The Transportation Planning Laboratory

MARCH, 1972

prepared by
APPLIED DECISION SYSTEMS, INC.

for

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY
Assistant Secretary for Environment
and Urban Systems

The contents of this report reflect the views of Applied Decision Systems, Inc. which is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the Department of Transportation. This report does not constitute a standard, specification or regulation.

OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

ASSISTANT SECRETARY

March, 1972

The Office of the Assistant Secretary for Environment and Urban Systems has been charged by Secretary Volpe to maintain a broad overview of the impact of transportation projects and programs nationwide on the urban and natural environment. This office seeks to identify approaches to transportation planning which permit involvement of a wide spectrum of the community in transportation choices -- choices that may have major effects on the quality of their lives.

Further, the National Environmental Policy Act of 1969 authorizes and directs all agencies of the Federal government, to the fullest extent possible, to utilize a multi-disciplinary approach to insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making; and to identify ways to appropriately consider environmental amenities and values in decision making along with economic and technical considerations.

To this end, this office contracted with Applied Decision Systems, Inc. to develop a transportation planning laboratory as a way to stimulate universities and representatives of local, State and federal organizations to experiment with alternative goals for transportation planning. The lab simulates the problems faced by a hypothetical major U.S. metropolitan area in making transportation decisions, and it is designed to bring together a cross-section of professionals and citizens to actively negotiate transportation decisions -- decisions which recognize social, environmental and economic implications, as well as political, financial and legislative constraints.

I am pleased to forward the final report of the contract which includes an overview of the project and a manual for laboratory instructors. I believe the lab can serve as a tool to sensitize planners, citizens and decision-makers to the complexities and options in transportation decision making, and to the important part transportation plays in the many facets of their lives.

I hope you will find this report of interest and value.

Herbert F. DeSimone
Assistant Secretary for Environment
and Urban Systems

Report No. DOT-OS-00053

THE TRANSPORTATION PLANNING LABORATORY

Applied Decision Systems, Incorporated
36 Washington Street
Wellesley Hills, Massachusetts 02181

March, 1972

FINAL REPORT

Document is available to the public
through the
National Technical Information Service
Springfield, Virginia 22151

Prepared for

THE DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY
Office of the Assistant Secretary
for Environment and Urban Systems
Washington, D.C. 20590

PREFACE

Contract DOT-OS-00053, the development and testing of the Transportation Planning Laboratory, has resulted in a number of products which can be used by the Office of the Assistant Secretary for Environment and Urban Systems. Among the products are:

(1) A tested design for the Transportation Planning Laboratory (see Appendix A for a summary of the laboratory process and Appendix B for a typical laboratory agenda).

(2) A full set of written materials for use by participants in the laboratory (see Appendix C for a table of contents to a participant's notebook).

(3) An instructor's manual for guidance in presenting the laboratory (Section 2.0 of this report).

(4) A time-shared computer model (SUPER) which simulates the behavior of a hypothetical metropolitan area before and after new transportation systems are built (see Appendix D for an example of the output from the model).

(5) A twenty-five minute four projector slide show with synchronized sound track which automatically drives the projectors. The show is for use in the early phases of the laboratory; it introduces participants to the simulated metropolitan area and its transportation related problems.

(6) Three ten-minute tapes of "man-on-the-street" comments from people who live in the simulated metropolitan area. The tapes introduce laboratory participants to some of the opinions that exist in the simulated communities.

(7) A series of transparencies (Vugraphs) of various maps of the simulated metropolitan area.

(8) Evaluation reports from the four test laboratories (Washington, D.C., Boston, Cleveland, and Seattle). Appendix E contains a copy of the evaluation form.

(9) A twenty-three minute four projector slide show with synchronized sound track which drives, independently, each bank of two projectors. This show is an audio-visual collage of opinions expressed by active transportation planners in Washington, D.C., Boston, and Seattle on urban transportation problems. Appendix F is a transcript of the final show. (Please note that this is <u>not</u> a transcript of the show which is used in the laboratory.)

These products represent the results of over fourteen months of concentrated effort by Applied Decision Systems, Inc. (ADS) of Boston, representatives from the DOT, and interested people in Washington, Boston, and Cleveland. The objective was to develop a suitable framework for people from many disciplines and backgrounds to learn more about how to utilize the resources available in a community to help solve difficult planning problems. This learning would, hopefully, suggest improvements which can be made in the process of planning urban transportation systems.

The Transportation Planning Laboratory is an example of product-oriented research. The dedication and commitments of a number of people made it possible to develop a laboratory which can be integrated into an urban transportation planning process. ADS would like to recognize

especially the contributions of Mickey Klein, Gene Tyndall, Ann Smith, Richard Bouchard and Bruce Barkley of the Office of Environment and Urban Systems, U.S. Department of Transportation. Their guidance, advice, and assistance throughout the project was invaluable to the ADS project team. Mickey Klein, who conceived of the project and directed the effort for the DOT, deserves particular credit for her desire to seek new approaches to transportation planning and her willingness to support a project which deviates substantially from classical transportation or consulting studies.

The ADS project team included professionals from a number of disciplines. The team was composed of:

- Dr. Stanley Buchin: Senior technical advisor
- Professor David L. Birch: Urban modelling advisor
- William Fleming: Senior technical advisor
- James L. Barker: Project director
- Robert Smith: Urban modeller
- James Glauthier: Urban modeller
- Susan Carnduff: Process and materials developer
- Elizabeth Gordon: Materials developer
- Donald Pasquella: Audio-visual materials producer
- Jamil & Beverly Simon: Audio-visual materials producers
- Cynthia Wilkinson: Materials production

This report contains three sections. Section 1.0 is an overview of the project, concluding with results and recommendations. Section 2.0 is a manual for persons interested in presenting the Transportation Planning Laboratory. The Appendices contain examples of most of the products of this project.

TABLE OF CONTENTS

LIST OF APPENDICES

SUMMARY

The process of planning urban transportation systems is undergoing re-evaluation and change in many major metropolitan areas. Pressure is being applied by all levels of government, and by an increasingly more involved citizenry, to force rigorous analysis of the social, economic and environmental impacts of transportation systems upon the communities which they serve or affect. The major premise of the Transportation Planning Laboratory is that a broader and more consistent participation by the community in this process is a step toward the development and reinforcement of mutual goals between transportation planners and the community.

The Laboratory is a model which permits citizens, planners, technicians, businessmen, politicians, and decision-makers to learn: (1) how various interest groups assess and interpret the impact of transportation systems upon the economics, environment, and quality-of-life in urban communities and metropolitan areas; (2) what kind of planning process is needed to assure that the natural conflict that arises over the construction of transportation facilities is managed (rather than ignored, suppressed, or attacked) in such a way that the resultant transportation plan is, in fact, comprehensive and implementable; (3) what resources, in the forms of information, data, and personal expertise are available in the community to help solve serious planning problems; and (4) how these resources can be shared and applied most effectively by a group of people with diverse backgrounds, interests, and power.

The Laboratory is a three-day simulation of a hypothetical major U.S. metropolitan area which contains

a large city with a population of about 750,000, and representative inner and outer suburbs. The simulation has four phases: (1) the first phase is the development of the characteristics, problems, goals and assets of each of the three communities; (2) the second phase is the solution of a highway design and routing problem, using a simplification of a typical existing process for arriving at a decision; (3) the third phase is the development of a negotiated transportation master plan for the metropolitan area which is acceptable to all communities as well as the transportation authority for the area; and (4) the fourth phase is the extrapolation of the implications of the simulation for real-world problem-solving.

Over the three days participants use written materials which describe the metropolitan area and the alternative projects which might serve existing and forecasted transportation needs, role-playing, negotiation, sophisticated audio-visual displays, and a time-shared computer model which simulates the socio-economic characteristics of the area over a ten year period and allows participants to test the quantitative impact of new transportation systems. The entire simulation is an integration of quantitative information within a structure which underlines the tradeoffs between behavioral and technical considerations.

The learning that has resulted from laboratory sessions during its testing appears to be diverse and substantial. Face-to-face negotiation is perceived as a more effective means for serving an interest than direct or indirect attack. There is a recognized need for <u>all</u> levels of a planning organization to use technical and numerical information and techniques as means for developing

a common understanding of the quantifiable aspects of the problem before non-quantifiable issues are addressed. The conflicts among a community's goals, goals for the entire metropolitan area, and the goals of the transportation interests are dealt with explicitly in a process of tradeoff and compromise.

1.0 PROJECT OVERVIEW

Urban systems are enormously complex. Researchers from many disciplines have spent years and large sums of money attempting to define "the system". Often these studies have focused on that aspect of the urban environment in which the sponsor has a vested interest. Thus, the generation of enumerable reports on housing, economics, health and social services, environment, transportation, and every problem area over which some institution has some degree of real or perceived control. For better or worse, a large amount of information and data has been generated, and a number of programs have been initiated to help alleviate the problems which cities and their surrounding communities are experiencing.

Many aroused citizens and concerned institutions are frustrated by the apparent gap between what they want their communities to be like and what they are like today, or what it appears they will be like in two, five, or ten years. To reduce this gap between expectations and reality it seems apparent that new methods for planning for an improved urban environment must be formulated.

The Transportation Planning Laboratory is a method for learning more about: (1) the interaction between transportation and various other elements of the urban system; and (2) the components of a process for planning urban transportation systems which is responsive to the real and perceived needs of the people and institutions of the area. A number of premises are key to the design of the laboratory.

> Premise 1; Understanding the behavior of the urban system: Decisions of choice among alternative urban transportation modes and systems options will be made more effectively if, in

addition to understanding the characteristics of the transportation system itself, the planner or decision-maker has an equally rigorous grasp of how the urban system will look in the future with and without changed investments in transportation facilities.

Premise 2; Understanding the conflict which exists within the urban system: Conflicting needs and goals among citizens, between citizens and institutions, and among or within institutions can lead toward a deterioration of the power of the decision-maker and can diminish the ability of the community to act positively --- unless the conflicts are recognized and dealt with explicitly during the planning process.

Premise 3; Involvement in the transportation planning process: Transportation systems will look different, and transportation decisions will be made more effectively, if the process of planning which precedes these decisions actively involves spokesmen who can represent a point-of-view, interest, or community need which is important to the type, routing, or design of the transportation system.

Note that each of these premises deals with one aspect of the complexities of planning within an urban environment. For example, the laboratory is designed to suggest that to plan urban transportation it is necessary to consider the behavior of the urban system as a whole and then to assess the impact of a change in one element (transportation) upon the city and its suburbs (Premise 1). This establishes a base of information which is useful for goal-setting and resource allocation. The transportation planner, however, must

also accept the fact that conflict undoubtedly will reduce the number of options he has available to him (Premise 2). Operating by himself, the planner may be capable of analyzing the urban system, the impacts of alternative transportation facilities, and the sources of conflict. However, reliance upon the results of these analyses as sufficient information for planning can result in a plan which cannot be implemented. Resolution of conflict and recognition and verbalization of the values hidden in the data which describes an urban system require involvement of the people and organizations who are stakeholders in the community. The third premise of the Transportation Planning Laboratory suggests that the additional complexity and costs incurred by involving a diverse group of people in the transportation planning process is more than offset by the benefits associated with increases in the probability that the resulting plan is "good" and implementable.

As an aside, the classical criteria for "goodness" of a plan (e.g., minimum cost, maximum cost effectiveness, etc.) are exploded in the Laboratory. During the laboratory, the quality of a transportation plan is judged according to the degree to which it supports a very diverse set of goals established by quite different communities. Acceptance (implementability) of a plan depends entirely upon the ability of community representatives and members of the responsible planning authority to negotiate an agreement without subverting the interests of their constituents.

As of September, 1971, approximately eighty persons in three cities (Boston, Cleveland, and Seattle) had attended a three-day lab. Results of these sessions indicate that the impact of the lab upon participants

is significant. A Cleveland participant summed-up this impact when he suggested that the process of the laboratory should be the model used in his city every time a major decision or planning exercise is required.

The lab does not "leave behind" answers to existing transportation problems in an urban area; nor does it leave behind a technique or computer model for solving these problems. However, it does establish an awareness that new and better transportation planning processes and techniques can be designed, and it does stimulate participants to seek new models for dealing with serious planning issues. The impact, therefore, is largely behavioral in nature. The success of the laboratory depends on the ability of institutions to apply the resources that surface, and the learning that occurs, in the laboratory to real problems. Otherwise the lab is just another interesting experience with the (all too common) ex post facto frustrations associated with seeing more clearly the gap between what is and what could be.

1.1 THE TRANSPORTATION PLANNING LABORATORY DESIGN

The Transportation Planning Laboratory is a three-day problem-solving experience. It is a dynamic simulation of the qualitative and quantitative factors which explain, in part, the form, texture, and definable elements of a hypothetical urban area.

The lab has four major elements:

(1) Base-line definition of the urban area and establishment of the characteristics, assets, problems, and goals of each of the three specific communities in the area. These three communities (New Sheffield, Willow Park, and The Hill) represent the core city, inner

suburban ring, and outer suburban ring in a metropolitan area of more than two million people.

(2) Solution of a "here and now" problem which requires an immediate decision by participants. The problem is whether or not to approve the routing of a major highway which connects the city with its outer suburb. The State Department of Transportation Area Coordinating Team seeks approval for the route from each of the three community transportation task forces. A hearing, intended to be similar to a design hearing, is held by the State DOT team. Community task forces are provided with very little information, prior to the hearing, about the proposed highway and the area transportation master plan.

(3) Evolution and approval by each community task force and the State DOT team of a metropolitan area transportation master plan. Each task force has a well-defined set of powers and responsibilities. They must work with an initial portfolio of transportation systems alternatives and arrive at a plan (combination of alternatives) which is feasible to implement. Resources are constrained, and the conflict in interests among the four task forces is enough to preclude agreement on a plan without substantial negotiation within and among the groups.

(4) Analysis of the laboratory planning process and its applicability to actual planning problems for the area in which the participants

live and work. The laboratory model is evaluated against reality. Analogies to the "real" situation in the area are constructed. Objectives for extending the results of the learning experience to on-going or impending planning requirements may be established. An exchange of points-of-view, technical knowledge, and area-specific information may also occur. Representatives from federal, state, and local transportation planning organizations provide information on the positions of their organizations, and on existing or planned models for broadening the base from which transportation plans are constructed.

To make this overall design work, a substantial amount of supportive materials are required. Laboratory materials are divided into three categories: (1) written materials; (2) audio-visual materials; and (3) computer-generated materials. Each of the materials has been tested to ascertain that they reinforce one another in the context of the overall learning objectives for the laboratory. It is important not only to provide participants with enough information to be able to discover ways to move through each phase of the simulation, but also to be sure that the process by which this occurs results in a predefined learning experience. The overall learning objectives for the laboratory are listed in Exhibit 1-1.

The following sections describe, in general terms, the various materials which are used in the laboratory and how these materials are integrated to form each element of the simulation. Participants are encouraged to make use of any of the laboratory materials to help them during the three-day process.

TRANSPORTATION PLANNING SIMULATION OBJECTIVES
September, 1970

Overall Objective:

To provide an action response to the Environmental Policy Act through the design, development, testing, and documentation of a process that brings together a multi-disciplinary cross-section of professionals and citizens to experiment, in a planning laboratory, with new approaches to transportation planning within the context of community goal-setting.

Technical Objective:

To identify possible new transportation planning processes and address the quantitative and qualitative aspects of community planning by developing a laboratory structure which utilizes behavioral techniques and a computer model to stimulate representatives of local, state, and federal organizations to experiment with alternative goals and program packages for a simulated community.

Impact Objective:

To cause a broadening of the perspectives of laboratory participants toward community planning, as indicated by their:

(1) Consideration of transportation decisions within the broader context of community goal-setting and planning;

(2) Understanding of the complexities of transportation planning, particularly: (a) the social, environmental, and economic implications of transportation decisions; (b) the political, financial, and legislative constraints upon transportation decisions; and (c) the dependency of community goal-setting and planning on transportation decisions;

(3) Ability to develop and prioritize alternative and complementary program packages designed to support a given set of community goals;

(4) Increased awareness of "unconventional" inputs into the transportation planning process;

(5) Motivation to play a more active role in the process of transportation planning; and

(6) Awareness of the importance of each phase of the transportation planning process in terms of commitments, ultimate impact, and sensitivity to community inputs.

Exhibit 1-1

1.1.1 Written Materials

Effective laboratory experiences require written material to provide enough information for a participant to absorb and re-use as the need occurs, but not so much that he or she feels submerged in paper. The amount and content of written materials in the Transportation Planning Laboratory are limited to: (1) information which a participant should know about the metropolitan area, his task force, the transportation alternatives, and the simulation "ground rules"; (2) information which a participant wants to be able to hold onto and re-use at his convenience; and (3) information which would normally be communicated in writing. The written materials for the laboratory include:

- Task force descriptions
- Personal role descriptions
- Historical trends of each simulated community
- Descriptions of each transportation alternative
- "Bulletins" announcing events which may influence the planning process in the lab
- Summaries of budgets, constraints, and legal powers of each task force
- Instructions on the use of the computer model
- Excerpts from relevant federal legislation.

1.1.2 Audio-Visual Materials

An important aspect of the laboratory is that participants get a "feel" for the "texture" of the simulated metropolitan area. The geographics of the area, what it looks like, and what people who live there have to say about it, provide the participants with a greater sense of living in the area. A good way to establish this sense of understanding what the area is like is to use audio and visual materials which complement and

extend the written materials. They are useful for filling the gaps which inevitably exist between the written word and what a person senses as information from his environment. The audio-visual materials used in the laboratory include:

- A 25-minute four-projector two-screen synchronized sound audio-visual show which introduces participants to the New Sheffield area and some of its existing controversies.
- 10-minute audio tapes of man-on-the-street comments about each of the three simulated communities.
- Transparencies of maps showing land-use, major arterials, proposed transportation projects, and general geographic characteristics of the simulated urban area.

1.1.3 Computer-Generated Materials

Recent work by researchers such as Professors David L. Birch of Harvard and Jay Forrester of MIT has indicated that computer-based simulation models of urban areas can be useful devices for learning about how the urban system behaves, for forecasting what it might be like in the future, and even for evaluating the impact of various development strategies. For example, Professor Birch has been very successful in modelling the New Haven, Connecticut SMSA. The New Haven model accurately replicates each year of a ten-year history of New Haven and has proven to be a very powerful forecasting tool. a/

Models of this type are behavioral in nature. The methods by which key actors in an urban area make decisions are modelled and then the connections among all the actors are made, i.e., all of the interactions are established.

a/"A Small Area Model for Planners", David L. Birch Division of Research, Graduate School of Business Administration, Harvard University, Boston, Mass.

Typical actors include heads of households, family members, workers, employers, builders, voters, and governments. Each actor is involved in a process which includes living somewhere, looking for and finding housing, schooling, birth, death, migration, working (and commuting to and from a job), constructing residential and non-residential buildings and facilities, employing, voting, buying, etc.

A model of the behavior of the actors in these processes (with all of the attendent linkages) is further complexed by adding a spatial dimension, i.e., by keeping track of all of the actors and their decision process by sub-area (e.g., census tract). The "flows" of people and transactions among all sub-areas within an SMSA and between the SMSA and the "outside world" are also modelled. To be useful for forecasting purposes a model of this type simulates the operation of an urban area for each year, year-by-year, of the forecasting period. Each year's experience becomes a starting point for the next year. The only assumption made is that the structure of the urban system remains reasonably constant.

A simplified version of an urban simulation model is used in the Transportation Planning Laboratory. Its purpose is to provide an immediate (the model operates on a timeshared computer system) feedback to participants of the numerical descriptors of the three specific communities in the hypothetical metropolitan area. Participants can ask "what if ---?" questions and see how their communities will change if, for example, a rapid transit system is built which connects the inner and outer suburbs to the core city.

Participants are supplied with a set of "do-nothing" reports which describe, numercially, their communities in 1970, 1972, 1975, and 1980, given that no intentional change is made to the historical behavior of people and

institutions in the area. Participants are then free to experiment with changing this behavior to see how their communities might respond. Packaged transportation changes which correspond to the transportation alternatives available for the master plan can be tested on the model. Portable remote computer terminals are provided for this purpose. A sample output from the computer program is contained in Appendix D.

There are many advantages to using this type of computer program in a learning environment. Detailed data about the urban area is readily available to all participants; the model is ruthless and indiscriminate -- it provides the same data in the same format to everyone who chooses to use it. The impact of a transportation alternative cannot be made to look good or bad -- it is what it is, and is entirely based on the established relationships among the actors in the model. Thus, if the output of the model is disagreeable to a participant, he is forced to construct a rigorous argument to support his position.

The computer model is designed to integrate with the written and audio-visual materials. It adds the dynamic dimension to the laboratory by forcing participants to think in terms of change over time. The model has not been designed to behave necessarily the way any specific urban system operates. The model is the New Sheffield metropolitan area, and it represents the way <u>that particular</u> hypothetical area operates. It is intended, however, that participants develop an appreciation for the <u>type</u> of information which a model like the one used in the lab can generate.

1.1.4 <u>Laboratory Process</u>

The written, audio-visual, and computer-generated materials are disseminated, or made available, to partici-

pants in a process which is designed to build continuously a problem situation which is a reasonable approximation of the real-world. In a sense, some of the learning that a transportation planner might experience over a ten-year period is condensed into a few days. Appendix A illustrates when each of the materials is used by the laboratory participants, and what activities are taking place during each element of the simulation. Figure 1-1 summarizes the laboratory process.

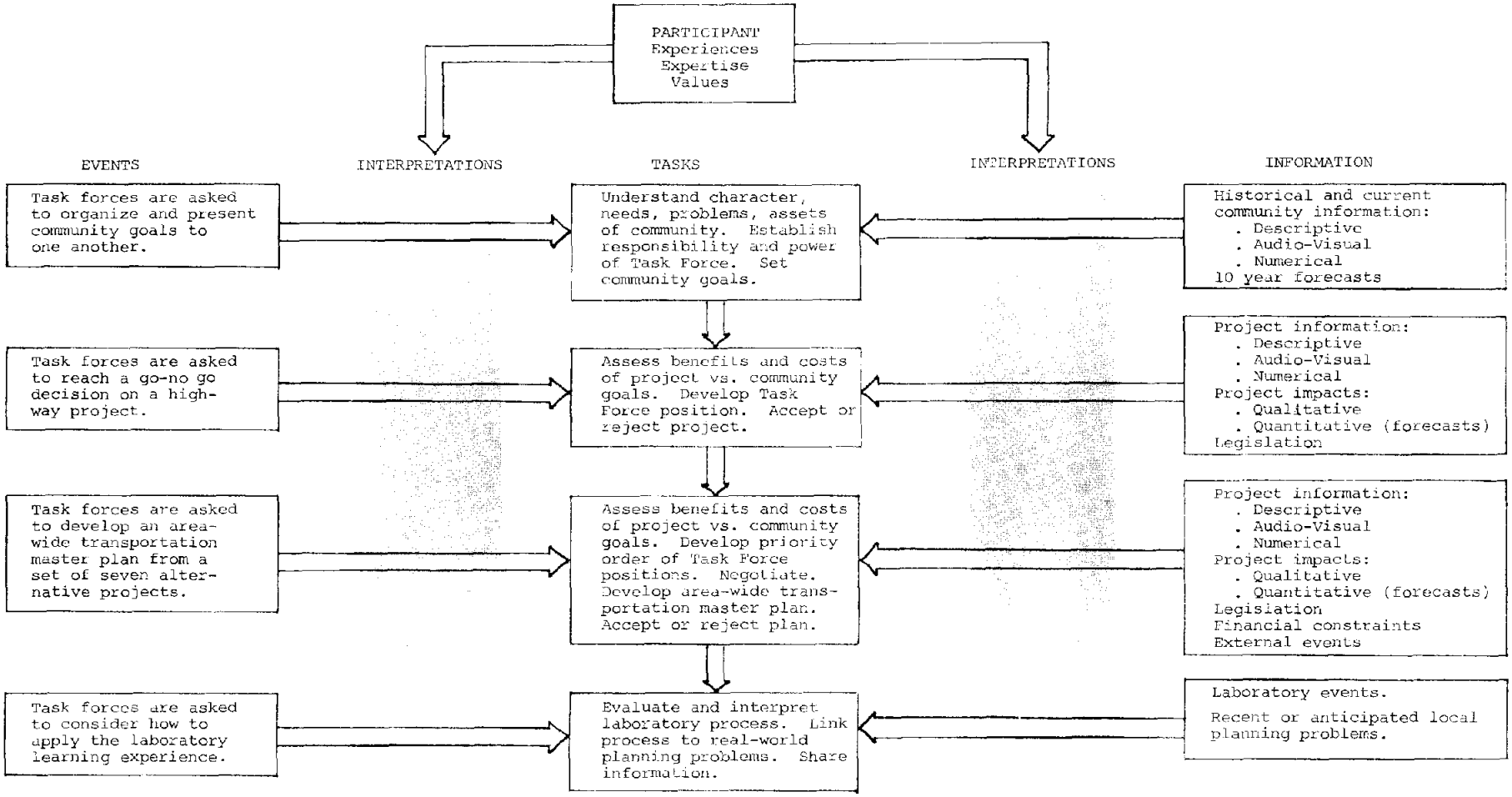

FIGURE 1-1

TRANSPORTATION PLANNING LABORATORY PROCESS

1.2 RESEARCH

A substantial amount of research was required to design the Transportation Planning Laboratory and produce the written, audio-visual, and computer-generated materials. The Office of the Assistant Secretary for Environment and Urban Systems at the U.S. Department of Transportation was particularly helpful during the research and development phases of the Transportation Planning Laboratory project.

The project was part of DOT's program of response to the requirements of the National Environmental Policy Act of 1969. The research proceeded in six overlapping phases.

1.2.1 Phase I: Definition of the Elements of the Urban Transportation Problem.

Project team members conducted a number of discussion and interview sessions with federal, state, and local transportation planners, engineers, politicians, city planners, and members of the academic community. In addition, a thorough review and analysis was conducted of the recent literature related to problems and theories associated with urban transportation planning. Past and present highway and transit controversies were researched to determine the critical elements of the problem.

Recent attempts to alleviate traffic problems in urban areas (e.g., rapid rail systems, reserved-lane express bus service, and CBD mini or shopper buses) were analyzed. The characteristics of new systems such as demand-responsive bus service, tracked air-cushion vehicles, and non-vehicular people movers were also reviewed.

Finally, the project team conducted an analysis of existing and proposed federal legislation which enables or constrains the process of planning, building, and operating transportation facilities and equipment.

The first phase of the research effort resulted in the isolation of four elements of the urban transportation planning problem which the laboratory needed to include. The first element was the politics of the problem, particularly inter-jurisdictional considerations.

The second element was the systems problem, i.e., the relationship between transportation systems and the behavior of urban systems as a whole. Of particular importance to this element was the process by which urban communities set goals and allocate resources to programs which support these goals. Treatment of transportation systems as facilitators of urban activities (economic, social, educational, etc.) emerged as a key assumption and reinforced the need to address the systems problem directly and "wholelistically".

The third element of the urban transportation problem was the need to utilize existing transportation technology more effectively and to develop new technology to meet the mobility needs of urban residents without sacrificing environmental quality.

The fourth element was the problem of financing transportation systems construction and operation. Of particular importance was the issue of control over how funds (federal, state, and local) are allocated.

1.2.2 Phase II: Target Area Research

An urban area which was experiencing all of the problem elements defined in the first phase of research was selected. Cleveland, Ohio, was chosen as the target area.

The objective for the second phase of the research was to develop a conceptual foundation for laboratory design based upon actual past and present experiences in transportation planning of federal, state, and local authorities and local citizens and interest groups. In-depth interviews were

conducted with a diverse cross-section of people involved in transportation decision processes in the Cleveland SMSA. The results of these interviews were analyzed, and a qualitative model of the transportation planning process was established. At the same time, a data base was constructed which detailed the characteristics of population, jobs, housing, transportation, labor force, land use, and municipal budgets over a ten-year period in the Cleveland area.

This research, in combination with the products of the first phase, was used to establish the general design for the laboratory. It was decided that the laboratory process would incorporate all of the four major transportation planning problem elements, and that actual experiences in Cleveland would be used as starting points for the development of laboratory materials. It was also decided that in order to capture the complexities and dynamics of an urban system it would be necessary to build a computer model -- again using actual Cleveland data as a starting point.

1.2.3 Phase III: Urban Model Selection

Analysis of the Cleveland data and specification of the laboratory design and objectives led to the conclusions that:

(1) The computer model should be able to represent, reasonably, the characteristics of typical communities in an urban area;

(2) The model should be dynamic, i.e., show how the communities change over time;

(3) The model should be a representation of how actors within the area behave rather than a statistical analysis of trends; and

(4) The model should be able to be used not only as a device for "testing" the impacts of alternative development policies or strategies but also as a forecasting tool.

The only type of model which can satisfy all of these criteria is a simulation model. A search for, and analysis of, existing urban or area simulation models resulted in the decision by ADS to modify the King Charles County (KCC) model. It had been developed by ADS for similar purposes under a contract with the Office of Economic Opportunity, and it seemed appropriate to use it as a foundation for the laboratory model. The KCC model, however, was a simulation of a rural county in the Delmarva Peninsula; it quickly became apparent that the complexity of the urban model required for the laboratory far exceeded the capabilities of the KCC model. One reason for this was the necessity to simulate the central city and at least one community in each of the suburban rings (inner and outer) which typically surround a large city.

The third phase of research resulted in a general specification for the urban model -- a model which had to be built from "scratch". The model would simulate a city and each of its suburban rings year-by-year for up to ten years. It would model, as actors, the behavior of family heads (who move, own or rent housing, migrate, work, buy, and have children), family members (who work or attend school), businesses (which employ people, expand, contract, move, and migrate), builders (who construct housing units), and governments (which spend money, tax, and provide services).

The model would also have to keep track of land use and commuter flows into an area. All of these operations would have to be done for each of the communities, taking into consideration "flows" between communities and interaction with the rest of the world. In addition, the impacts on any or all of the communities caused by constructing new transportation facilities would have to be assessed in terms of the behavior of each of the key actors.

1.2.4 Phase IV: Data Collection

Once the simulation model was specified, the major research task was the collection and analysis of data which described the characteristics of the three specific communities (city, inner suburb, outer suburb) and the factors which each actor (e.g., household head, business) considers when making a decision to change residence, plant location, job, etc.

Data was collected from over thirty secondary sources. Starting with data about Cleveland, a composite city was constructed. Data from studies about Boston, Washington, Baltimore, Pittsburg, Detroit, Chicago, and Philadelphia were used to "build" the city of New Sheffield and its suburbs Willow Park and The Hill.

Major problems occurred during this phase of the research. Available data was either not detailed enough or too detailed. Each source had its own way of expressing basic urban data, thus making it extremely difficult to combine them in one data bank. Organizations which generate urban data tend to develop a set of specialized (micro) information (e.g., forecasts of new housing starts by cost and location of units) based upon macro information (e.g., area population forecasts) which they also develop. This macro information is seldom in agreement with that from any other organization. The micro information is, therefore, suspect and incomparable. This was found to be true even for "state" data, i.e., data describing the characteristics of the area today.

The data base developed during the fourth phase of the research effort was used as input to the computer model. It also provided initial settings for the many parameters of the model which express the behavioral factors of the urban actors.

1.2.5 Phase V: Transportation Systems Impacts

In order to test the impacts of alternative transportation systems upon the communities in the simulated urban area, it was necessary to conduct research at two levels. The first level was directed at determining the direct impacts of transportation systems. For example, it was necessary to determine the cost per lane-mile of an interstate highway running through variously densely populated areas. Other direct impacts such as land used, houses demolished, businesses displaced, and jobs provided also had to be assessed. The second level was oriented toward estimating the effects of new systems upon such factors as mobility, attractiveness of communities to industry, and environmental quality.

For this phase of the research, recent studies of highway and transit system costs and impacts were complemented by assistance from experts in the transportation field. Federal Highway Administration, Urban Mass Transportation Administration, the Office of Environment and Urban Systems, and other Department of Transportation organizations provided data and judgments to the project team.

1.2.6 Phase VI: Local Opinions on Urban Transportation

To provide information about the feelings of local citizens, planners, and decision-makers toward transportation systems, over thirty hours of in-depth interviews were taped. A public hearing on a proposed highway was also taped.

This information was eventually used to provide laboratory participants with a better understanding of the more personal characteristics of the simulated area. The sound track for the 25-minute audio-visual show was taken from these tapes. The overall design of the laboratory and its individual elements was influenced heavily by the comments of the interviewees.

1.3 RESULTS AND RECOMMENDATIONS

Results from the last three sessions of the Transportation Planning Laboratory indicate that the laboratory meets the ojectives set for it. In their laboratory evaluations, participants gave high ratings to the lab and its individual elements.

What happened in the Transportation Planning Laboratories? In general, participants learned:

(1) What type of information is required to plan a system of urban transportation.

(2) How this information can be used (processed) to reinforce the interests of the planner and/or community.

(3) To what degree the organization, process, and politick of planning make a difference to the characteristics of the final decision.

(4) What types of conflict exist among the goals of citizens, communities, and public and private institutions in a metropolitan area.

(5) How these conflicts can be managed so that "do-nothing" situations caused by the inability to act are minimized.

(6) How quantitative and qualitative planning information, the interests, goals and concerns of citizens, and the responsibilities and authorities of public organizations can be integrated into a planning process which is responsive to the social, economic, and environmental needs of an area.

(7) Whether or not a model for transportation planning which is based upon an involvement in the planning and decision-making process by the people affected by the results of the decision makes any sense

of information sharing and negotiation are applicable to complex real-world planning problems.

Although each of the three test sessions was unique in terms of the process by which participants "solved" the planning problem, the learning experiences seemed to be remarkably similar. In general, the participants demonstrated that:

(1) The politics of transportation planning are at least as important as any other element.

(2) Face-to-face negotiation is much more productive in a conflict situation than attack from a distance or through a third party (e.g., the press).

(3) A plan which seems to be good for everyone is not necessarily acceptable to anyone.

(4) Real power lies in the ability to influence or control the allocation of funds; passive participation (i.e., participation without power) in planning exercises exacerbates conflict.

(5) Conflict caused by the perceptions of two groups or individuals for one another may diminish or dissolve when the skills of each are applied (jointly) to the solution of a common problem.

(6) Total decentralization of transportation decision-making, i.e., local control over all funds, may lead toward a chaotic process for planning a metropolitan-wide transportation system.

(7) Public hearings are not perceived as being democratic or participative unless a cross-section of interests have influenced: (a) the proposals presented at the hearing; and (b) actions taken after the hearing.

(8) The long lead time between a transportation plan and actual system construction and the transiency of community leaders make it difficult to predict whether or not the plan will be acceptable at the time of implementation.

(9) Technical planners will develop new and better alternatives if they are not placed in a position of defending their plans, but are asked to share their ideas with the people who will be most affected by their plans.

The outcome of each of the Transportation Planning Laboratories has supported the premises established earlier in this report. However, reinforcement of these premises within the laboratory environment does not guarantee that new concepts will actually be integrated into the urban transportation planning process. Change in the planning process is the only real measure of success for the laboratory.

The learning that leads toward implicit or explicit recognition of alternative concepts for transportation planning processes is based upon awareness of types of information and conflict. In an actual planning situation, the detail and complexities of the problems associated with transportation planning far exceed those which can be included in the simulation.

The learning that occurs in a lab is valuable, but it can lead toward frustration if: a) there is no identifiable reason for the learning, i.e., participants have little or no opportunity to put it to use; and b) there is no additional training available for those who wish to develop the skills required to participate effectively in an on-going planning process.

ADS believes that the Transportation Planning Laboratory is more than a learning experience -- it is a training device oriented toward preparing participants for a role in a new urban transportation planning process. Unlike a course in a university, the measure of success for the lab must be the degree to which participants are able to transfer the concepts learned in the lab to the real world, and the degree to which they are able to develop these concepts as part of an on-going planning process. To achieve this kind of practical application and development: a) the laboratory should be an early, if not initial, step in the development of a process for solving a real problem; and b) the laboratory should be treated as one element of an overall program of training and doing.

Experience with the Boston and Cleveland labs illustrated in one case the need felt by participants to "keep the group together" to work out solutions to existing problems in the city, and in another case a feeling that the lab process was extremely relevant to an existing planning problem but was not allowed to be transferred or developed in the context of that problem.

Participants in every lab have demonstrated a sincere interest in discarding their stereotypes. Highway engineers have gravitated toward the community task forces and have developed a new respect from former adversaries as well as a new perspective on how to work out seemingly unreasonable problems. Activists have discarded their "stop everything" tactics and have engaged in face-to-face negotiation with highway planners. The fact that in each lab the participants were able to work out a transportation plan which at least reinforced some of the major goals of all interests may indicate that this can be done in an actual metropolitan area using a model for planning which starts its development in the no-risk environment of simulation.

ADS recommends to the Department of Transportation that:

(1) The Transportation Planning Laboratory, or some similar technique for developing communication between the established transportation authorities and local citizenry, should be included as the first phase of any major urban transportation planning effort funded by the DOT.

(2) The planning model, or process, suggested in the laboratory should be evaluated to determine if it (not the lab itself) is worthwhile and valuable as a working model for urban transportation planning.

(3) Consideration should be given to developing a general computer-based urban simulation model which can be applied without too much expense in any major metropolitan area in the U.S., and which is flexible enough to evaluate the impacts of new transportation systems on urban areas in the context of the dynamics of these areas.

(4) The development of the Transportation Planning Laboratory should be extended so that a fully "packaged" laboratory (i.e., ADS or DOT staff members are not needed to direct its presentation) can be made available to any organization at a minimum cost.

2.0 INSTRUCTOR'S GUIDE TO THE TRANSPORTATION PLANNING LABORATORY

The Transportation Planning Laboratory is designed with a number of objectives in mind. They include the following:

- Identify approaches to transportation planning which permit individuals with diverse goals and interests to be involved in the process at an early stage.
- Provide a framework in which participants can be exposed to those complexities of transportation planning with which they previously had not had direct contact.
- Provide a problem solving situation in which participants can learn to work with others to evolve and achieve a common set of goals.
- Provide an environment which simulates reality but in which participants can experiment with solutions and approaches to problem solving without real world consequences.

The overall role of the instructor is to use the materials, the design of the laboratory, and his own skill in encouraging the fullest participation of those present, in order to realize the above objectives. This role is best fulfilled under the following conditions:

- When the instructor is thoroughly familiar with all the materials. That is, the instructor should be aware of the details as well as the issues raised in the materials.
- When the instructor facilitates the movement of the laboratory process from one step to the next, but does not impose his own ideas on the participants. On the other hand, the

instructor must constantly be aware of the status of each task forces' efforts in order to help them when a serious problem, or confusion, occurs.

- When the instructor is able, during the first crucial hours, to convey the seriousness, the purpose, and the structure of the laboratory to the participants.
- When the instructor is able to encourage the participants to share their own resources (experience, expertise, personal conviction) in order that the laboratory becomes their own, enriched by information and problems unique to them.

The instructor should also:

- Be flexible within the constraints and structure of the laboratory design.
- Listen
- Keep things moving without being perceived as a driver.

In short, the "instructor" is an administrator a guide, a facilitator, but not a teacher.

Note 1: Although this guide refers to only one instructor, it is likely that there will in fact be two, three, or four instructors. The above guidelines, of course, apply to all of them. The division of instructional responsibilities is flexible. However, the general categories are:

- General instruction
- Task force guidance
- Computer model description and use

Note 2: The laboratory written, audio-visual, and computer-generated materials contain a wealth of information. Many participants, however, will be experts in some field and will find the materials lacking in their field. They should be encouraged to fill the gaps. Other participants will enter the laboratory with pre-dispositions on transportation issues or needs, and will want to generate "their" pet projects. Although creativity should not be discouraged, participants should be urged to read, analyze, and use the information before them before deviating from it. The instructor, of course, must understand precisely what information is in the materials, how each piece fits together in the laboratory design, and what deviations are reasonable.

2.1 ADMINISTRATIVE DETAILS

A key element in the smooth running of the laboratory is proper pre-lab preparation. The following description covers those administrative preparations which must be made in advance. There will, of course, be some modifications depending on the context in which the lab is presented.

2.1.1 Participant Selection and Invitation

This may or may not be the responsibility of the instructor. In any case, the instructor should know as much as possible about the participants (resumes, discussions with sponsoring agency, etc.).

A. The laboratory is currently set up optimally to involve 25 participants.

B. The laboratory is most effective when the participants represent as many local and regional interests directly or indirectly involved or affected by transportation planning. The following breakdown by task-force is designed to suggest an optimal combination of participants. It is, however, only a suggested mix, and contingencies will always occur which will alter it.

. State Department of Transportation Area Coordinating Team

- Highway engineers and/or planners
- Urban mass or rapid transit specialists
- Representatives from federal and state and local decision making agencies (DOT, State Highway Department, City Council, State House of Representatives)
- Regional planning commission representatives (economic development, land use planning, environmental planning)

. New Sheffield Transportation Task Force

- Political leaders (City Council, Mayor's Office)
- Director of city projects (Model Cities, community development corporations)
- Small business representatives
- Citizen leaders
- Union leaders
- Advocate planner
- Housing specialists
- Industry executive
- Large retail outlet representative
- Member of Legal Aid Society
- Architect
- City planner

. Willow Park Transportation Task Force

- Political leaders
- Small businessman
- Housing specialist
- City planner
- Social worker
- Economic development specialist
- Citizen leaders
- Environmentalist/Conservationist

. The Hill Transportation Task Force

- School Board member
- Zoning Board member
- Lawyer
- Professor
- Political leader (Town Council)
- Housewife active in community affairs

C. The invitations should be mailed 4 weeks before the laboratory so that the potential participants will be able to make arrangements for the three day program. Potential participants should understand that it is essential that they plan a full-time commitment to the laboratory.

D. The invitations should be followed-up by a phone call or other communication to insure that all participants are aware of the necessary details.

2.1.2 Facilities

Facilities should be arranged for and checked well in advance. Suggested facilities are:

A. One large comfortable room for general meetings. An adjacent audio-visual control room with rear projection into the main room is very desirable. The general meeting room should have 30 chairs arranged in a semi-circle with the two movie screens completing the circle. There should be plenty of maneuvering room outside the semi-circle as well as a meeting area for the Department of Transportation Area Coordinating Team. Chairs should be comfortable, and windows should have black-out curtains or shades.

B. Three small rooms in the vicinity of the larger one. These are used by the three other task forces. They should be furnished with at least a table and six chairs.

C. The building to be used should be checked (particularly if it is an older one) for at least 30 AMP wiring.

2.1.3 Equipment

There are a number of pieces of equipment required for the laboratory:

A. For use of the SUPER model:

- 2 telephones with outside lines
- 2 computer terminals with send and receive capabilities and acoustic couplers for telephones (teletypes or any of the available portable terminals are acceptable)
- 2 extra roles of print-out paper for the terminals

B. For presentation of the 25-minute A-V show:

- 2 72" movie screens
- 4 Kadak Ektographic or Carousel 850 slide projectors
- 1 Montage Audio-Mate Stereo Cassette Recorder/Programmer, or Wollensak Model 2550 Cassette Recorder
- 2 MacKenzie Model AD-2 dissolve units, or their equivalent
- 1 "Y" cord for connecting from the programmer output of the cassette recorder to each of the dissolve units
- 1 8 Ohm auxiliary speaker with appropriate connectors and adaptors for hooking up to the tape recorder
- 2 4-outlet junction boxes on 50 ft. extension cords
- 10 three-prong to two-prong electrical outlet adaptors

C. For presentation of the 10-minute tapes on each of the three communities:

- 3 Cassette playback machines (e.g., the SONY Cassette-corder Model TC-60)

D. For presentation of transparencies or the area maps:

- 2 overhead transparency projectors

E. For general use by task forces in their presentations:

- 4 flip-chart pads 27" x 34"
- 4 easels for the pads
- 6 Magic Markers

F. Miscellany

- 1 role of masking tape
- 2 roles of Scotch tape
- 24 6" x 8" index cards
- 40 8½" x 11" note pads
- 6 assorted colors of vu-graph marking pens
- 2 Lobby signs
- 100 name tags
- 2 pairs of scissors
- 1 stapler
- 1 slide rule (optional)
- 1 calculator (optional)

2.1.4 Audio-Visual and Written Materials

A separate description of the appropriate use and distribution of materials is included in the relevant sections of this guide. Included in the required materials are:

A. 30-35 laboratory notebooks including a complete one for each instructor.

B. Vu-graph versions of all maps

1. Area
2. Area with existing major highway system
3. Area with land use patterns
4. Area with land use patterns and existing major highway system
5. Area with proposed transportation projects
6. Area with proposed transportation projects and existing major highways
7. Area with proposed transportation projects and existing major highways and land use patterns

C. 4 slide trays and cassette for 25-minute audio-visual presentation

D. 3 cassettes for 10 minute area descriptions

Appendix C is a list of written materials as they appear in a complete participants notebook. Handouts are identified by asterisks (*).

2.2 THE LABORATORY PROCESS

Appendix A contains a chart showing the various elements of the laboratory process, including estimates of the amount of time which should be spent on each element. This section describes the process and provides suggestions to the instructor.

2.2.1 Introduction

The introductory remarks made by the instructor should be brief and pointed. The following items may be included:

A. A General Description of the Laboratory Structure

1. The Transportation Planning Laboratory is a three day session of intense and concentrated learning about a hypothetical metropolitan area, examination of various transportation options, and negotiation to achieve ratification of the combination of options which most effectively realizes the goals of all four of the participating task forces.
2. The context of the three day session is a simulation of reality compressed into three days. The simulation is divided into three phases:
   a. Phase One of the simulation is the creation of the operational structure for the participants and the characteristics of communities they will live in for three days. All participants are divided into four task forces: one from each of the three simulated communities, and one representing the State Department of Transportation.

Each has power as well as constraints. During Phase One, the task forces will learn through audio-visual, written, and computer-generated material the basic facts about the simulated metropolitan area. The participants will be expected to pick up clues from the materials and add texture, feeling, reality, and a sense of pride and future to the simulation. It is during this phase that the overall goals for each community are established. These goals are expressed in terms which facilitate the evaluation of new transportation systems.

b. Phase Two of the simulation focuses on the translation of Phase One learning into action and decision-making on a single transportation project. The task forces will develop a method for examining and evaluating the need for, design, and routing of a crosstown expressway which links the central city with its outer suburbs. That method will serve as a model for what should or should not be done in a more complex situation. By the end of Phase Two, the dynamic of the simulation should be well on its way to belonging to the participants.

c. Phase Three is the application of the accumulated experience of Phases One and Two to the decision on which

combination of seven proposed transportation options best reinforces the stated task force goals, can be achieved within given constraints, and is acceptable to all task forces.

In Phase Two, each task force decides whether or not a single transportation project is acceptable to it. To make this "go-no-go" decision, the task force probably will evaluate the project against a set of criteria and accept it if it looks "good enough" on some or all criteria.

In Phase Three, however, the problem is considerably more complex. The task force must decide the "best" portfolio of projects, the second best, third best, and so on ... and the total cost of each portfolio must fall within the imposed financial constraints. They must then negotiate with the other task forces who have also developed a priority list of projects. From a community task force point-of-view, the objective of this negotiation is to arrive at a portfolio of projects (transportation system) for the entire metropolitan area which comes closest to the community's first choice. The State DOT, of course, wants this final system to be the "best" for the whole area. The conflict becomes apparent quickly.

B. A Very General Description of the New Sheffield Metropolitan Area:

1. It is an area of about 2 million people
2. It is faced with a transportation crisis in the inner-city, and in the east-west, north-south travel corridors; public transportation is minimal.
3. New Sheffield is the center city (730,000 people)

4. Willow Park (39,000 people) is an inner suburb contiguous to the city and represents the entire inner suburban ring around the city.
5. The Hill (35,000 people) is an outer suburb and represents the outer ring of suburbs.

Note 3: The maps with "existing highway system" and "land use" are aids for the introductory remarks.

C. Encouragement to Use the Resources Available Including:
   1. People
   2. Materials
   3. Computer (see the special section on the computer model)

The tenor of these remarks should be conversational, not a lecture.

Following the introduction, the instructor asks each participant to give his name, what resource (i.e., profession, interest, point of view) he brings to the laboratory, and what expectation he would like to see filled by the end of the laboratory. The instructor should start this process by providing his own information to the group.

The introduction of the participants should be handled as informally and as relaxed as possible; many of the participants are meeting for the first time and may not be willing to share too much too quickly.

Note 4: The instructor should remind the participants that they can expect frustration to occur frequently throughout the three days (sources of frustration: incomplete

information, unresolved conflict, inability to get point-of-view across). However, every period of learning is preceded by a period of frustration.

2.2.2 Audio-Visual Presentation

The audio-visual presentation is a 25 minute, two screen slide show with an automatically synchronized sound track. It is to be shown following the introductory discussions.

The purpose of the A-V presentation is to set the general scene for the simulation. It presents and highlights some of the issues associated with transportation planning and construction in an urban area.

A brief discussion should be held following the presentation. This discussion is intended to elicit reactions and share points of view on the issues which were introduced during the A-V show. Each participant should be encouraged to share his thoughts with the rest of the group.

During the interchange, the participants become more aware of each others concerns, prejudices and so on.

Note 5: The instructor should attempt to keep the discussion on the issues raised (or not raised) in the show -- rather than a critique of technique, quality, etc. The instructor should, however, be sensitive to the implicit substance or revealing nature of critical comments.

Note 6: The A-V equipment should be removed (except for the screens) while the group is at lunch.

2.2.3 Task Force Selection

The selection of task force members is the last activity in which the instructor plays a primary role. From this point on, the instructor will provide guidance only when necessary. (The exception to this is the discussion of computer modelling which takes place after the six transportation projects have been introduced.)

There are four task forces:

1) State Department of Transportation Area Coordinating Team (5-6 members)
2) New Sheffield Transportation Task Force (6-8 members)
3) Willow Park Transportation Task Force (4-6 members)
4) The Hill Transportation Task Force (4-6 members)

A description of each task force's responsibility is included in the participants' notebooks. Naturally, the character of the task forces is totally dependent upon the type of participants. The assignments should be made with the following criteria in mind:

> The State DOT force should have, if possible, a professional highway planner with experience in public hearings, a mass or rapid transit specialist, a representative from the Federal Department of Transportation, and a regional economist. The DOT task force can assume a great deal of responsibility during the laboratory; this will allow the instructor to interfere even less with the process. However, it is extremely important that he carefully ascertain the extent to which the DOT task force is able to assume the responsibilities of

successfully presenting the six transportation projects, and of establishing a structure within the laboratory.

- The three community task forces should have as many members as possible who in fact live in communities similar to those in the simulated area. In addition, the wider the diversity of interests on each task force, the more realistically the community will be represented.

The following information helps to indicate to the instructor what the appropriate task force assignments might be:

- Information available on participants prior to the laboratory.
- Comments made during the introductory session, and after the A-V presentation.
- Requests by participants for specific assignments.

Note 7: The instructor should not be unwilling to respond to requests for specific assignments, provided he is able to maintain a balance in size and type of representation on each task force. The State DOT team must, however, have a sufficient number of experts.

By the end of the discussion on the A-V, the assignments should be ready and read to the group, with the comment that from that point on they will all be "living" in the New Sheffield Metropolitan Area. The task forces will then adjourn to their respective meeting areas to begin the process of creating and organizing a "team". This is an awkward process initially, and the instructor can point out certain things around which they might orient their discussions.

- What areas of expertise/interest/experience are represented on the team?
- Should they elect a temporary chairman right away?
- How should they organize?
- What power/responsibilities does the team have?
- What power/responsibilities do the other teams have?

Note 8: The State DOT team and the New Sheffield task force will have the most complicated number of issues, so perhaps special attention may be in order if they are having difficulty getting organized. The State DOT team should be encouraged to think of its powers and responsibilities in light of the technical assistance role that is implied in the task force descriptions.

Note 9: Each team should read the task force descriptions before attempting to organize.

2.2.4 Role Descriptions

There are three personal role descriptions which have been written for each task force. The descriptions provide additional information about the people and responsibilities which the task force members represent. In addition, some of the issues which the task force might consider are highlighted.

However, the use of the role descriptions is entirely optional. The instructor may feel that sufficient variety is already present, and the role descriptions are unnecessary. If they are used, the instructor can decide whether to suggest that the roles be adhered to throughout the laboratory or that they can be considered simply as an additional resource, or source of information.

The objective of the role descriptions is merely to provide the task forces with a tool for generating certain points of view, and stimulating opinions, if necessary.

2.2.5 Dissemination of Descriptive Materials and Analysis of Each Community

The materials to be distributed at this time are:

- A 10-minute "man-on-the-street" audiotape of comments about each area.
- Written descriptions of the area socio-economic trends with an emphasis on the last 10 years -- "Historical Trends".
- "Do-Nothing" 10 year forecasts of quantifiable area descriptors.

Note 10: These materials should already have been placed in the team rooms before the lab started. Each task force receives information only on its own area -- except for the DOT team which receives all information and which retains any extra materials which will be given out upon request.

The objective of these materials is to permit the task forces to clearly understand the characteristics of their communities, and begin to establish their needs and priorities by which to measure transportation options.

At this point, the instructor should strongly suggest a reading period of about 45 minutes so that all the information can be absorbed. The participants should also be encouraged to contribute their own ideas to build upon the basic information which they are provided.

The task forces should be reminded that the first task they will have to perform is a presentation on their

area to the other task forces. The suggested content for this presentation appears in their notebooks; task forces should be encouraged to use whatever methods/ resources they want to to formulate their presentations.

2.2.6 Presentation on Each Area by its Task Force

At the designated time, all teams should reconvene in the main room at the request of the DOT task force. Rationale: Since the State DOT is a newly formed organization, it has a desire to hear about those issues which are of primary concern to the communities.

Each task force has a guide line sheet to help in the preparation of the presentation. The objectives for this session are to:

- Share information
- Give each task force an opportunity to state publicly what it has learned about itself and the priorities it represents. In the process of exposing themselves as identifiable entities, the task forces will establish the basis of their positions in all subsequent interactions.
- Gain an insight into each task force's position relative to the others.

2.2.7 Presentation of Initial Transportation Decision Problem

At the end of the area presentations, the State DOT Area Coordinating Team should introduce the Crosstown Expressway route which is to be the subject of a hearing later in the laboratory. In order to present the Crosstown issue, the instructor should inform the DOT task force of the following points, in addition to the written description of the project:

1) The Crosstown Expressway is part of the old Department of Public Works' Highway Master Plan for the Area.
2) It does fill a very critical need for additional access to New Sheffield in the east-west corridor.
3) The proposed route is one of three which were considered after the corridor hearing had been held.

The three alternatives were:

. Widening Route 124. This alternative was rejected because of the massive disruption of well-established commercial strip development all along the route.
. An elevated route (due to geological factors) swinging south of the park in Willow Park. This route was also rejected on the basis that the cost of an elevated structure was too high in terms of dollars, disruption of commercial and residential establishments, and visual pollution.
. The route going through the park. This route was deemed the most satisfactory because the right-of-way costs were not a consideration and there would be no commercial, industrial or residential displacement in the park section of the highway. It was intended that every effort be made to design the highway to create a minimum of negative impacts on the beauty of the park itself.

The new State Department of Transportation has decided to procede with the second hearing on the Crosstown Expressway even while it is reviewing the old highway master plan,

with the intention of developing a new plan which includes other modes of transportation.

The objectives for requesting resolution on a single highway with no knowledge of the rest of the transportation master plan are:

1) To illustrate the inherent difficulty in trying to resolve such a problem in a vacuum of information and with little or no prior involvement by the community in the decision-making process.
2) To introduce the task forces to the realities of decision-making problems that exist when all communities are directly affected and resolution requires consensus among them all.

Following the presentation of the Crosstown Expressway, the task forces will receive a copy of the Crosstown project description as well as the impact report for their areas. They should then adjourn to their meeting rooms to discuss the problem.

2.2.8 Final Preparation for Crosstown Expressway Hearing

Task forces should be finishing up whatever negotiations -- inter and intra team -- are necessary and be prepared for the hearing.

The instructor should attempt not to influence the results of the negotiation. Each communiy task force will be called upon to state its position on the road. Any one task force can veto the entire project. The road is funded 50% federal money and 50% state. The State DOT team should be prepared to offer expert supportive testimony at the hearing, and to entertain responses from the local communities.

2.2.9 Hearing

The hearing should be conducted by the State DOT task force as though it were a design hearing. (The

experience of a highway planner is very useful at this point.) The spokesman for the DOT task force should present the reasons for the hearing, the routing of the expressway, and the call for collaborating testimony from the experts on his staff.

Following the presentation, the DOT spokesman should call on the chairman of each community task force to enter the opinion of his task force. The chairman should either accept the Crosstown Expressway as proposed, or present clearly stated reasons for the task force's opposition to the State DOT's proposal.

2.2.10 Analysis of Hearing

The instructor should conduct a discussion on the outcome of the hearing.

- Why did resolution/no resolution occur?
- How did it happen?
- What were the crucial issues raised during preparation for and against the hearing itself?

Note 11: In all sessions of the laboratory conducted by ADS, the State DOT task force has cancelled the hearing. Instead, they held a pre-hearing meeting and determined that a negative consensus existed on the part of the community task forces. Most of the objectives for presenting the single problem had been accomplished. It was therefore felt that the hearing was unnecessary.

2.2.11 Presentation of Proposed Projects for Incorporation Into Area Transportation Master Plan

The six transportation projects which are presented to the communities for their evaluation are the State DOT's best effort to fill regional needs. They are being made available as early as possible to the transportation task

forces, in keeping with Governor's intention to promote community involvement at an early stage of the planning process.

The alternative projects should be considered as representative of the kinds of facilities which respond to travel needs in the east-west and north-south corridors, and to intra-city mobility needs. The objective is to define a master transportation plan for the metropolitan area which can be submitted as part of the comprehensive plan.

Note 12: In order for the DOT task force to prepare for the presentation of the transportation projects, they should be given project descriptions #1-6, their respective impact reports, and maps before the hearing on the Cross-town Expressway.

2.2.12 Introduction to Urban Simulation Models

The SUPER model is available to participants who wish to use it to help evaluate:

1) The impact, versus "do-nothing", of combinations of transportation projects upon their communities, i.e., the benefits and costs of various financially feasible portfolios of transportation projects; and
2) Similar information for the other communities and the metropolitan area as a whole.

This information should help the participants to develop strategies for their negotiations with other task forces.

This element of the laboratory is intended to:

1) Introduce the participants to the concepts of forecasting the future demographic, economic,

and physical characteristics of an urban area by simulating the behavior of people and institutions within and outside the area;

2) Illustrate that it is possible to analyze the effect of new transportation systems upon an area by defining the functions that the system will perform and the impact it will have on the variables which describe the urban system in the general model;

3) Identify the problems with models of the past, the state-of-the-art today, what to look for in a model (i.e., how to protect yourself against fake claims), and what to expect in the future; and

4) Explain what kind of model SUPER is and how it can be helpful within the laboratory.

Because written materials have not yet been developed for this element, the presentation requires a person familiar with urban simulation models and, specifically, one who understands SUPER.

An outline of the points that should be covered follows.

OUTLINE FOR DISCUSSION OF URBAN SIMULATION COMPUTER MODELS

I. Introduction -- The Need

A. There are so many factors, combinations, and complex interactions in an urban environment, that forecasting and analysis is very difficult.

B. Specialized models for current problems do not meet needs for tomorrow's problems.

C. Therefore, what is needed is a more generalized model of an urban area which can:

1. Take advantage of current information on the area
2. Analyze new problems as they arise

II. First generation models were designed to analyze specific problems. Among their drawbacks were:

A. They treated a narrow problem range

B. They were developed on an inadequate theory base

C. Detailed data was unavailable

D. Computers were too small and too slow

III. Second generation (current) urban simulation models: The General Model

A. The most important aspect is the understanding and analysis of flows within an urban system, e.g. people, industry, jobs, housing, etc.

B. An example of one type of flow: People

1. People move
2. Factors -- age, income, skill, etc. of family head
3. Where to move to depends on housing supply, price, job vocation, taxes, schools, attractiveness of area, etc.
4. These depend on business decisions, builder's activities, voters' behavior (taxes), etc.
5. Eventually develop understanding of why people of each type move, to where, and under what conditions -- i.e., develop a model of movers.

C. Do this for all aspects of system that make a difference to how it behaves

D. Glue pieces together and you have a general model

IV. Use of second generation models: Adaptation to specific problem areas.

A. Add special inputs, outputs, etc. to general model which relate to special problem area, for example:

Transportation	Politics
Housing	Welfare
Taxation	Banking

V. The Future -- Third generation models (next 5-10 years)

A. Perfect second generation models

B. More federal sponsorship

C. More private industry involvement

D. Local communities

VI. What to know about a model before relying on it. You should demand:

A. Testability: i.e., does the model behave reliably against actual historical data

B. Theory: does the structure make good sense

C. Utility: is output relevant to decisions

D. Learning: can you gain new insights as you use the model

E. Cost effectiveness -- cost vs. benefit

F. Accessibility: is it easy to use

VII. "SUPER" -- Computer model is learning tool in laboratory.

A. Represents a second generation-type of model with adaptation for testing transportation decisions

B. Could be used for other policy testing as well

C. Is a model of New Sheffield Metropolitan Area (hypothetical area). The data reflects relationships from some actual metropolitan areas

D. Its use in the laboratory is to test the relative impact of alternatives available but decisions should not rely solely on the model output.

Note 13: After the general presentation of the projects and computer model have been made, the task forces reconvene in their meeting rooms. The DOT task force should go to each of the communities, and hand out the descriptions of the projects, the impact ("Do-something" reports) and the Project Summary sheet. Care should be taken to clarify the power of each task force in terms of veto and use of funds.

Note 14: The instructor should encourage the task forces to spend sufficient time reading the materials so that they are fully aware of the contents.

2.2.13 In Basket Items ("Bulletins")

There are four additional pieces of information for the participants, which should affect the negotiation process.

1. Revenue Sharing Announcement. (Bulletin: State Department of Transportation Area Coordinating Team) This bulletin should be distributed immediately following the projects presentation. Its objective is to focus on new constraints and power bases for each of the task forces. The DOT task force will have to re-evaluate its position; the individual communities will have to look very carefully at the funds available to them, and to use other resources, including DOT, to help them in the allocation of those funds.
2. New Sheffield CBD Revitalization Bulletin
   This "bulletin" is the basis for Project #7. Project #7 describes that portion of the CBD Revitalization Program which requires the

"go-ahead" recommendation from the New Sheffield task force because it calls for a substantial portion of the city's transportation revenue sharing funds. Project #7 should be accompanied by the impact report, and "The Revised Project Summary". The objective of this bulletin is to focus on those non-transportation issues which face New Sheffield. It gives the task force the choice of concentrating on inner city problems rather than supporting some of the other projects. It should have an effect on the negotiating position taken by New Sheffield.

3. Willow Park Bulletin

   This bulletin focuses on Willow Park's need for expanding its economic and tax bases. The industrial park is an added motivation for Willow Park to support I-400 (beltway). The bulletin should be accompanied by the "Project 4 Impact Report Revised".

4. The Hill Bulletin

   This bulletin focuses on zoning issues which are key to the preservation of The Hill as a series of high income residential neighborhoods.

Note 15: The instructor should be aware of the progress being made within each task force to develop positions on Projects #1-6. He will then be able to decide when the bulletins would be most useful to the task forces.

Note 16: The bulletins (except Revenue Sharing) should be distributed only to the task force they most directly affect. The task forces can then make their contents

known when they feel it appropriate. The instructor should, however, tell each task force that the information will have to be made public at least two hours before the master plan hearing.

2.2.14 General Ratification Process for Final Plan

The characteristics of the last phase of the simulation are entirely dependent upon the pecularities of each laboratory.

The only active role played by the instructor is to remind the DOT task force of the time constraint on resolution. It is up to that task force to call the final hearing and oversee the final resolution. The measure of success of that resolution revolves around the task forces' ability (including DOT) to maximize the realization of their own priorities through compromise and cooperation with one another.

2.2.15 Wrap-Up Session

The wrap-up session is perhaps the most important phase of the laboratory. It is a general meeting following the presentation and ratification of the final plan. The objectives of the wrap-up are to:

- Share overall comments on the laboratory.
- Discuss the process by which compromise was (was not) reached.
- Identify each participant's original expectation for the three days and the degree to which that objective or others were fulfilled during the lab.
- Relate the process and the issues raised to the real world planning problems.

The instructor can stimulate this discussion process by giving some of his own observations, and how his expectations were filled or not filled. If the laboratory has met most of its objectives, the discussion will be lively. The instructor should make an effort to link some of the participants' remarks during the introductory session to what is being said during the wrap-up.

After about 30-45 minutes, however, the instructor should direct (if this hasn't occurred already) the conversation to the specific problems of the local area. If there is anyone present who might have some information of particular interest to the group -- he should be encouraged to share it.

This session can be as open-ended as appropriate.

Appendix A

LABORATORY PROCESS

LABORATORY PROCESS

ELEMENT	RELEVANT MATERIALS & EQUIPMENT	WHERE	PRIMARY RESPONSIBILITY	APPROXIMATE TIME
Introduction	. Notebooks (On Chairs) . Overhead Projectors . Map Vu-graphs	General Meeting Room	Instructor	45 min.
Audio-Visual Presentation	. 4 Slide Trays . 25 min. Cassette . 2 Screens . Cassette Player/ Programmer . 2 Dissolve Units	General Meeting Room	Instructor	30 min.
Audio-Visual Discussion		General Meeting Room	Instructor	45 min.
Task Force Assignment		General Meeting Room	Instructor	20 min.
Task Forces Form "TEAM" and Elect Spokesman	. Task Force Descriptions * Personal Role Descriptions . Cassette Player . 10 min. Cassettes * Area Historical Trends * Do-Nothing Reports	Task Force Meeting Rooms	Task Forces and Instructor	90 min.
Reading Period		Task Force Rooms	Task Forces	45 min.
Discussion of Materials & Preparation of Area Presentation	. Area Priorities Guideline Sheet . Flip Charts	Task Force Rooms	Task Forces	120 min.
Presentation on Communities	. Flip Charts . Map Vu-graphs	General Meeting Room	State DOT Task Force	45 min.

* Indicates written materials which are disseminated by the instructor or the State DOT Task Force

LABORATORY PROCESS
(continued)

ELEMENT	RELEVANT MATERIALS & EQUIPMENT	WHERE	PRIMARY RESPONSIBILITY	APPROXIMATE TIME
Presentation of Crosstown Expressway Problem	* Map Vu-graphs (with route) * Project Description #2 * Do-Something Report #2	General Meeting Room	State DOT Task Force	30 min.
Discussion of Problem	. State DOT Task Force Distributes above Materials	Task Force Rooms	Task Forces	60 min.
Preparation for Hearing	. Hearing Guideline Sheet	Task Force Rooms	Task Forces	120 min.
Hearing	. Flip Charts . Map Vu-graphs	General Meeting Room	State DOT Task Force	60 min.
Analysis of Hearing		General Meeting Room	Instructor	45 min.
Presentation of 6 Proposed Projects	* Project Descriptions #1-6 * Do-Something Reports #1-6 * Maps with Routing of Projects . Map Vu-graphs	General Meeting Room	State DOT Task Force	30 min.
Discussion on Urban Simulation Models		General Meeting Room	State DOT Task Force/ Instructor	45 min.
In-Basket Item	* Revenue Sharing Bulletin	General Meeting Room	Instructor	15 min.

* Indicates written materials which are disseminated by the instructor or the State DOT Task Force

LABORATORY PROCESS
(continued)

ELEMENT	RELEVANT MATERIALS & EQUIPMENT	WHERE	PRIMARY RESPONSIBILITY	APPROXIMATE TIME
Distribution of Project Descriptions & Impact (Do-Something) Reports	. Master Plan Hearing Guideline Sheet * Project Descriptions #1-6 * Do-Something Reports #1-6 * Maps with Routing of Projects * Project Summary	Task Force Rooms	State DOT Task Force	30 min.
Reading Period		Task Force Rooms	Task Forces	60 min.
Discussion and Analysis of Projects	. Everything -- Including On-line Use of Computer Model	Task Force Rooms	Task Forces	120 min.
Inter-Task Force Negotiations	. Everything	Everywhere	Task Forces	180 min.
Other In-Basket Items	* New Sheffield Bulletin * Project Description #7 * Do-Something Report #7 * Revised Project Summary * Willow Park Bulletin * Revised Do-Something Report #4 * The Hill Bulletin	Task Force Rooms	Instructor	During Negotiations
Presentation of Negotiated Alternative(s)	. Flip Charts . Map Vu-graphs . Computer output	General Meeting Room	State DOT Task Force	30 min.
Ratification of Area Master Plan	. Map Vu-graphs	General Meeting Room	State DOT Task Force	30 min.
Wrap-Up		General Meeting Room	Instructor	90 min.

* Indicates written materials which are disseminated by the instructor or the State DOT Task Force

Appendix B

SAMPLE LABORATORY AGENDA

TRANSPORTATION PLANNING LABORATORY

Wednesday, August 18

MORNING

8:00 a.m.	Introduction to Laboratory
	. Introduction of Instructors and Participants . Explanation of Process . Expectations
9:15 a.m.	Audio-Visual Presentation of Transportation Problems
9:45 a.m.	Discussion of Issues Presented in Audio-Visual Presentation
10·45 a.m.	Task Force Selections
	. New Sheffield Task Force . Willow Park Task Force . The Hill Task Force . State DOT Area Coordinating Team
12:00 noon	Lunch

AFTERNOON

1:15 p.m.	Dissemination of Descriptive Materials to Task Forces
	. Audio Tapes . Area Trends . Do-Nothing Reports
1:45 p.m.	Reading Period
2:30 p.m.	Analysis of the Simulated Areas by Task Forces
	. Problem Identification . Priority Setting . Environmental Statement . Spokesman Selection

3:45 p.m. Presentation on Each Area by its Task Force

- Environmental Report
- Problems
- Assets

4:45 p.m. Presentation of Initial Transportation Decision Problem

TRANSPORTATION PLANNING LABORATORY

Thursday, August 19

MORNING

8:00 a.m.	Preparation for Hearing on Initial Problem
10:00 a.m.	Hearing
11:15 a.m.	Analysis of the Hearing Process
12:00 noon	Lunch

AFTERNOON

1:15 p.m.	Presentation of Proposed Projects for Incorporation into Area Transportation Master Plan
2:00 p.m.	Introduction to Computer Model
2:25 p.m.	Analysis of Master Plan Problem by Each Task Force

TRANSPORTATION PLANNING LABORATORY

Friday, August 20

MORNING

8:00 a.m.	Final Negotiations among Task Forces
10:30 a.m.	Formal Presentation of Task Force Positions Ratification of an Area Master Plan
12:00 noon	Lunch

AFTERNOON

1:15 p.m.	Analysis of Planning Process and Final Plan
4:00 p.m.	Adjourn

Appendix C

PARTICIPANTS NOTEBOOK

TABLE OF CONTENTS

TRANSPORTATION PLANNING LABORATORY

PARTICIPANTS NOTEBOOK

TABLE OF CONTENTS

* Indicates written material which is handed out by the instructor during the lab.

TAB II — Page #

Appendix D

SAMPLE COMPUTER OUTPUT

NEW SHEFFIELD

Do-Nothing Report

NEW SHEFFIELD

SUMMARY REPORT

YEARS	1970	1972	1975	1980
TOTAL POPULATION	738540	734229	701451	647349
% WHITE	55	54	53	50
% BLACK	45	46	47	50
EXISTING JOBS BY SKILL				
PROFESSIONAL	79774	76247	70995	65889
SKILLED	224050	213798	200788	190050
UNSKILLED	73361	69929	65149	60794
NO. OF JOBS FILLED BY COMMUTERS	180960	165246	165618	161865
UNEMPLOYMENT LEVEL				
% WHITE	4	3	7	11
% BLACK	7	7	14	20
NUMBER OF HOUS. UNITS	232060	236695	236692	236687
*INCLUDED SUBSTD UNITS	38722	40440	43004	47110
PRIMARY SCHOOLS STUDENTS/TEACHER	30	32	31	28
SECONDARY SCHOOLS STUDENTS/TEACHER	32	31	30	27
REVENUE TOTAL	255873	253441	243200	229135
EXPENDITURES TOTAL	255873	269373	269576	259401
DEFICIT	0	15932	26376	30266

NEW SHEFFIELD

POPULATION REPORT

YEARS	1970	1972	1975	1980
TOTAL POPULATION	738940	734229	701451	647349
% WHITE	55	54	53	50
% BLACK	45	46	47	50
NUMBER OF FAMILIES BY INCOME				
$0 -$4000	67857	70785	70776	64072
% WHITE	47	47	46	45
% BLACK	53	53	54	55
$4000-$7000	74097	72986	69127	63014
% WHITE	61	60	58	56
% BLACK	39	40	42	44
$7000 -$10000	56035	53135	49276	44205
% WHITE	66	64	62	59
% BLACK	34	36	38	41
10000+	24705	22735	20015	17039
% WHITE	74	71	67	63
% BLACK	26	29	33	37

NEW SHEFFIELD

JOB STATUS REPORT

YEARS	1970	1972	1975	1980
EXISTING JOBS BY INDUSTRY				
DURABLE MFG	177280	169326	160875	152719
NON-DURABLE MFG	45263	42300	39557	36987
WHOLESALE & RETAIL	64122	63023	60619	57633
SERVICES & CONST	52607	49783	43774	36654
GOVERNMENT	37719	35547	31981	28237
EXISTING JOBS BY SKILL				
PROFESSIONAL	79774	76247	70935	63089
SKILLED	224090	213796	200756	190030
UNSKILLED	73361	69929	63149	57794
JOBS FILLED BY SKILL				
PROFESSIONAL	79774	76247	70995	63089
SKILLED	196657	191553	177841	159493
UNSKILLED	69212	69929	63149	63794
NO. OF JOBS FILLED BY COMMUTERS	180960	165246	165616	161805

NEW SHEFFIELD

LABOR FORCE REPORT

YEARS	1970	1972	1975	1980
WHITES				
LABOR FORCE BY SKILL				
PROFESSIONAL	27343	24033	20187	16167
SKILLED	110056	99635	79226	61138
UNSKILLED	27325	36720	43917	44261
UNEMPLOYMENT BY SKILL				
PROFESSIONAL	2656	1989	1439	611
SKILLED	159	0	0	0
UNSKILLED	3197	3346	9237	13989
BLACKS				
LABOR FORCE BY SKILL				
PROFESSIONAL	7677	8557	9801	9027
SKILLED	98704	95317	99104	91533
UNSKILLED	51227	59616	63058	66137
UNEMPLOYMENT BY SKILL				
PROFESSIONAL	1411	1173	1888	2602
SKILLED	651	591	1924	2965
UNSKILLED	6116	7176	13016	16709
UNEMPLOYMENT LEVEL				
% WHITE	4	3	7	11
% BLACK	7	7	14	20

NEW SHEFFIELD Do-Nothing Report

LAND USE REPORT

YEARS	1970	1972	1975	1980
PERCENT PRIVATE LAND (TAXABLE)	60	60	60	60
RESIDENTIAL	42	42	42	42
(%) DEVELOPED	90	91	91	91
COMMERCIAL	10	10	10	10
(%) DEVELOPED	50	49	49	49
INDUSTRIAL	8	8	8	8
(%) DEVELOPED	88	86	85	85
PERCENT PUBLIC LAND (NON-TAXABLE)	40	40	40	40
PUBLIC BUILDINGS	3	3	3	3
RECREATION, OPEN SPACE	5	5	5	5
TRANSPORTATION	32	32	32	32

NEW SHEFFIELD

HOUSING REPORT

YEARS	1970	1972	1975	1980
NUMBER OF HOUS. UNITS	232060	236695	236692	236687
NO. LOW COST UNITS*	113888	116606	118170	122276
DEMAND	98688	99979	98428	93277
*INCLUDED SUBSID UNITS	38722	40440	43004	47110
NO. MIDDLE COST UNITS	84672	86397	83830	79719
DEMAND	88982	86299	80598	73172
NO. HIGH COST UNITS	33500	34692	34692	34692
DEMAND	34043	33362	29860	25880

NEW SHEFFIELD

EDUCATION REPORT

YEARS	1970	1972	1975	1980
PRIMARY SCHOOLS				
TOTAL ENROLLMENT	83306	82820	79123	73020
STUDENTS/CLASSROOM	27	27	26	24
STUDENTS/TEACHER	30	32	31	28
SECONDARY SCHOOLS				
TOTAL ENROLLMENT	69422	69017	65935	60850
STUDENTS/CLASSROOM	31	31	29	27
STUDENTS/TEACHER	32	31	30	27

NEW SHEFFIELD

FINANCIAL REPORT
(THOUSANDS OF DOLLARS)

YEARS	1970	1972	1975	1980
REVENUE				
FROM STATE GOVT.	56000	55672	53185	49080
FROM FED. GOVT.	16380	16283	15554	14352
PROPERTY TAX	105067	103814	100090	96381
SALES TAX	26161	25713	24732	23514
OTHER REVENUE	52265	51959	49639	45608
TOTAL	255873	253441	243200	229135
TAX RATES				
PROPERTY TAX (/1000)	34	34	34	34
SALES TAX (%)	4	4	4	4
EXPENDITURES				
TRANSPORTATION	18000	17893	17093	15771
HUMAN SERVICES	178756	192709	196337	191817
OTHER	59117	58771	56146	51813
TOTAL	255873	269373	269576	259401
DEFICIT	0	15932	26376	30266

Appendix E

LABORATORY EVALUATION FORM

Name (optional)_____

Team Name _____

LABORATORY EVALUATION FORM

How relevant was this laboratory to you?

Irrelevant				Very Relevant
1	2	3	4	5

To what extent were your ideas or opinions about transportation planning changed during the laboratory?

Very Little Change				Significant Change
1	2	3	4	5

In what way? _____

_____

_____

_____

_____

To what extent do you think the ideas or opinions of other people were changed during the laboratory?

Very Little Change				Significant Change
1	2	3	4	5

In what way? _____

_____

_____

_____

_____

How effective was the audio-visual presentation in providing a setting for the laboratory?

Ineffective				Very Effective
1	2	3	4	5

How successful was audio tape on your community in introducing you to that community?

Unsuccessful				Very Successful
1	2	3	4	5

How would you rate the written materials presented in the laboratory?

Poor				Excellent
1	2	3	4	5

How useful did you find the computer simulation model in the context of the laboratory?

Not Helpful				Very Helpful
1	2	3	4	5

How effective were the negotiation and hearing processes in providing mechanisms for possible compromise without undermining the stated priorities of each community?

Ineffective				Very Effective
1	2	3	4	5

How would you evaluate the manner in which the audio-visual presentations, written materials, computer model, negotiations, and hearings were integrated within the laboratory?

Poor				Excellent
1	2	3	4	5

What purposes do you think the laboratory best serves? What suggestions do you have for improving the overall laboratory process?

Other Comments:

Appendix F

TRANSCRIPT OF 23-MINUTE
AUDIO-VISUAL SHOW

August 2, 1971

Final Version of
23-Minute Sound Track
DOT Audio Visual Show

Speaker	Comment
I. History	- MUSIC -
Narrator	This presentation is designed to stimulate awareness about the complexity of transportation problems especially in urban areas and to provoke discussion concerning the variety of solutions which are available.
Speaker I	We had no system really. That was the period when people were hollering about getting out of the mud. Nearly all the pavements that existed were in the cities. The main street and maybe out of town a mile or two or maybe five miles. The main efforts in 1927 then was to hook up the cities. In fact it was a rural program to join main street pavements from one city to the other.
Speaker II	Mass transportation began to grow in the United States as cities became larger and people needed more rapid means of getting from where they lived to where they worked, and from their homes to other places they wanted and needed to go. The horse car, practically, was the first form of public transportation in American cities. It was replaced by the elctric car, and it, in turn, was replaced by the bus. The automobile, however, quickly attracted a large portion of the regular users of mass transportation and as it did, traffic (on especially passenger transportation) began to decline.
	- MUSIC -
	Probably the traffic peak of public mass transportation occurred in American cities about the time of World War I. After that it declined, having only a temporary recovery during World War II when gasoline was short and people weren't able to make trips or make as many trips in their private conveyances as they had become accustomed

Speaker	Comment
	to do, and as they resumed doing immediately After World War II, as cars began to be manufactured, and gasoline became in good supply.
Speaker I	We had the war, and there was no highway program going on then until about 1946. Then we started out on what we called the ABC program, which was the Act of 1944, which not only included federal aid for the primary system but federal aid for a secondary system and for urban extensions. It was about that time, the cities began to really stack up with traffic. I saw this interstate program as the only opportunity the city is going to have to open up some trunkline type of facilities in the city to start carrying the load into town and out, and a beltline around for the traffic that didn't want to go through town. And I was one of them that pushed very hard for the interstate to go through the city. Now in retrospect, I might not have been too brilliant on that. But anyhow, I still think it was probably the best thing to do.

II. Current Problems

Herbert DeSimone Assistant Secretary of Transportation for Environment and Urban Systems	In every section of our country transportation planners are looking for solutions, solutions to the complex problems which we face -- especially in our urban areas. Some of them have discussed their concerns with us here in the Department of Transportation. And we in the U.S. Department of Transportation are listening and trying to respond. We're looking for solutions which respond to human needs. At the same time, we want to perserve and enhance the quality of our environment. Congress created this Department in 1967 in order to provide a transportation system -- a system with real choices. We don't pretend to have found all the answers. But we're searching.

Speaker	Comment
Speaker III	The problems were fairly typical of the large metropolitan areas of the northeast and one or two outside the northeast such as New Orleans and San Francisco. These are old, very densely settled metropolitan areas. People near the cores of these areas have been buffered about quite a bit in recent decades by urban renewal, other highway projects, and so on. There's a very severe housing crisis and any attempt to drive a new right-of-way through the inner portions of such a metropolitan area involves dislocation of very large numbers of people, and the disruption of fairly old well-integrated neighborhoods.
	- MUSIC -
	Route 128 was constructed about twenty years ago through what was at that time almost entirely open country. And that's the kind of highway that has always been feasible to build without an incredible amount of controversy. And in fact, if one looks at the background of the current highway controversies in the Boston area, I think it's importatnt to recognize that prior to the interstate system, nobody had tried on any significant scale to lay out transportation rights-of-way after areas had been built up. But in New York, Baltimore, Philadelphia, Washington, Boston -- in all of these cities -- there have been terribly intense highway controversies in recent years. The Boston situation is somewhat unusual in that it led to the stopping of a large portion of a regional highway system by a Governor for the first time in the history of the program. It has now led to a re-study which is free not simply to look at the design of the highways but to consider whether the highways ought to be built.
Speaker IV	Maybe a lot of people realize that we just cannot in any way, shape, or form provide all of the highway lanes to satisfy everybody -- and especially in our major metropolitan areas -- who want to drive their cars to work -- as one person per car. You know, even if money was no object, if we had all

Speaker	Comment
	the money in the world, still the social, the political problems of trying to do this are just too great in the major metropolitan areas. We can't handle this type of demand. So, this leads you to believe if we can't do it in the conventional way -- maybe we've got to look for other ways that will handle it.
Speaker V	Basically, I think you've got to have a system that's really compatible with the big system -- that is, with the automobile system. Everything is much more spread out than ever before and continues to get spread out. The effect of this has been to make it uneconomic to serve these very diffused origins and destinations with public transportation.

III. Current Projects

Speaker IV	We had no bus service. We'd approached the local bus operator to see if he would provide non-stop express bus service into Washington, D.C. better than three years ago. He said no, he could not make money at it. He was convinced. We said, "Would you be willing to charter us a bus?" Well, he was very willing to charter us a bus. We started three years ago by chartering one bus. We printed our own tickets, sold them in advance, advertised it, and within three weeks we were making expenses, our charter expenses for running that bus. The bus runs when and where we want it to go. It serves our travel needs.

- MUSIC -

The Shirley Highway is an interstate route starting in northern Virginia into the District of Columbia. The entire highway is being reconstructed so that eventually it will have three lanes in each direction, with two reversible lanes in the center. Why not let the buses use those reversible lanes that have already been built, exclusively? Don't let cars use them. This was done, it was started in September of 1969. In what you might call the peak of the peak period the buses will have about a one half hour time advantage over the automobiles on the line haul portion of the Shirley Highway.

Speaker	Comment
	The New Jersey Department of Transportation, in cooperation with the Federal Department of Transportation, started what is called the exclusive bus lane in the reverse direction. This is on Interstate 495 for a distance of 2½ miles between the New Jersey Turnpike and the Lincoln Tunnel. In essence, what they've done here is terribly overloaded travel corridor -- traffic crawled through. There are close to 600 buses in the peak hour on this facility carrying close to 28,000 people just in those buses alone. What they did is they actually took the lane next to the median and coned it off and ran buses the wrong way on it.
	In Seattle, Washington, the Washington Department of Highways were agreeable to giving buses exclusive use of one of the ramps from a reversible lane, once again on the interstate system, the closest one to the CBD. This gives the buses a very definite time advantage. At the same time, UMTA provided a massive fringe parking lot on the north end of town, and demonstration money to run special bus runs. This thing has been dubbed. It's called the Blue Streak Special.
Speaker VI	We estimated that 76% of the riders on Blue Streak were formerly driving all the way downtown, and we are now intercepting their cars at the parking lot and they are bus riders. Our problem is that within five days after we opened the lot, it was full at 9:00 a.m., and we have since been desperately trying to find additional parking lots, parking facilities, properly located so that we would have enough room for all the cars. Most of the complaints we've had really have been complaints from people who want to use the Blue Streak park-ride operation but can't find a place to park.
	- MUSIC -

Speaker	Comment
Speaker VII	They have here, as you know, the monorail from the downtown business district (over here about three blocks off) to the Seattle World's Fair area, and I have suggested that it is within the realm of possibility, and I think would probably contribute to the movement of people, to extend the monorail or some type of people mover system from the terminus of the monorail over here to perhaps down south a bit and over here under the Alaskan viaduct going out to Seatak Airport.
Speaker VIII	You see a continuation of the growth patterns across the water and thus the necessity for increasing ferry service. As the State continues to subsidize the ferries, as the State continues to treat the ferry system as part of the highway system as they now are, I am quite certain that there will be continued growth and continued usage of the ferries. I foresee the best system to be one of a mix. The kind of mix we have here now with the additional capability of a metro-wide or county-wide capability which we don't have now.

- MUSIC -

IV. Funding Problem

Speaker IX	A very significant question on referenda in most metropolitan areas of the United States -- you are asking the people as a whole to do something which they believe directly benefits only a small minority of the population. If you're asking for a majority of the people to approve a proposition to improve public transportation for the 10-15% of the people who use public transportation, they are likely to say, "let them do it themselves, I can take care of myself."

Speaker	Comment
Speaker X	There has not been very much done. In the last session of Congress, for the first time, adequate funds were made available for public transportation. But this was only after it had deteriorated to a point where it was practically in a total state of collapse. As a matter of fact, in some communities it is in a total state of collapse.
Speaker VIII	The Federal Government has systematically over a period of ten years or more, contributed, in fact made inevitable, the failure of mass transportation in an unsubsidized fashion when the interstate Highway Act was originally passed. If we're going to solve the problem of mass transportation in our metropolitan areas, we're going to have to have the same kind of a commitment, the same kind of an action by Congress and by the President, stating that we are now going to subsidize, preferably on the same 90-10 matching basis, mass transportation.

V. Planning Process

- MUSIC -

Speaker IX	I've watched a growing consciousness of the importance of public transportation among leadership elements in the community. And a growing awareness that something has to be done among the population in general. If you want a better city, you're going to have to do some accepting of compromises. They've been compromised in this program. It's not perfect, but it manages to be a major step forward.

Speaker	Comment
Speaker XI	Having a say doesn't mean that they're going to have the plan, whatever it is, precisely to their liking. But it's absolutely indisputable to my mind that the roads, that the transportation network, the mass transit, will look different (after the citizens have an opportunity to express themselves) from how these same modes of transportation would look without their involvement.
Speaker IX	I think the most inaccurate word we could use to describe this community is apathetic. But, if we say the community is not in a posture poised for action, we would be accurate. The real issue is, is it possible for a community to act in the transportation arena, and how do we make it possible for them to act? You always have to have a group. What happens is that you look for the men who will produce, and the women who will produce, and the blacks who will produce, and the whites who will produce, and let them produce. This is the great lesson I think exists in civic America. How do we harness the great energies and the will and the idealism that is there.
	- MUSIC -
Speaker XII	One of the things that is weak in terms of our planning is that our planners seem to idealize the future. We talk about year 2000 plans. We talk about plans of the future. We have visionary dreams of utopia. So we write these down on the planning board. But our problems are not for the year 2000 or the year 2020, our problems are with us today.
Speaker I	The effective and the successful planner is the guy who knows he can't tear the city down, he can't build his dream city, but that he takes what he's got and uses every opportunity to nudge it along in the right direction.

Speaker	Comment
Speaker IX	My suggestion is that the great value of the pluralistic society is to permit models to be developed. Locally, hopefully. Original, hopefully. Different, absolutely. And then learn from that process. In my judgement, the way out lies in three directions. Direction 1: adequate local funding for transit, not dependent on referenda and not competing with other demands for funds. If you will, an equivalent treatment of public transit to the kind of funding support that highways have received and have grown into what is, with all its faults, a magnificant system in the United States. That's point 1. Point 2, it requires metropolitan area-wide jurisdictional capability in order to operate an efficient system that will take people from where they are to where they want to go. This is a critical capability. The third element is, the development of a land use plan which does not become an impediment to system development but becomes an additional piece of a puzzle that gets put together.
VI. Future	
Speaker X	Transportation has been considered as a means by which people and goods were moved from point to point. Mobility has been the hallmark of transportation in the past. Improving the quality of life should be the hallmark of transportation in the future.
John Hirten Deputy Assistant Secretary of Transportation for Environment and Urban Systems	The quality of life, after all, demands full consideration of community planning goals -- economic opportunity, recreation, jobs, pollution control, preservation of open spaces and, of course, mobility. To achieve our goals of a decent quality of life, we must recognize the implicit relationship between land development and transportation plans. Finally, the form and quality of our life will be dramatically shaped for years to come by the decisions that are made now.

Speaker	Comment
John Volpe Secretary of Transportation	The citizens of our major cities are asking intelligent and important questions about the routes, the designs and purposes of many of our urban freeways. And I have been impressed by the validity of their questions. We've all nibbled at the edges of the problem. We've appraoched it, you might say, piecemeal. We've talked about all modes of transportation, but we've never looked at the system as an integrated entirety. Intermodalism is the heart of a balanced transportation system. But so is safety. So is the preservation of our environment, the preservation of historic sites, and the avoidance of hardships to families and disruption of communities affected by transportation construction. One alternative is to do nothing. And that's an alternative that is adopted, I must admit frankly, all too frequently. We just cannot afford to do nothing. We in the Department of Transportation realize full well that conventional transportation solutions will continue to fall short of meeting the real needs and desires of our cities into the future. I ask only one thing. Each solution must carry with it the authority of merit. And as we look for merit, it is axiomatic in this complex world that we also look for balance.
Speaker XI	The problems are enormous, the solutions exlude us often, but these are still very exciting times for us to be living in.
	- MUSIC -

*U.S. GOVERNMENT PRINTING OFFICE:1972 722-246/478 1-3