County Automated Terrestrial CAD Helper (CATCH)

Dave McMillan, PLS, MS
Introduction

Transportation Department
Contact: Rick Lantis County Surveyor
Background

- Subdivision Maps
  - Create Parcels
  - Taxation
- Parcel Fabric
  - Records Management
  - GPS Survey Control
  - CAD, Imagery
- Adjustment
- Improve Accuracy
Digital Submission

2005 Digital Files Accepted for Final Subdivision Maps

2008 GIS Pilot Project RCFC, Survey, Assessor


Goal
Problem

- Checked Manually
- Takes Too Long
- Files Submitted in Local Coordinates
- Base Parcel Layer is Inaccurate
- Many Files Cannot be Used
- Duplication
Solution

- An Automation Tool
  Check, report, and prepare parcel data for loading into Esri’s Parcel Fabric
Solution
Workflow
Workflow

CATCH

Name Check → Inside County Check → Layer Check → Topology Check
Workflow

CATCH

AutoCAD → AutoCAD → AutoCAD → AutoCAD

TXT ZIP EMAIL
Digital Submission Standards

- File format
- Layer Naming Standard
- Map Projection
- Line-work

California coordinate system, CCS83 Zone 6 utilizing the NAD83 (NSRS2011) adjustment, and the published epoch of 2010.00.

CATCH
Parcel Fabric “Topology Rules”

Covered By Polygon

Rule Description

Rule: Boundary Must Be Covered By

The boundaries of area features from one layer must be covered by line features of another layer.

The boundary of an area feature that is not coincident with a line feature is an error.

Show Errors

OK
Interface
Sample Report

County of Riverside Transportation Department, County Surveyor Division

Digital Submission Report for
Surveyor/Engineer of Record

Company Name
Contact Info
Reviewed By
Date Submitted
Date Reviewed
Total Pages in this Report

Overall Results:

<table>
<thead>
<tr>
<th>Check</th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naming Convention Check</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Inside County Check</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Projection Check</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Level/Layers Check</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Topology Check</td>
<td></td>
<td>FAIL</td>
</tr>
<tr>
<td>Overall Results:</td>
<td></td>
<td>FAIL</td>
</tr>
</tbody>
</table>

Transformation DATA

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination Factor For</td>
<td>TR30000_CP1</td>
</tr>
<tr>
<td>Convergence Angle For</td>
<td>TR30000_CP1</td>
</tr>
</tbody>
</table>

Dave McMillan PLS 8488
Cohort 25.5 Engineering
LS8488@gmail.com
Riverside County Surveyor
12-9-2015
12-15-2015
4
Layer Name Check

Results: PASS

Mandatory Layers in CADD File: PASS
The CADD drawing has all correct levels named:
V-PROP-LINE
V-PROP-SUBD
V-RWAY-LINE
V-RWAY-CNTR

Missing Layers in CADD File:

Map Optional Layers: PASS
The CADD drawing has optional layers named:
V-ANNO-STREET
V-ANNO-LOT
Boundary Topology Check

Results: **FAIL**

**Point Topology:** **FAIL**
- Must Not Self-Overlap Point Errors = 0
- Must Not Self-Intersect Point Errors = 0
- Must Be Single Part Point Errors = 0
- Must Not Intersect Or Touch Interior Point Errors = 0
- Must Be Covered By Boundary Of Point Errors = 0
- Must Not Have Dangles Point Errors = 2

**Line Topology:** **FAIL**
- Must Not Self-Overlap Line Errors = 0
- Must Not Self-Intersect Line Errors = 0
- Must Be Single Part Line Errors = 0
- Must Not Intersect Or Touch Interior Line Errors = 0
- Must Be Covered By Boundary Of Line Errors = 32
- Boundary Must Be Covered By Line Errors = 0
- Must Not Have Dangles Line Errors = 0

**Polygon Topology:** **PASS**
- Must Not Self-Overlap Polygon Errors = 0
- Must Not Self-Intersect Polygon Errors = 0
- Must Be Single Part Polygon Errors = 0
- Must Not Intersect Or Touch Interior Polygon Errors = 0
- Must Be Covered By Boundary Of Polygon Errors = 0
- Boundary Must Be Covered By Polygon Errors = 3
- Must Not Have Dangles Polygon Errors = 0
County of Riverside Digital Submission Report for: Dave McMillan PLS #468

Lot Topology Check
Results: **FAIL**

**Point Topology:** **FAIL**
- Must Not Self-Overlap Point Errors = 0
- Must Not Self-Intersect Point Errors = 0
- Must Be Single Part Point Errors = 0
- Must Not Intersect Or Touch Interior Point Errors = 6
- Must Be Covered By Boundary Of Point Errors = 0
- Must Not Have Dangles Point Errors = 0

**Line Topology:** **FAIL**
- Must Not Self-Overlap Line Errors = 0
- Must Not Self-Intersect Line Errors = 0
- Must Be Single Part Line Errors = 0
- Must Not Intersect Or Touch Interior Line Errors = 2
- Must Be Covered By Boundary Of Line Errors = 27
- Boundary Must Be Covered By Line Errors = 0
- Must Not Have Dangles Line Errors = 0

**Polygon Topology:** **PASS**
- Must Not Self-Overlap Polygon Errors = 0
- Must Not Self-Intersect Polygon Errors = 0
- Must Be Single Part Polygon Errors = 0
- Must Not Intersect Or Touch Interior Polygon Errors = 0
- Must Be Covered By Boundary Of Polygon Errors = 0
- Boundary Must Be Covered By Polygon Errors = 0
- Must Not Have Dangles Polygon Errors = 0
Summary

• Automates checking and reporting process
• Sends results to applicant via e-mail
• Verifies if data pass all checks
• Prepares parcel data for parcel fabric
Thank You

Dave McMillan
dmcmilla@RivCo.org
Processing Step 16 out of 16

Checking File Naming Convention
Meets Map Check Function has run: PASS

Loading Topology for Subdivision

Creating staging topology

Creating Polyline feature Class for Map Boundary named: TR_30000_PolylineBNDY

Creating Polygon Feature Class for Map Boundary TR_30000_PolygonBNDY

Adding polygons to topology: TR_30000_PolygonBNDY

Adding polylines to topology: TR_30000_PolylineBNDY

Importing Topology Rule 1
Importing Topology Rule 2
Importing Topology Rule 3
Importing Topology Rule 4
Importing Topology Rule 5
Importing Topology Rule 6
Importing Topology Rule 7
To Dave McMillan PLS 848B,

You're Digital Submitted CAD file for TR30000_CP1 has been reviewed and returned by CATCH. Please review the attached digital submission report. Please correct and re-submit your digital file, after corrections have been made and the file has passed the checks please send back for final review and approval.

Sincerely,
Richard G. Lantis, PLS
Riverside County Surveyor
To Dave McMillian PLS 8488,

You’ve Digital Submitted CAD file for TR30000_CP1 has been reviewed and has passed the checks please send back for final review and approval.

Sincerely,
Richard G. Lantis, PLS
Riverside County Surveyor
Mandatory Layers in CADD File: **PASS**
The CADD drawing has all correct levels named:
V-PROP-LINE
V-PROP-SUBD
V-RWAY-LINE
V-RWAY-CNTR

Missing Layers in CADD File:

Map Optional Layers: **PASS**
The CADD drawing has optional layers named:
V-ANNO-STREET
V-ANNO-LOT

Legend
- V-PROP-LINE
- V-PROP-SUBD
- V-RWAY-CNTR
- V-RWAY-LINE
Lot Topology Check

Results: FAIL.

Point Topology: FAIL
- Must Not Self-Overlap Point Errors = 0
- Must Not Self-Intersect Point Errors = 0
- Must Be Single Part Point Errors = 0
- Must Not Intersect Or Touch Interior Point Errors = 0
- Must Be Covered By Boundary Of Point Errors = 0
- Must Not Have Dangles Point Errors = 10

Line Topology: FAIL
- Must Not Self-Overlap Line Errors = 0
- Must Not Self-Intersect Line Errors = 0
- Must Be Single Part Line Errors = 0
- Must Not Intersect Or Touch Interior Line Errors = 0
- Must Be Covered By Boundary Of Line Errors = 0
- Boundary Must Be Covered By Line Errors = 0
- Must Not Have Dangles Line Errors = 0

Polygon Topology: PASS
- Must Not Self-Overlap Polygon Errors = 0
- Must Not Self-Intersect Polygon Errors = 0
- Must Be Single Part Polygon Errors = 0
- Must Not Intersect Or Touch Interior Polygon Errors = 0
- Must Be Covered By Boundary Of Polygon Errors = 0
- Boundary Must Be Covered By Polygon Errors = 0
- Must Not Have Dangles Polygon Errors = 0