

Land Management Tools and Strategy

C. H. Weir



How the Alberta government undertook a pilot project to develop land management tools and a land management strategy for lands associated with the Edmonton and Calgary transportation/utility corridors.

Introduction

In 1985, the Alberta Government Department of Public Works, Supply and Services, undertook a pilot project to develop land management tools and a land management strategy for lands associated with the Edmonton and Calgary transportation/utility corridors (TUC). Specifically, a prototype textual and graphics data base and a process to examine the program lands to identify constraints, land use potential, and management requirements were to be developed. This paper will briefly outline the unique Alberta TUC program and the strategy to evaluate and ultimately manage these lands, and, finally, will describe the computerized graphics/textual data base developed to facilitate land management.

Background

Alberta has created two transportation/utility corridors around the cities of Edmonton and Calgary. The TUC are approximately 0.8 km wide and are set aside land for a ring road eight-lane divided limited access freeway, buffers (30-m strips

adjacent to the road right of way), access (an 18-m strip set aside for service vehicle passage), future oil and gas pipelines, electric transmission lines, and municipal service rights of way (i.e., water lines, sewer lines). The TUC width is segmented into specific component areas that will eventually contain many individual facility rights of way, as shown in Figure 1.

In addition, secondary land uses such as parks, recreation, and storage are encouraged to use the land surface in order to better incorporate the TUC into the adjacent land use pattern.

The TUC were established through the Restricted Development Area (RDA) Regulation pursuant to the Alberta Department of the Environment Act. The RDA regulations are a form of zoning that grant the province the authority to control land use within the designated areas. The RDA regulations take precedence over all other provincial regulations and Acts and municipal bylaws. Any land use change or intensification requires the consent of the Minister of Environment. These regulations grant the Minister the power to maintain low density development on private lands in the TUC pending the construction of a corridor facility. The province is augmenting the land use control and alleviating landowner concerns by acquiring the lands for the Crown. Presently, approximately 75% of the Edmonton TUC and 65% of

the Calgary TUC lands have been acquired. The Department of Public Works, Supply and Services is responsible for all provincial government land purchases (except for Alberta Transportation) and is responsible for the management of selected Crown parcels. This department negotiates land purchases, leases Crown lands, grants easements, and undertakes all property management functions for the Crown-owned RDA parcels on behalf of Alberta Environment.

Issues

The RDA regulations hold the land for eventual Crown purchase and for the construction of TUC facilities. Many facilities will probably be built within a 25-year period. A few pipelines and powerlines have already been located in the TUC to date, and in Edmonton a portion of the ring road is to be constructed in the next few years. The fact that the TUC is not immediately used for its intended purpose has led to some concern over land sterilization or waste of a scarce resource. To address this concern, secondary land uses of the surface have been encouraged. However, this results in two management objectives: to implement primary use of the TUC, and to use the land surface.

An additional issue has been created as a result of the TUC/RDA boundary differences. The TUC plans, which allocate the land in the RDA to the various linear facilities, indicate that the entire RDA is not required for TUC purposes. The land in the RDA has been designated for the TUC primary uses (i.e., ring road, pipelines, powerlines, municipal services, buffers, and access) or has been deemed residual, unassigned, or surplus.

Residual lands are lands within the RDA that lie outside of the TUC and are not required for TUC purposes. Unassigned lands are lands within the RDA that are embedded between components in the TUC but are not required for TUC purposes. Generally, these parcels were created as a result of the design requirement, for example, to minimize deflections for powerlines and pipelines. An additional category of land related to the RDA/TUC program is surplus lands. These lands lie outside of the boundaries of the RDA but were acquired by the crown in order to facilitate the purchase of lands within the RDA. They are not required for TUC purposes.

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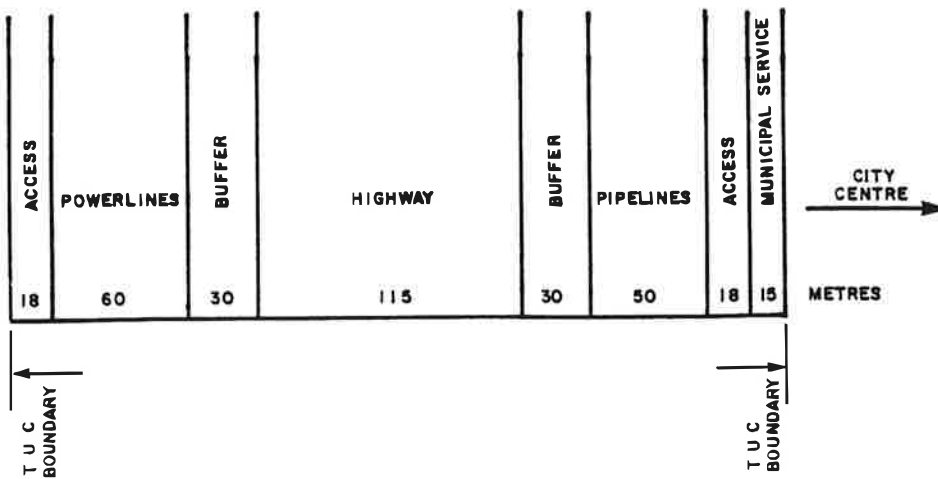


Figure 1. Edmonton transportation/utility corridor: typical cross-section.

This variety of land types has resulted in the need for a complex management strategy. The existence of land within the RDA not required for the TUC program raises the question whether the lands should be retained or released. The strategy developed assumes that the province will eventually retain only the TUC requirements. The management functions associated with these lands will include the ability to: (a) plan, operate, and maintain the TUC lands for the primary uses; (b) provide interim management of residual, unassigned, and surplus lands; (c) acquire TUC lands; (d) release/dispose of residual, unassigned, and surplus lands; (e) manage secondary land use on the surface of the TUC.

Land Management Strategy

The strategy analyzes each parcel of land and determines whether the parcels (or portions of the parcel) should be acquired, retained, or released. A number of interim management principles were developed to preserve the integrity of the TUC and the development potential of the non-TUC lands. In addition, a land disposal process for Crown-owned non-TUC lands was developed.

As shown in Figure 2, there are four stages to the strategy. In the first stage, every title area was assessed to determine the minimal land requirements of the parcel for TUC purposes or to identify non-TUC parcels or portions of parcels potentially subject to access or development constraints imposed by the TUC boundary, which must be retained or acquired by the Crown.

This process resulted in the identification of the land required for TUC purposes; the land not required for the TUC but con-

strained by access, or environmental, or development constraint and to be acquired and held by the Crown with the TUC land; and the land deemed non-TUC (i.e., no TUC requirements and no constraints). This information is valuable for the land acquisition and disposal process in that it clarified the lands that must be bought (i.e., TUC and constrained land) and which lands could be disposed of by the Crown.

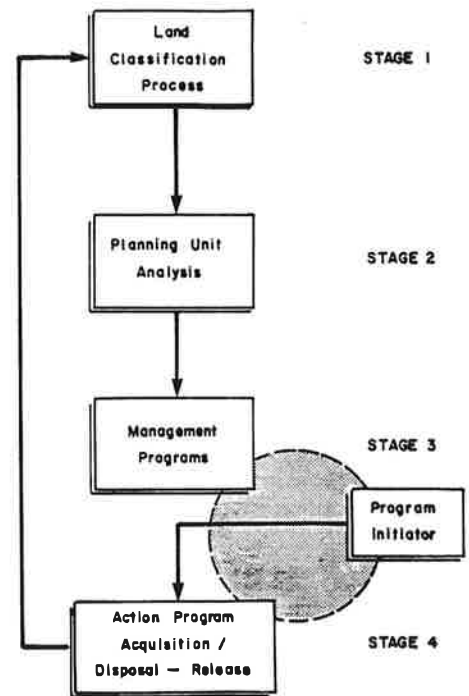


Figure 2. Land management strategy.

Stage II, Planning Unit Analysis, results in the identification of the probable future land use and development timing of the RDA lands. The ultimate land use outside



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Table 1. Management Requirements and Principles

Land Category	Program Requirement	Future Land Use	Ultimate Management Disposition	Interim Management Principles
TUC	Primary uses	Primary/secondary land uses	Retain	Protect TUC integrity Crown ownership Encourage interim/secondary land uses Restrict development to TUC compatible uses Review parcel relationship before purchase
Non-TUC				
Environmental area	Residual	Open space	Withdraw from RDA	Maintain character potential Transfer to municipality
Constrained lands	Residual	Urban	Withdraw from RDA	Use should not adversely affect possible purchase/sale Protect land use potential Use strategic purchase to limit amount of crown constraint lands Review parcel relationship before purchase/sale
Unconstrained lands	Residual	Urban	Withdraw from RDA	Protect land use potential Use should not adversely affect possible purchase/sale Link release with acquisition of related TUC requirements Review parcel relationships before purchase/sale
Unassigned intensive	Unassigned	Institutional/industrial/recreation/ancillary	Withdraw from RDA	Protect land use Use should not adversely affect possible purchase/sale Permanent physical access to be provided Access through land adjacent to the TUC/RDA must be provided
Unassigned extensive	Unassigned	Recreation/open space/ancillary	Retain	Use should not adversely affect eventual purchase Less restricted uses can be allowed
Surplus	Residual	Urban	Disposal	Use should not adversely affect eventual sale Use as trade stock for acquiring TUC requirements Review parcel relationships before sale

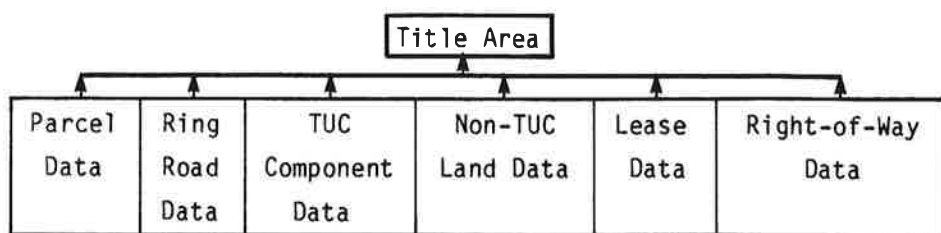


Figure 3

and adjacent to the RDA boundary is assumed to be continued to the residual lands within the RDA, unless urban servicing constraints require a lower density of development. For the remaining privately held TUC lands an acquisition priority was assigned, and for the non-TUC crown lands

available for release a disposal priority was assigned based upon the land use plan status on the adjacent lands. The closer the adjacent land was to ultimate development, the higher the priority (e.g., adjacent land vacant—priority low; adjacent land subdivided—priority high), the rationale being

that if the province is to modify the RDA boundary to cover the TUC requirements only, this must occur before land use decisions outside the RDA preclude the development and incorporation of the non-TUC lands.

This stage results in the assignment of an acquisition priority to all privately held TUC lands and a disposal priority for all Crown residual or surplus lands. The process is to be undertaken periodically to address recent purchases and adjacent land use changes.

Stage III involves the application of interim management principles to the various land classes within the RDA until full

implementation of the TUC (i.e., all TUC land Crown owned, the RDA boundary reduced to be coterminous with the TUC boundary and construction of many of the primary uses). Each of the land classes has an ultimate management disposition when the TUC is fully implemented. Table 1 indicates the RDA land classes and their ultimate disposition. The general management principles developed for each land class to guide the interim use in order to pursue the ultimate disposition is also shown in the table. Many parcels have unique characteristics; thus management principles are general in order to provide flexibility to the land managers. The principles, however, do highlight key issues, which, if overlooked, could impair the TUC implementation or result in the Crown buying and retaining unnecessary lands.

The final stage of the strategy is the implementation of acquisition and disposal program. The province had an equitable, effective, and efficient RDA land acquisition process before the strategy project that did not require modification. The acquisition priority assigned by the strategy to the remaining privately held parcels is an additional element available for ranking the lands.

A disposal program was designed to return non-TUC land to the private sector to allow for development and to generate revenue for the province while protecting the TUC purpose, the major provincial investment, and the local real estate market. The disposal program developed uses the disposal priorities assigned in stage II as an initial ranking of lands to be considered for release. High ranked lands are reviewed by other government agencies to determine whether the lands can be used for their programs. This ensures that the one arm of

the province does not reacquire lands recently released by another provincial department. Next, the local real estate market is assessed to identify the types and the number of parcels that could be offered for sale without negatively impacting the market. During the sale negotiation, any conditions of use required to preserve the adjacent TUC integrity are discussed and finalized. This process allows for the controlled release of lands not required for the program.

Land Management Tools— Computerized Data Base

In order to facilitate the management of the RDA lands, a computerized graphics and textual data base was developed. The system was based on an existing TUC plan graphics file and a dBase III textual data base for Crown land on microcomputer.


Using the Intergraph 200, the graphics data were transformed from a simple drafting file to a series of polygons. The graphics data base was derived by creating polygons using title areas as the base unit; that is each polygon was created by intersecting title areas with the element (e.g., the ring road right of way when intersected with the title areas created 235 polygons). The graphic system has 19 layers of information, including elements such as township grid, title area, utility right-of-way, ownership, TUC component areas, land use plan status, and disposal priority. These polygons were manually inserted into the graphics data base. This approach was used because of the limitations in the existing hardware and software for polygon processing. Although 3,000 polygons (pilot project) were created, the task was relatively quick and easy.

The existing textual data base was initially expanded to include both private and

Crown lands in the RDA. The textual data contain over 90 attributes. Figure 3 provides a schematic of the textual data base. All of the textual data are ultimately linked to parcel polygons. The general parcel information, the land planning, ring road and TUC component data, right of way information, and lease data are linked by specific parcel identifier.

The data base is accessed using the Data Management and Retrieval System (DMRS) and the Interactive Graphics Design Software (IGDS) and is run on the Intergraph Interactive Computer Graphics System. The DMRS data base is based on the network data model with hierarchical data model subsets. This data base allows a textual data base to be attached to a graphics design file by linking attributes to individual graphic elements. The attribute data can then be accessed through the graphics or by text.

For the pilot project a limited number of services were provided to demonstrate the system capabilities. This involved developing user commands and matrix menus to facilitate convenient access to the graphics/textual data base and to show the system performing basic searches on one or many entities, using standard Boolean and relational operators, and displaying the results in both graphic and report formats. It also involved the ability of the system to load and display attribute data stored in the textual data base in the graphics file.

It is hoped that the graphic/textual data base will aid the program administrators by ensuring that all participants have the same basic data foundation, by providing complete spatial relationships to be visualized, and by readily providing current accurate statistical and summary information. 

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