



IMPLEMENTATION OF COMPREHENSIVE MODELING TECHNIQUES ON *KARTOGEN* GENERALIZATION SOFTWARE

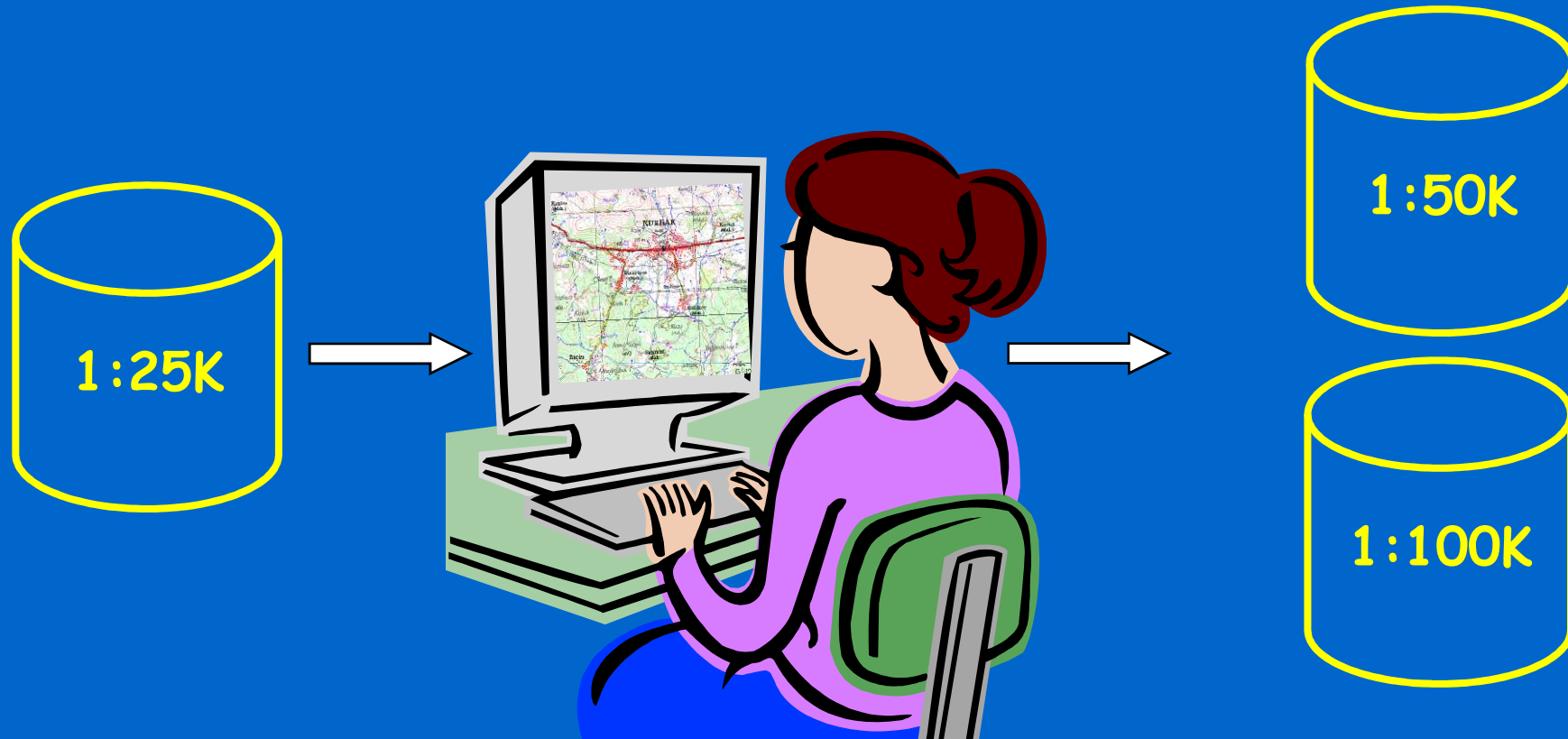
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IMPLEMENTATION OF COMPREHENSIVE MODELING TECHNIQUES ON *KARTOGEN* GENERALIZATION SOFTWARE

INTRODUCTION

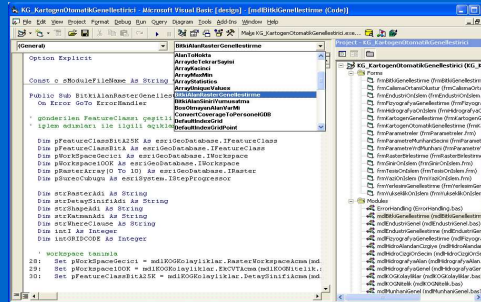




IMPLEMENTATION OF COMPREHENSIVE MODELING TECHNIQUES ON KARTOGEN GENERALIZATION SOFTWARE

INTRODUCTION

Simple Batch
Processing



Sophisticated
Methods



•Condition-Action (C-A),

Harrie and Weibel (2007)

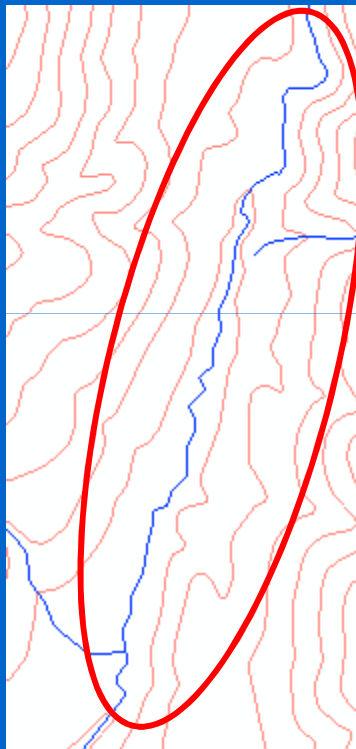
•Human Interaction (HI)

•Constraint Based (CB) modeling



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C-A Modeling Technique



Object

(Bendsimplify Algorithm)

Line Simplify

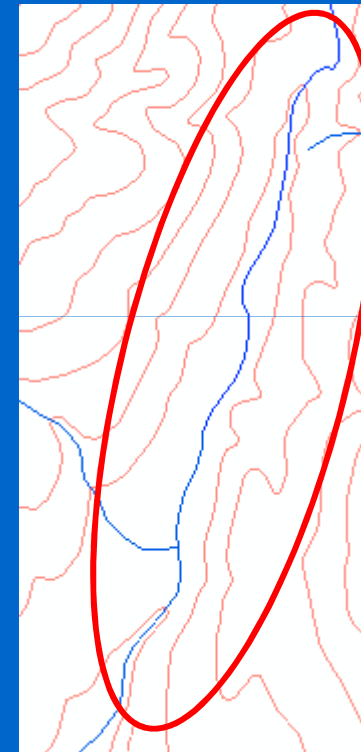
(PAEK Algorithm)

Line Smoothing

(Point Remove Algorithm)

Point Remove

Algorithms

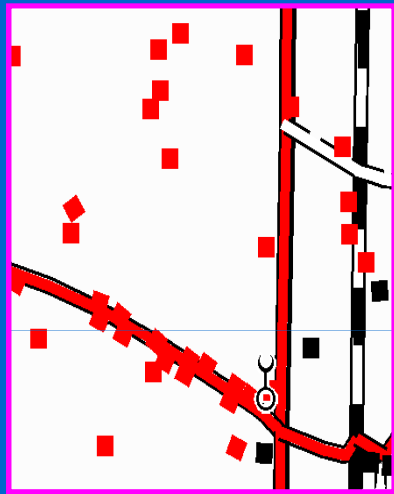


Object

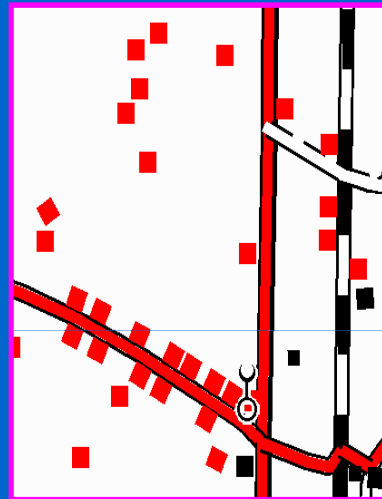


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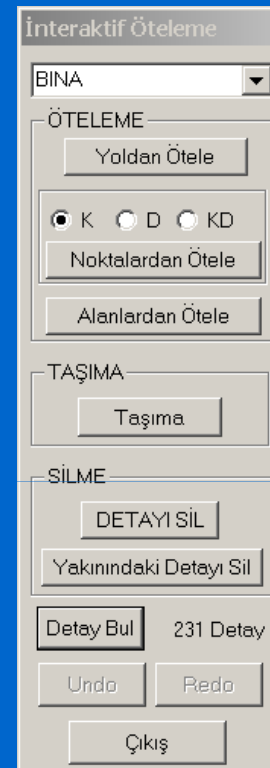
HI Modeling Technique



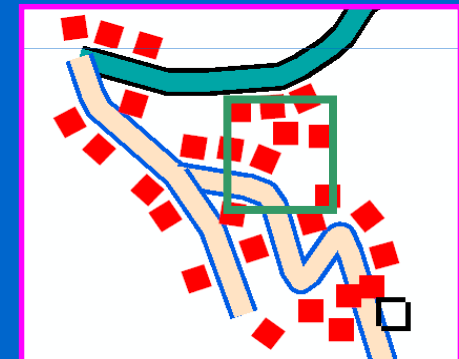
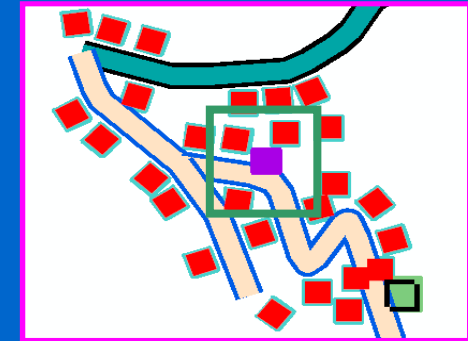
Before



After



Before



After

Though HI model is well enough for single map objects, it is time consuming and highly confined to cartographer's ability.



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CB Modeling Technique

- Defining the constraints (like geometric, topologic, semantic, legibility, etc.)
- Apply the related algorithms
- Defining the required values that satisfy the constraints.
- Evaluate the final state



IMPLEMENTATION OF COMPREHENSIVE MODELING TECHNIQUES ON *KARTOGEN* GENERALIZATION SOFTWARE

This study focuses on the practical implementation of three well-known modeling techniques on the text generalization and text placement within the *KartoGen (KG)* software and search for an appropriate model in terms of the requirements of the General Command of Mapping for the production of 1: 50K and 1:100K scale maps.

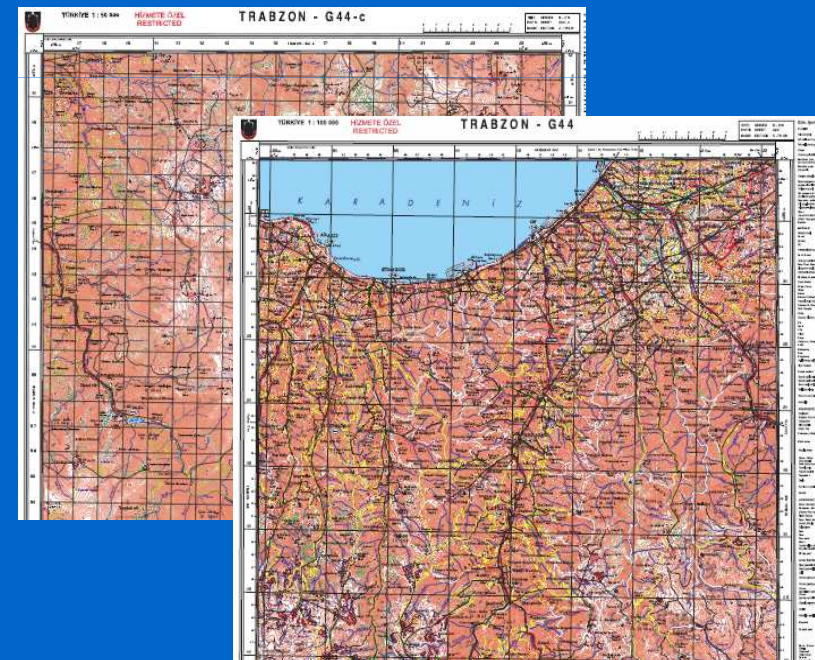
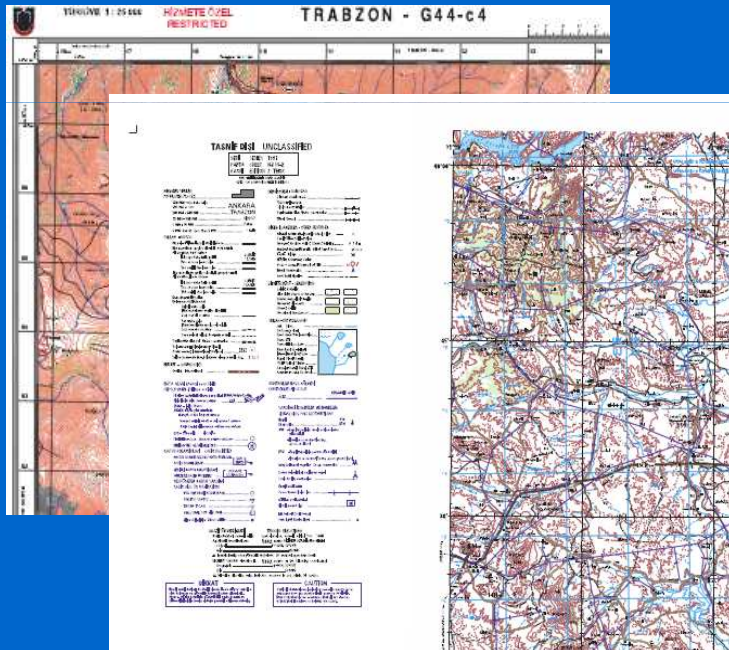


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KG SOFTWARE

• 1:25K, 1:250K, and 1:1000K
scales are **BASE SCALES**.

• Non-base scale Standard
Topographic Maps (STMs) like
1:50K and 1:100K

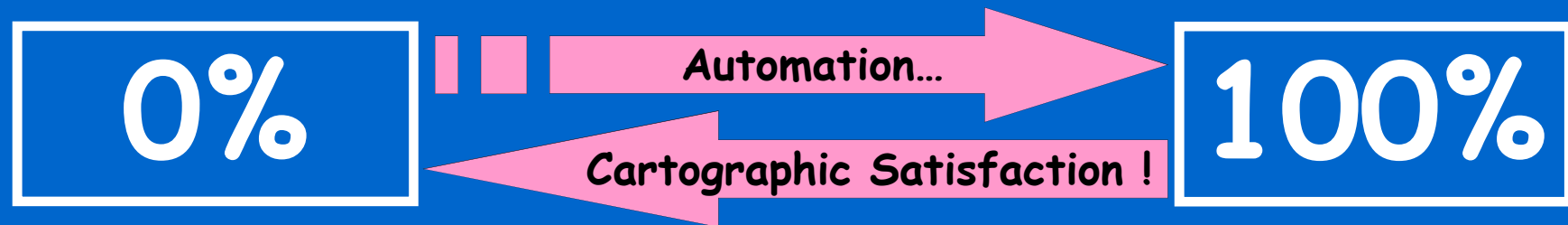




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KG SOFTWARE

KG project was initiated in 2002





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KG SOFTWARE

The screenshot displays the ArcMap software interface. The 'Extensions' window is open, showing a list of extensions with 'KartoGen Genelleştirme' selected. The main menu bar includes 'File', 'Edit', 'View', 'Insert', 'Selection', 'Tools', 'Window', 'KartoGen', and 'Help'. The 'KartoGen' menu is highlighted with a red box, showing options: 'KartoGen Araçları', 'Genelleştirme Araçları', 'Kitabe Araçları', 'KartoGen Yardım', and 'KartoGen Dokümanlar'. Two floating toolbars are visible: 'KartoGen Araçları' (containing icons for selection, zoom, and pan) and 'KartoGen Genelleştirme Araçları' (containing icons for various generalization tools like line simplification, vertex removal, and snapping). The 'Extensions' window also shows a description of KartoGen 1.0 and copyright information.

Extensions

Select the extensions you want to use.

- ☐ 3D Analyst
- ☐ ArcPress
- ☐ ArcScan
- ☐ Geostatistical Analyst
- ☒ **KartoGen Genelleştirme**
- ☐ Maplex
- ☐ Publisher
- ☐ Spatial Analyst
- ☐ StreetMap
- ☐ Survey Analyst
- ☐ Tracking Analyst

Description:

KartoGen 1.0
Telif Hakkı ©2005 Kartografya Dairesi, HGK. Tüm haklar saklıdır
KartoGen Harita üretim sistemi ve KartoGen genelleştirme.

About Extensions Close

J19.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window **KartoGen** Help

KartoGen Araçları
Genelleştirme Araçları
Kitabe Araçları
KartoGen Yardım
KartoGen Dokümanlar ▶

KartoGen Araçları

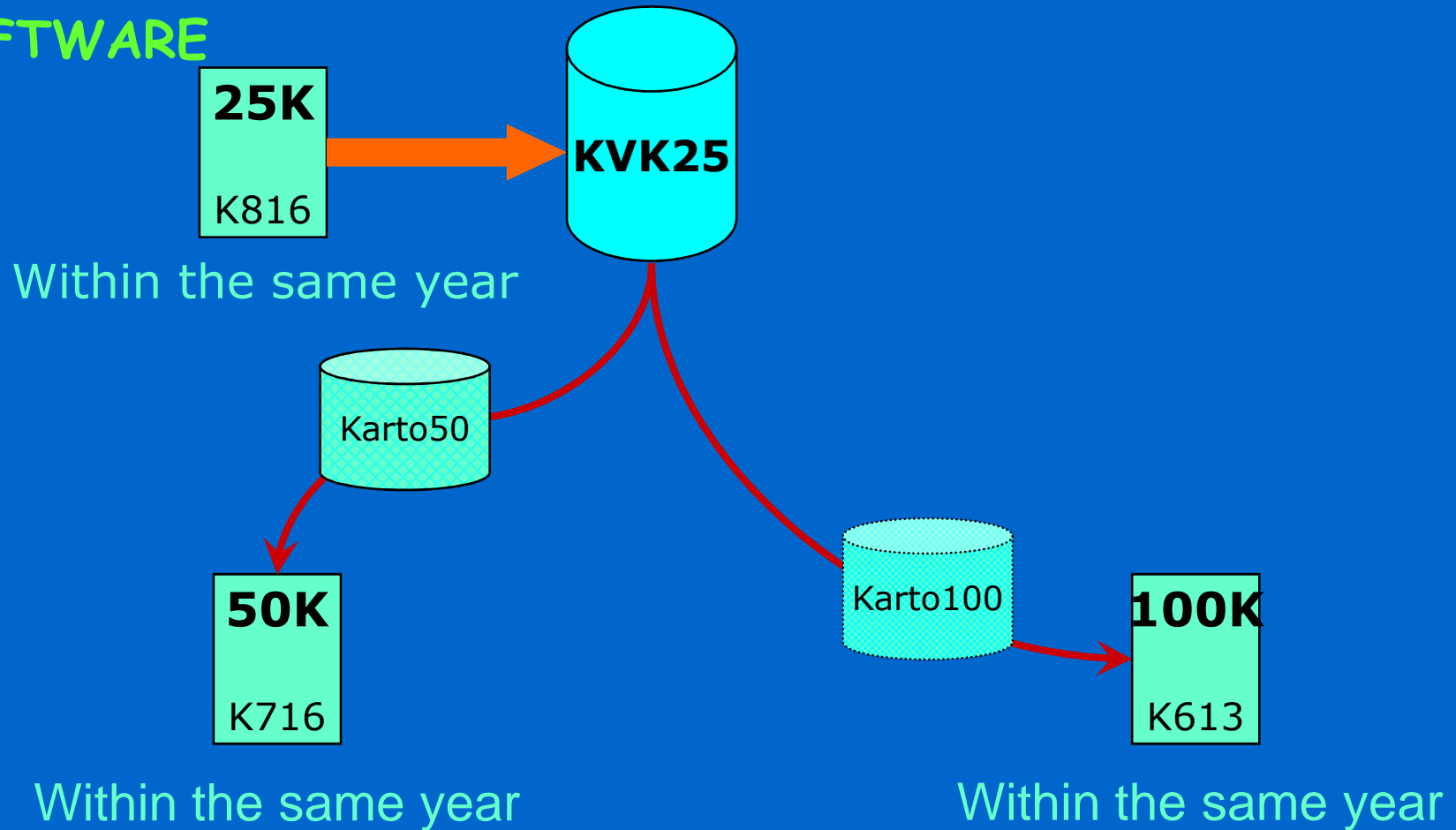
kartogen100 100000

KartoGen Genelleştirme Araçları



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KG SOFTWARE





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KG SOFTWARE

1:50K and 1:100K Maps covering the Turkish Territory;

<u>Scale</u>	<u>Turkey</u>
1:50K	1453
1:100K	391

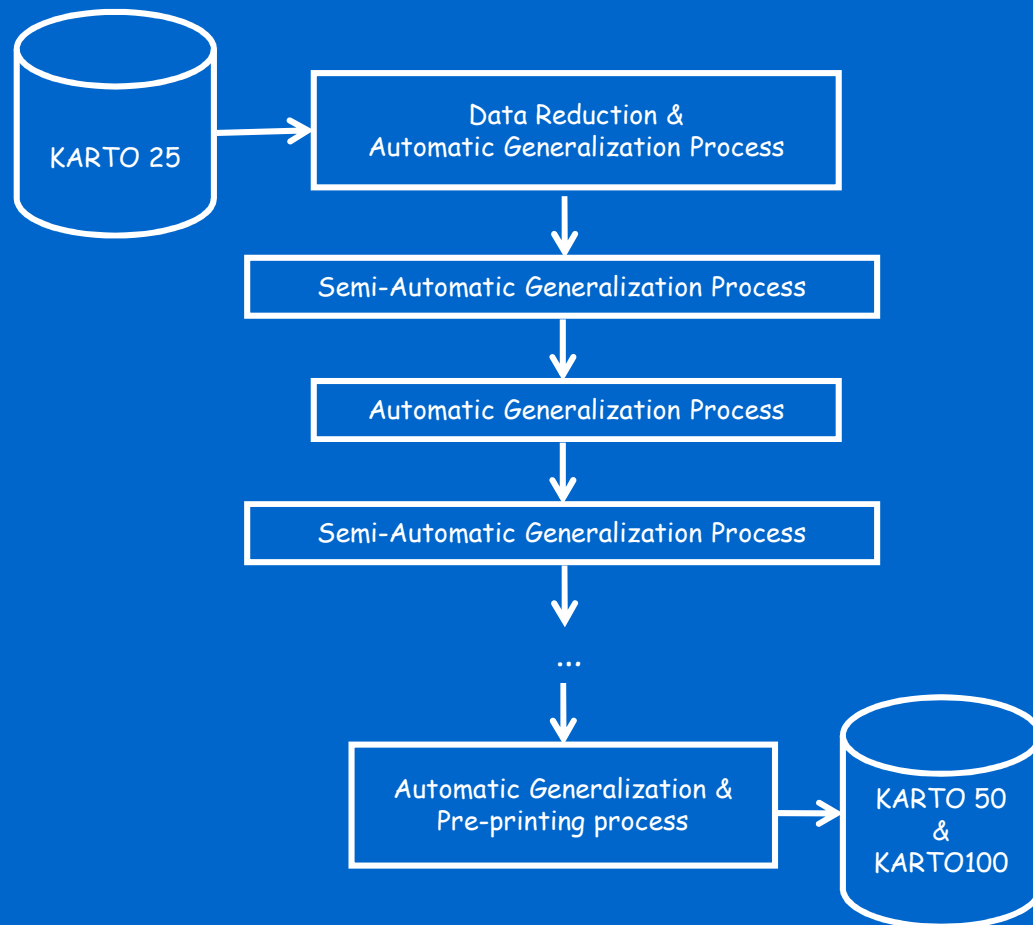
From the year 2005, the outputs of *KG* serves the requirements of GCM.

	1:50K	1:100K
2005	-	6
2006	30	35
2007	101	11
2008	228	35
2009	142	38
2010	145	39



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Generalization workflow of *KG* software



The system is mainly managed by means of C-A and HI modeling techniques.

We are now updating our software by taking the advantage of CB modeling.



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Modeling techniques used in *KG* software

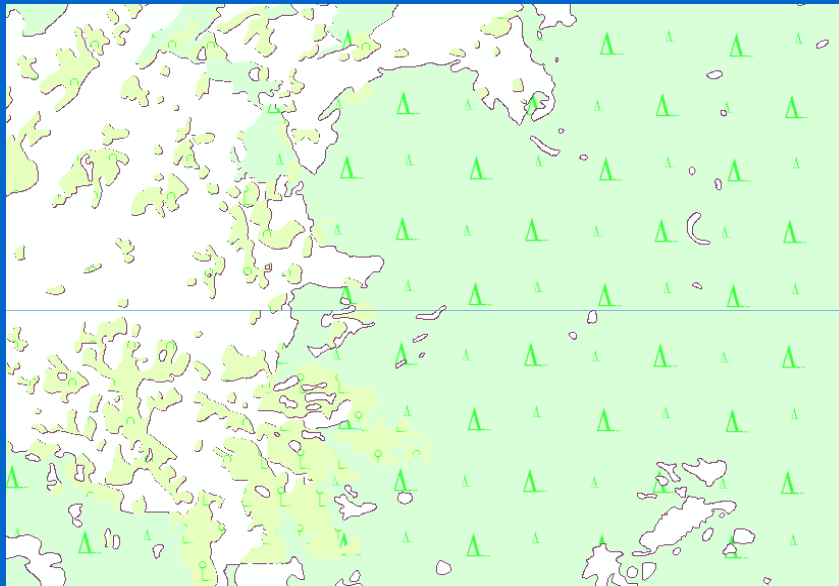
	C-A Model	HI Model	CB Model
Elevation Generalization	<i>A</i>	<i>A</i>	-
Hydrographic Network Generalization	<i>A</i>	<i>A</i>	-
Transportation Network Generalization	<i>A</i>	<i>A</i>	<i>R</i>
Building Generalization	<i>A</i>	<i>A</i>	<i>R</i>
Industry Generalization	<i>A</i>	<i>A</i>	-
Utility Generalization	<i>A</i>	-	-
Physiography Generalization	<i>A</i>	<i>A</i>	-
Boundary Generalization	<i>A</i>	<i>A</i>	-
Vegetation Generalization	<i>A</i>	-	-
Text Generalization and Text Placement	-	-	<i>A</i>

(*A* depicts the applied model and *R* depicts the model in research level)

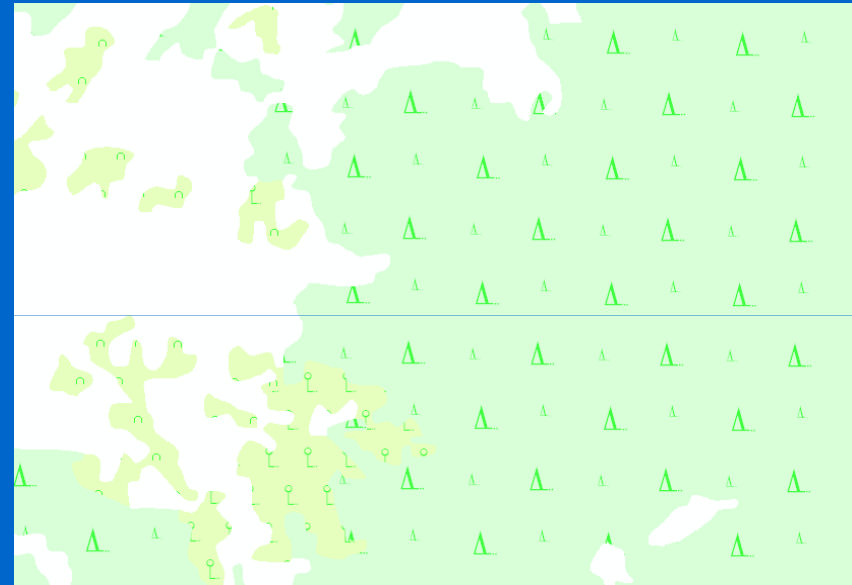


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Implementation of *C-A* Model on *KG* Vegetation Generalisation



(a)

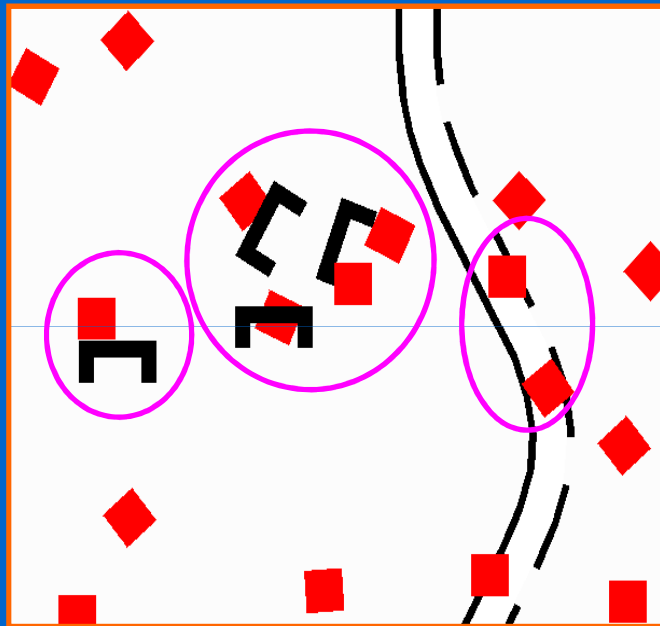


(b)

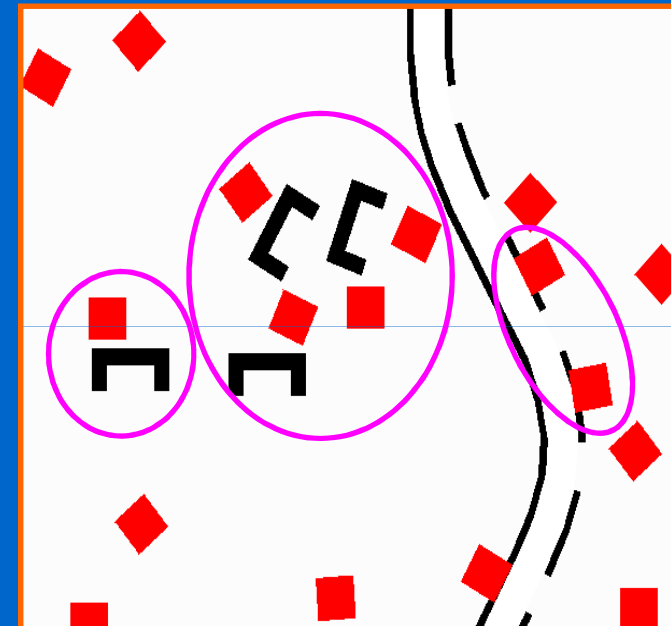
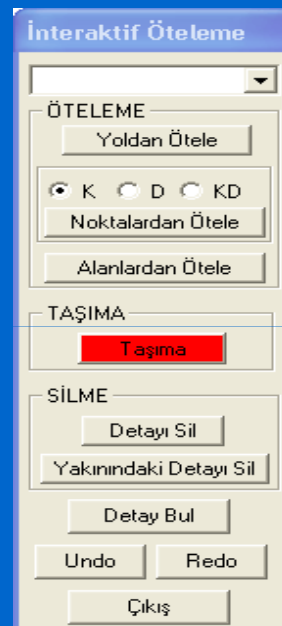


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Implementation of C-A & HI Model on *KG* Building Generalisation



(a) Before



(b) After



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Parameters that are used in Hydrography generalization

Hidrografiya Genelleştirme Parametreleri

	Tanımlanan Değer	Uygulanan Değer
Hidrografiya Noktasal Detay Genelleştirme :		
Hidrografiya çizgiden noktaya dönüşüm yada silme - uzunluk kriteri	50	50
Yakınında ilişkili olduğu detay yok ise silinmesi - mesafe kriteri	100	100
Hem cins hidrografiya nokta detayların gruplandırılması - mesafe kriteri	400	400
Hidrografiya nokta detay, çevresinde tek olma durumu - mesafe kriteri	1500	1500
Hidrografiya ilişkili olan detay detayların seçimi - mesafe kriteri	100	100
Diğer nokta detayların seçimi - detaylar arası minimum MESAFE KRİTERİ	75	75
Hidrografiya Basitleştirme ve Yumuşatma İşlemleri :		
Hidrografiya çizgi detay basitleştirme kriteri	70	70
Hidrografiya çizgi detay yumuşatma kriteri	25	25
Hidrografiya çizgi detay nokta seyreltme kriteri	2	2
Hidrografiya alan detay basitleştirme kriteri	5	5
Hidrografiya alan detay nokta sıklaştırma kriteri	50	50
Hidrografiya alan detay yumuşatma - kayıklık toleransı kriteri	0	0
Hidrografiya alan detay nokta seyreltme kriteri	2	2

ÇIKIŞ **Parametreleri Kaydet**



COMPARISON OF THREE MODELING TECHNIQUES ON THE TEXT GENERALIZATION

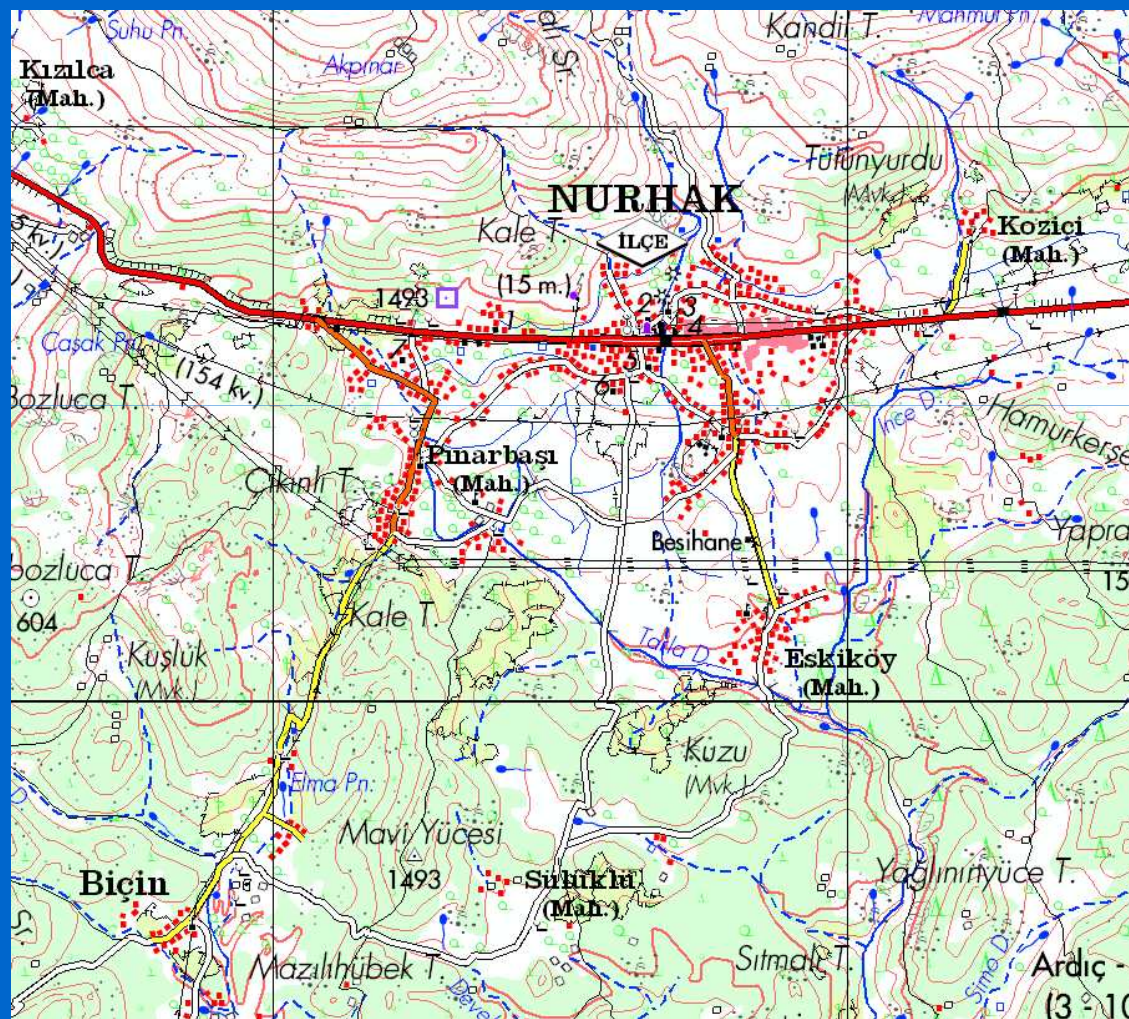
The adapted comparison criteria are;

- ❖ the processing time,
- ❖ the accuracies of the text positions and
- ❖ the number of the missing text data according to the *GCM* production requirements.



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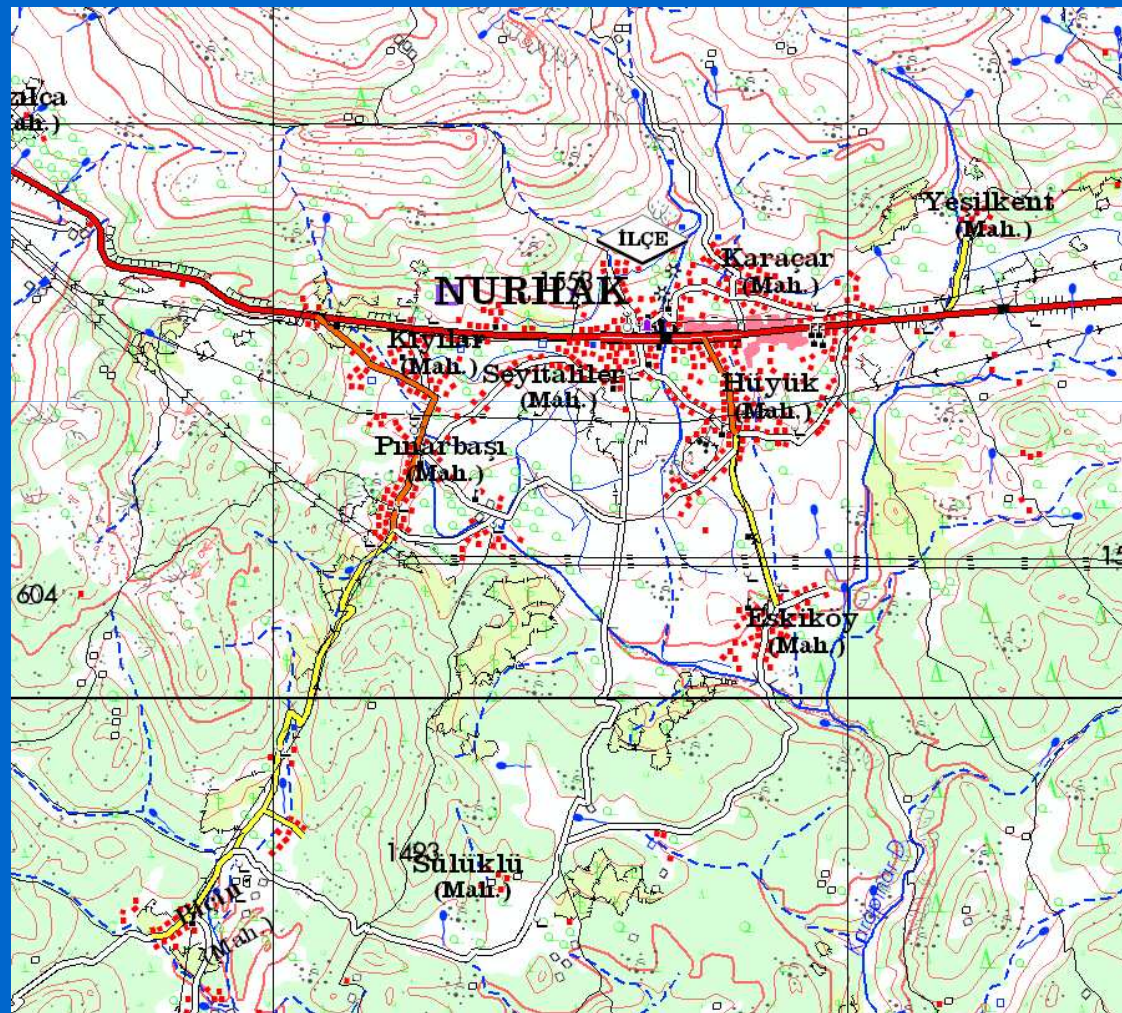
Reference 1:100K Map





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The same area with only C-A



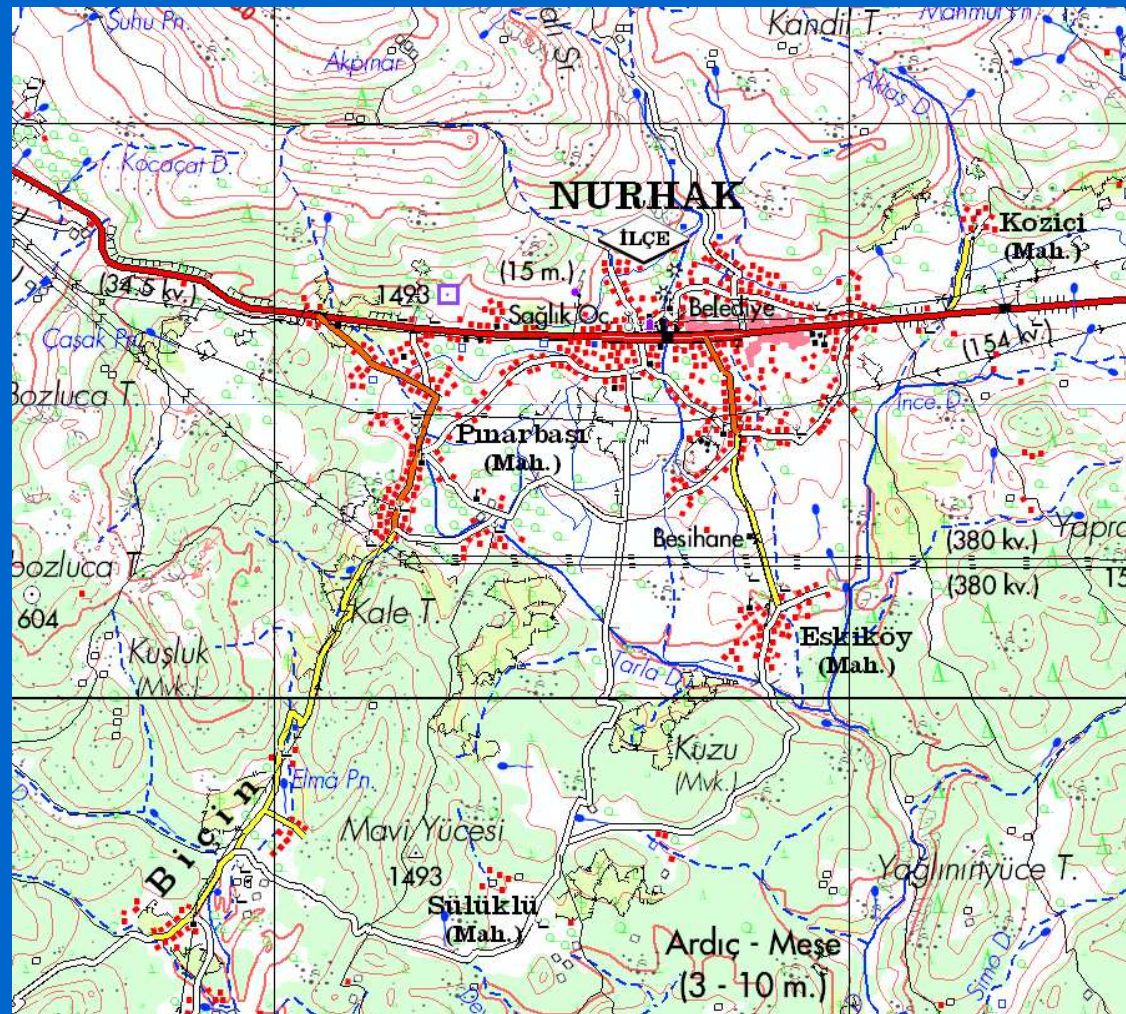
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The same area with CB



13th Workshop of the ICA Commission on Generalisation and Multiple Representation



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CONCLUSION

- *KG* software,
- The three modeling techniques,
- A case study about text generalization and placement.



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- ☑ CB model highly prevents the human interactivity and lead the automation of the generalization processes to a promising level.
- ☑ Implement CB modeling techniques into the displacement of buildings and transportation generalization including elimination, simplification and displacement operations and researches for its application have been recently initiated.



IMPLEMENTATION OF COMPREHENSIVE MODELING TECHNIQUES ON *KARTOGEN* GENERALIZATION SOFTWARE

- ☑ Each model be used in different parts of the system to obtain desirable and encouraging solutions.

- ☑ Feature classes that have not dense data such as industry, utility and boundary yield satisfactory results based on C-A model and need little interaction, whereas the densely distributed data such as text, building and transportation can be benefit from the advantage of CB model.



THANK YOU...

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