

Land Parcel Geodatabase: Constructing a Parcel Fabric from Survey Data

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Survey Data in Parcel Geodatabases

Parcel Geodatabase

Contain and maintain land records data – from PLSS to Parcel



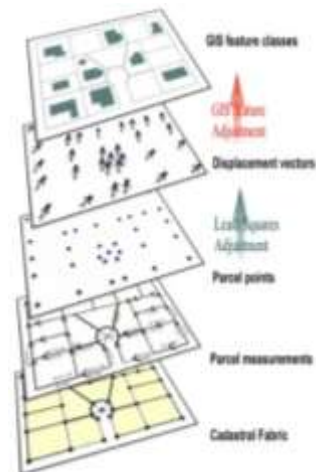
Survey Data

Acquired by accurate measurements. The base upon the land record data is developed.

GIS and Survey

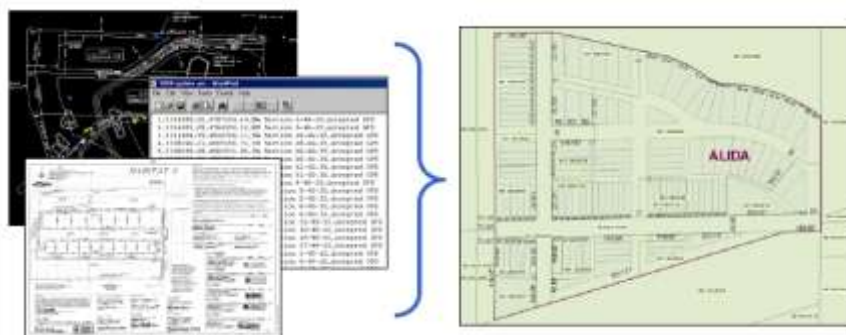
- A Parcel is only accurate as the base in which is create
- Survey bring accuracy to GIS
- GIS bring integration to survey

- Parcels are embedded in the hierarchical framework of the PLSS
- Relation with other surveys and administrative boundaries
- Data management
- User defined and flexible outputs

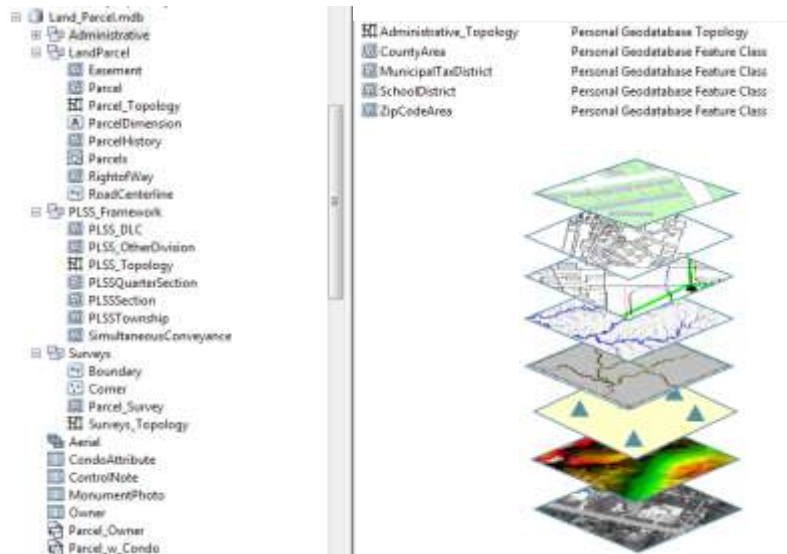


Goals

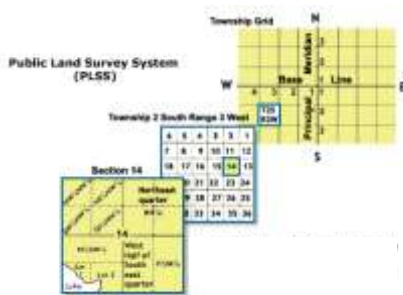
Create a Parcel Database and a Parcel Fabric feature from survey data using COGO, topological relationships and Parcel Editor in order to reach an accurate parcel geometry.



Land Parcel Personal Geodatabase



PLSS



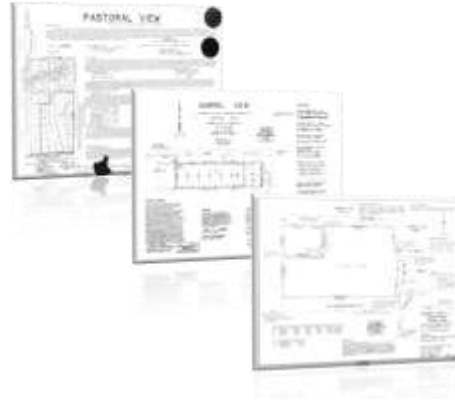
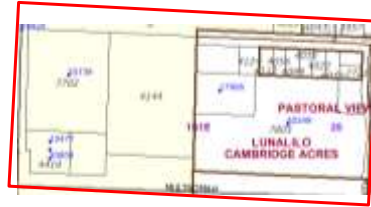
Willamette Stone

The Public Land Survey System (PLSS) is the framework from what all tracks of land are divided and described by a rectangular system of surveys.



Study Area

N½ NW¼ SW¼ Sec 20 T1S R1E



Data / Tools

Data

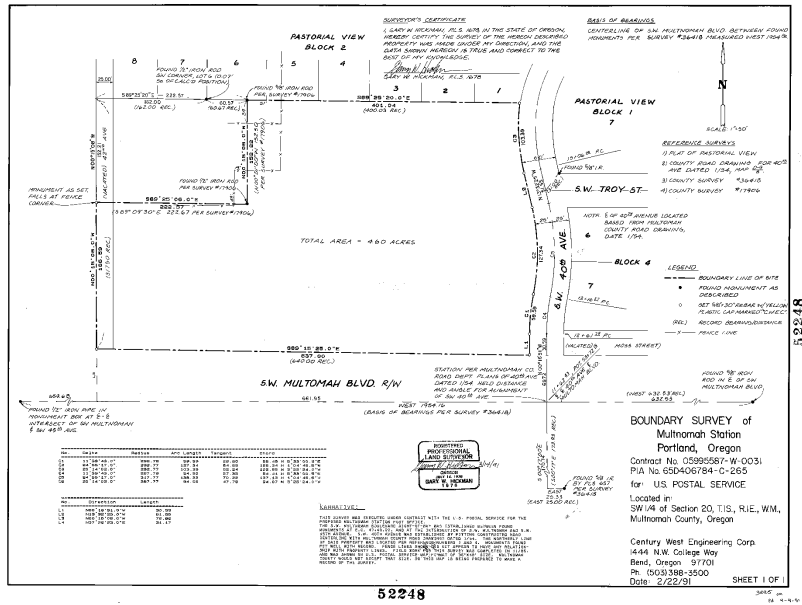
- Multnomah Survey and Assessor Image Locator (SAIL) gis.co.multnomah.or.us/sail

Survey	Year
Plat of Pastoral View in Sec. 20 T1S R1E, WM	1923
Survey of a portion of Pastoral View Plat	1969
Survey of track in the SW ¼ Sec.20 T1S R1E, WM	1970
Boundary Survey of a Track of Land in SW ¼ Sec.20 T1S R1E, WM	1971
Gabriel View. A replat of Lots 1-5 Block 2 Pastoral View	1987
Boundary survey of USPS Multnomah Station	1991

Tools

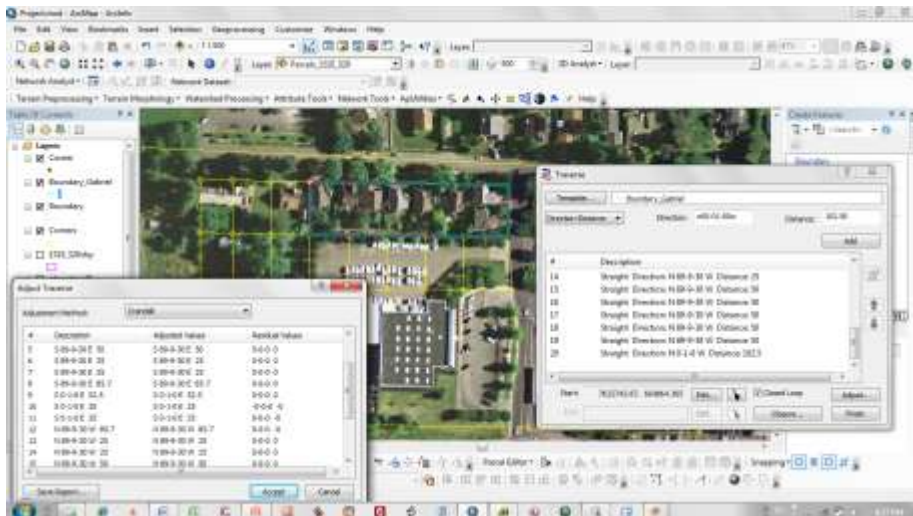
- Database Toolbox
- Editor Toolbar
- COGO Toolbar
- Topology Toolbar
- Create COGO Fields
- Load a Topology to a Parcel Fabric Tool
- Parcel Editor Toolbar

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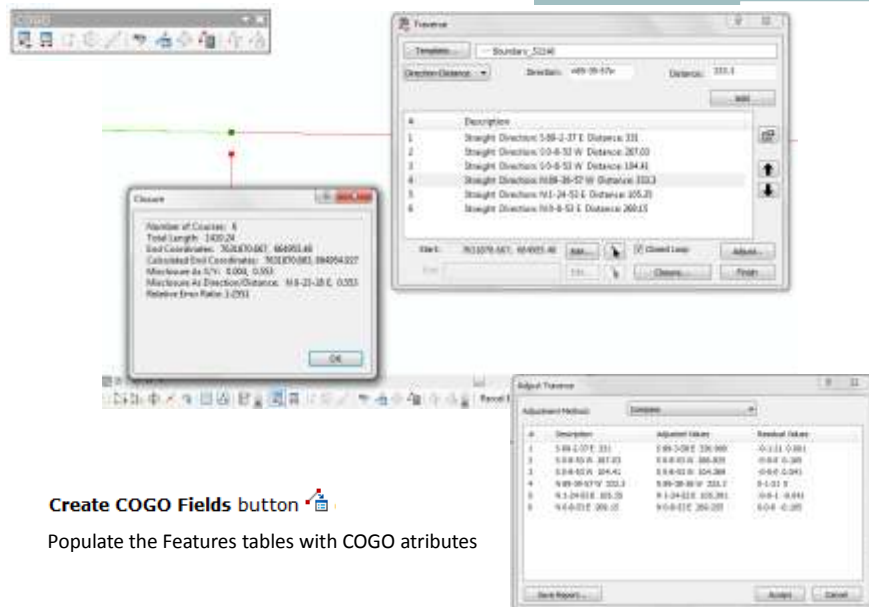


52248

COGO Tool – Traverse Window



Adjusting Traverse

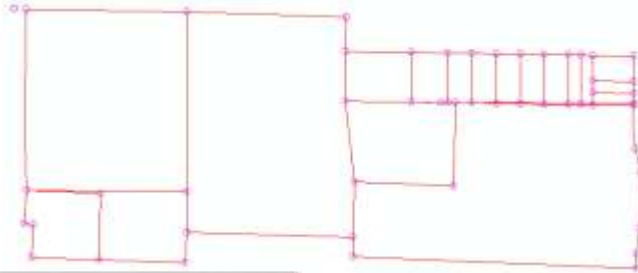


Surveys



Bridging Surveys

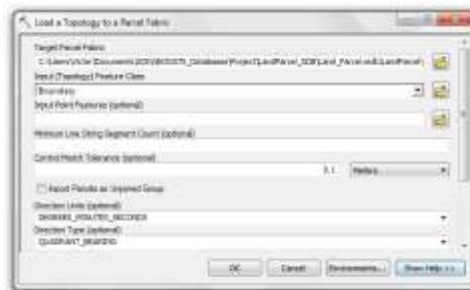
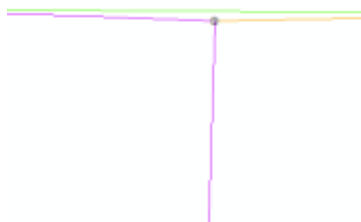
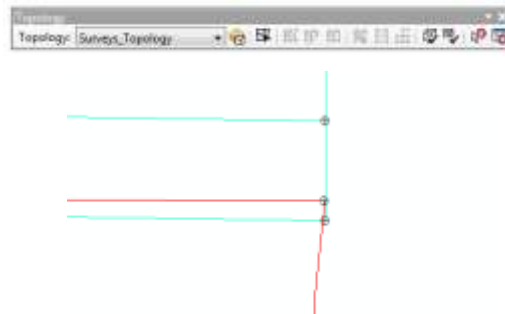
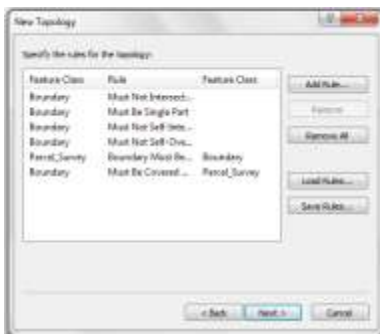
**Corners
+
Boundary**



The screenshot shows the 'Data' window in Microsoft Access, displaying a table named 'tblEmployee'. The table has columns: EmployeeID, LastName, FirstName, Title, TitleC, TitleF, TitleL, TitleS, TitleT, TitleU, TitleV, TitleW, TitleX, TitleY, TitleZ, TitleAA, TitleAB, TitleAC, TitleAD, TitleAE, TitleAF, TitleAG, TitleAH, TitleAI, TitleAJ, TitleAK, TitleAL, TitleAM, TitleAN, TitleAO, TitleAP, TitleAQ, TitleAR, TitleAS, TitleAT, TitleAU, TitleAV, TitleAW, TitleAX, TitleAY, TitleAZ, TitleBA, TitleBB, TitleBC, TitleBD, TitleBE, TitleBF, TitleBG, TitleBH, TitleBI, TitleBJ, TitleBK, TitleBL, TitleBM, TitleBN, TitleBO, TitleBP, TitleBQ, TitleBR, TitleBS, TitleBT, TitleBU, TitleBV, TitleBW, TitleBX, TitleBY, TitleBZ, TitleCA, TitleCB, TitleCC, TitleCD, TitleCE, TitleCF, TitleCG, TitleCH, TitleCI, TitleCJ, TitleCK, TitleCL, TitleCM, TitleCN, TitleCO, TitleCP, TitleCQ, TitleCR, TitleCS, TitleCT, TitleCU, TitleCV, TitleCW, TitleCX, TitleCY, TitleCZ, TitleDA, TitleDB, TitleDC, TitleDD, TitleDE, TitleDF, TitleDG, TitleDH, TitleDI, TitleDJ, TitleDK, TitleDL, TitleDM, TitleDN, TitleDO, TitleDP, 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[illegible]

migrate data to a parcel fabric



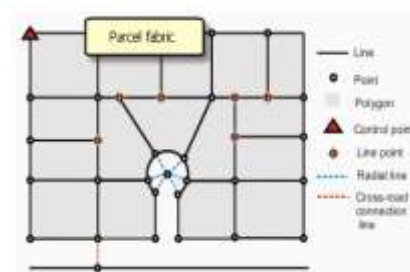
ArcGIS Parcel Fabric

Parcels

- Dataset for the storage, maintenance and editing of parcels under a geodatabase data model.
- Created under a feature dataset and inherits its spatial reference.
- Contain a set of related tables and feature classes, where connected parcel groups forms a parcel boundary network.
- Explicit topology defined by common parcel corners, no overlaps and gaps between neighboring parcels, inherent in the model and validated during data entry.
- Any editing in one parcel affect contiguous one.
- Survey data aware, editing is enforced through COGO and parcel editors.

ArcGIS Parcel Fabric

- Parcel lines (boundaries), which store and preserve recorded COGO attributes
- Parcel points (corners), which store x,y,z coordinates
- Parcel polygons, defined by parcel lines
- Parcel lines, which store and preserve recorded boundary
- Parcel points, which store x,y,z coordinates
- Parcel polygons, defined by parcel lines
- Control points, which have accurate, published coordinates for a physical location
- Plans (table), which store information about the record of survey
- Parcel fabric jobs (table), which track edits to the parcel fabric



Parcel Editor



Boundaries

Table

Personnel	Amount	To	Reversing	Reference
101	100.00	101	100.00	101
102	100.00	102	100.00	102
103	100.00	103	100.00	103
104	100.00	104	100.00	104
105	100.00	105	100.00	105
106	100.00	106	100.00	106
107	100.00	107	100.00	107
108	100.00	108	100.00	108
109	100.00	109	100.00	109
110	100.00	110	100.00	110
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113	100.00	113	100.00	113
114	100.00	114	100.00	114
115	100.00	115	100.00	115
116	100.00	116	100.00	116
117	100.00	117	100.00	117
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122	100.00	122	100.00	122
123	100.00	123	100.00	123
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163	100.00	163	100.00	163
164	100.00	164	100.00	164
165	100.00	165	100.00	165
166	100.00	166	100.00	166
167	100.00	167	100.00	167
168	100.00	168	100.00	168

Parcel Data Model



Conclusions

- The base over parcel geometry is collected is survey data. Parcels are created by surveyors with COGO descriptors referenced to a survey model framework.
- The Land Parcel Geodatabase contain 5 Feature datasets, several tables, topological and relationship classes that fulfill the proposed thematic layers for a Parcel Data Model.
- Construct the parcel geometry from COGO descriptors from original surveys ensure accuracy and survey aware features.
- Parcel Fabric create a from survey aware features, become an invaluable spatial framework for collecting, maintaining and managing land parcel data

Recommendations

- Survey Analyst
- Parcel Analyst
- ArcGIS 10 Service Packs

References

- Arctur, D. & M. Zeiler (2004): Designing geodatabases: Case studies in GIS data modeling, ESRI Press: Redlands.
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- CLPD (2007): National Land Parcel Data. A Vision for the Future. Committee on Land Parcel Databases The National Academies Press.