ANDS --

Aviation Noise Demonstration System

U. S. Federal Aviation Administration
Office of Environment and Energy

ANDS - Aviation Noise Demonstration System

A new tool for Airport Noise Compatibility Planning

Office of Environment and Energy
Federal Aviation Administration

ANDS

- ANDS is a computer driven airport noise simulation device
- Uses digitally recorded aircraft sounds to very accurately reproduce the noise environment near an airport

ANDS

- ANDS uses Graphics plus Audio to demonstrate:
- Stage 2 vs. Stage 3 Aircraft
- Day-Night Average Sound Level - DNL
- Sound Exposure Level - SEL
- Sound Insulation Benefits

ANDS

- ANDS also Demonstrates:
- Noise propagation
- How multiple sounds interact
- Effects of noise barriers
- Effects of residual environmental noise on one's perceptions of aviation noise

ANDS

- ANDS is Highly Portable:
- Uses a Powerful Laptop Computer with Built-in CD-ROM
- Uses Compact but powerful speakers and amplifier
- Uses a light weight, compact Multi-media Projector for Large Screen Presentations

ANDS

- Will operate in three modes: Basic, Custom, & Expert
- Will have a Kiosk version for exhibit use
- May include "real time" inputs from an airport's noise monitoring system
- Will feed commercial audio & visual equipment for large audience presentations

ANDS

- Major Uses:
- Supports the Part 150 -Airport Noise Compatibility Planning Program
- Supports the Noise Elements of Airport Environmental Studies
- Training for Planners, Controllers, Pilots, & Local Officials in Elements of Aviation Noise

ANDS

- ANDS is a joint project with USAF's Armstrong Laboratory
- Will have both DOD and FAA versions
- Will have sound tracks for up to 30 Civil &/or Military aircraft

ANDS -- *Who are its users*

- We plan to have one in each FAA Region
- ANDS Master Work Stations will be available to consultants and others
- Individual airport operators
- We plan for broad availability of the software package -- build up your own hardware

ANDS

- ANDS can be customized to replicate individual airports, including their own existing and future noise contours
- DDA has established a support team
- Additional modules and aircraft will be added in the future
- An Internet version may be developed

For more information contact:
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LBCS

Land-Based Classification Standards

Second Draft, April 18, 1999

Research Department
American Planning Association

In cooperation with:
Federal Highway Administration, U.S. Department of Housing and Urban Development, Federal Aviation Administration, U.S. Department of Defense, Bureau of Transportation Statistics, Federal Emergency Management Agency, U.S. Department of Agriculture, and U.S. Department of Interior.

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DRAFT
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Executive Summary

Land-Based Classification Standards (LBCS) provide a consistent model for classifying land uses based on their characteristics. The model extends the notion of classifying land uses by refining traditional categories into multiple dimensions, such as activities, functions, building types, site development character, and ownership constraints. Each dimension has its own set of categories and subcategories. These multiple dimensions allow users to have precise control over land-use classifications.

Classifying land uses across multiple dimensions, in database terms, means adding new fields to the land-use database. The total number of land-use fields in the database should equal the number of dimensions, that is, every record in the database is classified in not just one land-use field, but several—one for each dimension. The number of dimensions, in turn, will depend on the purpose of the data. When the purpose of the data changes, dimensions may be added or dropped as needed. For local planning purposes, LBCS calls for classifying land uses in the following dimensions: Activity, Function, Structure Type, Site Development Character, and Ownership.

> **Activity** refers to the actual use of land based on its observable characteristics. It describes what actually takes place in physical or observable terms (e.g., farming, shopping, manufacturing, vehicular movement, etc.). An office activity, for example, refers only to the physical activity on the premises, which could apply equally to a law firm, a nonprofit institution, a court house, a corporate office, or any other office use. Similarly, residential uses in single-family dwellings, multi-family structures, manufactured houses, or any other type of building, would all be classified as residential activity.
>
> **Function** refers to the economic function or type of enterprise using the land. Every land use can be characterized by the type of enterprise it serves. Land-use terms, such as agricultural, commercial, industrial, relate to enterprises. The type of economic function served by the land use gets classified in this dimension; it is independent of actual activity on the land. Enterprises can have a variety of activities on their premises, yet serve a single function. For example, two parcels are said to be in the same functional category if they belong to the same enterprise, even if one is an office building and the other is a factory.
>
> **Structure** refers to the type of structure or building on the land. Land-use terms embody a structural or building characteristic, which suggests the utility of the space

(in a building) or land (when there is no building). Land-use terms, such as single-family house, office building, warehouse, hospital building, or highway, also describe structural characteristic. Although many activities and functions are closely associated with certain structures, it is not always so. Many buildings are often adapted for uses other than its original use. For instance, a single-family residential structure may be used as an office.

Site development character refers to the overall physical development character of the land. It describes "what is on the land" in general physical terms. For most land uses, it is simply expressed in terms of whether the site is developed or not. But not all sites without observable development can be treated as undeveloped. Land uses, such as parks and open spaces, which often have a complex mix of activities, functions, and structures on them, need categories independent of other dimensions. This dimension uses categories that describe the overall site development characteristics.

Ownership refers to the relationship between the use and its land rights. Since the function of most land uses is either public or private and not both, distinguishing ownership characteristics seems obvious. However, relying solely on the functional character may obscure such uses as private parks, public theaters, private stadiums, private prisons, and mixed public and private ownership. Moreover, easements and similar legal devices also limit or constrain land-use activities and functions. This dimension allows classifying such ownership characteristics more accurately.

The underlying principle of the LBCS model is its flexibility. It addresses flexibility in adapting the model to a variety of planning applications, data collection methods, data-sharing and data-integrating methods, and color coding and mapping. The flexibility also makes it possible to assign new categories for new land uses, to accommodate new methods and technologies for analysis, and to customize the model for local needs without losing the ability to share data. Each of these aspects of LBCS calls for applying a variety of standards or conventions to maintain consistency in land-use classifications.

Introduction

Land-based Classification Standards (LBCS) are a set of methods to classify land uses and their characteristics for planning purposes. This paper, along with the attached tables, defines the classification standards. The LBCS Project has also developed other products, such as case studies, working papers, a user manual, and an annotated bibliography.

Objective of LBCS

The primary objective of LBCS is to update the 1965 Standard Land Use Coding Manual (SLUCM) and provide a common classification method to ensure the widest utility of land-use data routinely collected for planning purposes.

The purpose of this standard is to minimize redundant data collection and production among a variety of local, regional, state, and federal agencies that rely on local land-use data. Because many problems impeding data sharing extend beyond classification issues, the standard also provides a framework to uniformly collect, classify, store, and integrate land-use data with other types of information.

Scope of LBCS

LBCS is primarily concerned with land use, specifically land uses typically of interest at the local government level. It pertains to local land-use data commonly collected by planners for local, regional, state, or federal applications.

LBCS allows uniform classification of land uses irrespective of the unit of classification—it is independent of the taxonomic unit and applies equally to any measurement scale. For example, not all land-use databases classify or treat parcels as the measurement unit. Other units, such as buildings, parcel aggregates, traffic zones, arbitrary grids assigned by remotely sensed data sources, or combinations of such units, also get classified. By keeping classification independent of the measurement unit, the LBCS model allows integrating land-use data from a variety of scales.

LBCS addresses the need for flexibility with reference to differing levels of detail when classifying land uses. For example, many land-use databases group all commercial uses into a single category and do not classify every specific commercial use.

LBCS provides a standard for documenting databases that contain land-use data with a view toward easy access to land-use information. This part of LBCS, also known as the metadata

standard, will deal with reliable data sharing and efficient dissemination using such automated software and network tools as the Internet and GIS. The aim is to maximize public and private resources expended in collecting land-use data by making such data thorough and accessible to multiple applications or organizations.

The scope also includes providing a logical framework for dealing with other aspects of land uses that may be incidental but necessary for certain land-use applications. Many land-use applications employ mixed classifications that include terminologies from land-cover and land rights. Such mixing blurs the distinction between land-use and land cover and creates categories unusable for other applications. Mixed classifications do not follow any consistent pattern even among similar applications. For example, categories of land uses shown on comprehensive plans vary widely among communities, and sometimes, even within the same plan.

Finally, the scope of the project is limited to developing a land-use classification standard that integrates easily with other related standards. LBCS does not prevent local customization, or mandate its adoption.

Applicability of LBCS

Because communities vary widely in their land-use makeup and concerns about land-use characteristics are not uniform across the country, we frequently find a wide range of uses, activities, and physical characteristics grouped haphazardly without any consistent pattern. Adding to this lack of consistency, there is currently no single nationwide program, agency, or entity that can enforce a single classification standard. Consequently, we have a wide range of standards, many duplicating and some directly in conflict with other established standards. The LBCS model fosters an integrated, standardized, cost-efficient approach to identifying, classifying, and mapping land use data that local governments in the United States collect for various purposes.

LBCS is only a baseline standard that users should customize according to their specific application needs. The standard represents the minimum steps to maintain compatibility rather than the ideal or maximum. By focusing on core components that are similar across many local land-use data collection efforts, LBCS enables reporting, sharing, aggregating, and comparing data from many sources. It does not prevent local governments from continuing their existing classifications to meet their specific needs.

The standards pertain to classifying land uses based on their characteristics. Users can apply the concepts contained in LBCS to classify a variety of land uses and retain as much detail as possible without reclassifying or losing details of the underlying data. The classification standards in LBCS allow for incremental adoption to existing databases without losing any existing details. LBCS does not preclude using other classification systems nor does it require additional surveys or data

fields for existing databases.

For a more detailed understanding of the applicability of the LBCS model and the classification schemes contained in it, review the guiding principles and discussions in the next section. The applicability of LBCS, in sum, can be characterized as follows:

- LBCS classifies land uses based on their characteristics collected by local, state, regional, and federal governments in the United States.
- LBCS is a baseline from which applications may be customized to meet specific needs and purposes.
- LBCS enables reporting, sharing, aggregating, and comparing land-use data.
- LBCS enables incremental adoption so that existing databases can apply the concepts without losing any existing details.
- LBCS model fosters an integrated, standardized, cost-efficient approach to identifying, classifying, and mapping land use data that local governments in the United States collect for various purposes.

Guiding Principles

The following principles directed the development of LBCS. These principles summarize the rationale we used in developing the scope, content, and format of LBCS. Complete discussions about these principles (and those we chose not to adopt) appear below. The background for many of these discussions appears in the working papers, case studies, and symposium documents.

1. Land-use is multidimensional.
   a. Land-use concepts are employed both as a scientific measurement (what exists?) and a social construct (how does it work?).
   b. Some land-use characteristics are observable, but most are not.

2. Land-use applications depend on multiple characteristics for land-use analysis.
   a. Every characteristic of land use can have a separate classification schema.
   b. The interrelationships between characteristics that produce complex land uses vary widely between applications.

3. The classifications should be usable for developed and undeveloped areas and at a range of scales by those entities collecting local land-based data.
   a. Land-use applications do not depend on any single taxonomic unit.
   b. Parcel may be the most common taxonomic unit, but the model should be compatible with other units as well.
   c. Land-use classes and categories (groups of classes), correspond to the taxonomic unit.
   d. The level-of-detail required for classifying land uses should be flexible.
   e. Categories and uses in them reflect the purpose of the data.
   f. Logical consistency is more important within a scale than across multiple scales.

4. The standards need to be consistent and compatible with existing standards and conventions.
   a. Consistency of terms, categories, and application of the standard (ability to replicate the process of classification) needs to be maintained.
   b. The classifications need to employ commonly used land-use terminology, avoiding jargon.
   c. The standards need to acknowledge existing functional and related classification schemes.
   d. Conversion schemes need to be developed when an existing standard cannot be used in LBCS.
   e. Those characteristics that cannot be easily converted need to be identified.