UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Map Atlas of Basic Data for Computer-Aided Land-Use Planning Studies of the Northern Part of Jefferson County, Colorado

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INTRODUCTION AND CONTENTS

Environmental Map Atlas of the Northern Part of Jefferson County, Colorado

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Introduction

This atlas consists of a topographic base map and 19 environmental maps, each at a scale of 1:72,000 (6,000 feet to the inch). Each environmental map plus a slope map were converted to cellular computer map format at the same scale. The computer maps are being prepared for release as a supplement to this atlas. On those computer maps, the data are generalized and portrayed in cells of 10.3 acres each. The northern two-thirds of the county--about 600 sq. miles--is portrayed. This comprises more than 38,000 cells.

The maps in this release and their computer-map equivalents were prepared as part of a cooperative study of the following organizations under the initiative and direction of the Department of the Interior Resource and Land Investigations (RALI) Program:

U.S. Geological Survey

Federation of Rocky Mountain States

Colorado School of Mines

Jefferson County Open Space Office

This cooperative study was an attempt to devise a system for combining and manipulating a large and diverse assemblage of data on natural physical features and socioeconomic data for planning purposes. This

was accomplished by way of a cellular composite computer mapping system.

The approach was to select those data that already exist or that are inexpensive and easy to acquire which will also eliminate the maximum amount of county land that really is not suitable (for open space, in this case). This means that the places selected have high statistical likelihood of really meeting all the criteria.

At present, a base topographic map (USGS, 1975), and 20 maps of basic attributes have been compiled. These 20 maps have been converted to a format of about 38,000 cells each about 4.2 ha (10.3 acres) in size and entered into computer file. By computer overlaying and compositing techniques (Hackman and others, 1971; Smedes and others, 1974), a number of planning maps were produced by computer. Representative composite maps produced to date are:

a. optimum available sites for active-use open space;

b. optimum available sites for passive-use space;

c. priority areas for active-use open space considering competitive demands for other land uses;

d. priority areas for passive-use open space considering competitive demands for other land uses;

e. optimum future sites for open space, with sequential development of the land;

f. areas precluded from open space acquisition;

g. foundation stability;

h. sites suitable for septic tanks;

i. surface drainage;

j. potential for domestic groundwater supplies;

k. ease of excavation;

l. sites suitable for sanitary landfill;

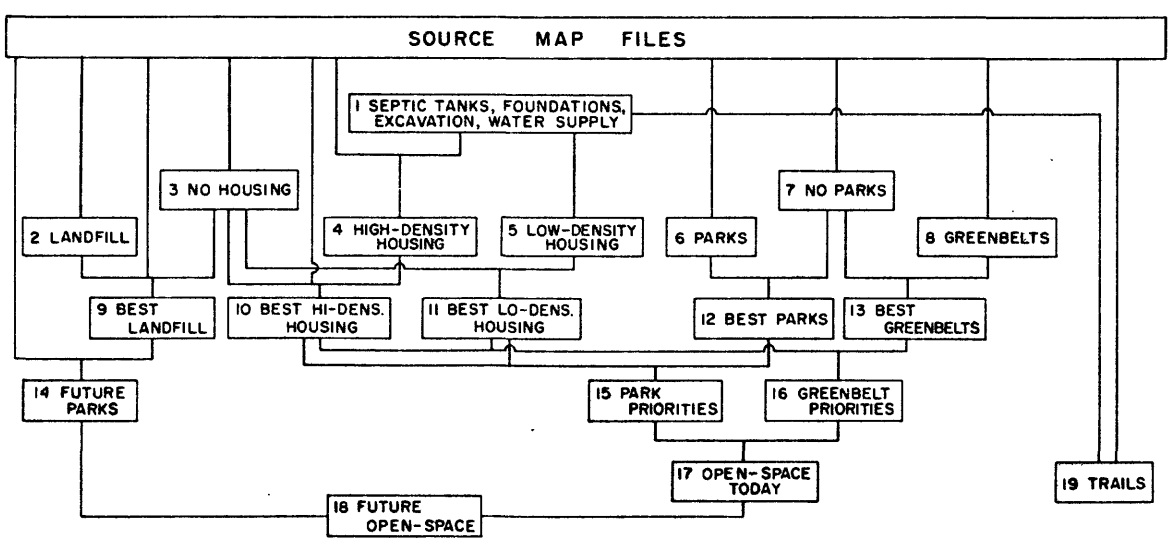
m. areas precluded from development;

n. optimum location for low-density housing;

o. optimum locations for high-density housing (planned unit-development area);

p. hiking trails, a demonstration of corridor selection capabilities.

The hierarchy of maps and compositing steps involved is illustrated below. Starting with 20 maps of basic data, we created an additional 22 derivative maps from them. Note that, although we started by addressing only the open-space problem (a-e) we were able at the last moment to expand the study (f-p). This demonstrates how a bank of basic data can be weighted and combined in different ways to solve a wide variety of land-use problems.



Contents of Map Atlas

Sheets 1-20. Conventional linework maps

1. Topographic base map
2. Map of present land use
3. Map of cities, unincorporated towns, and special-use federal lands
4. Map of principal water bodies
5. Major highways and principal rural roads
6. Map of principal landforms
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8. Map of surficial deposits
9. Map showing gross distribution of major vegetation association units
10. Map of potential sand, gravel, and aggregate resources
11. Map of geologic hazard areas
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16. Map of platted subdivisions
17. Map of historic and special features worthy of consideration for preservation
18. Map of zones of proximity to high-density residential areas
19. Map of zones of proximity to existing public open space
20. Map of landscape diversity

References cited

Hachman, F. C., Bigler, Craig, and Weaver, Rodger, 1971, Report on the implementation of composite computer mapping: Bur. for Ec. and Business Research, Univ. of Utah, Salt Lake City, Utah, 227 p.

Smedes, H. W., Nez, George, Salmon, Larry, Turner, A. K., Lutzen, E. E., and Reed, J. C., Jr., 1974, Land-use planning aided by computer cellular modelling/mapping system to combine remote sensing, natural resources, social and economic data: Proc. Ninth International Symposium on Remote Sensing of Environment: Ann Arbor, Michigan, vol. 1, p. 289-298.