

The Systematic Land Verification (SyLVer) Protocol

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INTRODUCTION

Cadastral Database

- parcel based and up-to-date land information database
- includes the geometric descriptions of the land parcels such as location, dimension and size.
- It is linked to other records that describe the nature of interests such as informations related to the rights, restrictions and responsibilities associated to the land parcel.

Cadastral Surveys

- surveys done to determine the metes and bounds of all land parcels within an entire municipality or city and the proponent is the government executed by licensed geodetic engineer (DENR 2007)

Isolated Land Surveys

surveys of individual or small groups of parcels done to determine the metes and bounds, correct erroneous boundaries and for other purposes and the proponent is either the government or private entities executed by licensed geodetic engineer.

INTRODUCTION

- Philippine Reference System of 1992
- Land Administration and Management Project

UPDATING???

DENR Regional Offices

- digitize cadastral data
- encoding and plotting the coordinates of individual parcels
- scanning and digitizing cadastral maps
- producing a computerized cadastral database

RESEARCH MOTIVATION

- Numerous initiatives done to improve land information system but minimal effort was done to answer the problem of maintaining and updating a cadastral database
- Development of modern geographic information systems (GIS) may help solve the problem of incremental updating of cadastral database

OBJECTIVES

- Determine and evaluate the factors affecting cadastral database's changing information, provide a way to create and update a cadastral database and provide a way to maintain the historical information.
- Propose a Systematic Land Verification (SyLVer) Protocol that may help agencies such as DENR to do computerized incremental updating while maintaining the topological integrity of a cadastral database.

CADASTRAL DATABASE

FIELD NAME	DESCRIPTION	REMARKS
UPI	Unique Parcel Identifier, primary key	
LotNo	Lot number	
SurveyNo	Survey number	
Claimant	Claimant or owner	
CMQuadSec	Cadastral map quadrangle where the parcel is located/plotted	applies to cadastral data from Cadastral Maps
Brgy	Barangay	
Municiplity	Municipality	
Province	Province	
Island	Island	
GeEngr	Geodetic Engineer	
dSSurveyed	Date Surveyed	
SurvSymNo	Surv. Sym. & No.	applies to titled lots only
LRCNo	LRC Record No.	applies to titled lots only
Area	Area of the lot declared on the survey plan	

Attributes of the Cadastral Database

D8Submitted	Date Submitted to DENR for verification and approval	
D8Approved	Date the survey plan was approved by DENR	can be used to trace the successive history of a parcel
Mothr_lotN	Mother lot number	applies to isolated surveys only
Mothr_surN	Mother lot survey number	applies to isolated surveys only
Mothr_UPI	Mother lot unique parcel identifier	applies to isolated surveys only; can be used as link between the mother lot and resultant parcel
OrigSurNo	Original Survey number	applies to isolated surveys only
OrigSurD8	Original Survey date	applies to isolated surveys only
OrigD8Aprv	Original survey date of approval	applies to isolated surveys only
OCTNo	Original Certificate of Title Number	applies to titled lots only
TCTNo	Transfer certificate of Title Number	applies to isolated surveys on titled lots only
CompArea	Computed Area	

CADASTRAL DATABASE

Types of Survey Based on Survey Symbols	
Survey Type	Survey Symbol
Cadastral Survey	Cad
Original Survey	Psu, RS, Fli, Msi
Subdivision Survey	Psd, Csd
Consolidation Survey	Pcn, Ccn
Consolidation-Subdivision Survey	Pcs, Ccs
Verification Survey	Vs

Typical survey symbols based on the type of survey conducted

CADASTRAL DATABASE INCREMENTAL UPDATING

I. Spatial characteristic- affects the geometry of the parcel

- | | |
|-------------------------------------|-----------------------|
| 1. Subdivision Survey | (segmentation/split) |
| 2. Consolidation Survey | (mergence /union) |
| 3. Consolidation-Subdivision Survey | (complex change) |
| 4. Verification Survey | (boundary adjustment) |

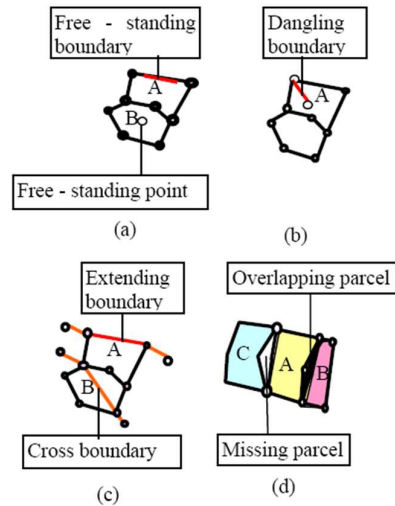
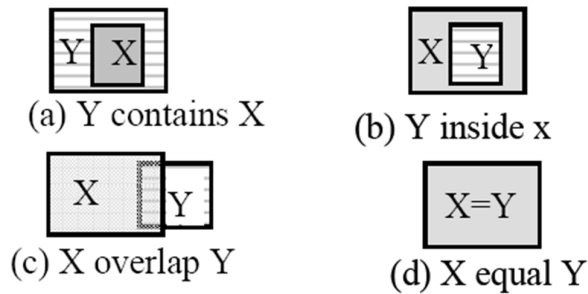
II. Attribute characteristic- geometric position does not change

- change in ownership, land classification etc.

CADASTRAL DATABASE INCREMENTAL UPDATING

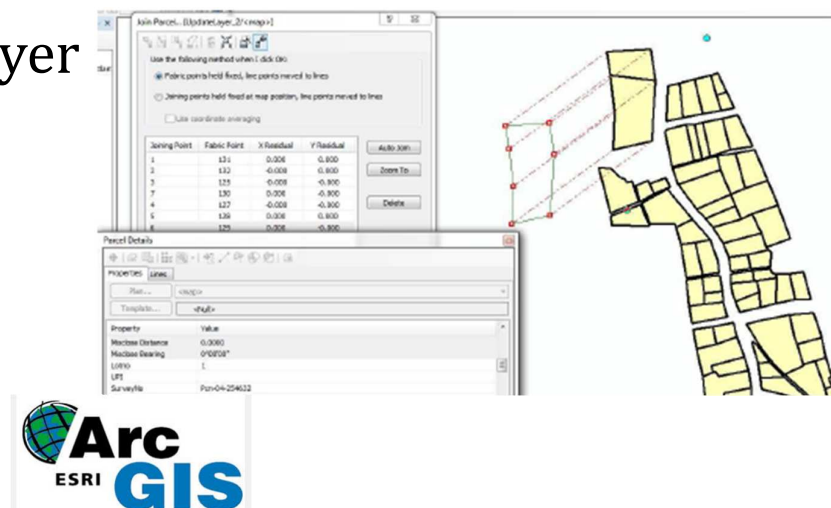
Change in the characteristic of a lot can be identified by

- topological relationship between the parcels before and after the change
- topological integrity constraints and attribute property (Chen, Zhou and Li 2007).

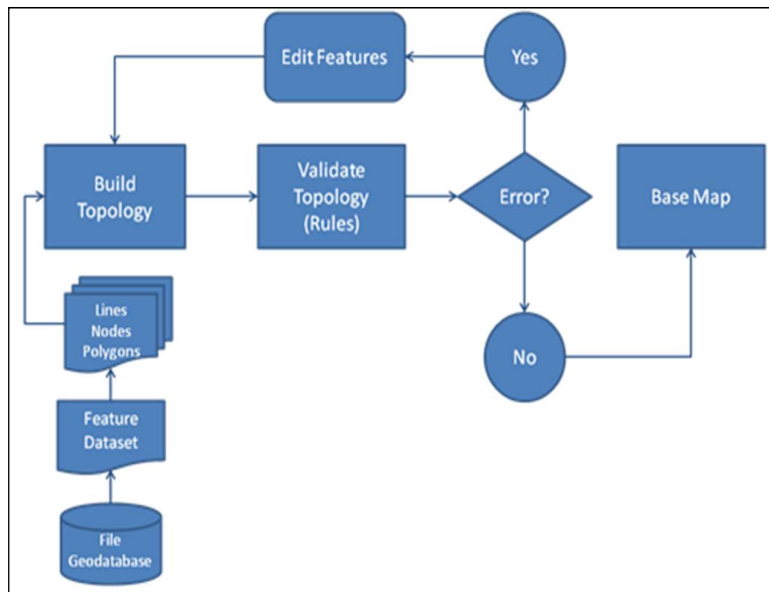


ARCGIS PARCEL EDITOR

- Parcel Fabric
- Base-map Creation
- Update Layer
- History Layer

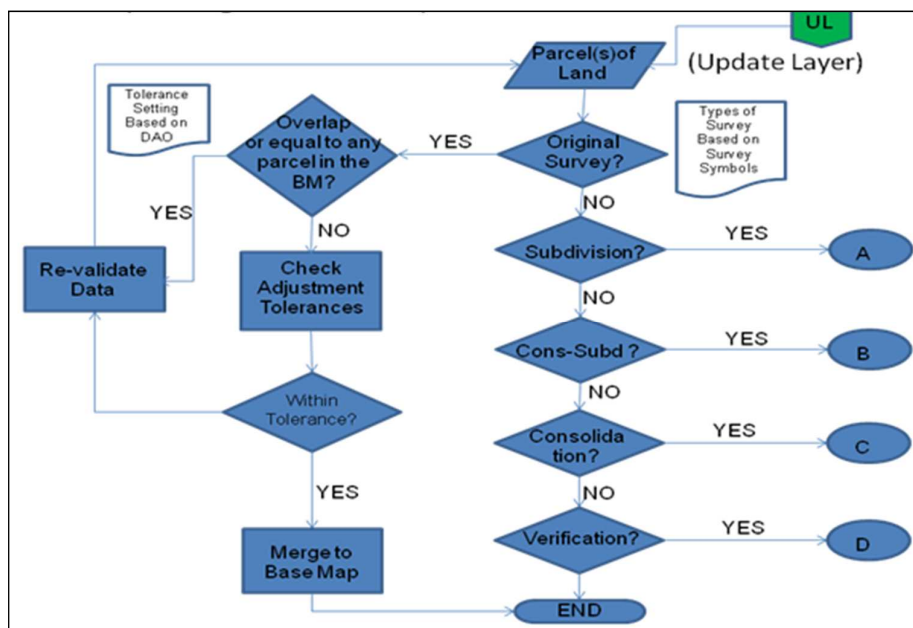


PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL



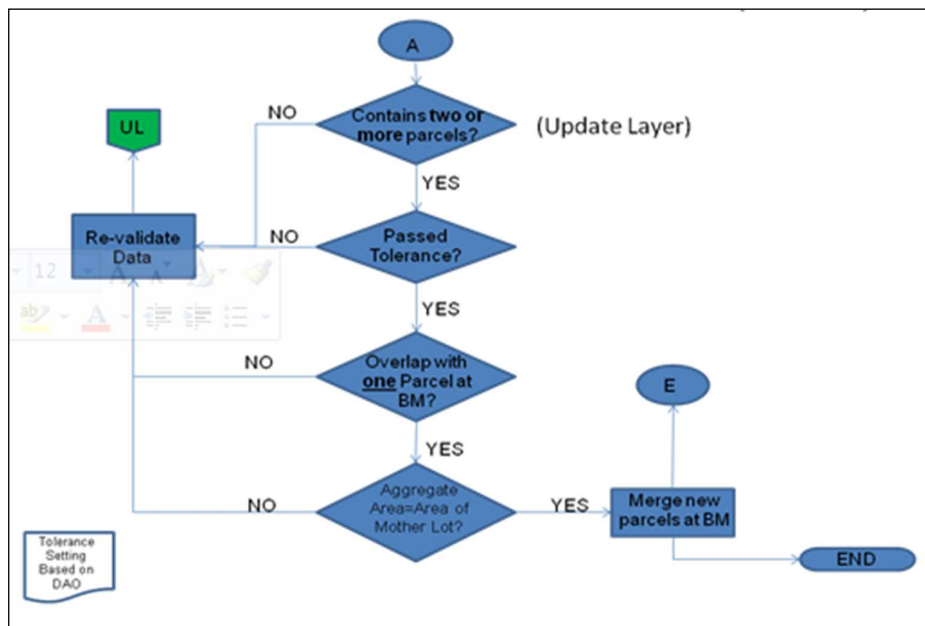
Base Map Creation Flowchart

PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL



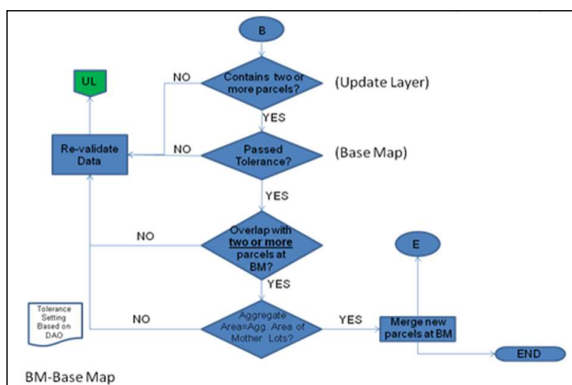
Procedure for Updating Cadastral Database Map

PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL

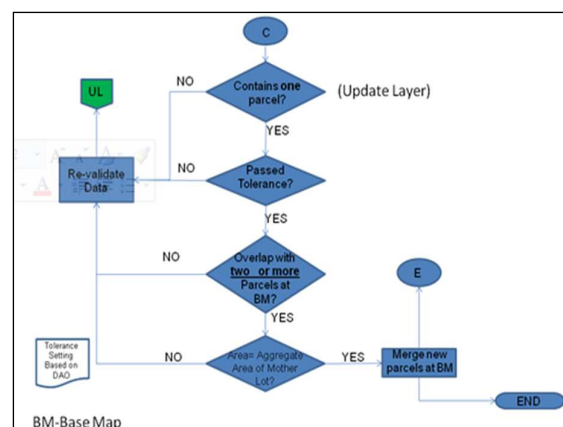


Subdivision Survey Protocol

PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL

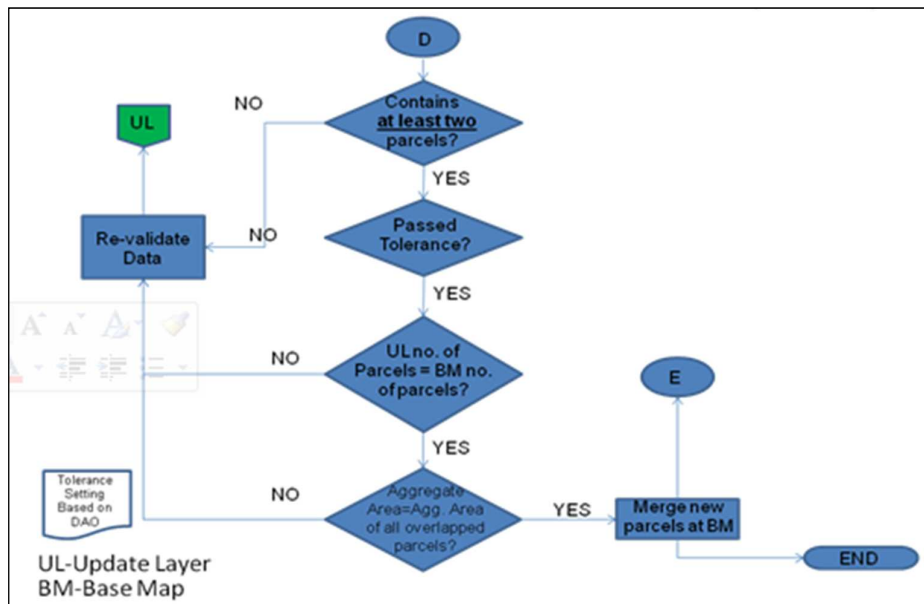


Consolidation-Subdivision Survey Protocol



Consolidation Survey Protocol

PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL



Verification Survey Protocol

PROPOSED SYSTEMATIC LAND VERIFICATION (SyLVer) PROTOCOL

Protocol checks for subdivision, consolidation-subdivision, consolidation and verification surveys include the following:

- Checking of the number of lots in the Update Layer;
- Tolerance checking;
- Checking of the number of mother lots in the base-map; and
- Checking of the computed land area of the parcels in the Update Layer and the Base Map Layer

CONCLUSIONS AND RECOMMENDATIONS

- A good parcel updating system is important as it provides user with up-to-date information. Historical data are still relevant as it provides chronological history of parcels that may be needed in several purposes such as investigation.
- The proposed SyLVer protocol may provide a means to do the implementation and updating of cadastral database in a computer environment.
- GIS software can provide an efficient and capable tool in the implementation of cadastral database build-up and incremental updating. ArcGIS provided modules such as the Parcel Editor that can readily be used. However, the cost of buying such third party software must be considered.
- Implementation using actual data is the next level of the study and use of the SyLVer Protocol. This will be done in coordination with DENR.

REFERENCES

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- DENR. *DAO 1998-12: Manual for Surveyors*. 1998.
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THANK YOU for your time and
kind attention!!!