

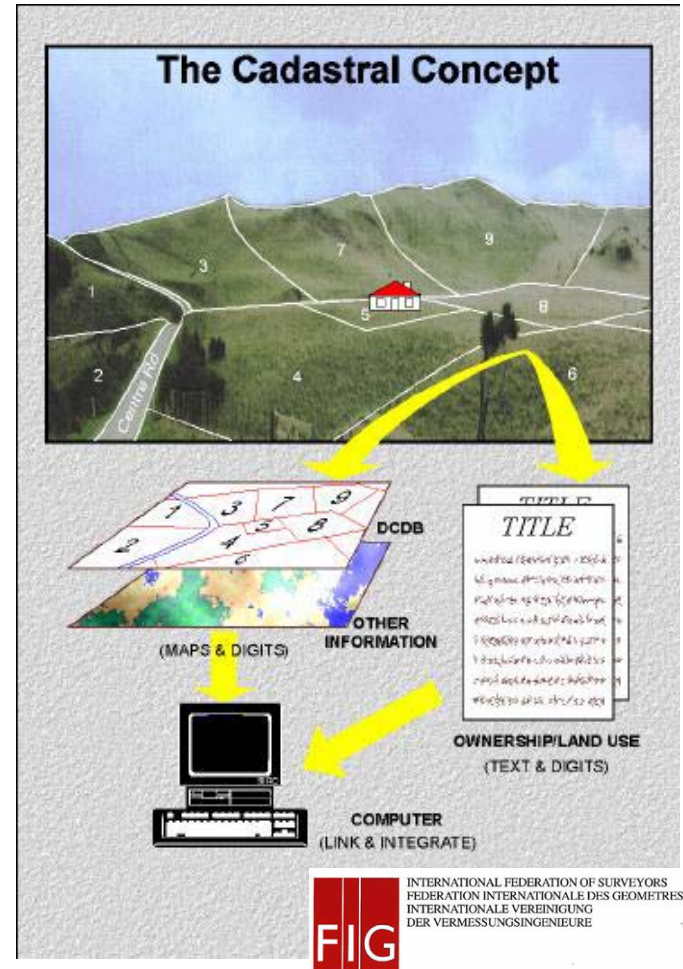
# GM Parcel Manager

Tóth Zoltán  
*GIS üzletág Igazgató*  
*graphIT KFT*

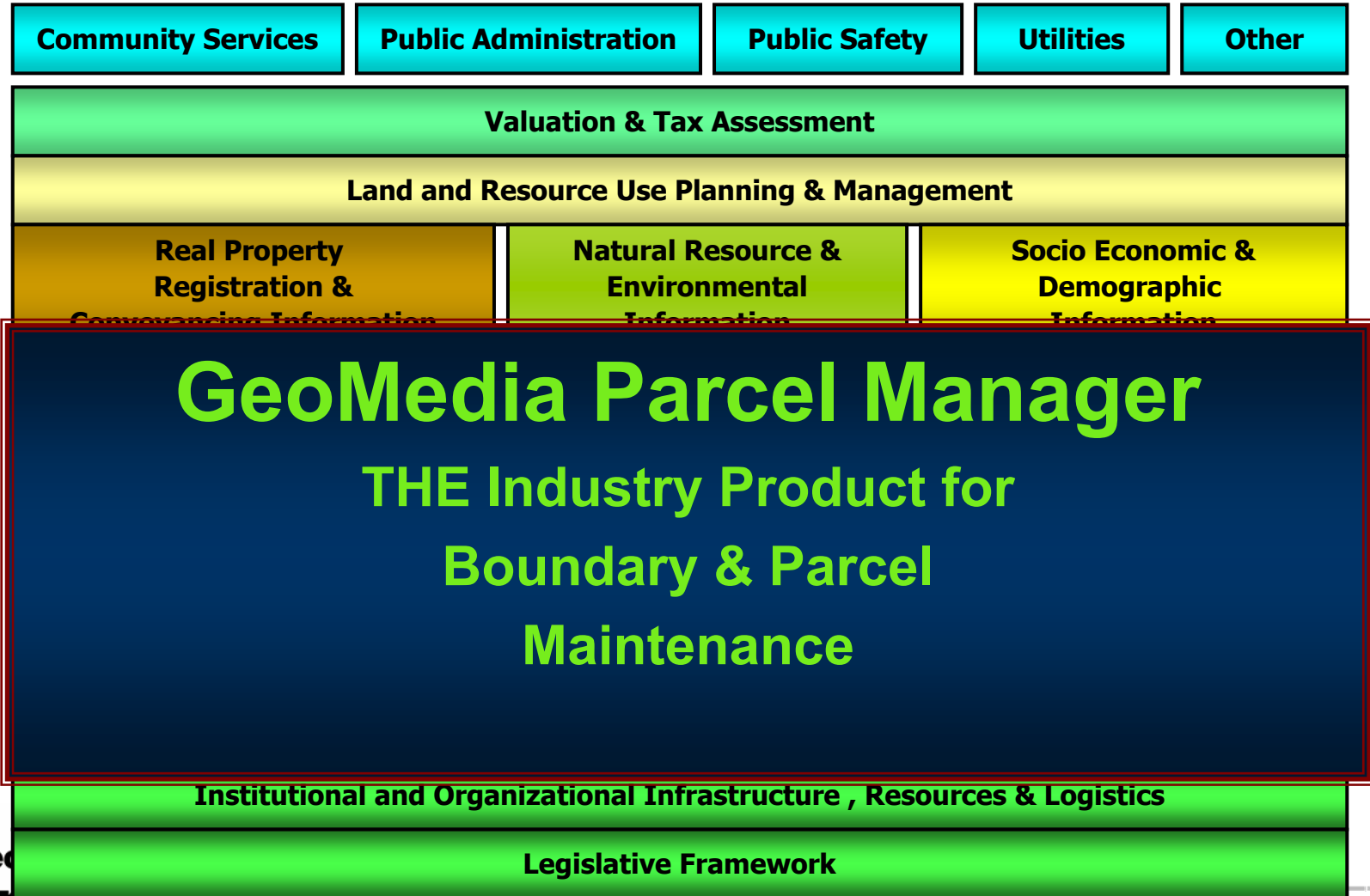
BRINGING  
IT TOGETHER.

# Cadastral

- A cadastral parcel based land information system.
- The parcel is the basic building block for maintaining land information bundle.
- Up-to-date Land Information System containing records of interest in land / property.



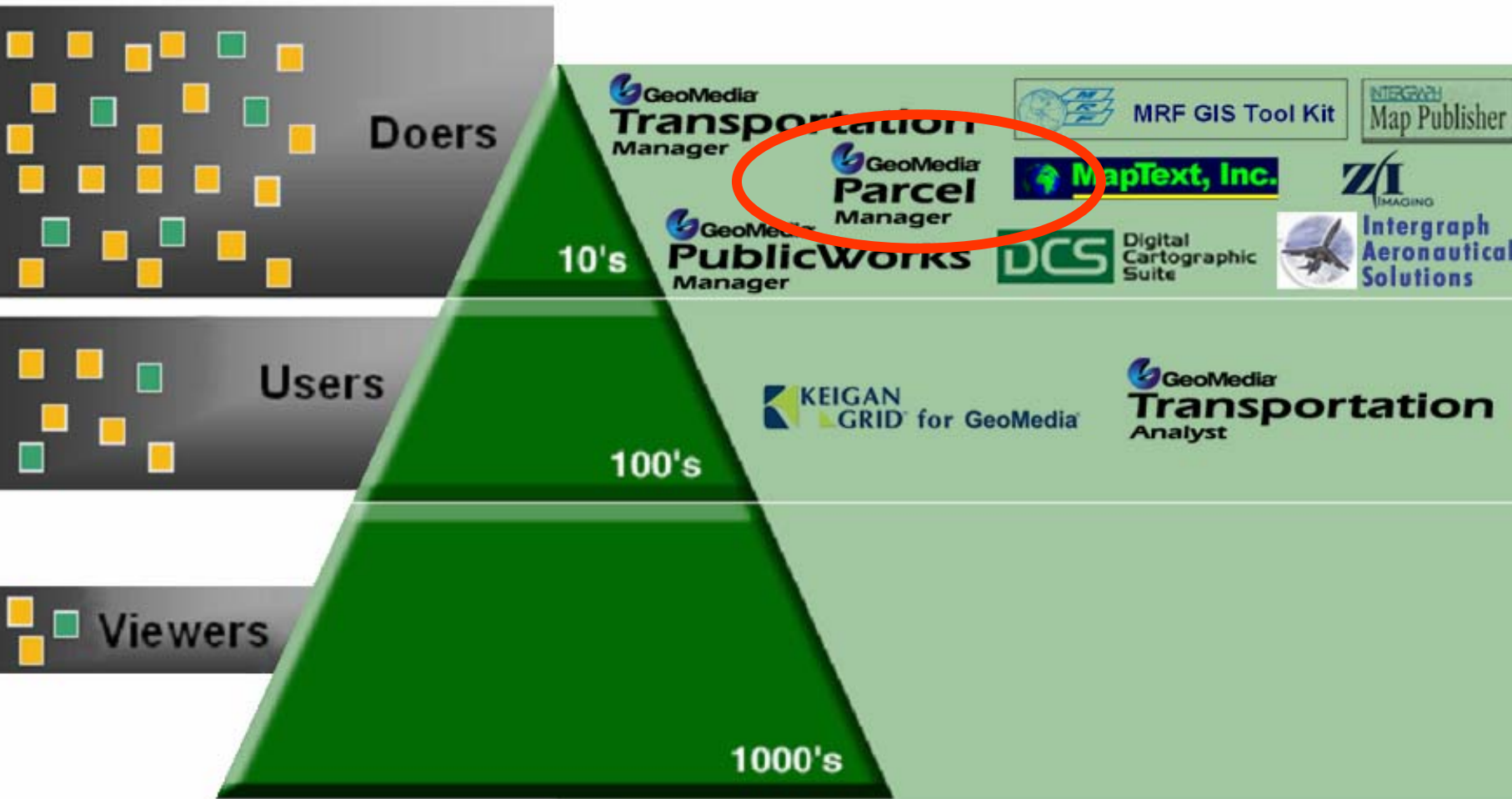
# Information Bundles



# About GeoMedia Parcel Manager

- Management of parcel data for large or small organizations - cadastres and tax assessment authorities
- IS a doer type of toolkit for Boundary & Parcel Maintenance Workflows.
- One of the building blocks of a Land Information Management System.
- **NOT** our complete solution for Land Information Management, but a component thereof !!!

# Industry/3<sup>rd</sup> Party Product Positioning



# Industry Solutions

Industry Solutions Consulting

GeoMedia Products, Technology & Partner Solutions

Web Appraiser, OnDemand, 3rd Party Integration

GeoMedia Terrain & Partner Solutions

Implementation

& Partners

Natural Resources & Environmental Information

GeoMedia Grid, Terrain

Static Economic & Demographic Information

GeoMedia Web Map/Web Enterprise

GeoMedia Parcel Manager

GeoMedia Transaction Manager

Unique PID System / Cadastral Survey System / Mining Cadastre & Other

GeoMedia Professional / Image

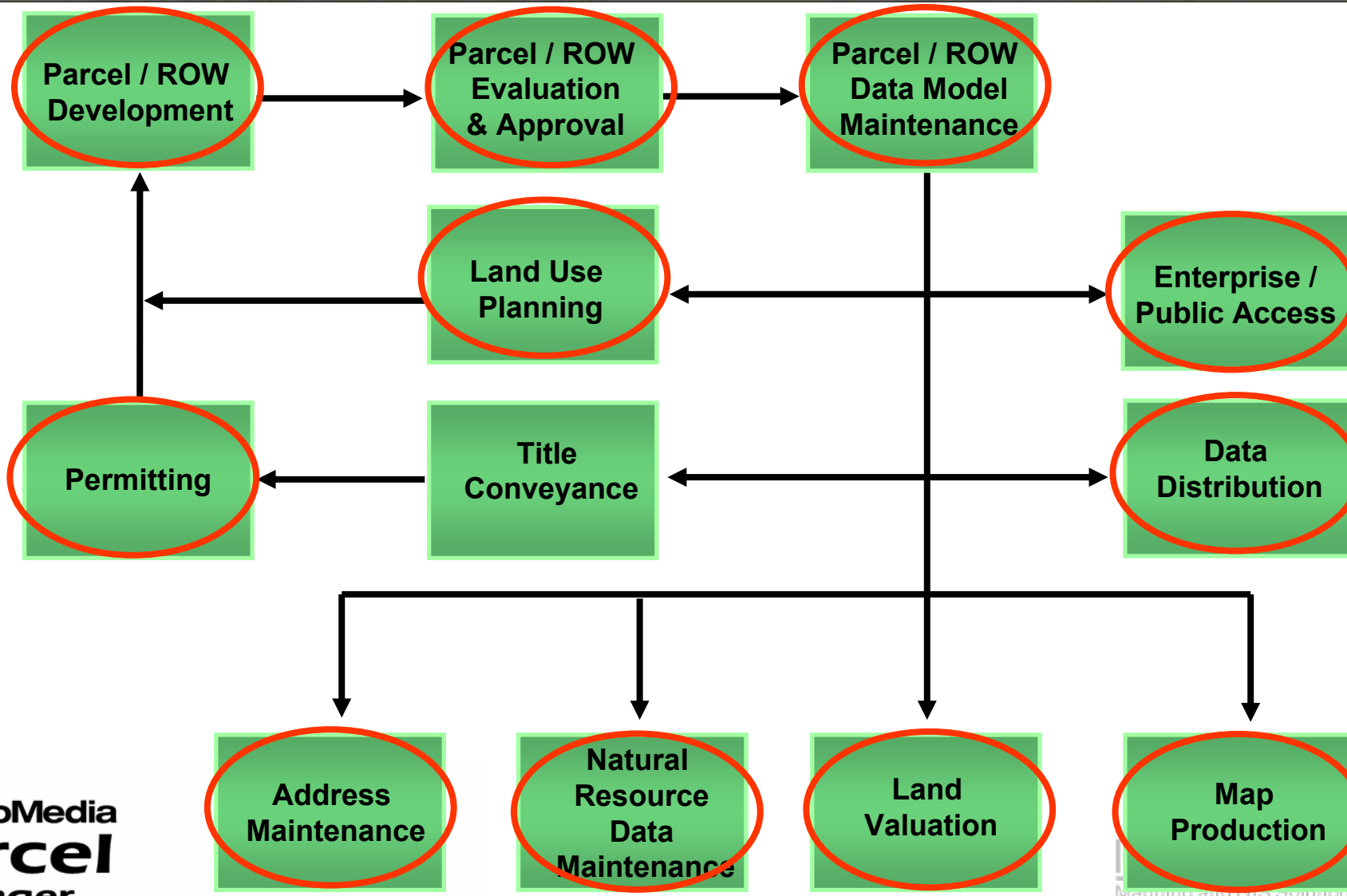
Topographic Mapping Information, Photography, Orthophotos & Remotely Sensed Data

SMMS Metadata Management

Institutional and Organizational Industry Structure, Resources & Logistics

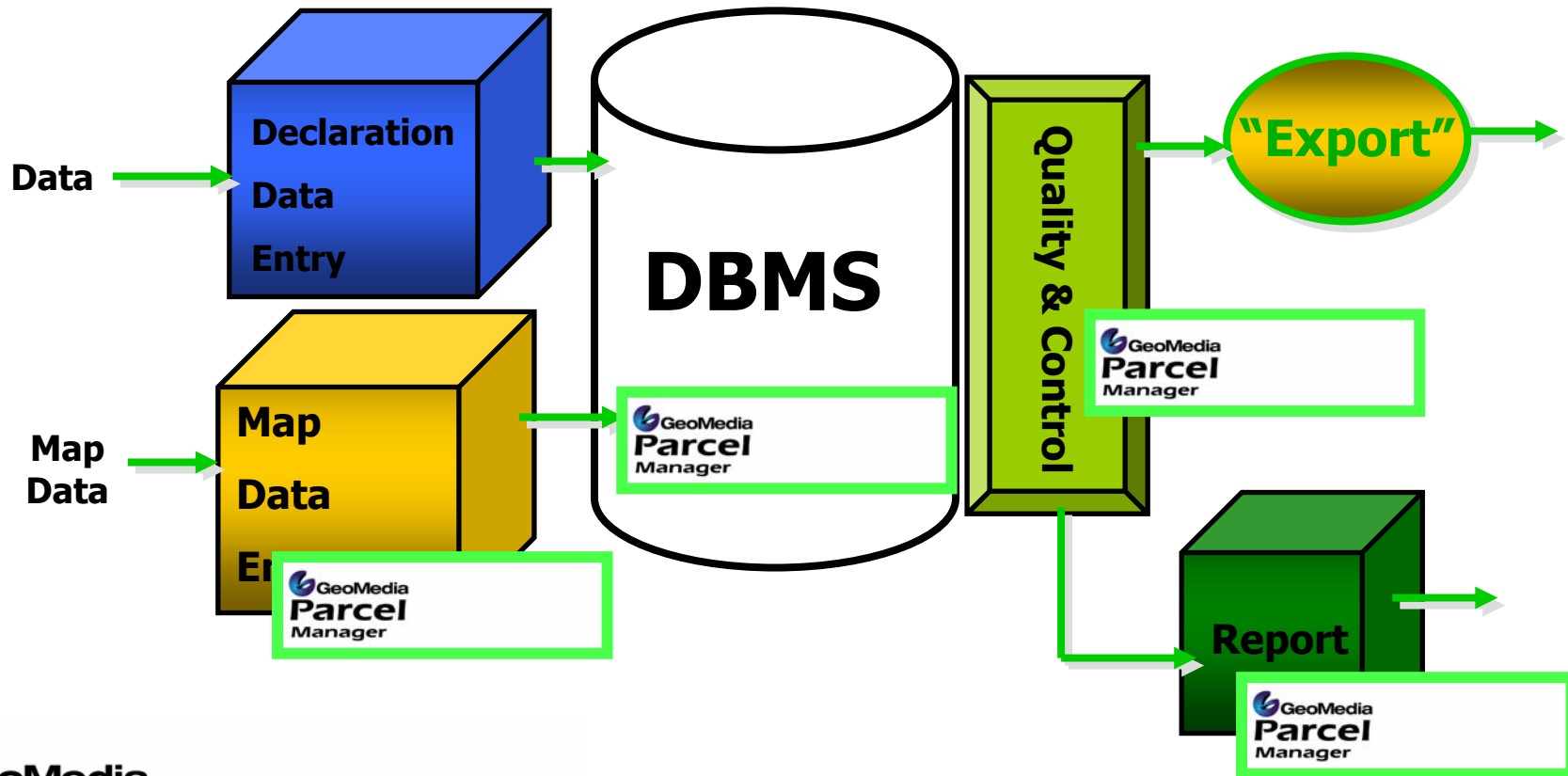
Leg Consulting

# Land Information Management - Workflows



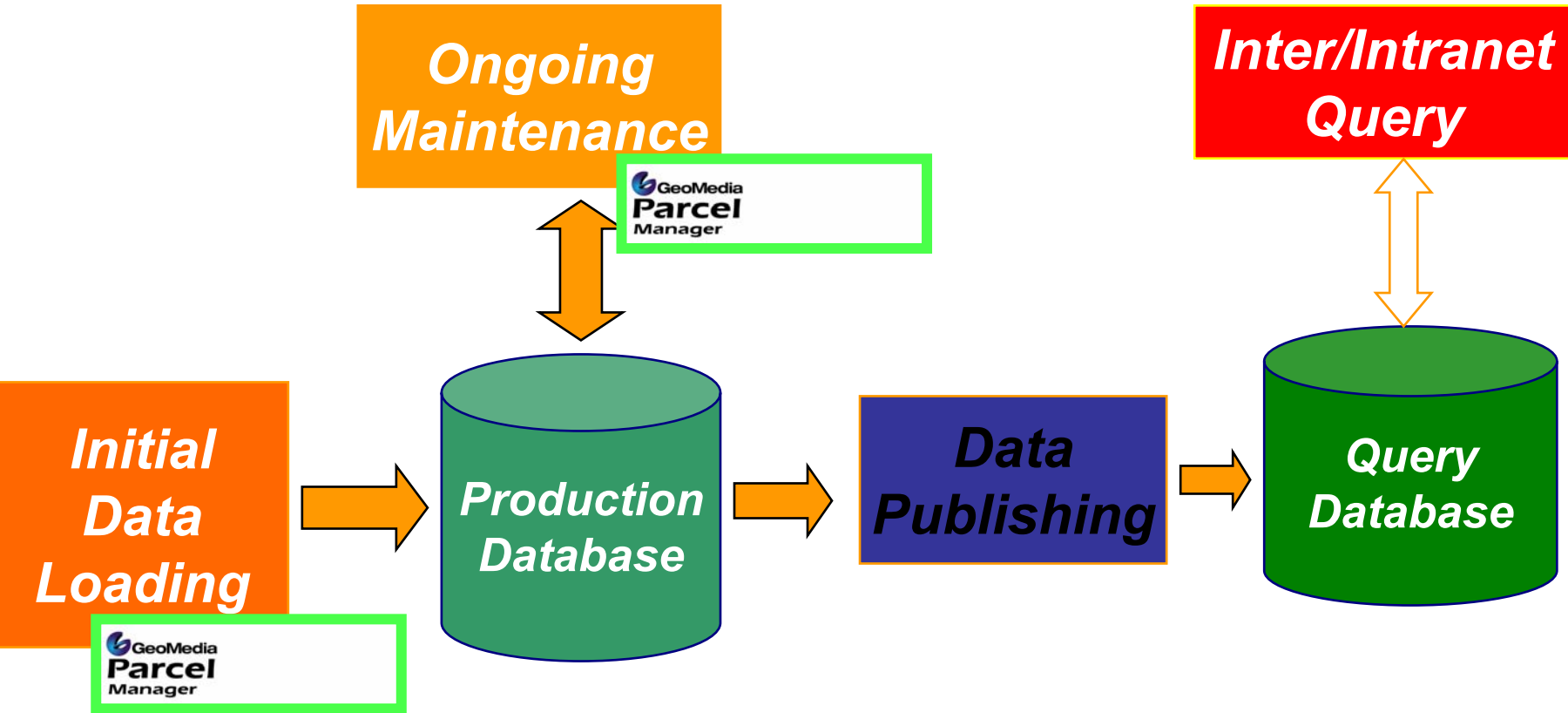
# Title Adjudication Example

## Modular Approach





# Typical Production Architecture



# Key Features

- **Flexible data model**

- Supports both boundary and area based data models
- User flexibility in data model specification

- **Coordinate Geometry Management**

- COGO Spreadsheet ...
- “Point of first capture” approach
- Database centric
- Fast ...



**New !!**

- **Adjustment**

- Automated or semi-automated
- Preview before adjust
- Provides more advanced workflows than MGE Projection Manager



**New !!**

# Key Features

- **Plan Integration Tools**

- Semi-automated plan integration tools
- Boundary data can be from any GDO supported format
- Process splits, merges, additions and geometry changes simultaneously
- Digital Data Submission



**New with 5 !!**

# Migration ...

**Microstation**

**MGE/NUC/MAP/GAD**

**GeoSolutions Parcel (GSP)**

**MGE Parcel Manager**



**MGE GeoData Manager (MGDM)**



**Implementation & Migration Services**

# Future Directions

- **Further Data Maintenance Workflow Enhancements**
- **Enhancements in Annotation Functionality**
- **Support for Advanced Feature Model**
- **Sequential Attribution**
  - Addresses , APN's & PIDs
- **Embedded & Transparent Optional Lineage Management**

# Summary

- **Parcel and Boundary Maintenance**
  - Focused on production workflows
  - Database Centric
  - Easy integration with other systems
  - Designed by cadastral systems experts for cadastral / parcel mappers.
  - Built on GeoMedia

A topographic map of a coastal region, likely the Atlantic Ocean area, showing terrain contours, rivers, and city names like 'ATLANTIC OCEAN'. The map is rendered in shades of blue, green, and yellow.

# **Boundary and Parcel Fabric Maintenance in GeoMedia Parcel Manager**

Workflow components

BRINGING   
 IT TOGETHER.

# General Fabric Maintenance

## - Considerations for Parcel Editing

Working with **large integrated datasets** requires various tools to produce efficient and accurate datasets.

1. The **seamless database** requirement.
2. Managing multiple **feature coincidence**.
3. **Data organization** – Symbology, levels, attribution, DB views.
4. **Data normalization** and relations to other datasets  
(Persisted DB **Joins** – CAMA, Permitting, Land Records, etc...)
5. Enhance the management and **editing** of GIS Features.
6. **Spatial filters** to limit working area.
7. **Locate Features** and **Review Attributes** to ensure correct work area.

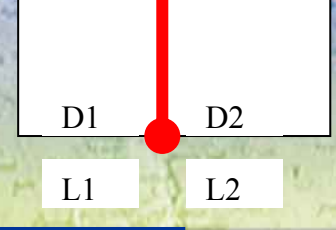


# Parcel Split Workflows

**Parcel splits** are usually performed by first editing the underlying boundaries that control the configuration of the parcels.

1. **Locate** position of new **lot lines** by:
  1. Proportion
  2. COGO / Precision Entry (GMPRO)
  3. Offsets
  4. Simple Feature Editing
2. **Break or add vertexes** to frontage and back boundaries.
3. **Add internal lot lines**
4. **Create new Parcel areas** based on updated boundaries

# Parcel Split Workflows -Proportion

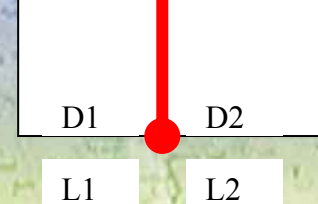


**COGO Proportion** is one way to split a parcel.

This functionality allows the user to:

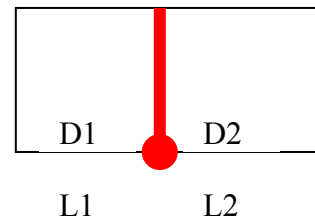
- Select **one or many lines/curves** to proportionately break.
- Specify alternate **deed distance(D) vs. GIS length (L)**.
- Add **internal lot lines** at the proportioned locations.

# Parcel Split Workflows -Proportion



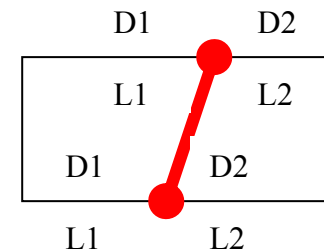
## Frontage Proportion

- automatically add lot lines



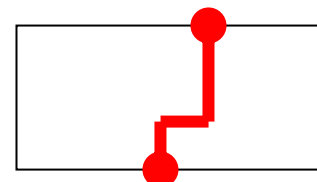
## Double Proportion

- manually add 2 point lot lines

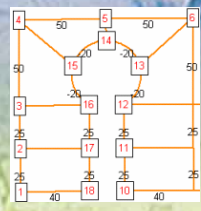


## Double Proportion and COGO

-Precisely place internal traverse lot lines.

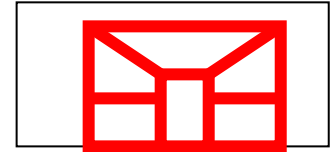


# Parcel Split Workflows -COGO



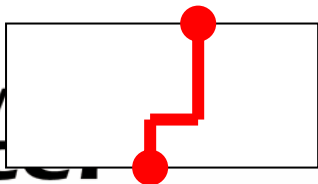
## Rapid Survey Plat/Plan Entry

- known coordinates or monuments
- entry of entire plan



## Integrated Survey Plat/Plan Entry

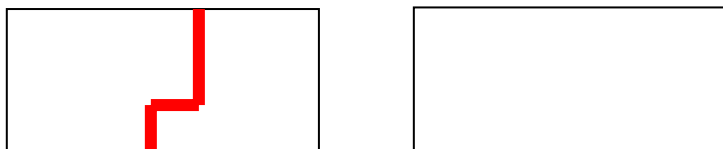
- known points on fabric to be used
- Proportion boundaries to create tie points
- Traverse adjustments to distribute errors



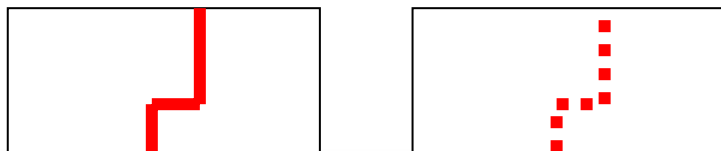
# Parcel Merge Workflows

**Parcel merges** are usually performed by first editing the underlying boundaries that control the configuration of the parcels.

1. **Delete** an internal lot line.



2. **Type Alterations** – Change an internal lot line's attribution to change its definition in a Query or View (multi-level rendering)



# Parcel Maintenance

The **GeoMedia architecture** provides many advantages and thus tools that can be employed in managing Parcel Areas

1. The **seamless database** requirement.
2. **Coincident Editing** – While editing boundaries edit the respective parcels with the use of the coincident editing option.
3. **Validate and Fix** the Parcel **areas** against the controlling boundary linework.
4. **Attribution aids and tools** to minimize user input.

# Parcel Maintenance

## – Coincident Editing

**Coincident editing** saves the user the requirement to post process the result of feature edits to correct the vertical alignment of multiple features.

1. Specifies that **placement and editing commands** will place vertices at snap points for coincident features.
2. When **turned on**, any **vertex edit** will affect all features coincident at the vertex. .
3. **Eliminates** the requirement to **rebuild or recompute entire area datasets** based on minor feature edits.

# Parcel Maintenance

## – Validate and Fix Areas

**Validate and Fix Areas** Identifies and corrects the differences from boundary linework to parcel area features. Only the differences (anomalies) are identified for correction.

1. Respects **spatial filter** settings to minimize analyzed area.
2. Identifies parcel areas that need to be:
  1. Updated
  2. Split – Inherits attributes from parent
  3. Merged – Inherits attributes from parent
  4. Created
  5. Special (Merged and Split)
3. **Eliminates** the requirement to **rebuild or recomputed entire area datasets** based on minor feature edits.



# Parcel Maintenance – Attribution

**Attribution** is an important aspect of integrated GIS systems. This ability allows systems to be easily related together as well as provides enhanced tools for placing attributes and subsequent labels.

1. **Copy Attributes** from previously placed features when inserting new features.
2. Display **properties dialog box** for attribute entry when inserting features.
3. **Mass update of specified attributes** on selected features or entire feature class.
4. **Sequential Attribution** allows rapid graphical identification of parcel areas that need to be attributed:
  - **Draw a line** through parcels in order of desired attribution placement.
  - Add **Prefix, Suffix, Start, Increment values** (Lot Numbering...)

# Fabric Adjustment Workflows

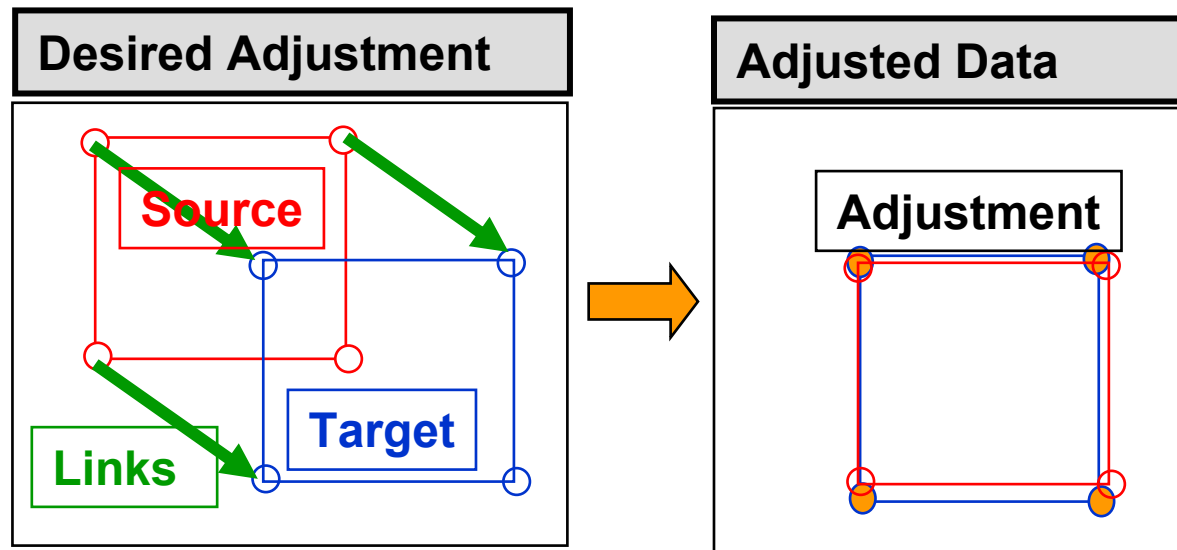
**Fabric Adjustments** are spatial adjustments made to the database to improve the fabric or incorporate other datasets.

These adjustments can be used to:

- **Integrate** digitally submitted survey plans or other data sets.
- Adjust **Plans to match the fabric**
- Adjust **Fabric to match plans**
- Adjust fabric based on **improved** data
- **Rubbersheet** other datasets to match the fabric.
- **Virtually adjust data** to queries and not affect the underlying dataset.

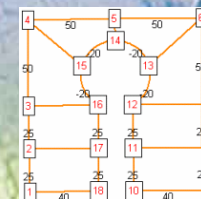
# Fabric Adjustment Workflows

**Least Squares** Mathematical Adjustments  
(Helmert, Affine, Polynomial, etc...)



# Fabric Adjustment Workflows

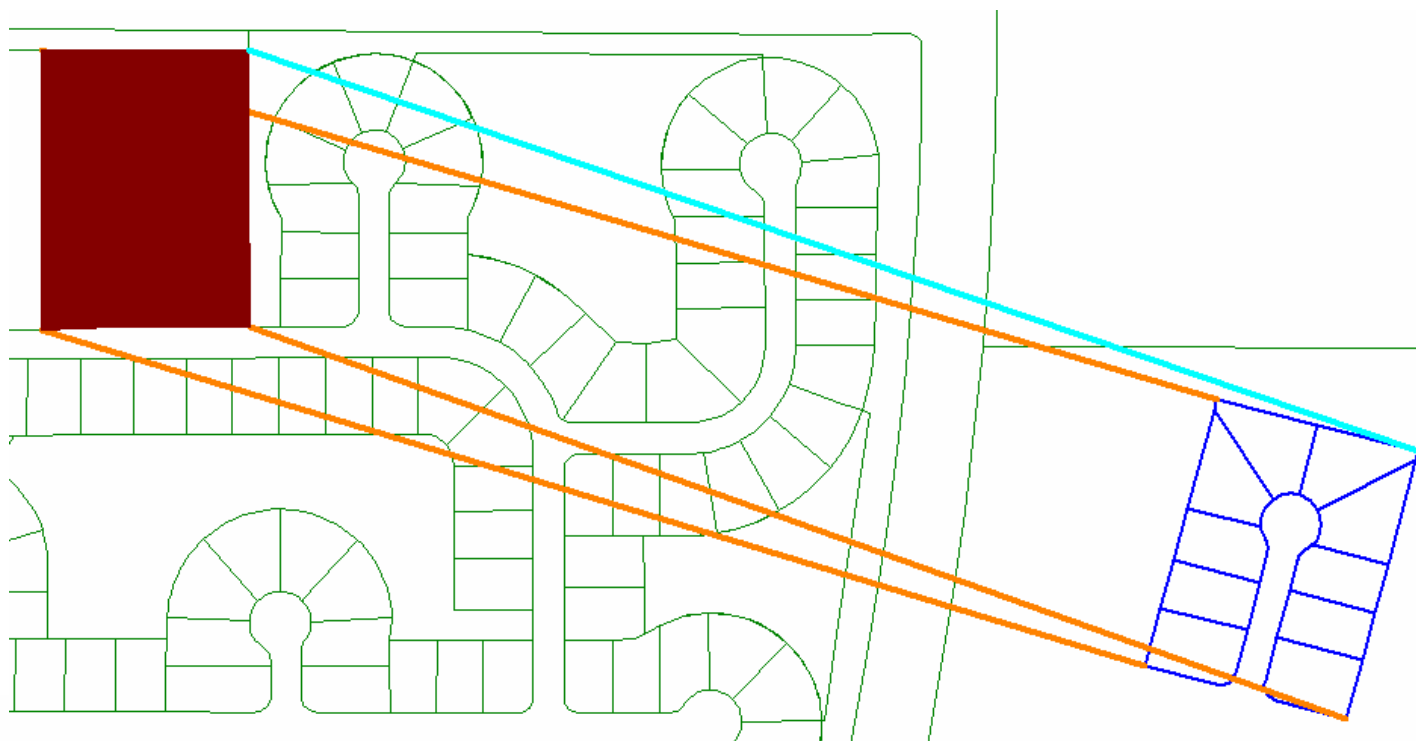
## Plan 2 Fabric



### Helmert Plan integration.

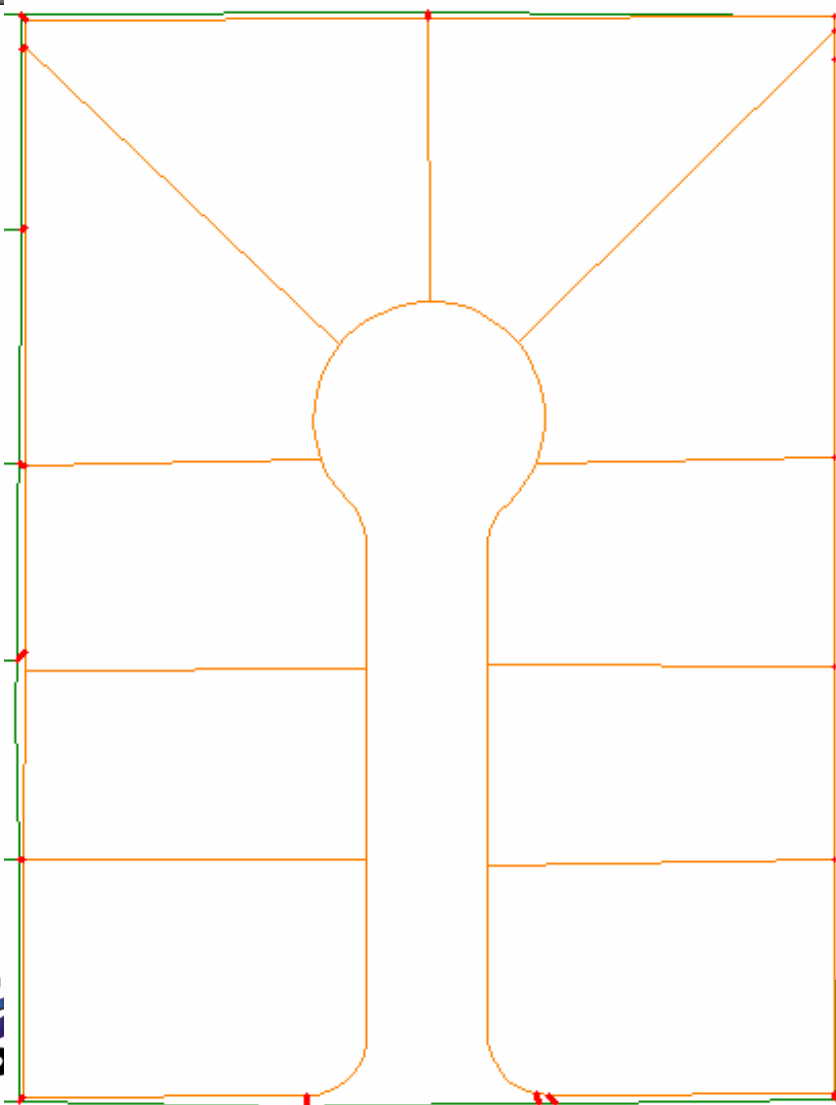
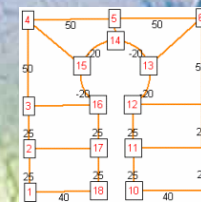
Parcel Number:

332357000670000



# Fabric Adjustment Workflows

## Fabric 2 Plan



## Fabric Improvement

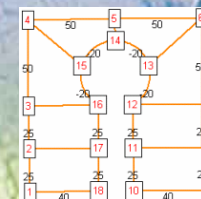
- Affine/Polynomial with Residual smoothing.

Parcel Number:

**332357000570007**

1. Spatial Filter
2. Hold Links
3. Auto Links 1.7meters
4. Manual Links
5. Adjustment

# Survey Plan Integration Workflows – Plan Example



Kataster nehnutečnosti - [Geometrický plán s číslom 35037296-101/99 - Zahájený]

Údaje Funkcie Služby Zostavy Pomocník Okná Koniec

VEĽKÉ BEDZANY Administrátor 27.06.02

Vlastnosti Výkaz výmer Geodetické údaje

Body pôvodného stavu (z VKM)

Parcela 124 riešená Výmera 1,664,041 m<sup>2</sup>

Skup. číslo	Por. číslo	Y	X	Poznámka
190018	149	491,671.97	1,237,046.59	
190018	43	491,679.98	1,237,033.65	
190018	45	491,654.24	1,237,012.64	
190018	80	491,591.67	1,236,961.14	
190000	580	491,581.25	1,236,973.47	
190018	75	491,608.28	1,236,995.04	
190018	189	491,610.15	1,236,992.70	

Body nového stavu (z SGI)

Parcela 124/3 riešená Výmera 95,222 m<sup>2</sup>

Skup. číslo	Por. číslo	Y	X	Poznámka
190045	2	491,646.68	1,237,007.68	nový
190045	7	491,642.68	1,237,012.53	nový
190045	6	491,647.64	1,237,016.62	nový
190045	5	491,647.55	1,237,016.73	nový
190045	4	491,652.02	1,237,020.41	nový
190045	8	491,653.15	1,237,019.04	nový
190045	3	491,656.09	1,237,021.46	nový

Zmeny vo výmerách (Diely)

Od parcely	K parcele	Výmera (m <sup>2</sup> )
124	124/1	1,012.
124	124/2	556.
124	124/3	95.
		1,664.

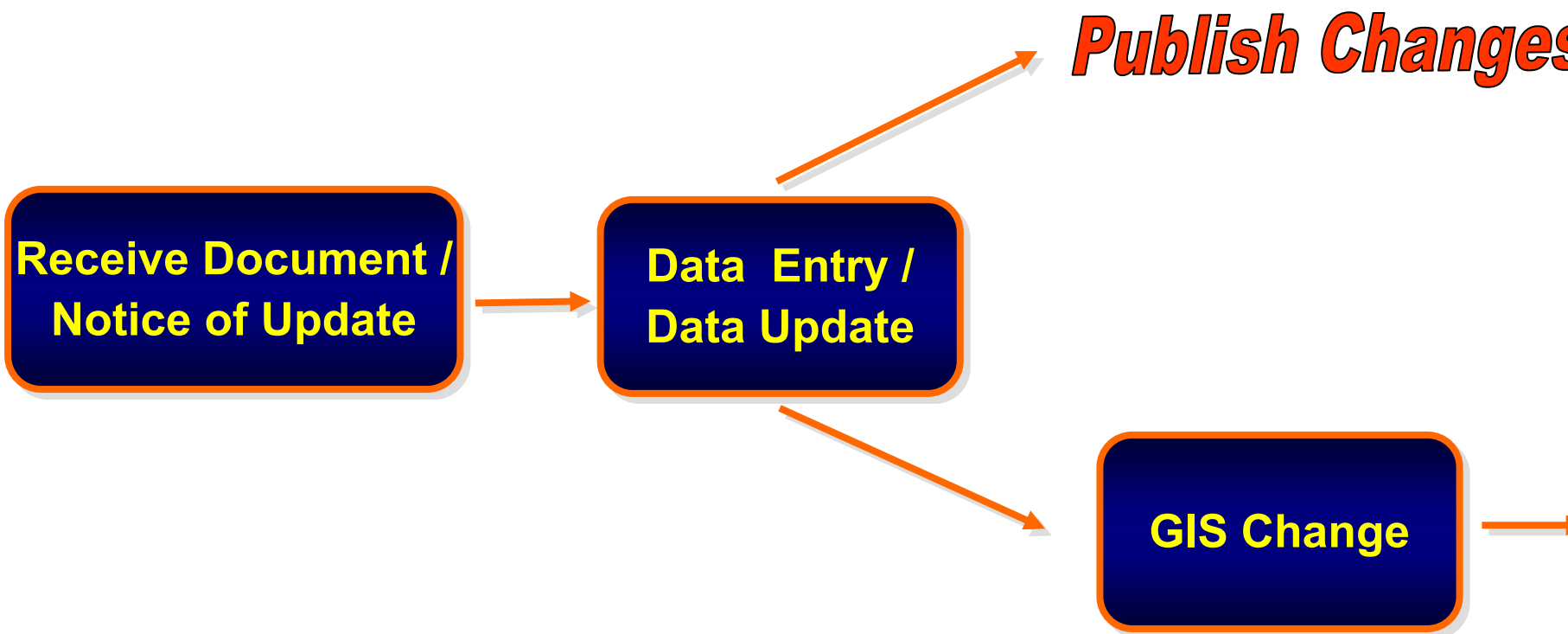
Ukázať v mape

Pôvodný stav  Legendu  
 Nový stav  Mierku  
 Poznámky  Severku

Zrušiť vyber Centrovat

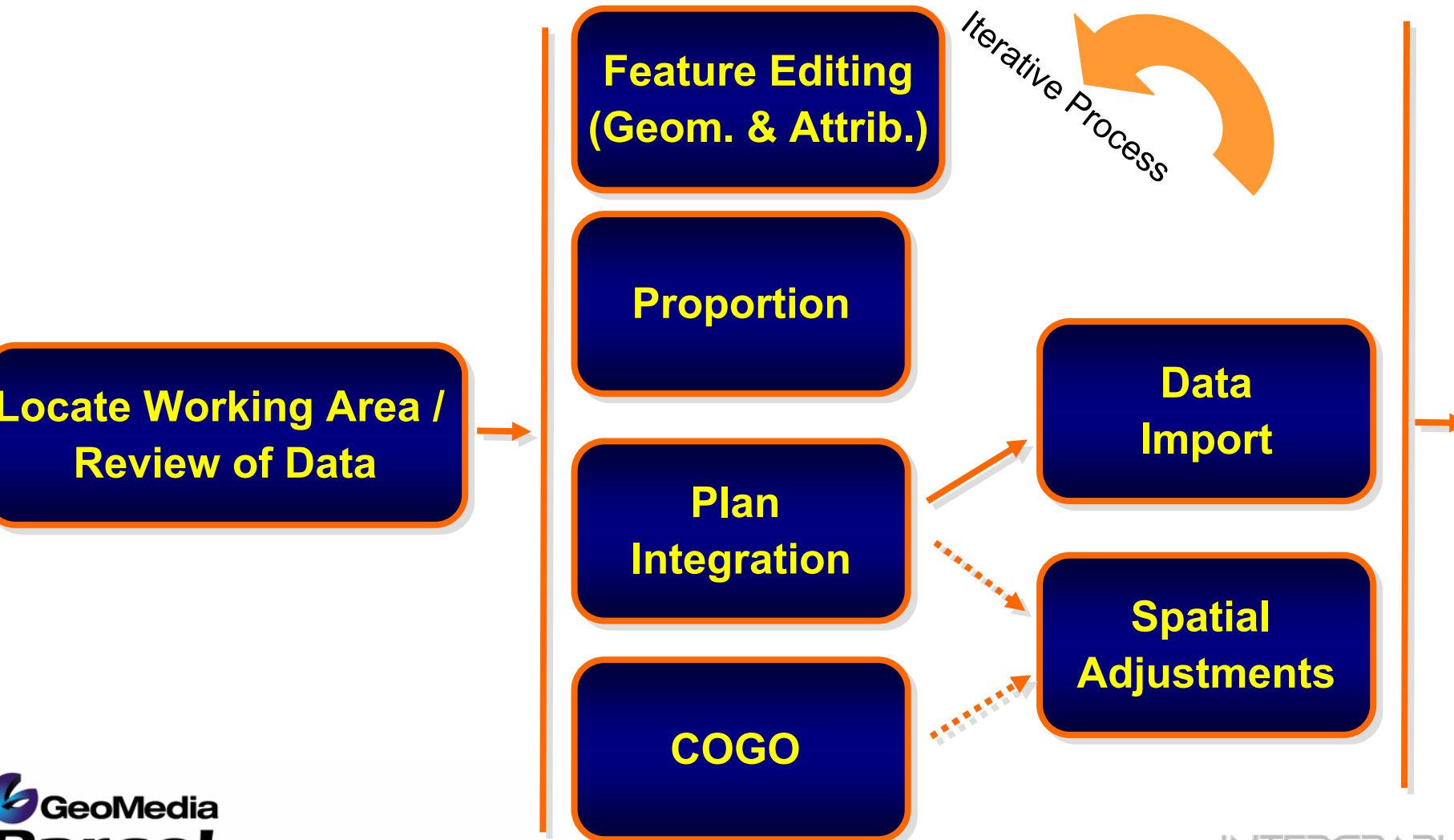


# Parcel Maintenance Workflow - Initialization



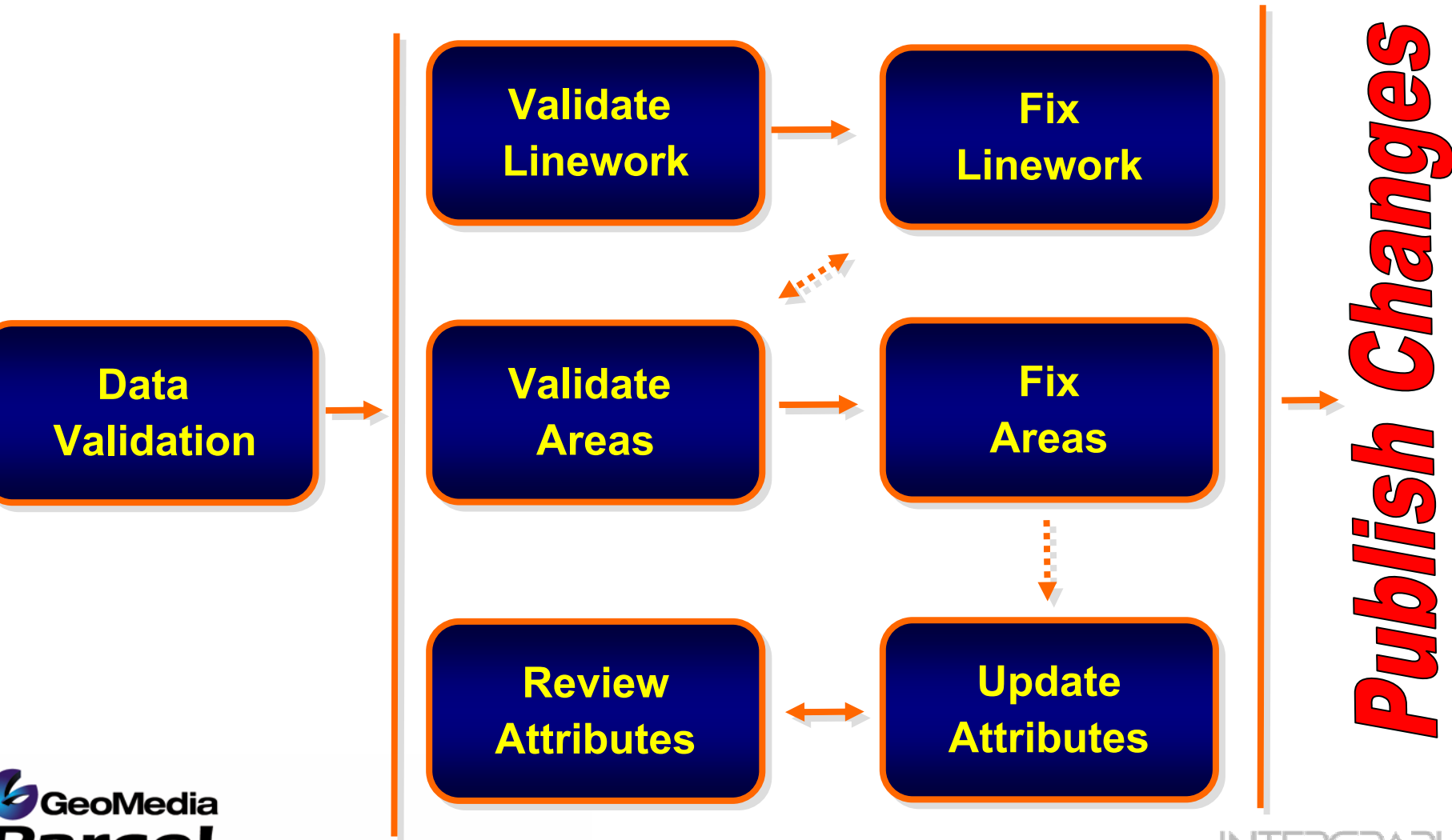


# Parcel Maintenance Workflow - GIS Change

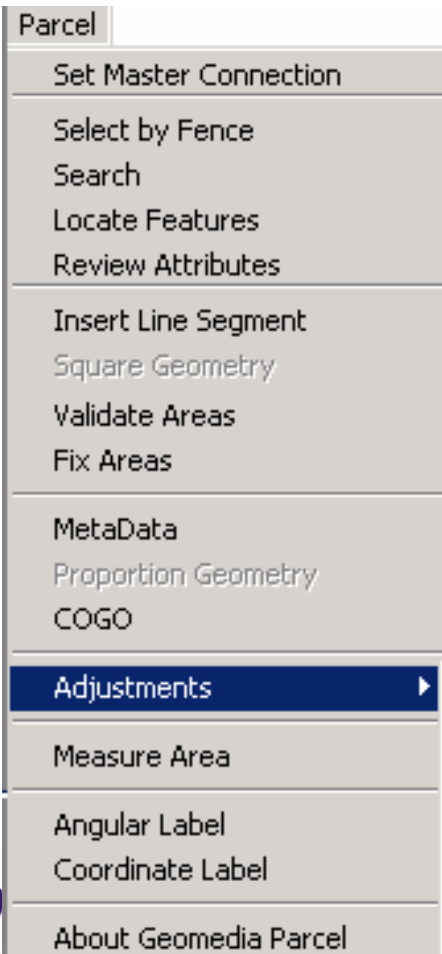


# Parcel Maintenance Workflow

## - Data Correction



# GPM Commands - Menu and Toolbar



- **GeoMedia Parcel Manager works within GeoMedia Professional**

- **GMPParcel provides a new Menu and Toolbar inside of GMPPro**

- **GMPParcel is designed to be open and to work with existing database schemas.**

- **Many commands in GMPParcel have:**

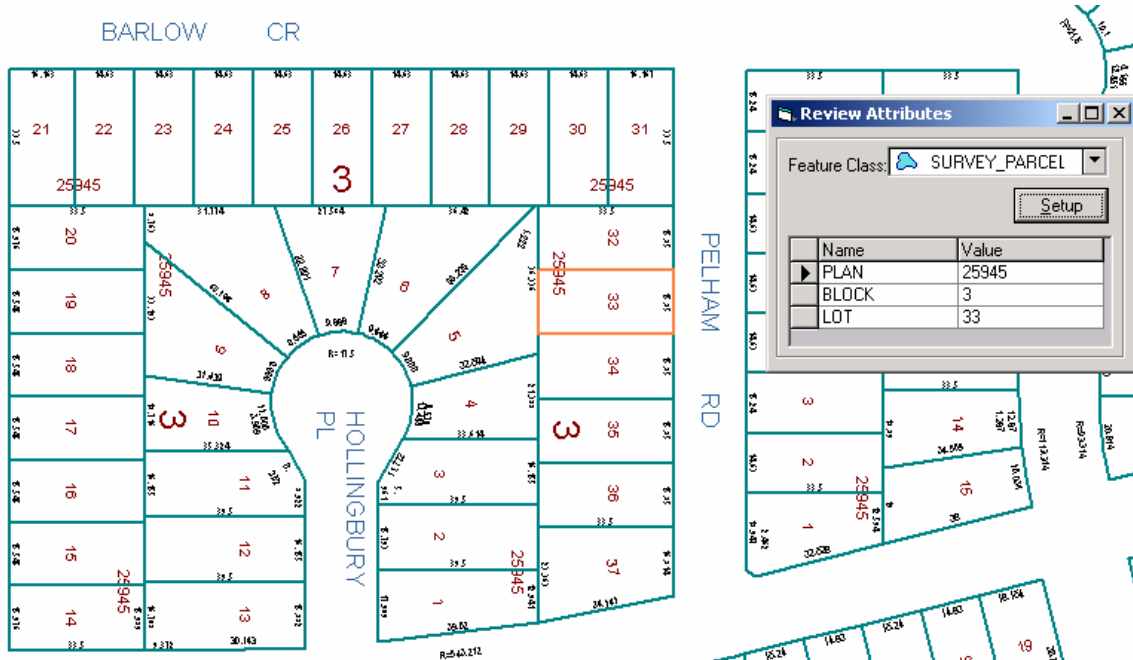
- ◆ a **configurable component** that can be customized at the database level;

- ◆ **Support data** maintained in the database for reuse and reporting purposes.

# GPM Command Review

## - Attribute Query Tools

- GMPParcel provides various tools for **searching and locating areas of interest**.
- Use the **Review Attributes** command to **scan** selected attributes on geographic features.

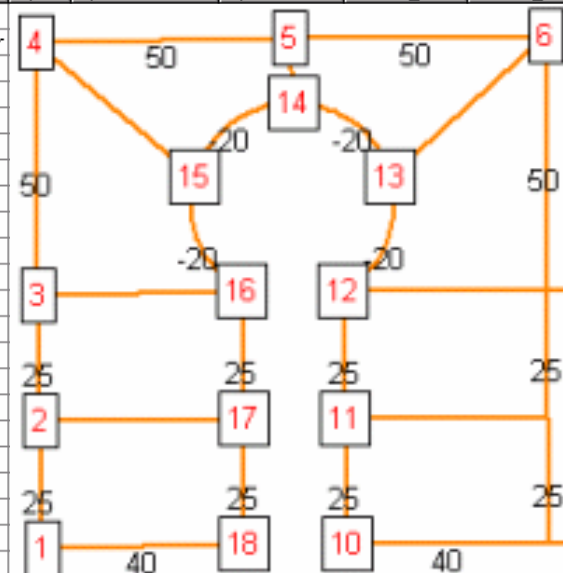


# GPM Command Review

## - COGO (COordinate GeOmetry) Entry

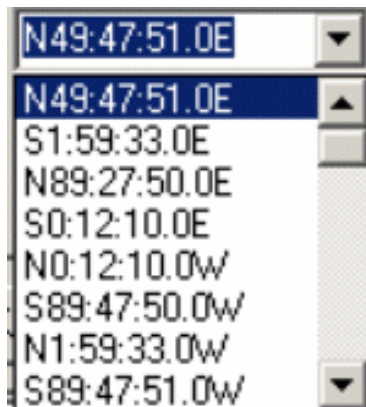
### COGO Spreadsheet Entry

ID	Active	From	To	Option1	Input1	Option2	Input2	Option3	Input3	Option4	Input4	Option5	Input5	Closure_Ratio	Closure_Dis
1	<input checked="" type="checkbox"/>			Distance Unit	m										
2	<input checked="" type="checkbox"/>	1	1	New Point	1	X-Easting	688254.834	Y-Northing	358146.105	Z-Elevation	4		5		6
3	<input checked="" type="checkbox"/>	1	1	Start Point	1										
4	<input checked="" type="checkbox"/>	1	1	Close Point	1										
5	<input checked="" type="checkbox"/>	1	1	Line FeatureClass	BOUNDARY										
6	<input checked="" type="checkbox"/>	1	2	Distance	25	Deflection	0.00000								
7	<input checked="" type="checkbox"/>	2	3	Distance	25	Deflection	0.00000								
8	<input checked="" type="checkbox"/>	3	4	Distance	50	Deflection	0.00000								
9	<input checked="" type="checkbox"/>	4	5	Distance	50	Deflection	90.00000								
10	<input checked="" type="checkbox"/>	5	6	Distance	50	Deflection	0.00000								
11	<input checked="" type="checkbox"/>	6	7	Distance	50	Deflection	90.00000								
12	<input checked="" type="checkbox"/>	7	8	Distance	25	Deflection	0.00000								
13	<input checked="" type="checkbox"/>	8	9	Distance	25	Deflection	0.00000								
14	<input checked="" type="checkbox"/>	9	10	Distance	40	Deflection	90.00000								
15	<input checked="" type="checkbox"/>	10	11	Distance	25	Deflection	90.00000								
16	<input checked="" type="checkbox"/>	11	12	Distance	25	Deflection	0.00000								
17	<input checked="" type="checkbox"/>	12	13	Radius	-20	Delta	75.00000	Radial BC-C	N30:00:00.0						
18	<input checked="" type="checkbox"/>	13	14	Radius	-20	Delta	75.00000								
19	<input checked="" type="checkbox"/>	14	15	Radius	-20	Delta	75.00000								
20	<input checked="" type="checkbox"/>	15	16	Radius	-20	Delta	75.00000								
21	<input checked="" type="checkbox"/>	16	17	Distance	25	Bearing/Azimuth	S0:37:52.7E								
22	<input checked="" type="checkbox"/>	17	18	Distance	25	Deflection	0.00000								
23	<input checked="" type="checkbox"/>	18	1	Distance	40	Deflection	90.00000							1/2653.4016	0.2204
24	<input checked="" type="checkbox"/>	1	1	Snap On	True										
25	<input checked="" type="checkbox"/>	2	17											1/1	40.0018
26	<input checked="" type="checkbox"/>	3	16											1/1	40.0018
27	<input checked="" type="checkbox"/>	4	15											1/1	41.1773
28	<input checked="" type="checkbox"/>	5	14											1/1	12.5783
29	<input checked="" type="checkbox"/>	6	13											1/1	41.0901
30	<input checked="" type="checkbox"/>	7	12											1/1	40
31	<input checked="" type="checkbox"/>	8	11											1/1	40
32	<input checked="" type="checkbox"/>	11	11	Snap On	False										
33	<input checked="" type="checkbox"/>	7	7	Start Point	7										
34	<input checked="" type="checkbox"/>	9	9	Close Point	9										
35	<input checked="" type="checkbox"/>	7	20	Distance	280	Rotation	91.00000							1/0.9874	283.5689
36	<input checked="" type="checkbox"/>	20	21	Distance	50	Rotation	-90.00000							1/1.1823	279.1274
37	<input checked="" type="checkbox"/>	21	9	Distance	280	Rotation	-90.00000							1/699.0174	0.8727



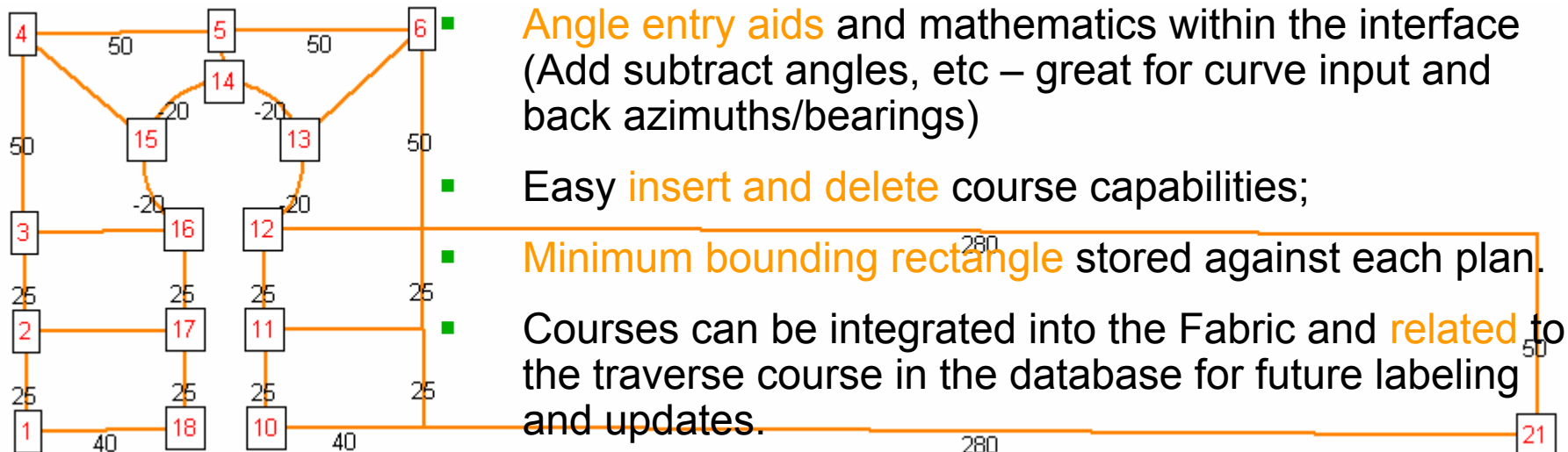
# GPM Command Review

## - Coordinate Geometry (COGO) Entry



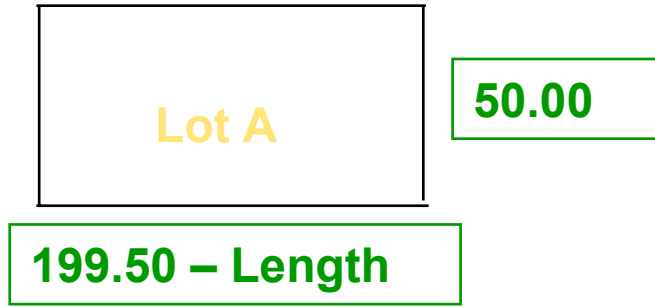
### COGO Entry of survey plans and Plats:

- **Optimized** for rapid **keyboard entry**;
- **Hotkey** customization capabilities;
- **Spreadsheet** entry for easy viewing and editing of input;
- Traverses are **persisted in the database** for easy access retrieval and report writing;

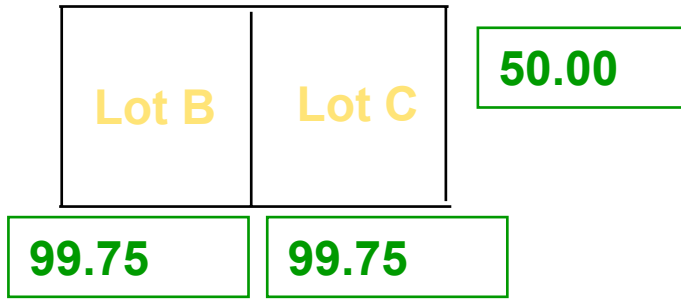


# Deed Distance vs. Length

Before



After



100.00 - Deed

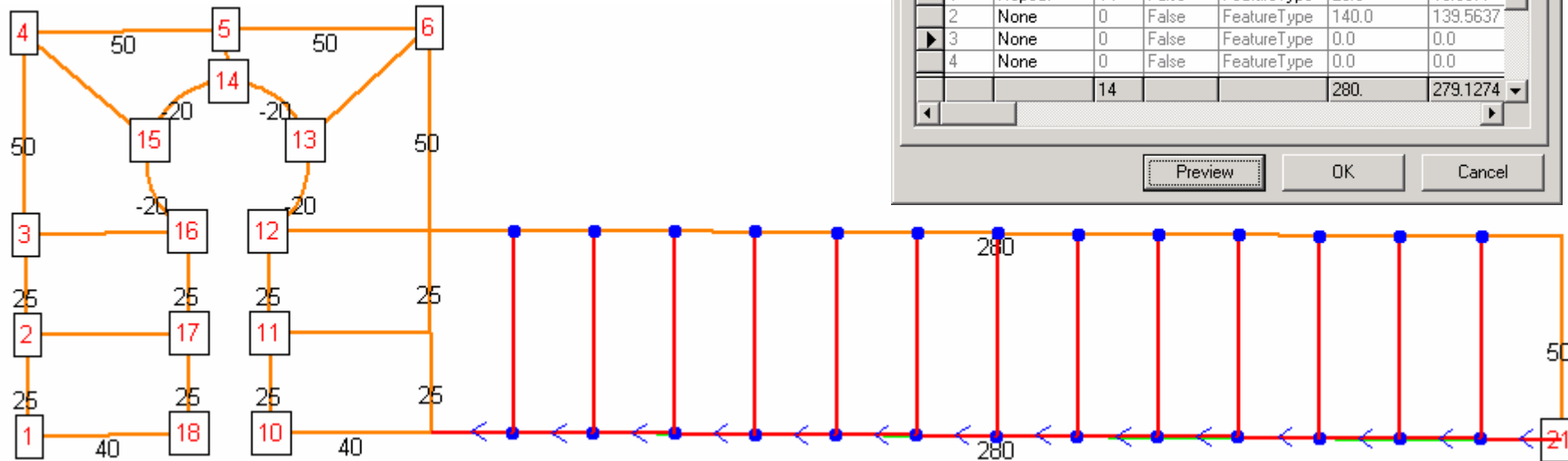
100.0 - Deed

- Deed Distance is the actual length of the measurement. For example, the Deed indicates to create two new lots 100 X 50 from the existing lot 200 X 50
- Length is the system length calculated by the GIS. For example, the length is 199.50 for the lot in the GIS
- Proportion is used to divide the lot based on a ratio of the Deed Distance to the system length

# Proportional Geometry

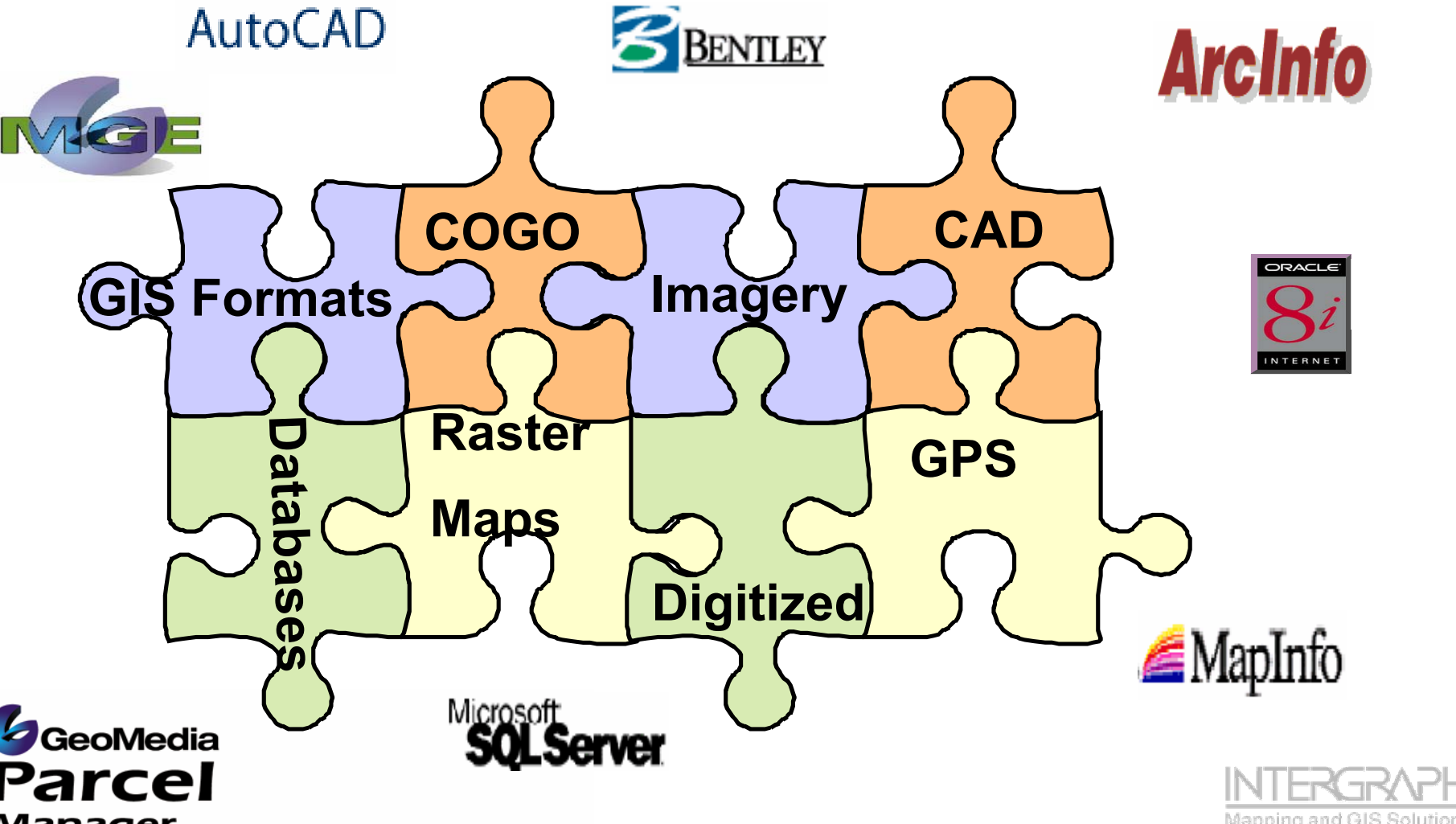
## Proportional entry and modification of data:

- Easy mechanism for entry of **deed information**;
- Input is based off of **relative** information;
- **Computations** are performed by the command and **previewed** to the user for acceptance.





# Bringing it Together – Data Integration and Digital Plan/Plat Submission



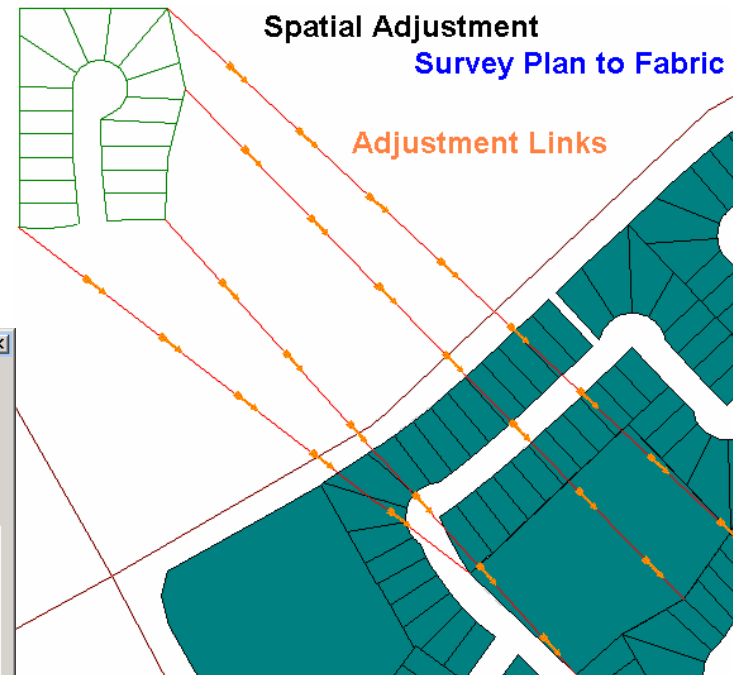
# Spatial Adjustments

Spatial adjustments are broken down into 2 components:

- Link Geometry
- Adjust Geometry

The **Link Geometry** dialog box is shown with the following settings:

- Create links manually
- Create links automatically
- Create control points from:
  - Source: Plan\_New
  - Target: BOUNDARY\_LINI
  - Source item: Vertices
  - Target item: Vertices
- Create links automatically by distance
  - Distance: 10.0
- Create links automatically by attribute values
  - Source attribute: TYPE
  - Target attribute: TYPE
- Standard Deviation: 1
- Map window name: MapWindow1
- Link Collection: Link\_Boundaries
- Link Group: AutoLink\_10meters
- Query Link Collection
  - Query name: Link\_Boundaries\_Links
  - Description:



The **Adjust Geometry** dialog box is shown with the following settings:

- Adjust:
  - Features: Plan\_New
  - Connection: Access CWPG
- Output As:
  - Query: Move\_of\_Plan
  - Update Original Data
- Adjustment:
  - Name: Move\_of\_Plan
  - Description:
  - Parameters: Helmert
  - Link Collection: Link\_Boundaries
  - Apply Standard Deviations
  - Create Residual Query

# Spatial Adjustments

- Spatial adjustments can:
- **Correct and massage** data to match more accurate data;
- Improve fabric data **incrementally** based on improved information;
- **Amalgamate** different read/only datasets together for presentation and analysis purposes.

Typical use of adjustments include:

- Adjusting **digitally submitted data** to match the target fabric location.
- Rubber sheet or improve the fabric geometries based on **more accurate data** such as GPS;
- **Edge match** different datasets together;
- **Overlay** external datasets over internal datasets for analysis and reference.

# Discussions

Questions/Answers

The logo for graphIT, featuring the word "graph" in a lowercase sans-serif font, followed by "IT" in a bold, uppercase sans-serif font inside a dark blue circle.The logo for INTERGRAPH, featuring the word "INTERGRAPH" in a bold, uppercase, sans-serif font. The letters are white and set against a black background. A horizontal white line is positioned below the text.

Mapping and GIS Solutions