

City of Surrey's Digital Plan Submission Process



Cadastral Update



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Mission



- Provide GIS Maintenance, input, analysis, conversion and publication services to internal and external clients in the most efficient and effective method possible.



Objectives



- Implement the requirement for digital survey plan submission by March 1, 2002 for all Legal Survey Plans prepared under statute
- To reduce the effort required to maintain the Cadastral database
- To provide a “cash in lieu” option



History



1983 - Started conversion of hard copy maps to digital

- Drafting Team input Cadastral Plans under supervision of the Municipal Surveyor

1993 – Team split into 2 Sections: Survey and Drafting

- Survey Section responsible for creation of Survey Plans
- Drafting Section responsible for Cadastral Database Maintenance

1995 - Input methodology reviewed due to backlog caused by increase in development demand



History



1996 – Survey and Drafting initiated strategy for Digital Legal Survey Plans (DLSP)

- Workshop sessions with private sector surveyors
- Established digital plan standards to satisfy the requirements of the Surveyor General (SG) of British Columbia
- Amended City's Preliminary Layout Approval (PLA) document to include DLSP requirement

1997 – Survey and Drafting streamlined Cadastral database maintenance

- Digital Survey Plan Standards were implemented into test phase
- Utilized in-house and on a voluntary submission basis from private sector surveyors



History



2000 –

Survey Section:

- City's DLSP Standard significantly modified
- Perfected creation of Digital Plans in-house
- Voluntary submissions still ongoing

Spatial Information Section (Drafting):

- Implemented Microstation/Oracle Solution for Cadastral Maintenance System (CMS)



Introduction

2000 –

Survey and Spatial Information Sections:

- Backlog reduction commenced

March 2002 -

- Implemented Digital Plan Submission

December 2002 -

- Reduced backlog by half
- Kept up with the demand of incoming plans
- Maintained staffing levels of 2000



Process Overview



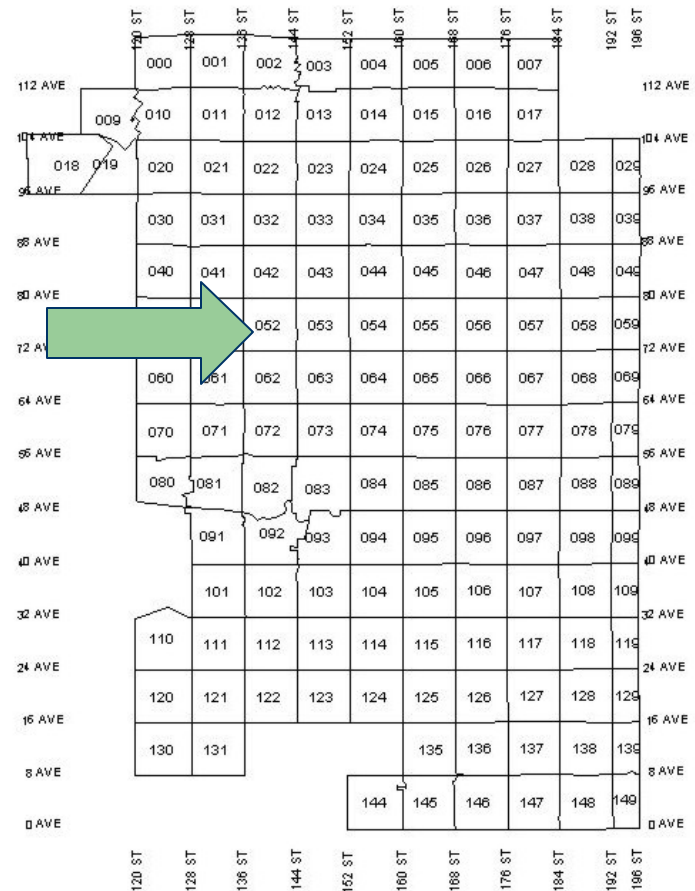
- DLSP and accompanying hard copy checked for standards (Accepted or Rejected, becomes Early Copy Plan)
- Early Copy Plans (EC) Scanned and Recorded
- Cadastral Information input
- Key attribute information Oracle Tables



Surrey



- Cadastral data is captured by square mile
- Surrey is 140 sq. miles (360 sq. km)
- Edge matching is resolved
- Digital Legal Survey Plans stored on City Network – accessed by Survey, Spatial Information and Fire
- Scanned images for all Legal Plans stored on City Network





Process Overview



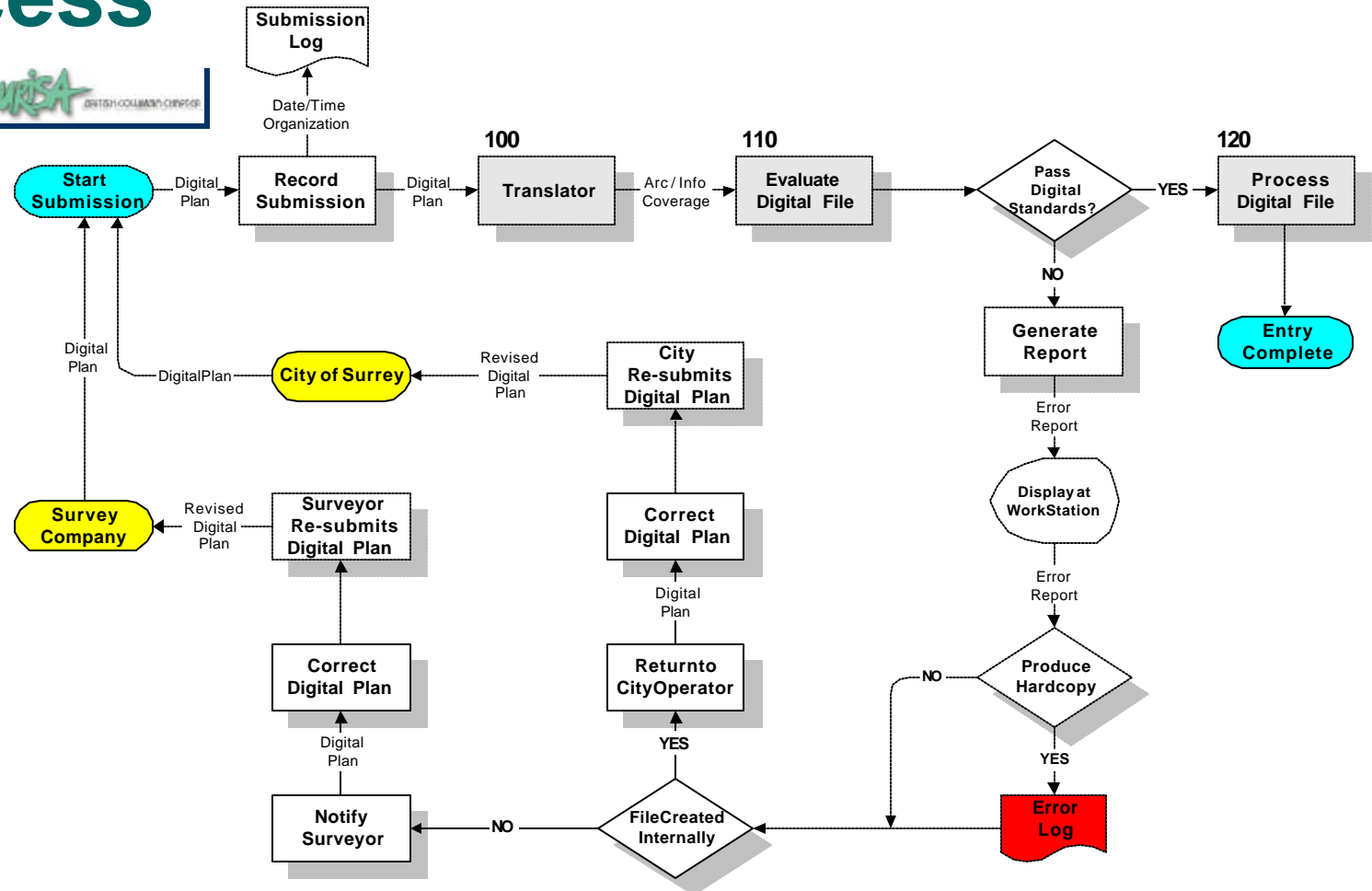
- DLSP = Survey
- Cadastral Maintenance = Spatial Information
- GIS = Published Dataset



Process



000-DigitalDataSubmissionProcess



13 such Diagrams for the entire process (DC to Registered)



Legal Plan Process



- To ensure quality a rigid process is followed
- The Legal Plan Process goes through many steps (Includes internal and external processes)
- Preliminary to Final stages are all recorded in the spatial database
- Coordinated Team Effort



Digital Copy (DC)

+

Hard Copy Plan

=

Early Copy (EC)

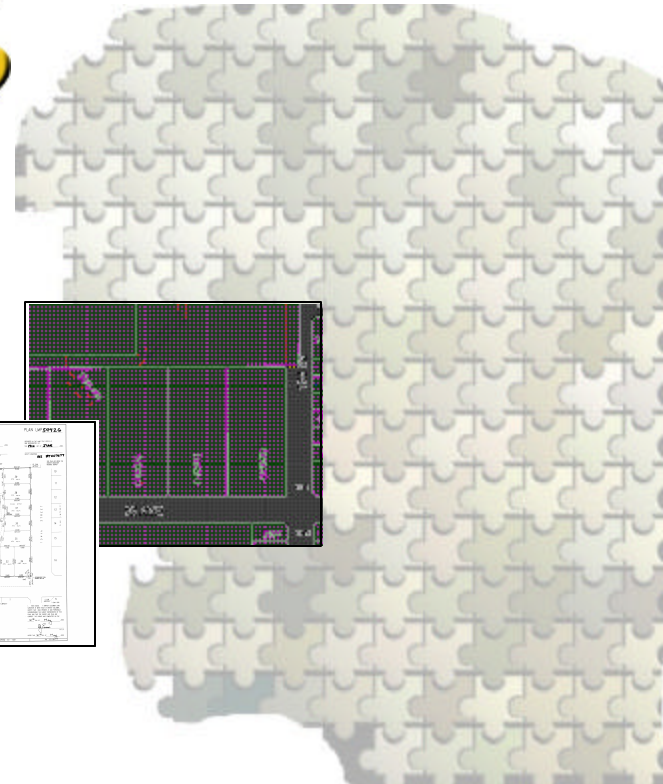
Registered Copy



Legal Plan Process



- Fits together like a puzzle
- Newest Plans considered most accurate
- Digital Plans used as reference for Maintenance
- Plan Fitting Process
- Coordinated Team Effort





Legal Plan Process



1. DLSP = Full NAD83 CSRS GRID (DWG or DXF Format)
2. Shift and Scale to Truncated NAD83 NMIP GRID
3. MSCAD does Autocheck to Ground to Confirm Hardcopy Plan
4. Use DLSP as Reference in Microstation to complete Plan Fitting Process
5. Converted to GIS and reproject to FULL NAD83 NMIP Grid

Survey

Spatial

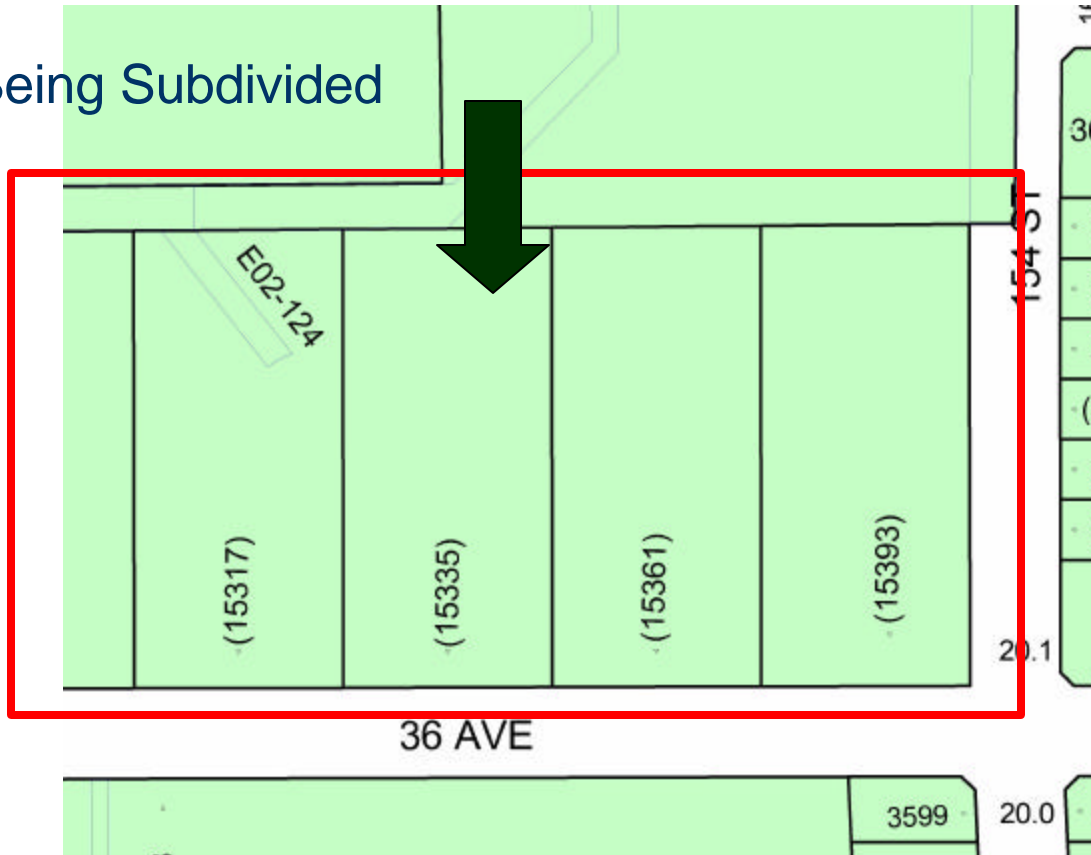
Information



Legal Plan Process

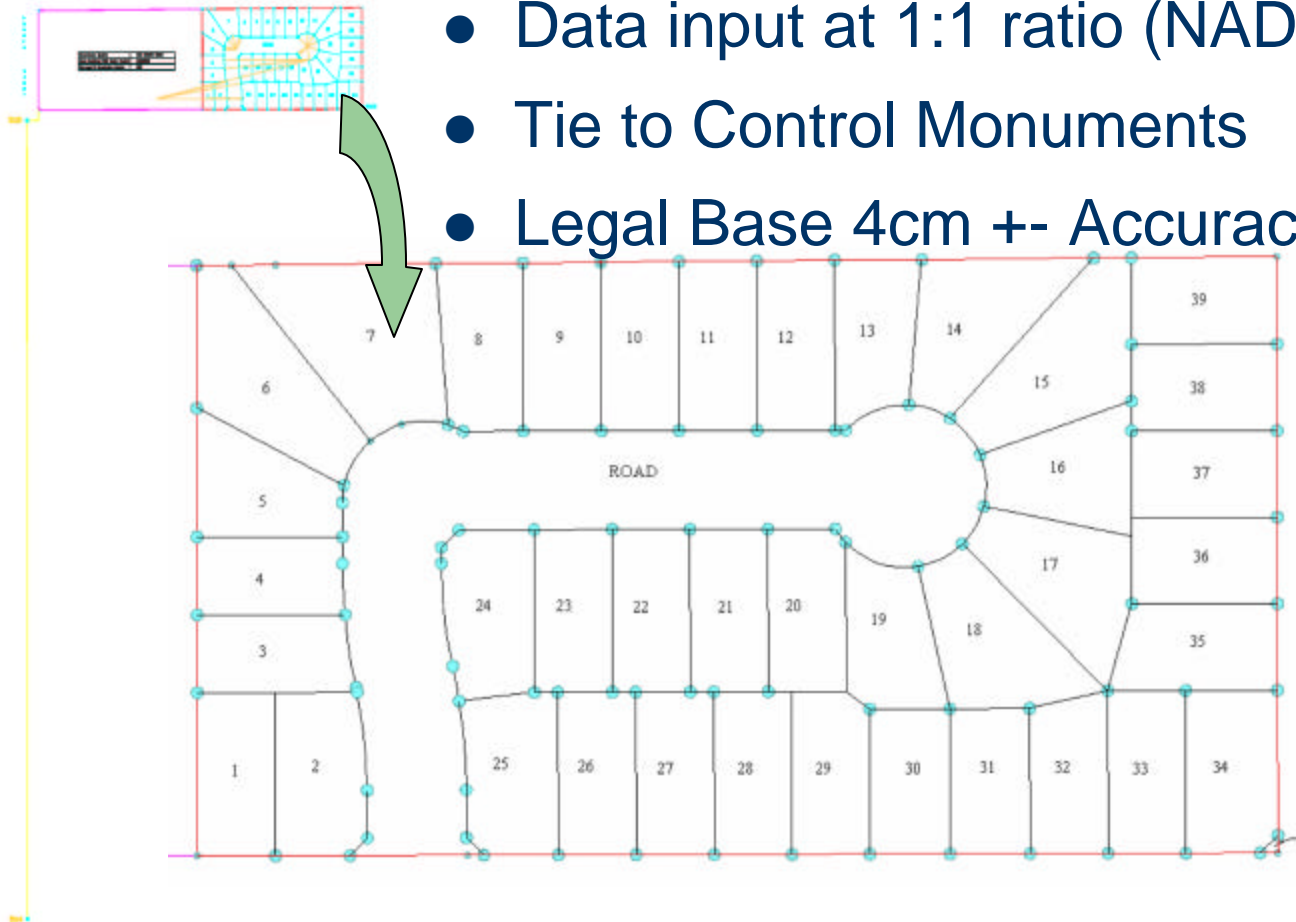


Area Being Subdivided



Legal Plan Process

- Data input at 1:1 ratio (NAD83 Grid)
- Tie to Control Monuments
- Legal Base 4cm +/- Accuracy

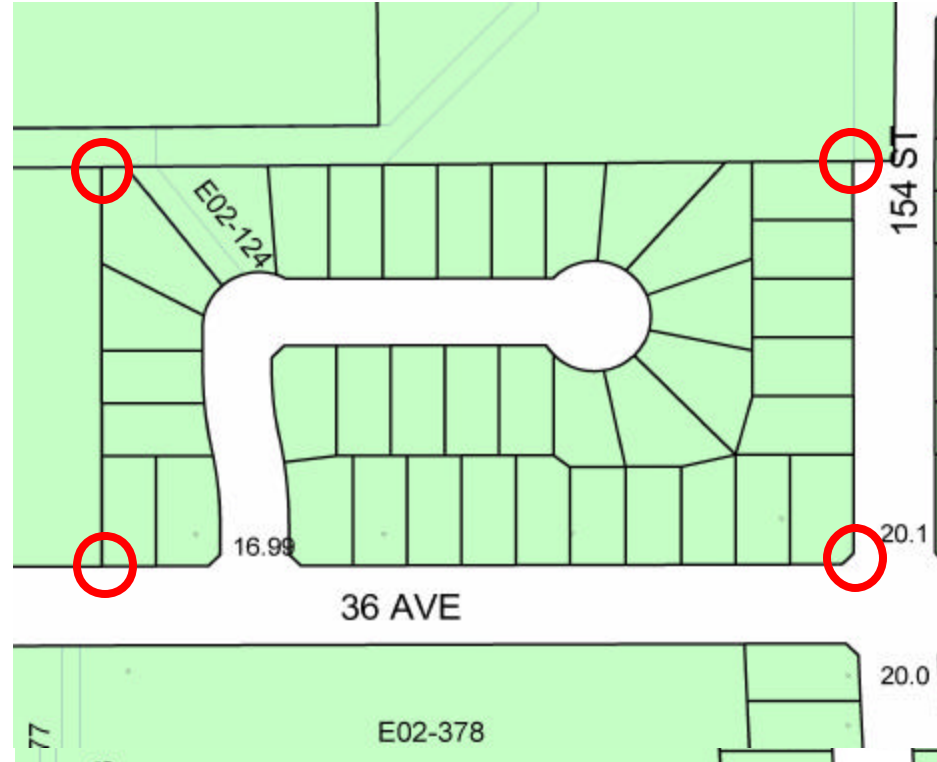




Legal Plan Process



- ● Check new DLSP to Existing
- Within tolerance Hold New
- Out of Tolerance Check for errors
- Complete Plan Fitting Process

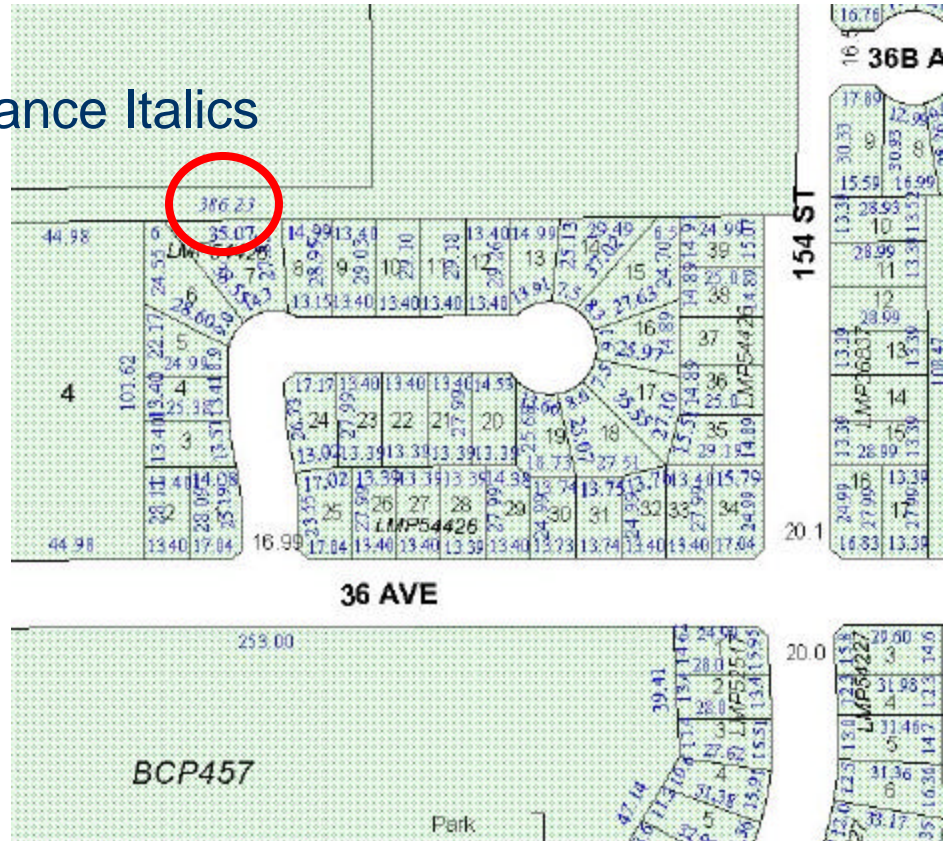




Legal Plan Process



Out of Tolerance Italics

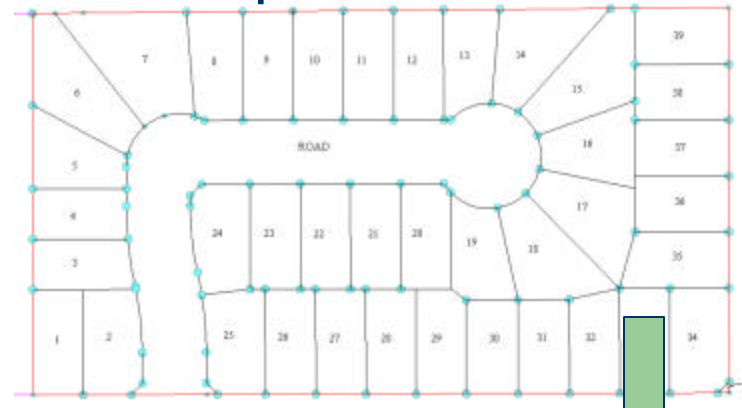




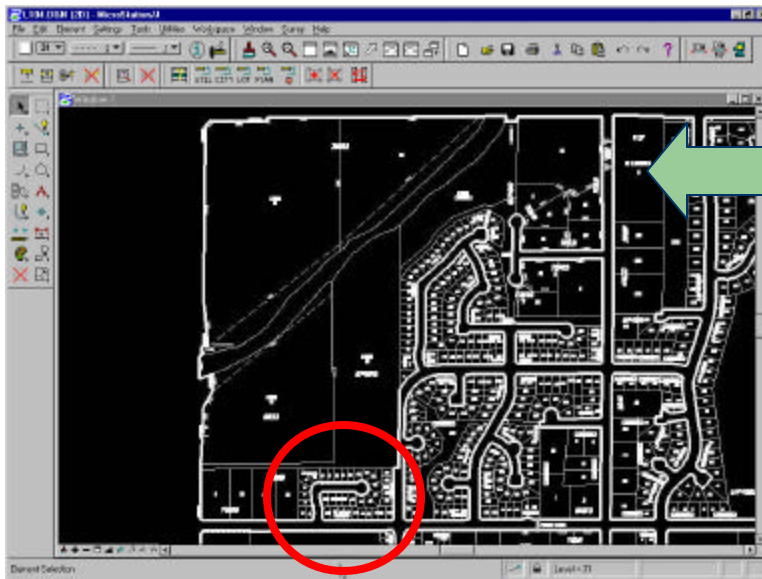
Our Solution



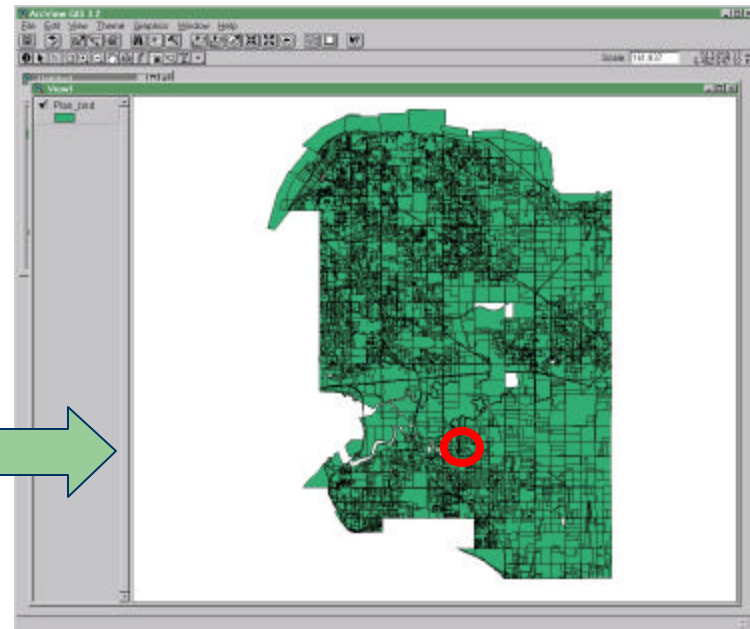
Required DLSP



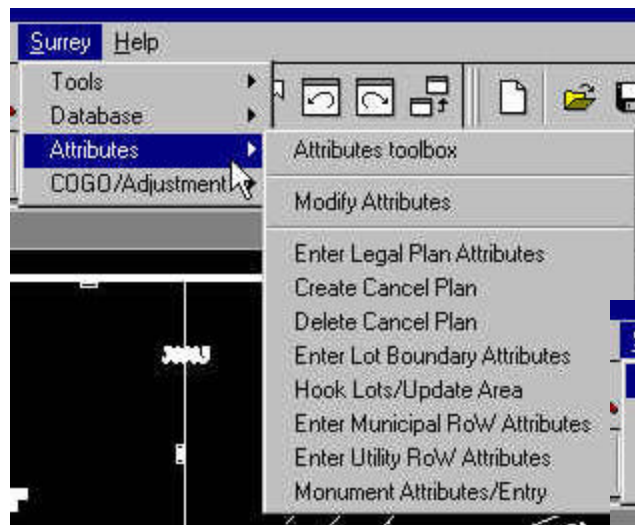
Custom tools written in MicroStation for Cadastral Maintenance



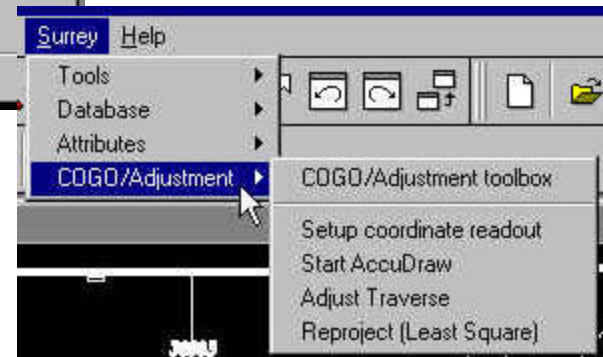
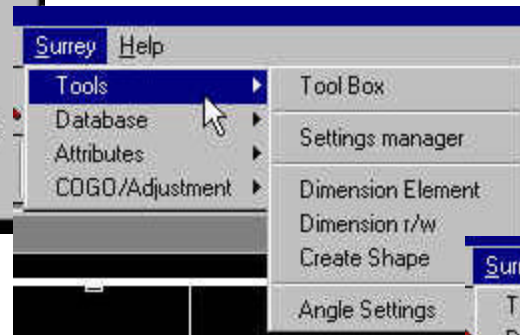
Conversion of DGN to ArcINFO for spatial data publication



CMS Functionality



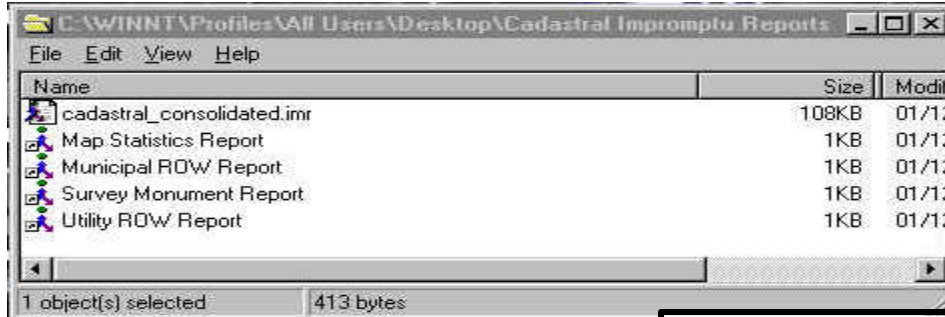
- *CMS utilizes many customized tools*
- *Look Up Tables (LUT) used for Validation and Selection*



- Attributes keyed in via standard form
- Attribute display for checking purposes to confirm input



Reporting



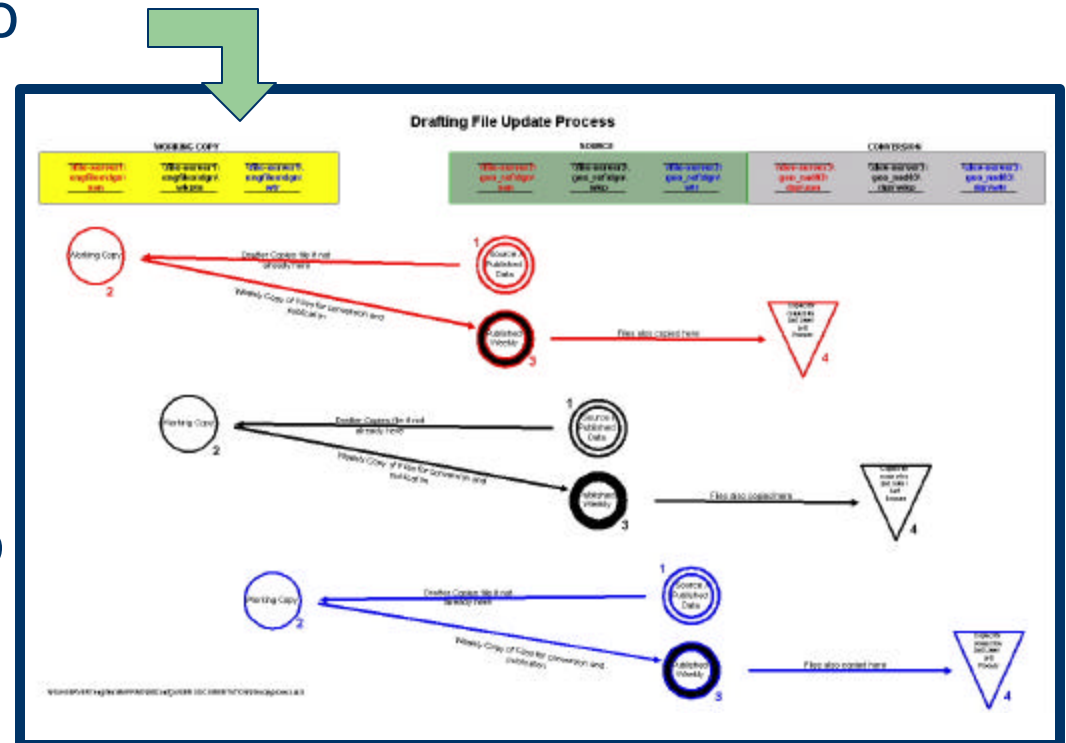
- Select Appropriate Dataset for Search (Plan Number, Municipal R/W or Monument)

- Impromptu utilized for report creation
- Print or Save Desired Report

The City of Surrey								
Municipal Right-of-Way Report								Date: 14-May-2003
Map No	Row Number	YR	Status	Width	Purpose	Description	Plan Number	Project Number
MAP #: 046								
046	E00-11	2000	BL	0.000	DR	PTN LT 2 PL 16125	LMP46862	4898-420
046	E00-131	2000	BL	0.000	MF	PTN LT A PL LMP48365	LMP48367	7899-0079
046	E00-132	2000	BL	0.000	MF	PTN LT A PL LMP48365	LMP48367	7899-0079
046	E00-133	2000	BL	0.000	DR	PTN LT A PL LMP48365	LMP48367	7899-0079
046	E00-134	2000	BL	0.000	DR	PTN LT B PL LMP48365	LMP48367	7899-0079
046	E00-135	2000	BL	0.000	SA	PTN LT B PL LMP48365	LMP48367	7899-0079
046	E01-098	2001	BL	7.500	PA	PTN LT 2 PL 32014 (LT 1 PL LMP50103)	LMP49517	LMP49517
046	E01-100	2001	BL	6.500	PA	PTN LT 2 PL 32014 (LT 1 PL LMP50103)	LMP49517	7897-0118
046	E01-220	2001	BL	6.000	DR	PTN LT 17 PL 26642	LMP51050	7801-0184
046	E01-221	2001	BL	0.000	MF	PTN LT 17 PL 26642	LMP51049	7801-0184
046	E01-221	2001	BL	0.000	MF	PTN LT 17 PL 26642 (LMP54217)	LMP51049	7801-0184
046	E01-222	2001	BL	0.000	MF	PTN LT 71 PL LMP26089	LMP51049	7801-0184
046	E01-223	2001	BL	0.500	MF	PTN LT 7 PL 10587 (LTS 1-3 PL LMP52930)	LMP50948	7800-0353
046	E01-224	2001	BL	0.500	MF	PTN LT 6 PL 10587 (LTS 3-8 PL LMP52930)	LMP50948	7800-0353
046	E01-235	2001	BL	0.900	MF	PTN LT B PL PCL BK 12/704/6798F(LMP52454)	LMP51228	7896-0294
046	E01-236	2001	BL	0.900	MF	PTN LT B PL PCL BK 12/704/6798F(LMP52454)	LMP51228	7896-0294
046	E01-237	2001	BL	0.900	MF	PTN LT B PL PCL BK 12/704/6798F(LMP52454)	LMP51228	7896-0294

Conversion to GIS

- Weekly Conversions to ARCINFO (Via Customized scripts)
- All modified/updated data files are converted (DGN, Shapefiles, etc.)
- Data projected back to Full NAD83 NMIP GRID coordinates
- Inconsistencies resolved



Benefits of Conversion to GIS

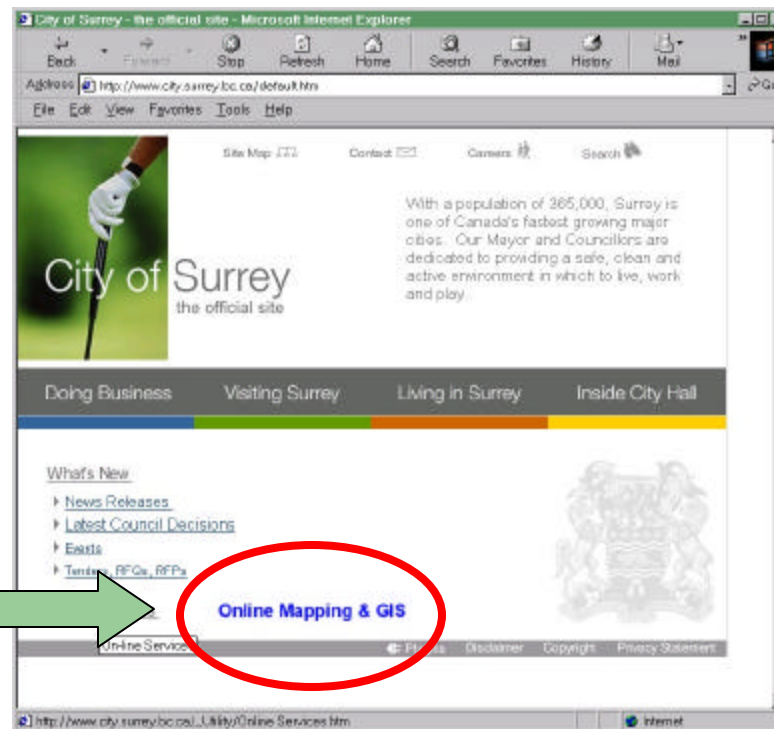
- Label and Node Error checks completed on all converted data before publication
- Errors easily identified and corrected in the CAD files
- Conversion process runs Interactively or in the 'background' – it is used for checking purposes

```
Polypipe 132 has 0 label points.
Polypipe 407 has 0 label points.
Polypipe 473 has 0 label points.
Polypipe 478 has 0 label points.
Polypipe 484 has 0 label points.
Polypipe 500 has 0 label points.
Total number of Polypipes with No Labels: 6
Total number of Polypipes with Multiple Labels: 0
map - 808
Polypipe 1 has 0 label points.
Polypipe 207 has 0 label points.
Polypipe 251 has 0 label points.
Polypipe 1114 has 0 label points.
Total number of Polypipes with No Labels: 4
Total number of Polypipes with Multiple Labels: 0
map - 109
Polypipe 1 has 0 label points.
Total number of Polypipes with No Labels: 1
Total number of Polypipes with Multiple Labels: 0
map - 109
Polypipe 1 has 0 label points.
Total number of Polypipes with No Labels: 1
Total number of Polypipes with Multiple Labels: 0
Label Error Checking Complete ...
map
```



Future Vision

- Provincial Digital Legal Plan Submission Project
- Designed for easy automation (i.e. Data exchange)
- Distributed GIS
 - *Everyone to have access*





Conclusion



Average Legal Complete 1999-2002

TYPE	Intergraph (Old System)	Microstation (New System)		
		1999	2000	2001
Overall Legal Plans	99	235	361	566
Legal Plans March – December				450
Legal Parcels March – December				2704
Total Legal Parcels	371	1350	1063	3396

*Digital Plan Submission
for Cadastral Base Plans*



We have increased our input productivity by approximately 50%



Summary



- Traditionally Legal Survey Plans input manually using COGO from hard copy plans
- Backlog incurred – Input Process Reviewed
- Implemented DLSP Process to Streamline Cadastral Maintenance
- Convert to GIS for publication (Query/Analysis)



City of Surrey's Digital Legal Plan Submission Process



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