develop an informal bibliography of studies completed, underway, and research contemplated and other activities related thereto.

4. Papers and presentations related to the issues and research needs referred to above will be offered at the future TRB Annual Meetings.

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(1) Some individual companies are conducting limited research but there is no known concerted effort.

(2) The National Cooperative Highway Research program of the Transportation Research Board has published a report on this subject. "Encasement of Pipelines Through Highway Road beds." Final Report Project 20-7/22 March, 1983.

Committee on Vehicle Size and Weight - A1B04
John Fuller, Presenter

KEY ISSUES AND RESEARCH NEEDS

The following statements represent the views of the majority of the committee, they are offered to prospective researchers and authors as a guide for potential new research, and as a focus for papers to be submitted for TRB publication and/or presentation:

1. Investigate the effects on both pavement and structures of differences in vehicle axle configurations, suspension systems, tire types and pressures, and loadings.

2. Investigate the handling and stability characteristics of multiple unit combination vehicles. Are there particular problems associated with various configurations, load conditions, sizes, dolly types or braking systems?

3. Determine how trucks can be designed to optimize productivity, and vehicle handling and stability characteristics, while minimizing damage to highway pavements and structures.

4. Investigate the safety effects of allowing 102-inch-wide combination units to operate on roadways built to various geometric standards and having different types of access control. Can relationships be estimated between truck accident rates, and vehicle and lane widths, and route geometry?

5. Investigate regulations and operating conditions (including work rules) which limit innovation in vehicle design, when such innovation could improve highway safety or reduce highway damage while improving productivity. How can truck size and weight limit changes be used as incentives to produce vehicle designs that are more efficient and less damaging to facilities?

6. Investigate the activity of heavy trucks and buses which operate under state or local regulation or permit using axle loadings and/or gross weights in excess of Federal limits. Ascertain the relationships between the facility costs attributable to such activity and the user fee contributions.

7. Assess current methods and investigate new methods of measuring vehicle activity, axle load distributions, and highway structural reactions on various types of highway facilities. Develop combinations of instrumentation and periodic manual measurements that are appropriate for different state and local management situations. Determine institutional and managerial mechanisms for ensuring the develoment of optimal vehicle - highway relationships.

8. Assess current techniques for estimating the impacts of changed truck size and weight limits on overall transportation efficiency. Of interest are the prospective shifts in traffic between competing modes and the consequent impacts on highway facilities and highway operations, and on the operations and economics of complementary as well as competing modes.

9. Assess techniques for measuring secondary impacts of changed vehicle dimensions and operations on communities and the environment.

10. Determine whether the information base permits the investigations and evaluations suggested above; if not, devise appropriate information sources and evaluation methodologies.

Intermodal Freight Transport, A1B05
W. Bruce Allen, Presenter

Broad Issues

1. Research into changing intermodal concepts, e.g., domestic containerization, potential additional land bridges, or load center ports, can provide direction to the second intermodal generation.

2. Research into intermodal service changes, e.g., railroad mergers, load center ports, or barge feeder service, can produce a blueprint of capital investment and restructuring needs.

3. The development of better data collection techniques to support better research and decisionmaking. Specific attention to commodity, size of shipment, and length of shipment.

4. Assessment of recent regulatory actions, e.g., the Shipping Act of 1984, and its impact on domestic and international intermodal freight movement.

5. [illegible] e.g., intermodal drayman or clearances, and their impact on long haul intermodal traffic.

Specific Research Topics

1. Rail to ship interface costs and the resulting impact on the all truck to ship route.

2. What effect do the present drayage market mechanisms have on intermodal traffic?

3. Does improved scheduling, longer single line hauls, and greater use of hub centers result from railroad mergers?

4. Examine the economics of all water traffic versus U.S. land bridge/ Mexican land bridge.

5. Intermodal data: commodity profile for intermodal shipments, the availability and quality of import-export freight data.

6. What is the likely impact of load center ports and the development of feeder service to non load center ports.

7. Assess the present scope and likely extent of domestic containerization.

8 Review the 1984 Shipping Act and its impact on intermodal traffic.

Surface Freight Transport Regulation-A1B06
Rolf Schmitt, Presenter

Research Interests

The current scope of the TRB Committee on Surface Freight Transport Regulation (A1B06) "includes all aspects of research pertaining to surface freight transport regulation of all kinds. Consideration will be given to research into the impact of regulation on social, public, and private costs and benefits; among the various modes; on regulated vis-a-vis unregulated carriers; and on technological change." In recent meetings, the Committee has emphasized:

- the responses of carriers, shippers, arrangers of freight transportation services, trade associations, and government agencies to the new regulatory environment;
- prospects for and desirability of continued deregulation or reregulation; and
- the nature and consequences of public policy tools which are replacing economic regulation to serve public concerns.

Some Committee members have suggested that the Committee's name and scope should be modified to reflect its concerns with an increasingly broad range of public policy tools and the effects of those tools on the structure and performance of the freight transportation industry.

The Committee's interests fit within the emerging emphases of TRB's Section B on Freight Transportation, which provides a forum for the development and exchange of analytical and data resources, research findings, and research topics which are:

- shared by more than one discipline among planners; researchers, and practitioners in freight transportation; related to more than one mode of freight transportation; and
- of interest to professionals in both public and private organizations which make decisions regarding freight transportation.

Section B and its Committees differ from organizations outside of TRB by emphasizing multimodal, interdisciplinary discussions among professionals who are concerned with a broad spectrum of interrelationships between public and private organizations.

The Committee's interests were indicated in its conference on "Research Needs in the New Regulatory Environment in Surface Freight Transportation," which was held in conjunction with the annual meetings of the Transportation Research Forum in Novermber 1983. The sessions covered public policy concerns, the changing structure of the transportation industry and of transportation firms, and emerging approaches to services and pricing in freight transportation. Committee members took a fresh look at research needs during the TRB conference on strategic planning held by Section B. The suggested research questions were developed without first reviewing the findings of the previous meeting, and include:

- What tools of public policy are replacing past economic regulations to support public goals?
- What data are needed by public decisionmakers and private firms to perform effectively and efficiently in the new regulatory environment? ("Strategic Planning in the Absence of Data" was one suggested title for the next Section B conference.)
- How can the data needs best be met (particularly with respect to the roles of private data collection efforts and to the activities and programs of the U.S. Bureau of the Census)?
- How has the structure of the transportation industry been affected by the new regulatory environment, and what are the consequences of any realignments for physical distribution systems and for the national economy?
- What role will independent owner-operators of trucks and their-party arrangers of transportation industry, and what arew the implications for public policy?
- Is the transportation industry becoming more concentrated (functionally as well as in the number of firms), and what are the impications of competition? (For example, end-to-end mergers can reduce the number of firms without damaging the competition within a region.)
- What is the likely and appropriate role of the Interstate Commerce Commission in the implementation of future public policy?
- What is the likely and appropriate Federal-State relationship in the implementation of future public policy affecting freight transportation?

No order of priority is implied by this list.

Urban Goods Movement, A1B07

Richard A. Staley, Presenter

Background

The Committee on Urban Goods Movement recognizes that its field of especial expertise actually bridges a wide range of other activities and disciplines within the Transportation Research Board. The Committee also recognizes, however, that this "bridging" is not universally recognized by such other affected groups and that, therefore, duplications and parallels sometimes occur. The Committee on Urban Goods Movement has and is dedicated to offering its assistance and aid to any and all other TRB Committees through joint sessions, panels, presentations and papers wherein the especial problems concerning the movement of goods into, through, and within urban areas are to be considered. The Committee recognizes that its tasks are both modal and multimodal, as well as

intermodal, freight oriented and that they likewise impinge on such other disciplines as signing, street geometrics and the like. Our primary mission remains to: Enhance efficient, expeditions, economic and environmentally acceptable urban freight services.

Key Issues and Research Needs (not prioritized)

1. Dissemination of accumulated information and techniques.

   The committee finds that while a considerable body of materials exists concerning urban goods movements and techniques, little apparently has found its way into the hands of other than urban goods practictioners. This has led to a general lack of awareness that something is actually known and has been researched in the field. Techniques to disseminate the available information should be explored.

2. Examination of the effects of the emerging "transportation companies" on movement patterns and services.

   Commencing several years ago, multimodal transportation companies began to appear in the United States. These are companies that perform two or more transport and transport-related functions; such as air/truck, rail/truck, or rail/truck/warehouse/truck movements. The ability of such integrated operations to better control and utilize their urban goods vehicle fleets should be examined closely.

3. Examination of how new and developing technologies effect existing urban goods movements?

   The 1970s and 1980s have seen the emergence many new and improved operating and management techniques that could have a significant impact on urban goods movements. Computerized routing, on-board truck computers, improved two-way radio operations, and new vehicle configurations and power sources, represent only a sampling of the possibilities that must be considered as potential tools to improve urban goods movements.

4. What are the economic effects of community policies relating to urban goods movements?

   Communities may either restrict or facilitate urban goods movements in a number of ways--primarily through the use of various regulatory devices. In an economic sense, it is most desirable to ascertain whether there is any significant relationship between a community's facilitation or restriction of urban goods movements and that community's present economic viability.

5. Research is required regarding the number, size and location of land extensive urban goods facilities needed to service an urban area (e.g., modal and intermodal terminals and warehouses).

   While general requirements for land extensive urban goods facilities have been studied in some detail, it remains to be determined just how many--and/or what size of--such facilities are required to provide economically viable service in any given urban area. Here, the inputs would consist of population, growth patterns, population density, degree of industrialization, and possibly a number of other similar pertinent parameters. The output desired would represent minimum, optimum, and maximum of urban goods facilities under any given scenerio.

6. The impact of double trailers in the urban environment.

   Double trailers are now permitted nationwide on designated highways. It is obvious that at some point(s) in time these vehicles will appear within some portion of most urban areas -- either as "doubles" or broken down into individual short single trailers. Therefore, it has now become imperative that the impacts of such equipment--both potential and probable--be examined in detail.

7. The impacts associated with the growing use of longer and wider trucks operating in urban areas.

   Not only have double trailers become lawful nationwide, but so too have other larger commercial vehicles. Trucks may now have single trailers of at least 48 feet in length. Truck widths have now been set at 8.5 feet (102") overall. While the impacts of the longer equipment, may have approximately the same effect in urban areas as will double trailers (subject to confirmation), the wider truck limits may impact all urban goods movements. Both the traffic and facility related impacts of these limit changes must be examined in an effort to determine whether any other parameters or urban goods movement are affected by the size alterations.

8. What are truckers' information and guidance needs in order to move safely and efficiently in urban environments?

   In the wake of motor carrier deregulation and increased operating freedom of private motor carrier fleets, there has apparently been a rise in what traffic authorities refer to as "lost" drivers in an around urban areas. Put another way, many trucks and truck drivers are entering cities and towns they had not previously served. When one adds to this problem the emerging problems of special routing requirements for some or all large trucks in parts of our urban areas, there emerges a need for improved routing and guidance information specifically directed toward such vehicles. Research is required to determine the means for obtaining and disseminating such routing and guidance materials to over-the-road truck operators entering and/or transiting urban areas.

Committee Action Plan (Prioritized)

1. Realign the Urban Goods Committee's internal structure in a manner responsive to the strategic issues and needs.

2. A paper/presentation session on "Applications

of Urban Goods Strategies" was organized for the 1985 TRB Annual Meeting. A call for papers and presentations illustrating examples of recent applications of knowledge in the field of managing urban goods transportation movements was made by the Committee.

3. The currently critical, and little understood, prospect of "injecting double trailers in the urban environment" was made the subject of a wide-based panel discussion session at the 1985 TRB Annual Meeting also under sponsorship of Committees A1B07 and A1B04. To obtain the broadest possible participation, the panel consisted of an academic, officials of state and local governments, and a trucking industry spokesman. Further, this representation ranged geographically from California to Massachusetts and New Jersey.

4. Commence to seek means for holding a special conference on: Designing for, and Institutional Accommodation of, Goods Movement Facilities for Present and Future Urban Environments.

5. Actively seek increased cooperation and topical exchanges with other communities of interest within the TRB; and with similarly minded groups in other transport-oriented organizations. This would be accomplished through such mechanisms as joint sessions and exchanges of speakers, etc.

Freight Transport Service Quality (A3A13)

Jack F. Battel, Presenter

Background

1. Individual carriers have their own system to develop data on freight service performance for in-house use.

2. Shippers and receivers have their own system to develop data on freight service performance.

3. With deregulation of intermodal and boxcar freight and the freedom to enter into contracts with shippers, levels of service can be priced at different values.

4. With deregulation, rail carriers will be more cautious about meeting their counterparts and working on common problems of interest to the carriers and users due to antitrust concern.

Research Needs

1. Development of a standardized measurement system to define the transit time within a transport mode moving towards Dock to Dock.

2. Development of a standardized measurement system to (define) state the reliability of freight service within a transport mode.

3. Development of a standardized methodology to equate a level of service within a transport mode and a commensurate rate level.

4. Development of a system or methodology to more quickly estimate transit time within the rail mode between several carriers and specific locations and routes for quoting to interested shippers.

5. Development of a standardized measurement system to state the reliability of intermodal (rail-truck) service.

Action Plans:

1. Review the Car Cycle analysis model of the AAR Freight Car Management Program and determine how refinements can be made to give inter railroad transit time information.

2. Survey major railroad and motor carriers on their methodology of developing data on Freight Service Performance.

3. Survey major shippers who keep and develop information on freight service performance.

4. Present results at a conference session at the TRB Annual Meeting.

5. Review directions the Data Coordinating Committee has expressed as being needed for measuring freight transport

PARTICIPANTS IN STRATEGIC PLANNING
MIDYEAR MEETING

W. Bruce Allen
Professor of Public Policy and
Management and Transportation
Wharton School
University of Pennsylvania
3620 Locust Walk
Philadelphia, PA 19104

David L. Anderson
Senior Consultant
Temple, Barker and Sloane, Inc.
33 Hayden Lane
Lexington, MA 02173

Marsha D. Anderson
Consultant
Transportation Consulting MDA
4907 Lou Ivy Road
Duluth, GA 30136

Philip C. Anderson
Research
Colorado Department of Highways
4201 East Arkansas
Denver, Colorado 80222

Arne J. Bang
Program Officer, R&D
Federal Railroad Administration
400 Seventh Street, SW
Washington, DC 20590

Arthur J. Balek
Chief, Impact Assessment Branch
Federal Highway Administration
400 Seventh Street, SW
Washington, DC 20590

Philip J. Barbato
Research Analyst
U.S. Dept of Transportation
400 Seventh Street, SW
Washington, DC 20590

John W. Barker
Director of Strategic Planning
Texas State Department of Highways
and Public Transportation
P.O. Box 5051
40th and Jackson
Austin, TX 78763

John W. Bates
Assistant Professor
Business Administration
Georgia Southwestern College
Americus, GA 31709

John F. Battel
Marketing Manager - Metals
Norfolk Southern Corporation
8 North Jefferson Street
Roanoke, VA 24153

Leigh B. Boske
Associate Professor
University of Texas
Drawer Y, University Station
Austin, TX 78712

Lee H. Bowser
Director for Strategic Planning
Pennsylvania Transportation Dept.
Commonwealth Avenue
Harrisburg, PA 17120

David A. Caplan, Director
Freight Traffic Division
Military Traffic Mgmt. Command
5611 Columbia Pike
Falls Church, VA 22041

Arun Chatterjee
Professor
The University of Tennessee
Dept. of Civil Engineering
Knoxville, TN 37996-2010

Tom A. Cooney
Arizona Dept. of Transportation
206 South 17th Avenue
Phoenix, AZ 85007

Patrick H. Corcoran
Executive Director
Association of Oil Pipelines
1725 K. Street, N.W.
Washington, DC 20006

Thomas M. Corsi
Associate Professor
College of Business & Management
University of Maryland
College Park, MD 20742

John P. Dumblis
Transportation Planner
Port Authority of New York
and New Jersey
One World Trade Center, Room 54E
New York, NY 10048

Robert Dienes
Deputy Special Assistant for
Transportation Engineering
Military Traffic Management Command
5611 Columbia Pike
Falls Church, VA 22041

Paul J. Diethelm
Research and Development Engineer
Minnesota Dept. of Transportation
Transportation Building, John Ireland
Blvd.
St. Paul, MN 55155

Dwight Fee, Policy Advisor
Traffic Safety Programs,
Nat'l. Highway Traffic Safety Admin.
400 Seventh Street, SW
Washington, DC 20590

Philip Fanara, Jr.
Assistant Professor
University of Maryland
College of Business
University of Maryland
College Park, MD 20742

Stephen E. Frank
Transportation Planner
University of Maryland Dept. of
Transportation
P.O. Box 8755
Baltimore Washington International
Airport, MD 21240

Dr. John W. Fuller, Professor
University of Iowa, 340 JH
Iowa City, IA 52242

Curtis M. Grimm
Assistant Professor
University of Maryland
College of Business & Management
College Park, MD 20742

Peter Griskivich
Vice President
Motor Vehicle Manufacturers Assn.
1620 Eye Street, N.W.
Washington, DC 20006

Philip I. Hazen
Community Planner
Federal Highway Administration
400 7th Street, S.W., Room 3312
Washington, DC 20590

Arthur F. Hawnn
Senior Civil Engineer
Dept. of Army Corps of Engineer
Casey Building
Fort Belvoir, VA 22060

Robert E. Hightchew
Director-marketing
Greehorne and O'Mara
9001 Edmonston Road
Greenbelt, MD 20770

Colin Hershey, President
Planning Dynamics, Inc.
850 Ridge Avenue
Pittsburgh, PA 15212

Mark P. Howard
Asst. Transportation Planner
Metropolitan Transportation Authority
of the State of New York
347 Madison Avenue
New York, NY 10017

Jeffrey F. Hudson
Manager, Business Planning
Trailer Train Company
101 North Wacker Drive
Chicago, IL 60606

Donald J. Igo
Assistant for Energy Policy
Office of Economics
U.S. Dept. of Transportation
400 Seventh Street, SW
Washington, DC 20590

William C. Jordan
Senior Research Engineer
General Motors Research Labs
General Motors Technical Center
Warren, MI 48063

Sheldon Landy
Vice President
Railpool
208 South LaSalle Street
Chicago, IL 60022

George T. Lathrop
Assistant Director
Department of Transportation
City of Charlotte
600 East Trade Street
Charlotte, N.C. 28202

Herbert Levitt
Economist
7000 Boulevard East, Apt. 20A
Guttenberg, NJ 07093

Carol E. Lutz
Manager, Statistical Analysis
Association of American Railroads
1920 L Street, N.W.
Washington, DC 20036

Robert G. Maher
Division Manager
American Telephone & Telegraph Company
550 Madison Avenue, Room 29-941
New York, NY 10022

William A. Mangels, Manager
Planning, Development & Evaluation
Maryland Dept. of Transportation
Box 3755
BWI Airport, MD 21240

Domenic J. Maio
Operations Research Analyst
U.S. Dept. of Transportation
Transportation Systems Center
Kendall Square
Cambridge, MA 02142

James R. Mann, Director
Transportation Planning & Planning
Quaker Oats Company
Merchandise Mart
Chicago, IL 60654

Edward Margolin
Transportation Consultant
8500 Freyman Drive
Chevy Chase, MD 20805

Gay E. Maring, Chief
Community & Environmental Plng. Branch
Federal Highway Administration
400 7th Street, SW
Washington, DC 20590

Mr. Ronald D. McCready, Manager
Policy and Research
Arizona Dept. of Transportation
206 S. 17th Avenue #310B
Phoenix, Arizona 85007

Mr. Bruce D. McDowell, Senior Analyst
Advisory Commission on Intergovmntl.
Relations
1111 20th Street, N.W.
Washington, DC 20575

Edwin G. McKeever, Manager
Office of Strategic Planning
Port Authority of New York
and New Jersey
One World Trade Center
New York, NY 10901

Robert R. McPherson, Director
Service Performance
Consolidated Rail Corporation
Room 322, Six Penn Center Plaza
Philadelphia, PA 19103

Claude Morin
Administrator at the OECD
OECD Road Transport Research Programme
2 Rue Andre Pascal
75 Paris, France

Howard D. Niebur
Senior Civil Engineer
Roads for National Defense
Military Traffic Management Command
Washington, DC 20315

Byron Nupp
Office of Economics P-30
U.S. Department of Transportation
Washington, DC 20590

Howard E. Olson, Economist
Institute for Water Resources
Corps of Engineers
Casey Building
Ft. Belvoir, VA 22060

William J. O'Neill, Jr.
Executive Vice President
Leaseway Transportation Corportation
3700 Park East Drive
Cleveland, OH 44122

Roy B. Opitz
Assistant Vice President
Consolidated Rail Corporation
Six Penn Center
Philadelphia, PA 19103

Linda J. Pendlebury, Manager
Highway/TSM Programs
Los Angeles County Trans. Commission
354 South Spring Street, Suite 500
Los Angeles, CA 90013

Jossef Perl, Professor
Dept. of Civil Engineer
University of Maryland
College Park, MD 20742

Chris M. Randall
Deputy Secretary
South Dakota DOT
700 Broadway Avenue East
Pierre, SD 57901

John L. Reith
Director-Economic & Taxation, ATA
2200 Mill Road
Alexandria, VA 22314

George D. Riley
Secretary and Director of Research
Association of Oil Pile Line
1725 K Street, N.W.
Washington, DC 20006

Raymond R. Ruggieri
Freight Transportation Specialist
Port Authority of New York
and New Jersey
One World Trade Center, Room 54E
New York City, New York 10048

Rolf R. Schmitt
Geographer
Federal Highway Administration
400 7th Street, SW, HPP-12
Washington, DC 20590

Mr. Keith M. Sherman, Chief
Policy Planning Section
Illinois Dept. of Transportation
2300 South Dirksen Parkway
Springfield, IL 62764

Alvin J. Sloup
Senior Manager, Market Research
Union Pacific Rail Road System
1416 Dodge Street
Omaha, NE 68179

James M. Souby, Director
The Council of State Planning Agencies
400 North Capitol Street, Suite 291
Washington, DC 20001

Frank Spielberg
Principal
SG Associates, Inc.
4200 Daniels Avenue
Annandale, VA 22003

Richard A. Staley
Principal, RAS Consulting
1221 South Buchanan Street
Arlington, VA 22204

Mr. Bradley D. Statter
Transportation Economist
American Trucking Association
2200 Mill Road
Alexandria, VA 22314

Kathleen E. Stein-Hudson
Deputy Director of Transportation
New York City Dept. of City Planning
2 Lafayette Street, Room 2228
New York, NY 10007

Carl N. Swerdloff, Chief
Economic Studies Division
U.S. Dept. of Transportation
400 7th Street, S.W.
Washington, DC 20590

William H. Tallman, Principal
The Emerson Consultants, Inc.
30 Rockefeller Plaza
New York, NY 10112

Richard A. Torbik, Chief
Program Management Division
Federal Highway Administration
400 7th Street, SW
Washington, DC 20590

Mr. Donald G. Ward
Director, Advanced Planning
Iowa Dept. of Transportation
Ames, Iowa 50010

Arthur A. Webster
President
EXP Associates, Inc.
8302 Westmont Terrace
Bethesda, MD 20817

Richard Weissbrod
Executive Vice President
Enternational Thomson
424 West 33rd Street
New York, NY 10001

J.L. Williams
Operations Manager
Dome Pipeline Corporation
Box 1430
Iowa City, Iowa 52244