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ABSTRACT

This paper provides an overview to the Land Use Decision Making Kit. The Land Use Kit includes 16 audio-tutorial units and a variety of supplementary materials. Each audio-tutorial unit consists of a programmed mix of cassette tapes, guidesheets, visuals, pamphlets, and issue keyed problems. The materials are designed for use by secondary school students, college students, or interested citizens. The topics were selected by consultants, developed by consultants in each topic area, and distributed to secondary schools, colleges, and community centers for trial. A suggested order for the use of the materials is included. (RH)

A SELF-INSTRUCTIONAL APPROACH

To

ENVIRONMENTAL DECISION MAKING

Focus on Land Use*

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INTRODUCTION

"This country is in the midst of a revolution in the way we regulate the use of our land...(there exists) the need to provide... participation in the major decisions that affect the use of our increasingly limited supply of land."

Fred Bosselman and David Callies, In The Quiet Revolution in Land Use Control, 1971.

"Land use is where the action is" has most recently become the motto of planners at all levels of regional, state, and local governments. It is at once both a call to arms and an expression of concern. Citizens are concerned because they are increasingly being forced to acknowledge the real and potential impact of population and technological expansion upon the finite environment. The challenge to multiply, and subdue the earth, which in the past characterized American attitudes toward land use, can no longer be tolerated. There is an urgent need for the formulation of environmentally sensitive land use strategies which accommodate requirements for watersheds, agriculture, recreation, waste disposal, housing, transportation and other cultural needs. Recent public interest in land resource management is part of a growing nationwide concern for the environment of man. Whyte's study of open space usage and preservation (1) and the Rockefeller Task Force documentation of the impact of urban growth on land use and the environment (2) reflect this concern.

Planners agree that there is a need for objective land use decision making on a local and regional basis. In the process, there often arises a need to expose community members to creative educational materials on the land use decision making process. This provides for an environmentally conscious citizenry which can make enlightened decisions concerning state and local land use planning. Recognizing the need for public education in land use decision making, specific sections have been included in Connecticut land use legislation to deal with the

issue. These sections specifically call for the accumulation and dissemination of information for the purpose of providing public land use education at the local level. Based upon an obvious need, E-P Education Services (an environmental education center) developed a Land-Use Decision Making Kit (L.U.K.). The L.U.K. includes 16 audio-tutorial units and a variety of supplemental materials. Each audio-tutorial unit consists of a programmed mix of cassette tapes, guidesheets, visuals, pamphlets, and issue-keyed problems. The completed L.U.K. incorporates basic information, instructional skills and exposure to issues and concepts considered useful to citizens involved in the land use decision making process.

THE INSTRUCTIONAL FORMAT

A basic objective of the L.U.K. Project was to expose adults and secondary students to educational materials concerning the general concepts of land use decision making. The materials have been designed with a flexible instructional format to accommodate the diverse needs, background and time schedule of individuals who make use of the kit. An audio-tutorial systems approach was determined to be the most utilizable mode of instruction.

Audio-tutorial (A-T) systems have been in use for the past 14 years, they are showing signs of increased popularity as an effective educational device (Mintaes, 3). A-T systems provide the individual participant with a well structured multi-media, multi-sensory approach to the learning - teaching process. Specifically, A-T systems prove to be effective for the following reasons (Haakonsen, 4):

1. Instructional goals are clearly stated in behavioral terms so they may be evaluated.

2. The learning environment is structured so that students are exposed to fundamental concepts which can be used in future learning and problem solving.

3. Effective educational media are matched with specific learning events.

4. A-T systems foster a positive attitude toward learning.

5. Provision is made for evaluation which keeps the learner informed of his/her progress.

6. A-T Systems allow for aptitudinal, attitudinal and personality variability among students.

The educational advantages offered by A-T systems are well suited to the L.U.K. Project goals. With A-T Units it is possible to transmit information, discuss issues, solve problems and develop skills.

CONSTRUCTION OF THE AUDIO-TUTORIAL UNITS

Development of the L.U.K. materials followed a systems design. Decision makers in Connecticut's towns (i.e. selectman, planners, and conservationist) were asked to fill out and mail back a questionnaire designed to evaluate the need for community education in land-use decision making. Questionnaire responses were coupled with input from a consultant group consisting of experts in the fields of geography, sociology, economics, geology and ecology. A preliminary list of 30 topics was developed and critically discussed. Sixteen major topics selected for inclusion in the L.U.K. Units were allocated to consultants with expertise in the assigned topic field. Consultants were charged with developing a script outline, a list of objectives and an annotated bibliography. Topic outlines incorporated appropriate media such as visuals, guide sheets and supplementary materials. Each outline was critically reviewed by the collective

consultant group to ensure inclusion of pertinent material and to establish a continuity among the individual units.

Consultants developed scripts incorporating concepts delineated in revised outlines. Completed units were reviewed and revised by a team of editors. After revision the units were produced, packaged and distributed to secondary schools, colleges and selected community centers which had volunteered to test the Kits for effectiveness and utility. Following field testing and revision, the L.U.K. was mass produced. Under the terms of an HEW office of Environmental Education Grant, one free Kit was made available to each town and city in Connecticut.

L.U.K. DESIGN

The L.U.K. is designed as a series of self-contained units. Each unit focuses on a topic which should be considered when making enlightened land use decisions. Care has been taken to provide a basic unit format which provides a continuity to the total land use kit. Each of the units was designed to be self-contained for independent utilization. This permits individuals to select specific topics of interest for study. Specific topics are cross referenced at appropriate points within units. Throughout the units there is a recurrent emphasis on the need to recognize the importance of environmental, cultural, economic and implementation variables which must be considered when making a land use decision.

UNIT OPIENTATION

Figure 1 graphically presents the basic L.U.K. structure. Units are organized into a framework, proceeding from the base to the top of the pyramid. An introductory unit acquaints the user with the organization of the L.U.K. and describes purposes, format and content of each of the units.

Two unit skills, Maps & Map Reading and Aerial Photography, for the pyramid base. Both units contain information and develop requisite skills for objective land use decision making. The units delineate the methods through which a land parcel may be geographically located and topographically defined. These units are action oriented and focus on problem solving.

The second tier of units provide in-depth information on systems typically operative on any land parcel. Each unit includes discussions of key land use issues and problems. For example, Geosystems stresses on-site geology with particular emphasis on soil types and their role in planning. Specific topics treated in this unit include septic system placement, bearing capacity, erosion, and the role of soil maps as a planning tool. Hydrosystems is a companion unit on characteristics of water flow and usage; it examines the associated problems of water quantity and quality.

Biological systems, Inland Wetlands, Coastal Wetlands, and Uplands are introduced in tier three. These units describe the structural and functional dynamics of coastal wetlands, inland wetlands, and upland environments. The importance of these environments and man's impact upon them is described by means of planning and management studies, pertinent laws and regulations,

LAND USE DECISION MAKING KIT

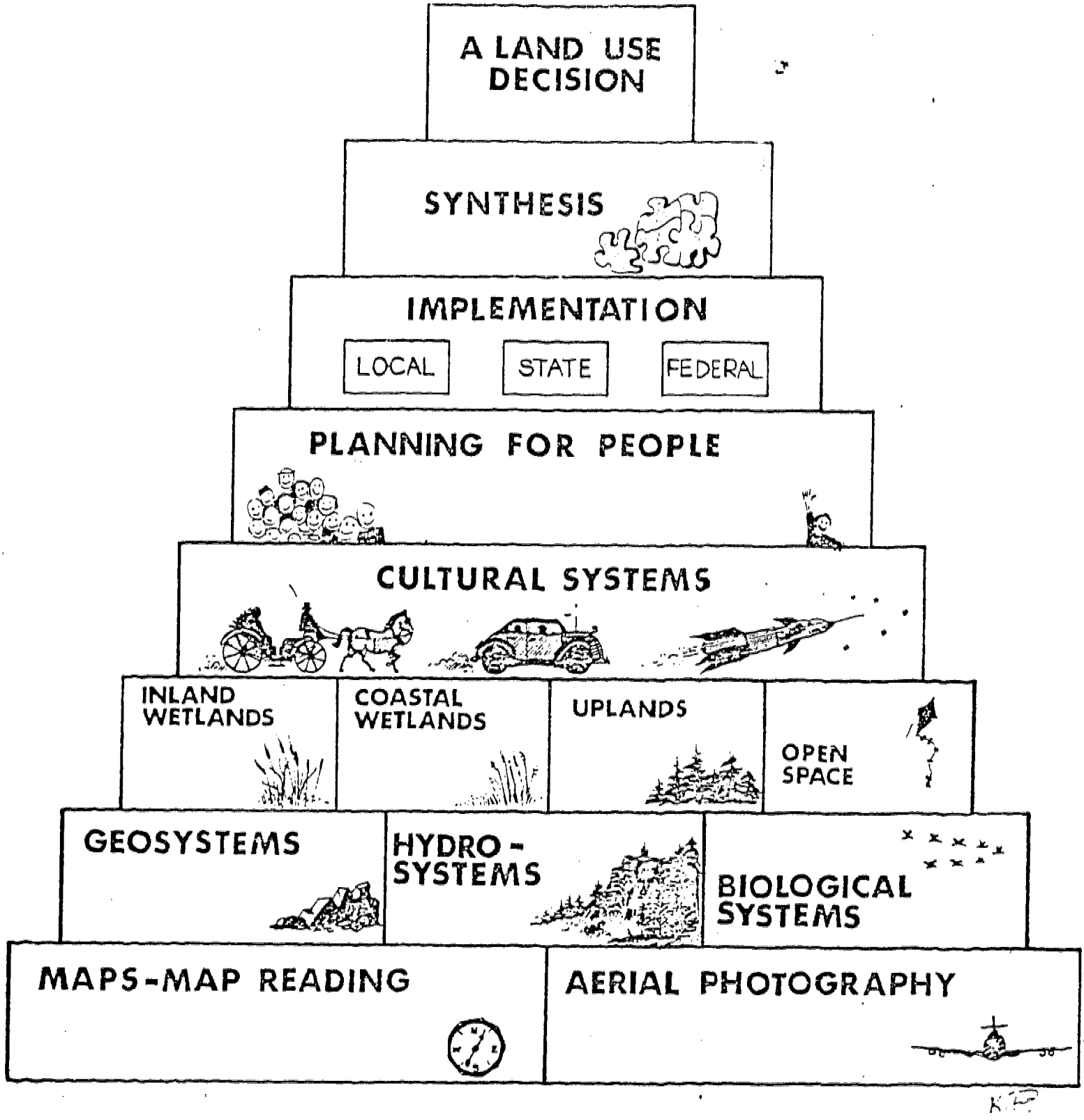

Figure 1. Basic Land Use Kit Structure

and case studies. A special unit, Open Space, illustrates the interrelationships of natural systems and human needs. This unit describes the value of open space, whether the land parcel is in the form of coastal wetlands, inland wetlands, or uplands. Within this unit a section on urban open space introduces man into the land use picture.

Cultural Systems and Planning for People have quite different emphases. Cultural Systems describes the interaction of man created systems with the land. The unit includes sections on transportation, energy needs, housing, water, gas and sewer lines, and solid waste disposal. Planning for People focuses on global, regional and local population growth patterns. L.U.K. users are given a chance to observe how demographic techniques are used in assessing population trends and planning for the land use requirements of future generations. A major component of the unit demonstrates how to survey a community, obtain census data and project basic community requirements for housing, schools, hospitals and recreation. It is necessary to understand the dynamics of human populations in order to plan for man's future land needs.

The units in the first five tiers of the Land Use Pyramid (Figure 1) define and illustrate the operative systems impingent upon land use decision making. An understanding of these systems is extremely helpful in developing a land use plan. Case studies and activities within these units demonstrate how specific information can be useful in developing a land use plan.

In addition to the natural laws that govern land use decisions, it is necessary to study local, state and federal laws which will have an

impact on the implementation of future plans. These laws and programs are described in the implementation units.

Zoning is the primary subject of the Local Implementation Unit. The unit begins with a description of zoning ordinances and zoning boards. As the unit progresses, the learner is asked to complete several forms which ultimately describe both the zoning ordinances and the make-up of the zoning board and planning commission for their own community. This information proves to be extremely helpful in the planning process.

The role of state and federal laws in the planning process are treated in a single unit. Major laws affecting inland wetlands, coastal zone management, air quality, water quality, flood plain management, flood plain insurance and environmental impact statements are outlined and discussed in the State and Federal Implementation Unit. When appropriate, case studies are utilized to demonstrate exemplory land use programs in several states.

Objective land use decisions require a careful analysis of economic parameters. Taxes, assessment procedures, and benefit-cost analysis are all treated in the Economics Unit. In addition, economic considerations are inserted in other units when they are of importance.

When and L.U.K. user has completed the units in the first six tiers of the pyramid or has had sufficient exposure to the information, issues, problems and skills associated with land use decision making, they may pro-

ceed to the synthesis units. Synthesis Buildability, examines the suitability of a site for construction from the standpoint of the impact on ground, water, erosion, flooding, foundation suitability, vegetation and wildlife. Synthesis-Attractiveness examines the other side of the land use problem: the overall usefulness of the projected land use. That is, how does the projected land use fit into the prevailing community pattern. At the completion of these units the L.U.K. user has worker through the top level of the pyramid, the land use decision.

UNIT ORGANIZATION

The unit format selected for the program includes (1) an audio-tutorial tape, (2) a set of guide sheets, (3) a glossary of terms and (4) an annotated bibliography. Supplemental materials consisting of slides, aerial photos, maps, booklets and bulletins have been included. The Kit can be customized for specific states or communities through the selection of appropriate state and local materials.

Each unit begins with a statement of behavioral objectives and list of special instructions. The behavioral objectives briefly outline the skills and concepts which are to be mastered as the participant proceeds through the unit. The objectives may also serve as a self-check which may be referred to upon completion of the unit. Special instructions enumerate the supportive materials such as pencils, scrap paper, rulers, maps and pamphlets which are needed for completion of the unit. Guide sheets, 35mm slides and other materials are integrated into the taped instruc-

tional flow. These supportive materials provide (1) visual reinforcement of audio flow concepts, (2) a format for active user participation in problem solving or simulated land use decision making activities (3) materials best presented in written form and (4) a summary of the major concepts presented in the unit. This method of instruction provides the participant with an individualized and self-paced learning process. As a rule of thumb, one hour of integrated tape and materials provides three hours of instruction. Thus the L.U.K., which consists of 15 hours of tape provides 45 hours of instruction concerning all aspects of the land-use decision making process.

The following example illustrates the tape-guide sheet-slide integration format. Early in the Inland Wetland unit the participant is introduced to Golet's (5) eight inland wetland categories. These wetlands are classified by soils, surface water and vegetation types. As each wetland category is discussed on tape, the participant is referred to a specific guide sheet which details a cross-sectional survey of the wetland type. A 35mm color slide illustrates the specific wetland category. A plant key on a separate guide sheet identifies specific vegetative types found in each wetland category.

The audio-tutorial format of the L.U.K. involves the learner as an active participant, not a passive listener. Participatory activities include: map reading, aerial photo analysis, chart interpretation, case studies,

problem solving, overlay techniques and simulated decision making.

Upon completion of a unit, the participant is referred to a glossary of terms and an annotated bibliography. The glossary provides a review of basic terms and reinforces major concepts. The annotated bibliography serves as a guide to germain books and articles for participants who desire to further explore the unit topic. Care has been taken to ensure an adequate mix of technical and layman sources which are available in most local libraries.

ACCESSING INFORMATION

Two matrices provide a system for accessing and cross referencing information in the L.U.K. These two matrices are first presented in the introductory unit. The matrices act as organizers for the use of the kit as an informational resource, a skills development program, or a problem solving tool. By studying the matrices, the multi-faceted nature of the land use decision making process becomes apparent. The matrices permit the user to determine the types of information found in a specific unit, or to define an issue or area of interest and select units that treat that subject

A matrix correlating land use decision making problems and skills, with the units of the L.U.K. is present in figure 2. Land use decision making problems and skills are listed along the left margin of the matrix and unit titles are placed along the upper margin of the matrix. By entering the matrix from the left margin, it is possible to identify units which are primary or secondary sources of information on a specific skill or problem.

FIGURE 2

A MATRIX INDICATING THE CORRELATIONS BETWEEN LAND USE DECISION MAKING PROBLEMS AND SKILLS AND THE UNITS OF THE LAND USE DECISION MAKING KIT.

P=Primary source of information
S=Secondary source of information

	INTRODUCTION	MAPS-MAP READING	AERIAL PHOTOGRAPHY	COASTAL WETLANDS	INLAND WETLANDS	OPEN SPACE	UPLANDS	GEOSYSTEMS	HYDROSYSTEMS	CULTURAL SYSTEMS	SYNTHESIS - BUILDABILITY	SYNTHESIS - ATTRACTIVENESS	LOCAL IMPLEMENTATION	STATE AND FEDERAL IMPLEMENTATION	ECONOMICS OF LAND USE	PLANNING FOR PEOPLE
MAP READING		P	S		S	S		S			S	S	P			
MAP INTERPRETATION		P	P		S	S		S			S	S	S			
READING EARIAL PHOTOS			P	P						S		S				
USE OF SOIL KEYS					S			P			S					
INTERPRETATION OF MATRIX FOR DECISION MAKING	P			P	P		S	S	S		P					
USE OF ATTITUDE SURVEY						S	S									P
USE OF CENSUS DATA																P
OVERLAY TECHNIQUES								S			P	P				
SITE EVALUATION		P	S	P	P	P	P	P	P	S	P	P	P	P	S	S
DECISION MAKING	S	S	S	S	P	S	S	S	S	S	P	P	P	S	S	S
COST-BENEFIT ANALYSIS												P			P	
IDENTIFICATION OF COASTAL WETLANDS		S		P												
ECOSYSTEM STRUCTURE AND FUNCTION.				P	P	P	P		S							
POPULATION GROWTH & PROJECTIONS	S			S	S	S	S			S		S				P
IDENTIFICATION OF INLAND WETLANDS		S			P			S	S							
FLOODING				S	S				P		P		S	S		
FOUNDATION SUITABILITY								P	S		P					
EROSION					S		S	P			P			S		
GROUND WATER POLLUTION							S		P		P			S		
WATER QUALITY				S	P		S		P		S			P		
SEPTIC TANK FAILURE								P	P		P					
SEDIMENTATION			•					P	P					S		
IMPACT OF HUMAN ACTIVITY ON WETLAND FUNCTIONS		S		P	P	S									S	S
URBAN SPRAWL			S			P	P			S		P	P		S	
OBTAINING INFORMATION ON LOCAL, STATE, & FEDERAL LAW				P	P	P	S		P	S			P	P	S	
UNIQUE HABITATS				P	P	P	P				S					
EFFECTS OF POPULATION GROWTH				S	S	S	S			S			S	S		P

By entering the matrix from the top, an analysis can be made of the primary and secondary topics considered in a specific unit. A second matrix (Figure 3) focuses on determinant systems in land use, cost-benefit analysis, impacts of alternative land uses and the significance of selected land uses.

PACKAGING AND DISTRIBUTION

Costs for producing one copy of the "Land Use Decision Making Kit" per Connecticut town were included in the funded project. Since this was an innovative attempt at adult education and since the cost of the materials was over $200/kit, a free kit was distributed to each town which was represented at one of seven regional training and distribution workshops. The sole constraint on the recipient community was that the kit be located in a place of public access. (e.g. town library, town hall, or school library). One hundred and twenty of Connecticut's 169 towns sent representatives to the training workshops and received a free L.U.K. for use by their citizenry. Additional kits have been made available at cost to interested individuals, agencies and organizations through E-P Education Services, c/o ACES 800 Dixwell Avenue, New Haven, Connecticut.

DISCUSSION AND SUMMARY

The audio-tutorial L.U.K. was designed to provide easily accessible information on land use decision. The materials have been produced in a format that permits the individuals to learn about environmental considerations in the land use decision making process on their own time, in their own home, and at their own pace.

FIGURE 3

A MATRIX CORRELATING LAND USE ISSUES WITH UNITS OF THE LAND USE DECISION MAKING KIT.

P=Primary source of information
S=Secondary source of information

		INTRODUCTION	MAPS-MAP READING	AERIAL PHOTOGRAPHY	COASTAL WETLANDS	INLAND WETLANDS	OPEN SPACE	UPLANDS	GEOSYSTEMS	HYDROSYSTEMS	CULTURAL SYSTEMS	SYNTHESIS - BUILDABILITY	SYNTHESIS - ATTRACTIVENESS	LOCAL IMPLEMENTATION	STATE AND FEDERAL IMPLEMENTATION	ECONOMICS OF LAND USE	PLANNING FOR PEOPLE
Significance of Selected Land Uses	OPEN SPACE		S		P	P	P	P					S			S	S
	WATERSHED		S		S	P	S	P		P							
	COASTAL WETLANDS		S		P		S			S					S		
	INLAND WETLANDS		S			P	S		P	P				S	S		
	FLOOD PLAIN		S							P		P		P	P		
	AGRICULTURAL LAND			S			P	P		S						S	
	NATURAL AREAS				P	P	P	P				S					
	FORESTS		S	S		S		P		S							
Impacts of Land Use	RECREATIONAL SITE						P		S	S			S		S		S
	ENVIRONMENTAL IMPACTS				P	P		P	P	P		P	S				
	FLOOD PLAIN ZONING	S								P		S		P	S		
	ZONING PROCESS	S				S	S			S				P			
	POPULATION GROWTH	S			S		S				S						P
	ENERGY USAGE										P		S				
	TRANSPORTATION		S	S	S						P		S				
	POLLUTION				P	P		P				S	S		P		
	HOUSING			S	S	S			S		P	S	P			P	
Cost Benefit Analysis of Land Use	COMMERCIAL DEVELOPMENT												P			P	
	RESIDENTIAL DEVELOPMENT				S	S							P			P	
	INDUSTRIAL DEVELOPMENT				S	S							P			P	
	CLUSTER DEVELOPMENT						S						P	P		P	
	LAND VALUES						S	S					P			P	
Determinant Systems In Land Use	PROPERTY RIGHTS				S	S	S							S	P	P	
	SOILS	S				P			P			S					
	GEOLOGY	S							P			S					
	HYDROLOGY	S			S	S			S	P		S					
	BIOLOGICAL				P	P		P				S					
	CULTURAL	P					S				P						P
	POPULATIONS	S		S	S								S				P
	ECONOMICS	S			S	S							P			P	

The L.U.K. project was designed to translate technical reports into instructional material for community land use decision makers. One of the most important and difficult tasks was delineating the concepts to be included in each unit. There was inevitably more information on a topic than could be handled within the limits of a one hour script.

Kits were distributed to community representatives thorugh a series of dissemination workshops. Early experience indicates that the primary users of the materials are members of planning and zoning commissions and inland wetland commissions. The materials are also being utilized by organized groups such as the league of women voters, jaycees, secondary schools and colleges. General interest in land use decision making processes and local controversy have fostered use of the L.U.K.

The concept of an idea exchange has been developed to stimulate interest and promote effective use of the L.U.K. "An Idea Exchange" will be issued periodically to update information in the kit, and to relate ways in which towns, groups or individuals have successfully used the materials.

Responses from 26 communities and 44 schools indicate that the L.U.K. is playing a significant educational role (6) and has generated a high level of concern for objective land use decision making.

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