Report of the
Existing Land Use Information Needs Workgroup

PURPOSE

The purpose of the Workgroup was to find ways of meeting most, if not all, of the existing land use information needs of the MetroGIS community using the best available data in a standardized classification system – coding scheme / database model.

TASKS

To fulfill its purpose, the workgroup undertook a variety of tasks. These are documented in this report and in the accompanying spreadsheet.

1. Clarify the existing information needs of the MetroGIS community and consider general data uses (pg. 1);
2. Identify data sources that could potentially meet those information needs and uses (pg. 2);
3. Investigate classification systems – understand classification challenges and identify potential classification systems – coding schemes / database models – that are useful in assimilating multiple-source data and helps distribute the information to the MetroGIS community (pg. 3);
4. Pilot the implementation of data and various classification systems and identify both the benefits (values) of each system and gaps between the information needs, available data sources, and difficulties in implementing the systems (pg. 6);
5. Recommend policies and actions that best meet the current existing land use information needs through available data and an effective coding scheme / database model (pg. 13); and
6. Refer tasks to other MetroGIS workgroups that are necessary for or would enhance the existing land use information needs solution (pg. 14).

MEMBERSHIP

The following people served on the Workgroup:
David Arbeit, Land Management Information Center
Dick Carlstrom, TIES
Paul Hanson, Metropolitan Council
Jim Hafner, Minnehaha Creek Watershed District
John Mertens, Dakota County
David Windle, City of Roseville

1. CLARIFY THE EXISTING INFORMATION NEEDS OF THE METROGIS COMMUNITY

a. Original Existing Land Use Information Needs: The Workgroup reviewed some 33 statements about land use information needs made at the original Needs Forum held by MetroGIS in 1996. The group then clarified the land use component of the information needs. In general, because most detailed land use data is generated at a very localize extent (municipality), the workgroup felt the mechanism to convey land use information – the classification scheme and/or database – was the critical piece in resolving many of the

information needs. In other words, comparison of highly refined data across the region can only be accomplished within an appropriate classification system.

b. General Data Uses: Through statements obtained at the original Needs Forum held by MetroGIS in 1996 and the follow-up Planner's Forum held in May 2003, it was discovered that communities use land use information in many ways. It is used for watershed and flood plain modeling, neighborhood and transportation planning, determining water and wastewater service needs, and assisting fire and EMS response. Perhaps more importantly, land use information is used to monitor growth and to evaluate changing trends in land devoted to various purposes. Monitoring land use change provides information on where development pressures are likely to be greatest, and it helps communities identify policy responses to prevent or remedy damage to natural resources and avoid or relieve overburdened infrastructures such as roads and sewers systems. Land use information also provides a critical input for community household and job forecasts. Planning departments responsible for the long range community planning as well as the enforcement of existing ordinances use land use information and land policies to help them plan in advance for the secondary effects of development, including employment growth, infrastructure requirements, and fiscal impacts

2. DATA SOURCES:

The workgroup identified the following data sources as potential vehicles to meet the data component of the information needs:

a. **Generalized Statewide and Nationwide Data.** These data convey land use information consistently across the entire region but tends to represent overly generalized information. Additionally, these data typically include some general land cover classification rather than purely land use classifications (i.e. Land Management Information Center's Minnesota Land Use and Land Cover - 1990s Census of the Land or the U.S. Geological Survey's Land Use and Land Cover Digital Data). However, some state- and nation-wide data can provide additional information that is somewhat ancillary to "land use." For example, some U.S. Census information can help classify land based on its enterprise – its overlying business – which supplements the often-simplified use.

b. **The Metropolitan Council's Generalized Land Use data.** This data also conveys land use information consistently across the entire region yet tends to provide additional detail and exclude land cover classifications. However, this data is used by the Metropolitan Council to monitor growth and to evaluate changing trends in land devoted to various *general* urban purposes. Traditionally, fairly general land use categories (i.e. commercial, single- and multi-family residential) that relate to growth and development provide a sufficient level of information for regional planning. Some community and sub-regional planners have stated that the generalized information in the Council's dataset does not provide enough detail to adequately meet their specific land use needs (i.e. flood plain modeling, EMS response).

c. **Community-based Data.** These data are frequently more detailed then regional, state- or nation-wide datasets. Unfortunately, communities within the region have not adopted a standard classification system. As a result, various challenges exist when attempting to

analyze information across the region without a standardized classification system (see Data Classification Challenges below).

d. **County Assessor Data.** These data are typically recorded by taxable parcel for purposes of levying taxes. The impact of this distinction is that these information or cadastral systems of land use inventories are biased toward activities that contribute to a community's tax base. For example, a local community park that has a concession stand selling ice cream may be classified as "commercial" in a cadastral system rather than "Park." Additionally, some counties only assign a "parcel" to lands that are taxable. In other words, frequently, roads, railways, water bodies, and even parklands are not represented in a county's parcel database, implying there is no assigned "land use."

Like most data, the value of land use information is directly related to how it is gathered and classified. The workgroup felt that generalized small-scale regional data yields less information about an area than large-scale, community-based data or direct field observations will. However, the workgroup acknowledged that communities can gather data differently and implement different classification systems based on their own internal needs or perceived uses thus making the integration of data from multiple communities for a regional map or dataset difficult.

3. CLASSIFICATION SYSTEMS – CODING SCHEMES / DATABASE MODELS:

Armed with an understanding of the overall MetroGIS land use information needs and the potentially useful data sources, the workgroup began to explore possible regional coding schemes and database models to record, maintain and display land use information consistently across the region.

a. Classification Challenges

During the process, many classification difficulties and inconsistencies among the systems were revealed. Because communities vary widely in their land-use makeup and more particularly, the fact that their perceptions with regards to land use concerns are not uniform across the region, we find a wide range of uses, activities, and physical characteristics classified into any one land use category. For example, first consider what communities classify as "park." Keeping in mind that communities within the region have not adopted a standard classification system, there are numerous land use categories that represent "park" (i.e. "Neighborhood Park," "Park Facility," "Parkland," "Open Space," even "Public"). In addition, communities tend to classify land information at different levels of detail. In other words, one community's "Park and Recreation" is collectively another community's "Neighborhood Park," "Community Park," "Golf Course," and "Open Space." Adding to this lack of consistency, currently no single nationwide, statewide or regional program, agency, or entity can promote a single classification standard that works for all possible users. Consequently, there are a wide range of standards, many duplicating and some directly in conflict with other established standards, making it difficult to promote a single land use classification model that effectively generalizes and identifies land use in ways that are appropriate for all users.

Additionally, considering the root term "land" itself as applied in policy discussions about land uses, we find that it is continuously being expanded to express other purposes that reach beyond physical or functional characteristics. For example, physical purposes (housing, neighborhood playground or transportation) and social purposes (redevelopment, preservation or planned unit development) compel new ways of thinking about land-use information. In most planning

applications "land use" implies the inclusion of at least some aspects of land cover and land rights. As a result, conceptually to many, "land use" increasingly implies the inclusion of at least some aspects of land cover and land rights. However, the implication is not universal. For example, the following MetroGIS existing land use information needs demand additional information beyond use: “location of prime farm land” (soil cover or type is useful to define prime farm land); and location of public parks (public vs. private - rights to land). Therefore, it is important to understand what information needs constitute “land use” for purposes of MetroGIS and what information is more accurately described by other land-based information: land cover and land rights.

b. Possible Classification System Solutions

Considering these challenges in conjunction with potential data sources, three different classification systems were considered. Each system brandishes specific advantages that utilize different resources and thus produce different results. It was important to consider the underlying factors that drive their use or development and then determine what advantages and disadvantages are associated with each model through a pilot study.

(1) **Built Environment Model**. The concept of a "Built Environment" database model has been fleshed out by the Metropolitan Council based in part on information needs stated at the MetroGIS Existing Land Use Planning Forum held in April 2003 and the increasing desire by Council departments to utilize county assessor information.

Participants at the April 2003 Forum expressed the need for not only detailed land use data, but perhaps more importantly, supplemental information focusing on specific, quantifiable attributes of a piece of land (i.e. sq.ft. of build space, building and/or land value, NAICS codes, etc.). Metropolitan Council departments, such as Research and Planning Support, have expressed desire for similar information that would assist them in fulfilling their business objectives. These needs have propelled the Council’s GIS unit to consider how these information pieces are collected and maintained. The development of a “Built Environment” database that is fundamentally built upon county assessor information and available landmark datasets would supplement the Council’s Generalized Land Use data and accomplish several things:

- Minimizes the need for an all-encompassing “land use” dataset – a dataset that would demand categories for information such as specific intensity measures, structure types, business types, and other land use associated data – thus making a land use coding scheme less complex and easier to compare.
- Maintains detailed, associated information within the spatial context of their original inventory (i.e. recorded by parcel or census block unit, or represented by a address-point location) – retains the value of maintaining address-specific attribution in separate but related databases; and
- Minimizes the need for precise, annual land use surveys – a potentially time consuming process without municipal level responsibility and development – by utilizing existing institutionalized, annual county-assessor inventories.

(2) **Hierarchical Land Use Coding Schemes and Database Systems.** Hierarchical classification systems consist of layers representing information of a similar rank or order that is a subordinate to the layer above it. Hierarchical systems can vary in the amount of aggregation and can be nearly infinite. Most land classification systems are based on a hierarchical scheme that may start with very detailed, activity-based land use categories (elementary school, playground) and end with more broad categories (Institutional). Typically, established land use classification systems are 2 to 4 levels of aggregation and frequently assimilate land cover classifications with land use.

Inherent in most hierarchical classification schemes are implications of scale – subordinate layers of classification categories typically illustrate finer detail of activities on the land. For any given land use question, the sufficient level of detail is dependent on what needs to be defined or answered. For example, understanding the location of Level-1, non-residential land uses (institutional, among others) may be sufficient data for a housing need assessment study since its main concern is to determine the present amount of housing. Non-residential land, no matter how detailed, is irrelevant. On the other hand, Level-4 data (elementary school playground - institutional) location could be vital for emergency response services.

The advantage of a hierarchical classification system is its familiarity to users. Hierarchical systems are incorporated everywhere in our daily life - from office politics to computer files systems - and therefore are easy to comprehend, reducing the cost of education and implementation.

In an effort to have coding schemes comparable to the MetroGIS endorsed Planned Land Use (PLU) information Need, the workgroup modified the two-tiered, hierarchical PLU coding scheme to meet all perceived existing land use needs. In general, the coding scheme was modified to include two addition levels of detail within the major land use categories.

(3) **Land-Based Classification Standard.** Acknowledging a growing misnomer in the application of “land use” within policy discussions that reach beyond physical or functional characteristics, such as redevelopment, “planned unit developments,” or preservation, the American Planning Association (APA) has adopted a more appropriate term to describe such conditions - land-based information. An amalgamation of three broad categories, the APA has worked to articulate and disseminate the differences of land-based information in the expanding lexicon of land planning. The three broad categories are:

(a) land-cover information related primarily to the existing natural environment,
(b) land-use information related primarily to the existing built environment, and
(c) land-rights information related primarily to fee and less than fee ownership and to development rights such as those proscribed by zoning and other regulatory measures.

Based on these categories, the APA has developed the Land-Based Classification Standard (LBCS) that was designed to standardize the broad variety of land-based data currently being collected and stored at varying administrative levels in a variety of formats and classification systems. The principal purpose of LBCS is to ensure that such data is more compatible and, thus, more easily transferable between jurisdictions, agencies, and institutions both horizontally, from geographic area to geographic area, and vertically, between local, regional, state, and national jurisdictions. A LBCS type database is essentially an effort to breakdown

the growing "land use" misnomers into 5 analogous groups or "dimensions" based on similar descriptive qualities – Activity, Function, Site Development, Ownership, and Structure (see Appendix A for more detail). In other words, each dimension attempts to provide "apples-to-apples" comparisons of various land descriptions. For example, consider the potential difficulty when comparing land uses between communities within traditional land use coding schemes. The following "real world" land use descriptors may provide enough information to have an adequate understanding of the facility, it use or function, however, communities may choose to either interpret the contents dramatically differently or associate the use with differing uses.

Country Club

Do all country clubs have a golf course? If golf courses can contribute to higher nitrate concentrations in underlying groundwater, should country clubs be associated with elevated nitrate concentrations in groundwater?

Nursing Home

Are nursing homes a commercial, institutional, residence use? Or all of the above? Conversely, how do you locate all nursing homes across the region when communities vary in characterizing the land use of a nursing home as commercial, institutional or residential?

The adoption of a classification system like LBCS in light of new technologies (the recent and anticipated proliferation of information-handling technologies such as advanced relational databases and geographic information systems) has significant productivity implications for the public sector in an era of scarce financial resources.

4. PILOT STUDY RESULTS:

The workgroup had requested that pilot studies be conducted on a small subset of the City of Roseville to determine the advantages and disadvantages of Hierarchical Coding Scheme and the Land-Based Classification Standard database models. An additional investigation was conducted by the Metropolitan Council to determine the potential usefulness and possibility of creating a functional "Built Environment" model with available information – the results are included below. Additionally, it should be noted that the implementation of the current Metropolitan Council's Generalized Land Use dataset is a possible - yet less desirable - regional solution and is therefore also included here. Each pilot study synopsis is concluded by an overall assessment of the model and any significant concerns or impediments that need to be overcome.

a) **Metropolitan Council's Generalized Land Use Data.** No testing was conducted on the Metropolitan Council's Generalized Land Use dataset due to the already well documented benefits and limitations of the data for some community-level land use inventorying and analysis.

   Briefly, some communities define land uses based on the legal property extent (parcel boundary) that many times reflects the zoning of a property (acceptable use) and less on actual use. Additionally, because the Council uses the data to monitor growth and to evaluate broad changing trends, it classifies land use in fairly general categories. While the level of definition is adequate for many rural communities, several more urban communities have stated that this

dataset does not provide enough detail to adequately meet their specific land use needs.

b. **Built Environment Model – An Overall Investigation.** The concept of a "Built Environment" database model is based on the expressed need for detailed land use data and perhaps more importantly, supplemental information that focuses on quantifying specifics attributes of a piece of land (i.e. sq.ft. of build space, building and/or land value, NAICS codes, etc). The Metropolitan Council also has a desire to better track redevelopment that can contribute to regional growth and impact land supply forecasts and views a “Built Environment” database as a viable solution.

   Potentially, annually updated county assessor data could provide the ability to track land use changes in greater detail then current Council procedures, improving the ability to help answer questions about various attributes associated with specific land use types. For example, assessor data has the potential of providing intensity of use measures (i.e. inferred housing and job densities) that can help users track not only development but also redevelopment or infill. Additionally, assessor’s land value estimates have the potential to suggest underutilized lands to city planners that are ripe for redevelopment. As a result, communities and developers can make better-informed assessments about development needs that are based on the current densities, redevelopment opportunities, and possibly building occupancies.

   Assessor information may also provide more specific detail to mixed-use designations in land use inventories and assist traffic planners and emergency managers by improving daytime population estimates that can be fed into traffic generation models that help assure adequate regional services.

   By developing a new database based on existing data (Metropolitan Council land use and County Assessor data) the difficulty and cost of conducting timely annual land use inventories may be alleviated.

   Based on a limited investigation, it appears that some County Assessor information may be helpful in fulfilling many of the land-based information needs that have been outlined by the MetroGIS community. However, currently all desired assessor information IS NOT readily available. Further investigation and cooperation between MetroGIS participants and County Assessor Offices is needed to make this solution truly feasible.

   Valuable but currently not all necessary data is readily available to create a working model.

c. **Land-Based Classification Standard – City of Roseville.** Based on the most extensive and detailed information known (land use classifications based on the I-35W Corridor Coalition Existing Land Use Scheme, aerial photography, field collection data from city staff, and county assessor land use designations), a one square mile pilot area in Roseville was inventoried in LBCS format. The extensive inventory took 5 hours to complete (approximately one hour per dimension per square mile).

   Although the City of Roseville planning staff felt having the land-based information in a LBCS format added little value to their current procedures of obtaining needed information, they expressed support in the structure of the database and the overall value of standardized classifications. The ability to conduct cross-tab analysis within its structure and with other

datasets, to run queries and reports, and associate more closely with other land-based information provide a tremendous value for trend analysis and planning.

The American Planning Association (www.planning.org/lbcs) provides a wealth of information and guidance from vast amount of research on the development and implementation of an LBCS database.

A significant concern is the perceived need for community-based support for information and maintenance. It may be possible to generate less specific inventories based on some quick cross-tabular queries of readily available data in digital form that still provide a great deal of value to communities. It may be possible for a single organization to create simplified a database that could be further enhanced or modified by communities or other information experts and users.

Valuable but unclear if communities will adopt an out-of-the-box – from scratch – recipe for LBCS. It is perceived that an intermediate version created by one, but enhanced by many, would precipitate a more likely adopted system that could develop into a truly community-based incorporated and maintained tool (see Scott Co. – LBCS pilot described below). The workgroup concluded it needs feedback from the planning community on the usefulness of an LBCS-like land-use database model.

d. **Hierarchical Coding Scheme – City of Roseville.** Based on the two-tiered hierarchical coding scheme developed and endorsed by MetroGIS for planned land use information, a more detailed (four-tiered) hierarchical coding scheme was developed to test on the same one square mile pilot area in Roseville used in the LBCS pilot study.

Using the resulting database from the LBCS pilot study as a surrogate for local knowledge, land units (mostly parcels) were assigned land use designations at each of the first two tiers of the hierarchical coding scheme. Where appropriate, the third and fourth tiers were populated. The process took about two hours (poor local knowledge of an area could multiply the needed time). Although most coding was relatively straight forward, some information was difficult to pigeonhole into a single designation due to the multiple uses of a unit of land or the chosen classification strategy of the previously endorsed planned land use coding scheme.

A significant issue of concern is the need for detailed community information and assistance to fully utilize. Other concerns with this system surrounded commercial classification. Consider businesses, business service area, building type, and situations where multiple businesses, with varying services areas, within a single structure (strip mall), attempting to capture and effectively nest the desired information into a logical hierarchical system is very difficult. In addition, there is little perceived value to ask communities to change their business practice other than easier regional comparisons between communities, especially since most communities are already utilizing a single dimension hierarchical system.

Valuable for the improved ease of community comparison across the region or within a sub-region if embraced by communities. However, on an individual community basis, there appears to be limited value to discard their current hierarchical coding scheme for this one.

e. **Land-Based Classification Standard – Scott County.** Based on the best readily available information, development of a countywide LBCS database was attempted. Acknowledging that the available data was limited in its depth of detail, to some extent, the pilot study supported the APA's claim that available data can be quickly transformed into a LBCS style database through queries and cross-queries of data. And the APA's assertion that the flexibility of the LBCS design to expand or contract to the breadth of available data helps dismiss any concerns of limited data. In other words, a LBCS database does not have to be fully populated to be valuable – standardized classifications, at any depth of detail, and the ability to conduct cross-tab analyzes are value-added features to land-based data that frequently are encumbered by poorly managed land database.

   Using the Metropolitan Council's 2000 Generalized Land Use Data and Scott County parcel and assessor data from 2000, a very basic LBCS database was partially created (75% of records, spatially covering 85% of county) in a couple of days.

   Some noticeable limitations:

   - Metropolitan Council's land use delineation is based on discernable use (LBCS-Activity) and not political or property boundaries (LBCS-Function or Ownership) As a result, when the Council's land use and county parcels boundaries are not coincident thus creating numerous slivers that would need to be resolved;
   - Current MetroGIS Parcel data lacks key information (use, building square footage, number of floors, etc). However, many of these information pieces are included in the second generation parcel agreement that is currently being drafted;
   - Ownership, as defined by LBCS (rights/access to property), is not readily accessible and can only be inferred from traits such as owner or business name, assessor use, and function;
   - Site development can only be quickly inferred from use and aerial imagery;
   - Available structure information is limited to assessor data and appears to be tied to legal property rather than the specific building footprint. Although most footprint information is not readily available, if it were, concerns with the parcel-based assessment approach surfaces when attempts to assign structure information to parcels with multiple structure.

   This pilot illustrated the value of community input and revealed some technical issues involving spatial accuracy that deserve consideration. Both items inadvertently direct a solution towards a multi-phased approach that would involve local communities, sub-regional information producers and regional organizations to create a solid database foundation for community enhancement and "ownership." Once again, this system needs further community feedback to determine usefulness.

Synopsis of Benefits and Concerns for Possible System Solutions:

To better understand some of the basic tenants that surround each type of solution, it is important to review some of the perceived benefits and concerns of each solution. The italicized text states the principle benefit / concern.

SOLUTION	BENEFITS	PITFALLS
Met Council Generalized Land Use	- Regionally consistent methodology and classification; - Existing custodian	- Limited Detail; - Updated every 3-5 years; - Methodology concerns based on alternative assumptions and business needs than the Council's; - Not very useful for all;
	Consistently maintained	*Limited local input*
Built Environment Model	- Utilizes regional land use data (Council), implying all benefits that come with Council data; - Can fulfill many information needs if Assessor data is up-to-date, consistent, and freely available; - Can be updated "annually" from assessor data.	- Currently, there is limited access to assessor data; - Inherent discrepancies with assessor data (land use descriptions based on taxing potential).
	May eliminate need for annual use inventories and has willing custodian	*Limited local input and support data isn't freely available*
Hierarchical Coding Scheme	- Familiar concept to users; - Can fulfill current basic needs.	- Unknown regional custodian; - Perpetuates static databases and misnomers on "land use" definitions limiting the flexibility of descriptions; - Scheme may not be useful for all. - Little perceived value in communities embracing new codes other than regional comparison
	Familiar model concept and utilizes local input	*Demands local input*
Land-Based Classification Standard	- Extensive research and support; - Standardizes defining data (improves efficient use of terms and information; - Integrates more efficiently into growing Enterprise systems integral to communities and regional business procedures.	- Unheralded by users; - Unknown regional custodian.
	Utilizes local input where available and provides more functionality	*Encourages local input*

Reviewing the basic values and concerns of each classification systems, it appears the LBCS-type systems has the most value in term of its functionality, followed by the "Built Environment" model for its similar approach but focus on available data and custodian. However, it was concluded that the value of an LBCS-type system was not fully perceived by the workgroup after the conclusion of the pilot studies. Compounded with the seemingly lack of national and local interest outside of an academic environment, the group was concerned about "endorsing" a conceptual solution that may be void of any true acceptance. It was decided to bring the concept to the trenches and obtain potential user's feedback.

Meetings with municipalities, county planning groups, and regional organizations were initially met with indifference towards LBCS – clearly due to a lack of knowledge of the model. However, after discussions about the perceived values and advantages of a LBCS, generally, there was positive interest in the implementation of such a system. Little, if any, skeptical or negative support for the concept was received.

Formulation of a Recommendation for a Regional Existing Land Use Solutions:

Even after mostly positive feedback in an LBCS-type solution and acknowledgement of its advantages, two items of concern remained:

1) A perception that a limited amount of communities, if any, would embrace the LBCS system if provided to them in a straight of "out-of-the-box" format from APA – basically concept, no data; and
2) That several more complex land-based information questions (i.e. "What is the amount of redevelopable land in my community?" or "What is the market potential for a new grocery store based on location of existing stores and residential density?") can not be solely addressed with the LBCS system.

The workgroup concluded that in order to lessen the daunting task of creating and then maintaining a multi-layered, multi-dimensional database systems for land use information, an interim dataset based on the LBCS classification system may be extremely useful. An interim system or a Version I dataset based on available data could serve as a basis for a truly community-based and maintained system that could be readily shared among communities. Or, the Version I dataset may prove to be a viable solution in itself by relieving the need for intensive community input or business modification (Note: it is MetroGIS policy to never require an organization to do anything that they do not have an internal business need to do). Whether the Version I dataset serves as an interim solution or becomes a permanent regional solution, communities expressed a need for additional assistance. It was concluded that to effectively encourage communities to embrace such a land use classification system and efficiently integrate it with their numerous other enterprise information systems, it would be important to provide clearly presented examples of the benefits, instructional material, and overall implementation support.

How do we get a Version I solution? Is there a way to utilize existing data to generate a relatively quick and painless interim LBCS? Looking more closely at different dimensions, it is possible to view each as equating to:

Activity	-	Use – general, discernable uses
Function	-	The "Economic" use of the land (e.g. a factory and an office building belong to the same enterprise describing the economic use of the land but they have distinctly different Activities. Function appears to be most appropriately equated to legal property boundaries (parcel) – possible exceptions are larger properties.
Ownership	-	Applies to legal property (parcel) and access to property and less to the visible use. Therefore, the ownership distinctions are basically inherent in parcels and county assessor data – information being addressed by another MetroGIS workgroup through a standardized regional parcel database.
Site Development	-	General levels of alteration of the land. Beyond defining parkland's level of development – acknowledging most parks have similar activities, functions, and even ownership – site seems to have limited value.
Structure	-	Building information that, with the exception of housing types, shopping center categories and a few other minor use types, would be vastly more valuable when implemented with precise building locations – "footprints."

Using the following data sources:

- Metropolitan Council's generalized land use – primarily activity based with some housing and commercial structure, and site development distinction,
- County parcel data – constituting the principal ownership classifications, providing function definitions and some important housing, commercial, and institutional structure distinction, and
- Expanding landmark datasets – point data providing enhanced activity, function, and structure information,

a Version I LBCS database can be generated that not only provide the framework for basic land use analysis, but in effect, also provides a foundation for communities to embrace and further refine and improve spatial and informational accuracy. It also provides a mechanism to migrate community imposed land use categories based on internal needs and perceptions into more standardized descriptors based on activity, functions or purpose. Through the simple translation of community land use categories into a LBCS model, inconsistencies in a community's classifications and differences between communities are exposed. Exposing these inconsistencies and differences can assists communities in adopting complete and comparable land descriptors that will help users more easily answer information questions about land supply, service demands, or market analysis.

The workgroup also concluded that as helpful as a Version I data solution would be for users, many more complex land-based information questions would remain unanswerable. Frequently, demanding more qualitative and quantitative information that may vary from application to application, it was acknowledged that additional solutions or more precisely, the drafting of best practices to consistently obtain reliable results would be beneficial to the MetroGIS community. Most likely rooted in the existing procedures of the majority of users, the workgroup felt that a Phase II Workgroup could investigate the range of options appropriate to address these more complex land-based questions and propose any desired next steps while the Version I dataset is being built.

5. RECOMMENDATIONS POLICIES AND ACTIONS (ROLES AND RESPONSIBILITIES):

a. The Metropolitan Council will be updating their Generalized Existing Land Use data for the Twin Cities Metropolitan Area in 2005. Through MetroGIS, a Regional Parcel Data Sharing Agreement is being drafted that will allow all government entities access to a suite of county parcel attributes associated with parcels.

   Starting in 2006, the Metropolitan Council will generate a Version I dataset that implements the American Planning Association's Land-Based Classification Standard relational database model (see Appendix B). The Council will use the following data to generate the Version I dataset:

   a) The Metropolitan Council's 2005 Generalized Existing Land Use data;

   b) The most current MetroGIS Regional Parcel Dataset; and

   c) The Metropolitan Council's Landmark dataset – locations of specific land use features focused on distinguishing activities in and between structure (i.e. schools, hospitals, "big box" stores, pharmacies, parking lots, commercial strip malls, etc.);

   The Council may also choose to employ information from:

   d) The most current MetroGIS Regional Planned Land Use data – since it is parcel based, some institutional lands are better defined in this dataset than with the above data; and

   e) The U.S. Census (i.e. economic information recorded with the North American Industry Classification System).

   To maintain the integrity of the Regional Parcel Data Sharing Agreement, the Version I dataset will dissolve information based on unique land-based characteristics.

b. The Council will develop and maintain a web-based application to distribute data, monitor users, and gather enhanced data. The Council will be responsible for the functionality of the original data and application to assure that communities have access to the information for a two to three year period. The Council will not be responsibly to update or modify the data as changes occur although they may choose to do so in cooperation with a community. Through the web-based application, communities – being the land use content experts for their community - will be encouraged to use, enhance, modify the posted data and resubmit the results back to the Council.

c. Nearing completion and distribution of the Version 1 Dataset, the Council will request MetroGIS to establish a Outreach Strategy Workgroup to:

   a) Outline outreach strategies to encourage communities, having the local expertise and enhanced data, to complete, correct or modify information based on better, more accurate data; and

   b) Define the final data-distribution and data-collection mechanisms of the web-based application to track data access, survey intended data uses, upload community enhancements, and aggregate submitted data.

d. Immediately establish a Phase II Existing Land Use "Best Practices" initiative to address more complex land-based information questions (i.e. "What is the amount of redevelopable land in my community?" or 'What is the market potential for a new grocery store based on location of existing stores and residential density?") than the Version I solution can produce.

The Phase II Workgroup would evaluate the range of options appropriate to address these more complex land-based questions and propose any desired next steps.

e. After the two to three year period, the Council and MetroGIS will analyze the "success" of the Version I dataset and web application to determine the next steps. Analysis should include or consider information such as: who accessed the data, amount of submitted updated or enhanced data, user feedback on value and functionality of the data and application, availability and currentness of supporting data (i.e. parcel, landmark data), and continued agreement of established roles and responsibilities.

6. ITEMS TO REFER TO OTHER WORKGROUPS.

In order for the above roles and recommendations to be met as stated it is vital that the new Regional Parcel Data Sharing Agreement is signed and implemented. Without the Regional Parcel Dataset, the above "built environment" data model is incomplete and therefore ineffective – resulting in a MetroGIS existing land use information solution that is essentially limited to the Metropolitan Council's 2005 Generalized Land Use.

The workgroup would also like to encourage the Coordinating Committee to take efforts to make building footprint geography and land easements available to users. This information would greatly improve the geographic accuracy of land use information and building footprint information would help separate and further define land uses within larger "mixed use" complexes.

Additionally, with the greater dependence on county parcel data, the workgroup would strongly encourage any efforts made by MetroGIS to help standardize county assessor information – particularly those incorporated into the regional parcel dataset.

Appendix A

American Planning Association (APA)

LAND-BASED CLASSIFICATION STANDARDS (LBCS) - *www.planning.org/lbcs*

Land-Based Classification Standards provide a consistent model for classifying land uses based on their characteristics. The standards are based on a multi-dimensional land-use classification model.

LBCS updates the 1965 *Standard Land Use Coding Manual* (SLUCM), a standard which was widely adopted for land-use classifications. Because many current applications and land-based data depend on SLUCM and its derivatives, this update includes tools and methods to migrate such data.

Executive Summary

LBCS provides 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 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 ones 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, Type, Site Development Character, and Ownership.

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.

The principal purpose of the project is to ensure that a broad variety of land-based data now being collected and stored at local, regional, state, and national levels, in a variety of formats and classification systems, can be ***standardized [land-based data] so that such data would be compatible and, thus, easily transferable between jurisdictions, agencies, and institutions.*** While the use of such a revamped system would be voluntary, potential users would be strongly inclined to embrace such a system because it would increase opportunities for reciprocal data sharing, both horizontally, from geographic area to geographic area, and vertically, between local, regional, state, and national jurisdictions.

In addition, a new and revised classification system would broaden the subject matter of the original 1965 SLUCM, which addressed only matters pertaining to land use. Today, we find practitioners collecting, storing, and manipulating three broad categories of land-based information: (a) land-cover information related primarily to the existing natural environment; (b) land-use information related primarily to the existing built environment; and (c) land-rights information related primarily to fee and less-than-fee and to development rights, such as those prescribed by zoning and other regulatory measures. ***The purpose of LBCS is to create a classification system capable of accommodating all three categories of land-based information: land cover, land use, and land rights.***

LBCS

Land-Based Classification Standards

Land-Use Dimensions

LBCSActivity
- Residential activities
- Shopping, business or trade activities
- Industrial, manufacturing, and waste-related activities
- Social, institutional, or infrastructure-related activities
- Travel or movement activities
- Mass assembly of people
- Leisure activities
- Natural resource-related activities
- No human activity or unclassifiable activity

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.). For example, residential uses in single-family dwellings, multi-family structures, manufactured houses, or any other type of building, would all be classified as residential activity.

LBCSFunction
- Residence or accomodation functions
- General Sales or services
- Manufacturing and wholesale trade
- Transportation, communication, information, and utilities
- Arts, entertainment, and recreation
- Education, public amin., health care, other inst.
- Construction-related businesses
- Mining and extraction establishments
- Agriculture, forestry, fishing and hunting

Function refers to the economic function or type of enterprise using the land. Land-use terms, such as agricultural, commercial, industrial, relate to enterprises. Enterprises can have a variety of activities on their premises, yet serve a single function. For example, areas said to be the same enterprise or function, may contain an office building in one place and a factory in another.

LBCSStructure
- Residential buildings
- Commercial buildings and other specialized structures
- Public assembly structures
- Institutional or community facilities
- Transportation-related facilities
- Utility and other nonbuilding structures
- Military installations
- Sheds, farm buildings, or agricultural facilities
- No structure

Structural character 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.

LBCSSite
- Developed site
- Developed site with a structure -- building
- Developed site with a structure -- nonbuilding
- Developed site that is functional (crops, storage etc.)
- Developed site that is primarily ornamental (landscape)
- Developed site functional and ornamental (park)
- Developed site that is graded
- Site with temporary structure
- Site in natural state

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.

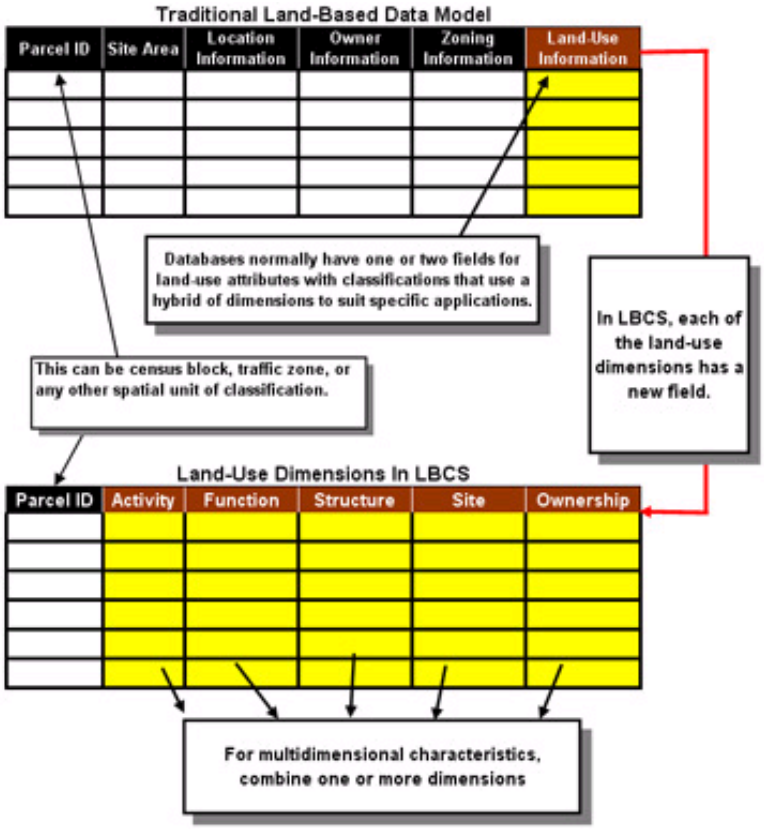
LBCSOwnership
- No constraints -- private ownership
- Some constraints -- easements or restricted use
- Limited restrictions -- leased or tenancy restrictions
- Public restrictions -- local, state, federal ownership
- Other public use restrictions -- regional, special district
- Nonprofit ownership restrictions
- Joint ownership character -- public entities
- Joint ownership character -- public, private, nonprofit, etc.
- Not applicable to this dimension

Ownership refers to the relationship between the use and its land rights. Although , this may typically be associated with the lands function (i.e. public, private) some uses are more complicated(i.e. private parks or mixed public and private ownership). Moreover, easements and similar legal devices also limit or constrain land-use activities and functions.

Appendix B

The following is derived from the *One-Page Summary* link located at http://www.planning.org/lbcs/standards/QuickImplementation.html that illustrates the potential structure of an LBCS database. The MetroGIS Version I Existing Land Use solution will be constructed following this structure (shown below and throughout http://www.planning.org/lbcs) but may vary based on final data availability. The final Version I data solution will be made freely available in NAD83, UTM coordinate system, with metadata, entity and attribute information, and contact information.

LBCS provides 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 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 ones 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, Type, Site Development Character, and Ownership.