MCI Telecommunications Corporation

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

EX PARTE

September 25, 1997

William F. Caton
Acting Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: Ex Parte Submission
Federal-State Joint Board on Universal Service; CC Docket No. 96-45
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs; CC Docket No. 97-160

Dear Mr. Caton:

On September 24, 1997, Richard Clarke and Michael Lieberman of AT&T, Christine Antis of PNR & Associates, Inc, John Donovan of Telecom Visions, and I, representing the Hatfield Model sponsors, met with the FCC and Joint Board staff members listed at the end of this letter. Also attending the meeting were several representatives of the parties advocating the Benchmark Cost Proxy Model (BCPM), and other interested parties. We discussed several issues relating to the customer location and outside plant algorithms of the cost models.

We presented the attached description of the new clustering algorithm that will be used in the next release of the Hatfield Model, and described generally the current state of development of our customer location methodology to be used in the data submission to be made on Friday, September 26, for the six selected wire centers in Colorado, Georgia, and Texas. We also provided the attached maps of these six wire centers, showing how both the existing Hatfield Model, version 4.0's customer location algorithm, and our new clustering technique, locate customers within these wire center service areas.

We also provided the attached vendor specification sheets, showing that Litespan 2000 DLC systems will operate to specification against a maximum loop resistance of 1930 ohms, which (because this allows for a station set resistance budget of 430 ohms) will permit up to 1500 ohms of resistance from the loop cable. Similarly, the maximum loop cable resistance specification for Lucent SLC-Series 5 is also identical at 1500 ohms – and allows for an additional station set resistance budget of 430 ohms. Given the signal levels provided by these industry-standard DLC systems, we argued, the maximum copper loop length should

be set at 18,000 feet rather than 12,000 feet -- based on mixed use of 26 gauge copper cable (at 83.3 ohms per thousand loop feet) and 24 gauge copper cable (at 51.9 ohms per thousand feet). We also noted that the last legs of any lengthy distribution cable in the Hatfield model will be 24 gauge cable because this is the Hatfield Model's default specification for all copper cables of less than 400 pairs.

Respectfully submitted,

Chris Frentrup

Chris Frentrup
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CC: FCC Staff

Bryan Clopton, Abdel Eqab, Wade Herriman, Vaikunth Gupta (telephone), Chuck Keller, Mark Kennet (telephone), Bob Loube, Bill Sharkey, Sheryl Todd (not attending), Natalie Wales

State Joint Board Staff (by telephone)

David Dowds, Florida PSC, Ann Dean - Maryland PSC, Charlie Bolle - South Dakota PUC, Rowland Curry - Texas PUC

Hatfield Clustering Algorithm

- *Issues:*
- Varying Density Types
  - Rural areas vs. non-Rural areas
- Missing data
  - 97 million households
  - Current geocoding level can be improved

Hatfield Clustering Algorithm

- *Geocoding Problems and Advances:*
- Currently geocoding approx. 80% of full database
- Working with vendor to correct their database
- Unknown, but small number of "non-deliverable" addresses

Hatfield Clustering Algorithm

- *Aggregating Data*
- Measuring up to "independent" sources
  - 1990 Census, 1995 Claritas projections
- What to do about missing data
  - more than 50% missing
  - less than 50% missing

Hatfield Clustering Algorithm

- *Conceptual Outline:*
- User selected granularity
  - lower setting maintains data integrity
- Data iterations to find *d*
- Cluster intersections based on user defined parameters

Hatfield Clustering Algorithm

- *Clustering Parameters*
- Merge distance = 200 ft.
- Minimum cluster size = 15 lines
- Maximum cluster size = 1500 lines
  - Ideal cluster size is between 200 and 600 lines
- Maximum distance = 18 kft

Litespan®-2000 Specifications

TYPES OF SERVICES

4-Wire
800 Service Line
800 Service Trunk
AIOD
Centrex Line
Consolidation of SLC-96 Mode 1
Consolidation of SLC-96 Mode 3
Consolidation of SLC Series
5-Feature Package B
Dial Tone First Coin
DID
Digital Data Services (DDS)
DLC Transport
Fractional T1
FX Lines and Trunks
Hi-Cap T-1 Transport
Inter-office T-1
Intra-office T-1
ISDN
Off-Premises Extension
Off-Premises Station
P-Phone (Meridian Business Set)
PBX Tie Line
PBX Trunking
POTS
Private Network T1 Transport
Secretarial Line
Voice Data Type 1
Voice Data Type 2
Voice Data Type 3
WATS Line 2-Way
WATS Line Out
WATS Trunk 2-Way
WATS Trunk Out
Private Line Automatic Ring Down (PLAR)
DC Alarms

ENVIRONMENTAL CONDITIONS (PER TR-057)

Temperature	
CO & RT	-40° to +65°C (-40° to +150°F)

PHYSICAL MEASUREMENTS

Rack Assembly		
	Height	213 cm. (7 ft.)
	Width	66.7 cm. (26 in.)
	Depth	30.8 cm. (12 in.)
Outdoor Cabinet		
	Height	152.4 cm. (60 in.)
	Width	203.2 cm. (26 in.)
	Depth	104.2 cm. (41 in.)

BELLCORE COMPLIANT

The Litespan-2000 and Starspan systems are designed in compliance with the following major Bellcore Standards:

Operations Technology Generic Requirements (OTGR)
TR-TSY-000008
TR-TSY-000057
TR-TSY-000253
TR-TSY-000303
TR-TSY-000496
TR-TSY-000909

OPTICAL INTERFACE

Fiber	Single-Mode
Connectors	FC/PC, or Customer-Specified
Wavelength	1310 ± 30nm
Format	SONET

DS1 INTERFACE

DSX-1	Up to 96 DS1 positions available per channel bank
Line Code	B8ZS, ZCS
Framing Formats	SF (D4, SLC-96), ESF
Alarm Monitoring	RCV frame slips, AIS, ESF, CRC, Yellow, BPVs

T1 INTERFACE

T1 SPAN	Up to 96 T1 positions available per channel bank
Line Code	B8ZS, ZCS
Framing Formats	SF (D4, SLC-96), ESF
Alarm Monitoring	RCV frame slips, AIS, ESF, CRC, Yellow, BOVs
Line Powering of	
Span Voltage	-130 Vdc
Current	60 mA
Line Build Out (XMT)	7.5, 15, 22.5 dB @ 772 kHz
Line Build Out (RCV)	ALBO

POTS

Capacity	Up to 224 lines per channel bank 4 lines per POTS Card
Loop Resistance	1930 ohms (including set)

COIN

Capacity	Up to 224 lines per channel bank 4 lines per Coin Card
Loop Resistance	1730 ohms (including telephone set) Dial Tone First/Coin First

UVG (UNIVERSAL 2-WIRE)

Capacity	Up to 224 lines per channel bank 4 lines per UVG Card
Loop Design	Carrier Serving Area Rules Loop Start/Ground Start Loop Reverse Battery

EQUALIZED UNIVERSAL VOICE GRADE (EUVG)

Characteristic	Impedance	Min. (dB)	Max. (dB)
XMIT TLP	600Ω	-9.0	+1.0
	900Ω	-9.0	+1.0
RCV TLP	600Ω	-6.0	+6.0
	900Ω	-6.0	+6.0

UNIVERSAL 4-WIRE (U4W)

4-Wire Impedance	Provisionable for 150, 600 or 1200 ohms
Programmable Gain	0.1 dB steps over a 24.5 dB range
Signaling Mode	FXS, FXO, DX

4-Wire E & M (E&M)

Signaling Modes	E&M modes I to V Tandem modes I and II PLR (Pulse Link Repeater) Modes I and II
4-Wire Impedance	600 ohms
Provisionable Gain	0.1dB steps over a 24.5 dB range
Signaling Leads	E, M, SG, SB

OFFICE CHANNEL UNIT DATA PORT (OCUDP)

Data Rates	2.4, 4.8, 9.6, 19.2, 56 or 64 kbps
Loopback Types	OCU, CSU, DSU, and customer-controlled far-end loopback
Provisioning Options	Secondary channel, customer data error correction

DSO DATA PORT (DSODP)

Primary Channel Rates	Secondary Channel Rates
2400	133.3
4800	266.6
9600	533.3
19200	1066.6
56000	2666.6
64000	Sec. Chan. Not Available

BASIC RATE INTERFACE UNIT (BRIU)

Data Formats	2B+D, B1+D, B2+D, or D only
DSL Data formats	2B1Q
Bit Error Rate	<10⁻⁷ for loops 0 and 2-15 with all impairments

ASYNCHRONOUS DS1U (ADS1U)

Framing Formats	N/A (transparent)
Line Coding	AMI
Zero Suppression	B8ZS
Equalization	1 to 655 feet (distance from cross-connect) 5 steps

ASYNCHRONOUS T1U (AT1U)

Framing Formats	N/A (transparent)
Line Coding	AMI
Zero Suppression	B8ZS
Equalization	
Receive	Automatic Line Build-Out (ALBO)
Transmit	0 dB, 7.5 dB, 15 dB, 22.5 dB

ELECTRONIC BUSINESS SET (EBS) (P-PHONE)Ω

Maximum Loop Length For Powered Phones (38 mA max.)	500 Ω DC loop resistance or < 20 dB @ 8 kHz at the network interface
Maximum Loop Length For Locally Powered Phones (20 mA max.)	500 Ω DC loop resistance or < 20 dB @ 8 kHz at the network interface
Battery:	
Loop Powered - Display	38 mA max. per line
Loop Powered - Non Display	20 mA max. per line
Locally Powered	20 mA max. per line
Loop Current Detection Threshold	Must detect > 4.5 mA Must not detect < 1.7 mA
Loop Current, 52.0 Ω Volt Battery:	38 mA max. into Telset

DSC
COMMUNICATIONS

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1420 McDowell Blvd. North • Petaluma, CA 94954 • (707) 792-7000

Specifications subject to change without notice
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POTS
Capacity — Up to 224 lines per channel bank
4 lines per POTS Card
Loop Resistance — 1930 ohms (including set)

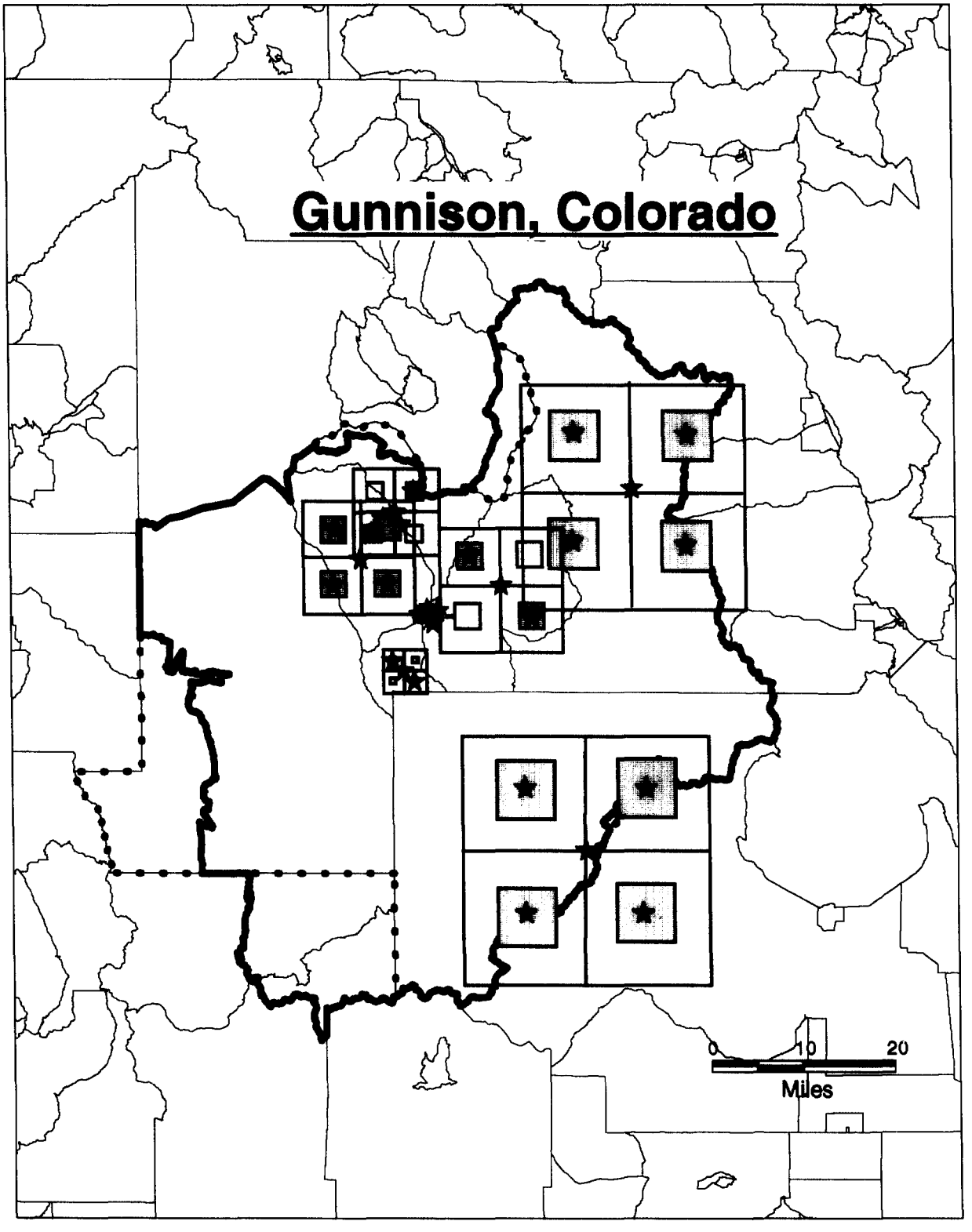
Terminal-To-Terminal Voice Frequency Transmission Characteristics

Parameter	Value (Measured at 25° C)	
	POTS	SPOTS[9] CU
Loop Resistance (Beyond the RT excluding the Set)	0-1500 Ohms	CSA Loops
1000-Hz Loss (±0.5 dB Typical ± 1.0 dB max)	1 dB ($R_{EXT} \leq$ 1000 Ohms)[1] 0 dB ($R_{EXT} >$ 1200 Ohms)[1]	0 db[2]
Bandwicth (Relative to the 1000-Hz loss)	0 to −3.0 dB at 300 Hz and 3000 Hz 0 to −1.5 dB at 400 Hz and 2800 Hz	
Return Loss at the COT[3]	ERL ≥ 18 dB SRL ≥ 12 dB	
Return Loss at the RT[4]	ERL ≥ 18 dB SRL ≥ 15 dB	
Idle Channel Noise (at the RT)	20 dBmC Maximum	
Signal-to-Distortion Ratio (at−10 dBm)	> 33 dB	
Data Pulse Distortion (PAR)	> 90	
Gain Tracking (1004 Hz) −37 dBm0 to + 3dBm0 −50 dBm0 to −37 dBm0	 ±0.5 dB Maximum (±0.25 cB Average) ±1.0 cB Maximum (±0.5 cB Average)	
Intermodulation Distortion (−13 dBm0 Input)	A-B (R2) Product >43 dB 2A-B (R3) Product >44 dB	
Single Frequency Distortion (0-12 kHz 0 dBm0)	<−28 dBm0	
Impulse Noise[5]	≤15 Counts in 15 Minutes	
Overload at COT and RT	≥ +3 dBm0	
Longitudinal Balance at the RT[5] (minimum)	200, 500, 1000 Hz: 58 dB 3000 Hz: 53 dB	
Loop Current	>20 mA	>23mA

Note:

1. Measured as insertion loss between 900-ohm terminations. R_{EXT} includes both the loop resistance and the station set resistance. Actual threshold value for R_{EXT} is 1100 ohms ±100 ohms.
2. Measured as the ICL with the RT terminated in 600 ohms and with the COT terminated in 900 ohms.
3. Measured with respect to 900 ohms and 2.16 μF with the 4-wire path broken or with the other end terminated in 1100 ohms in parallel with 0.03 μF.
4. Measured with respect to 600 ohms and 2.16 μF with the 4-wire path broken or with the other end terminated in 900 ohms and 2.16 μF.
5. Measured with a holding tone of −13 dBm0 and a threshold of 59 dBmC0.
6. Measured by IEEE method 455-1976.

09/18/97 10:31 FAX 303 442 9125 HATFIELD ASSOC. 005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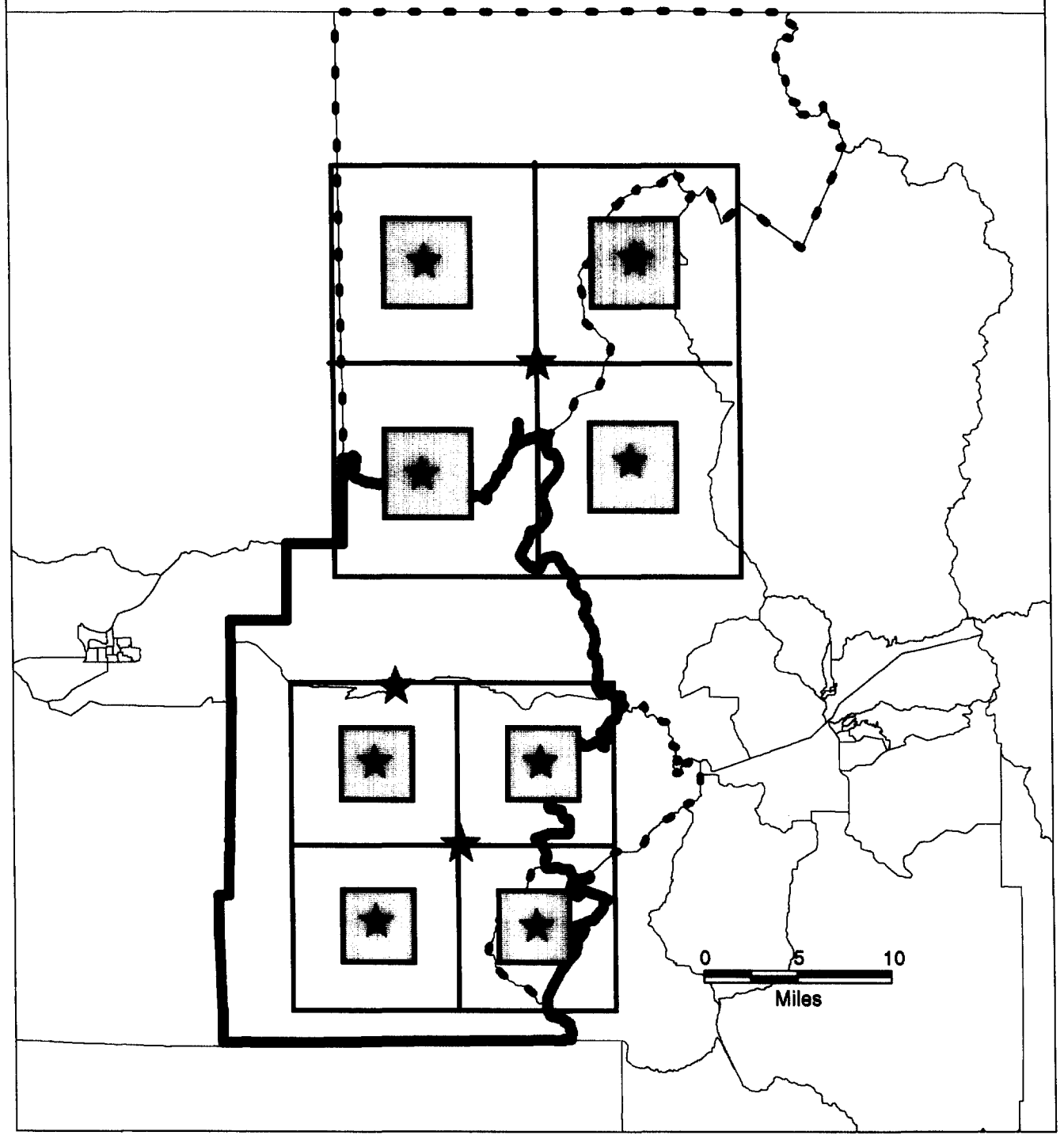
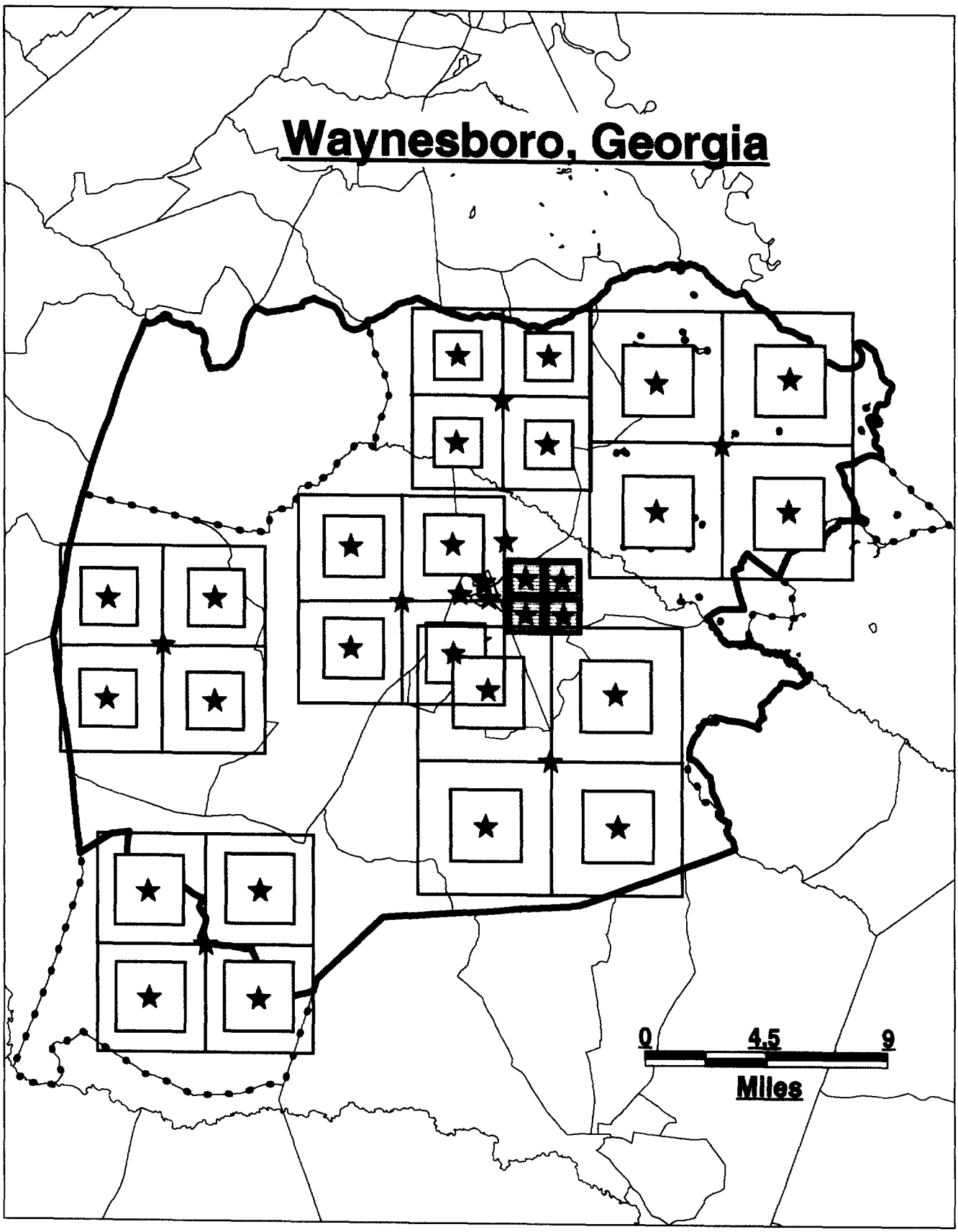
0
10
20
Miles

Hayden, Colorado

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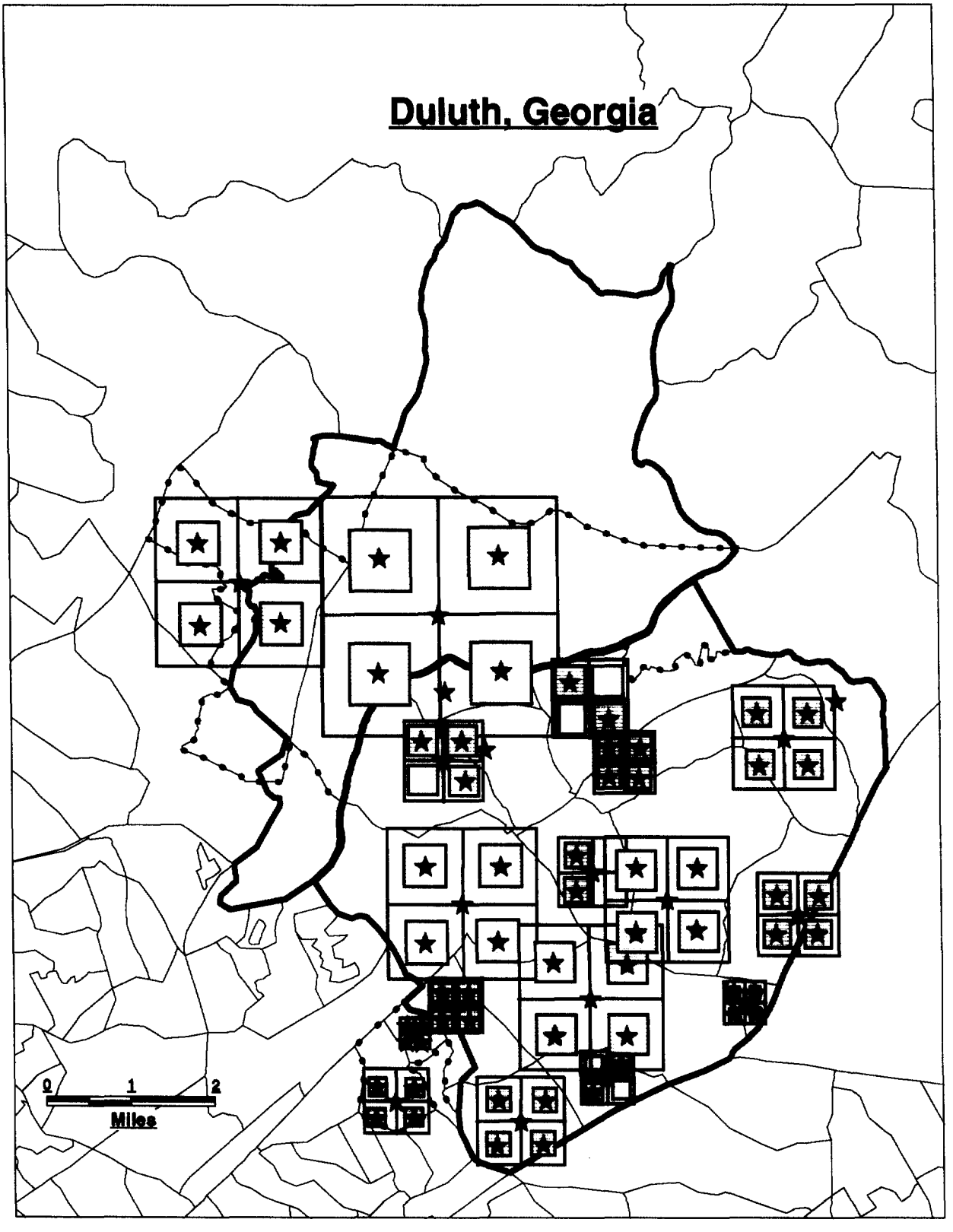
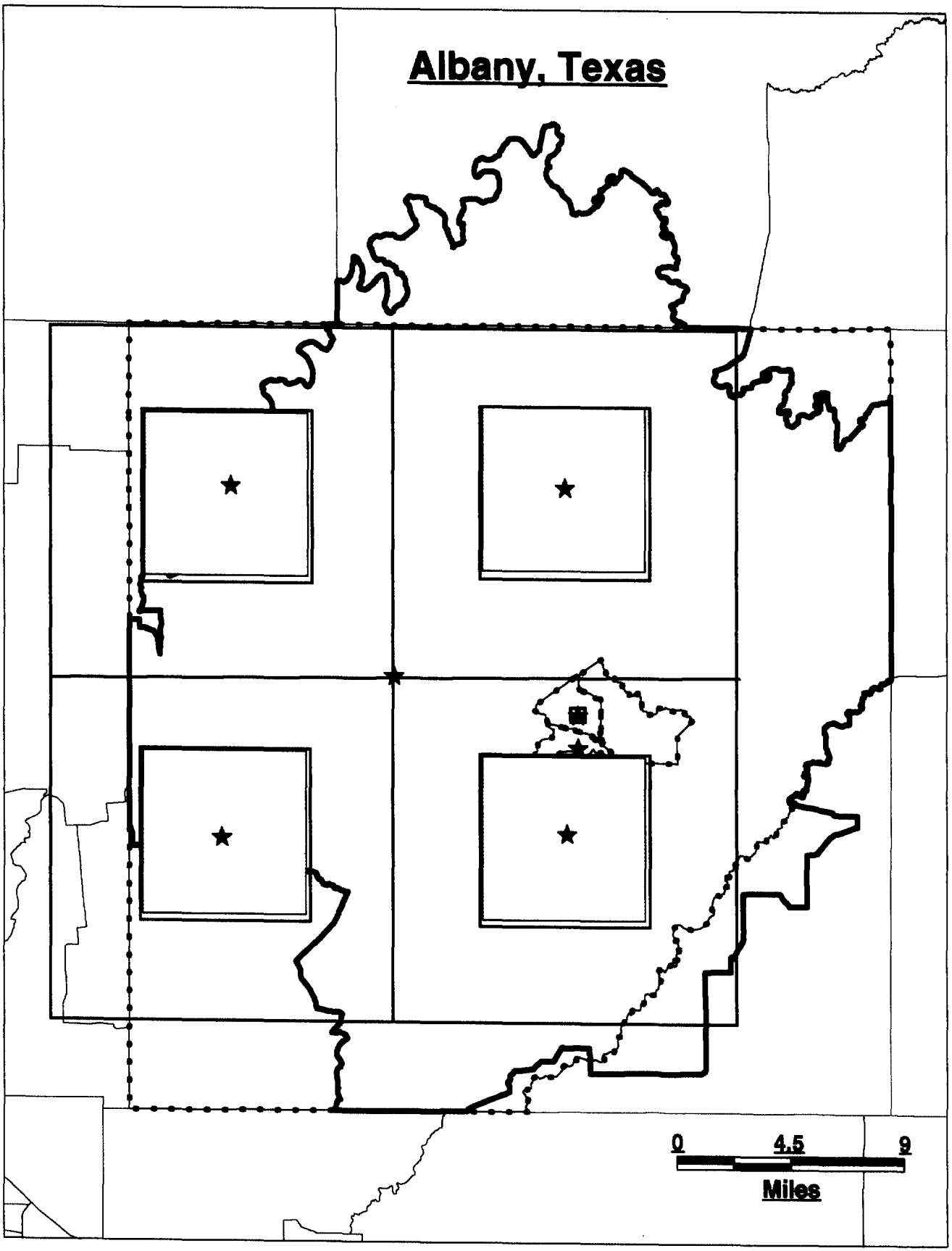
0
4.5
9
Miles


Duluth, Georgia
0
1
2
Miles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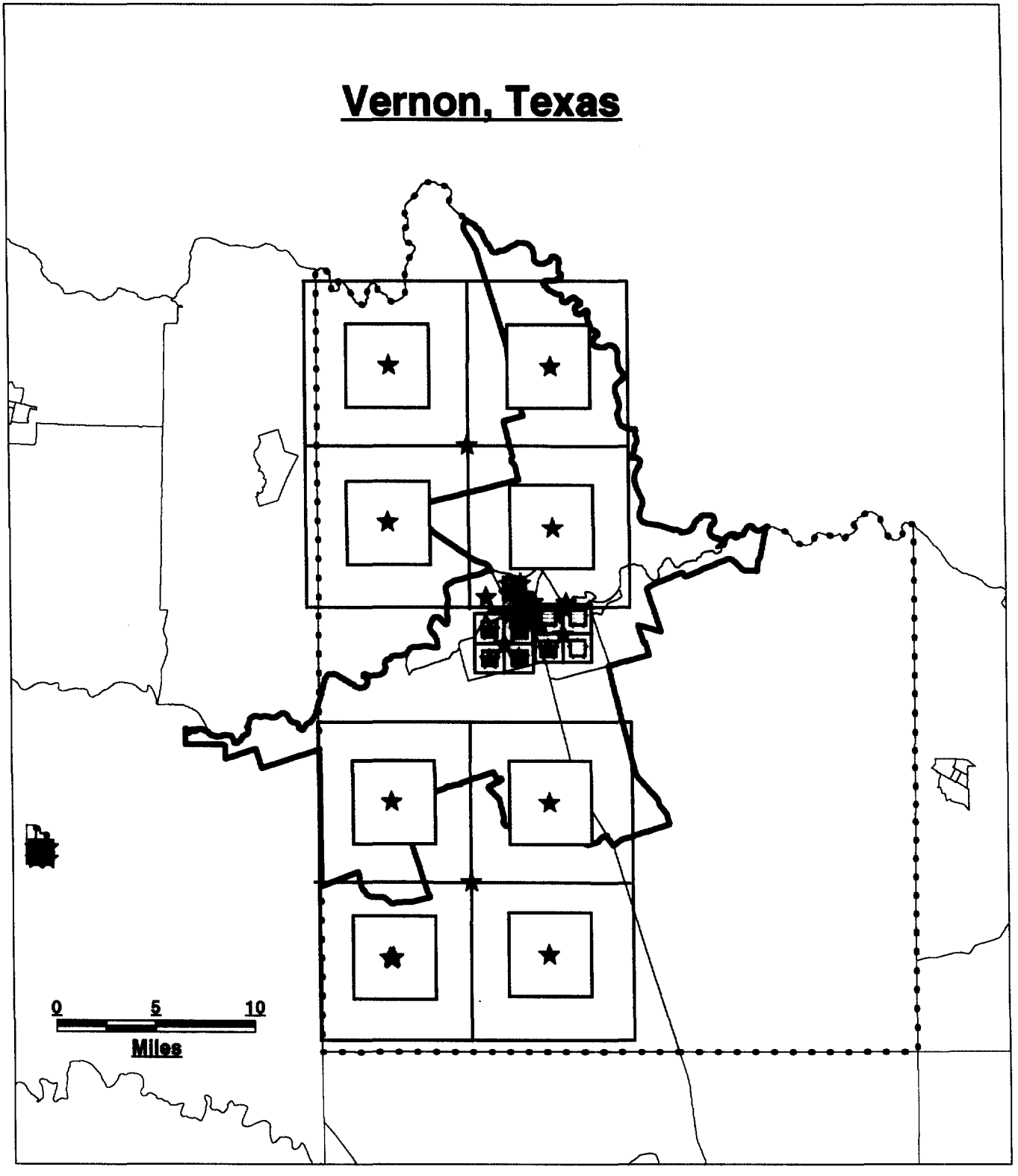
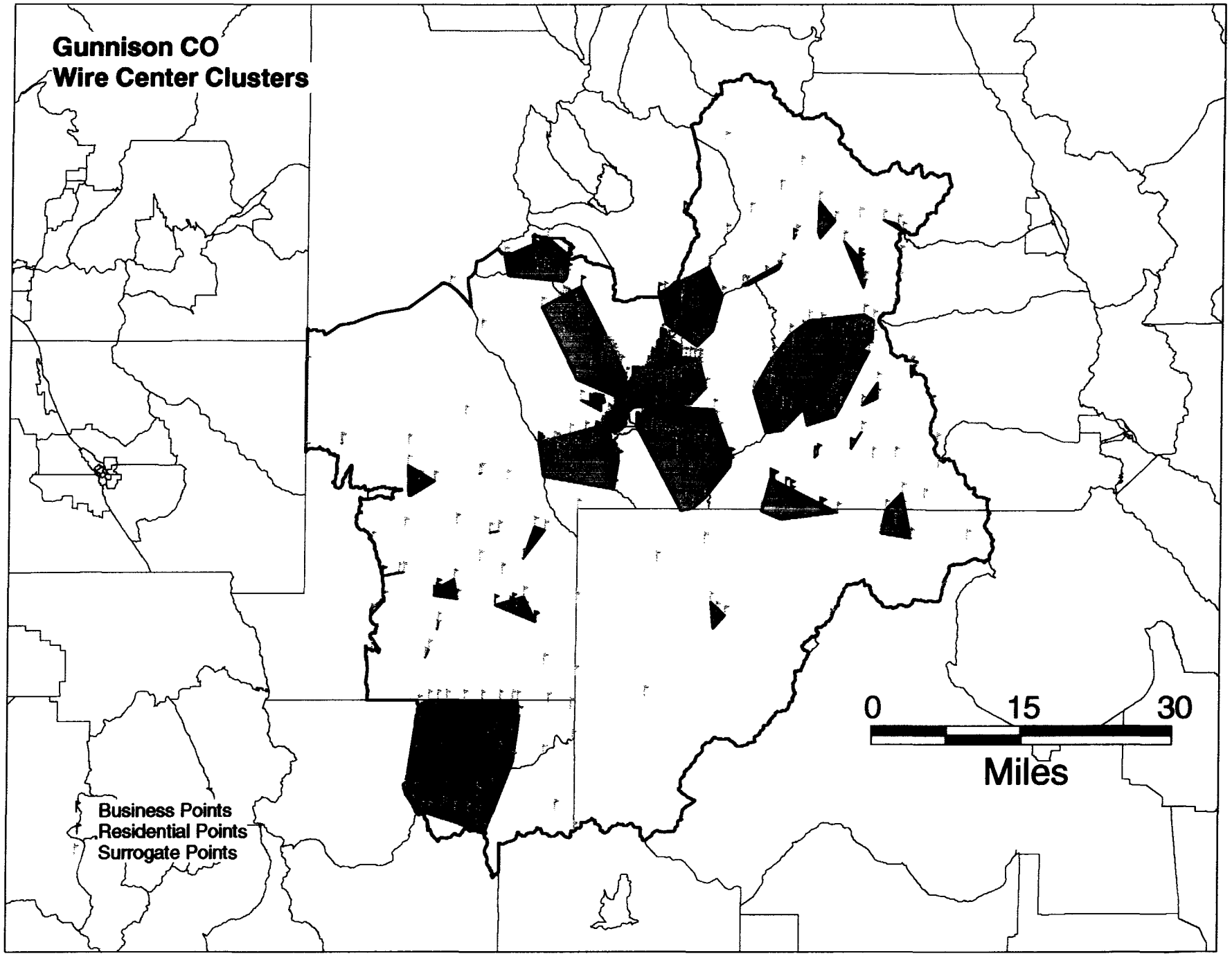
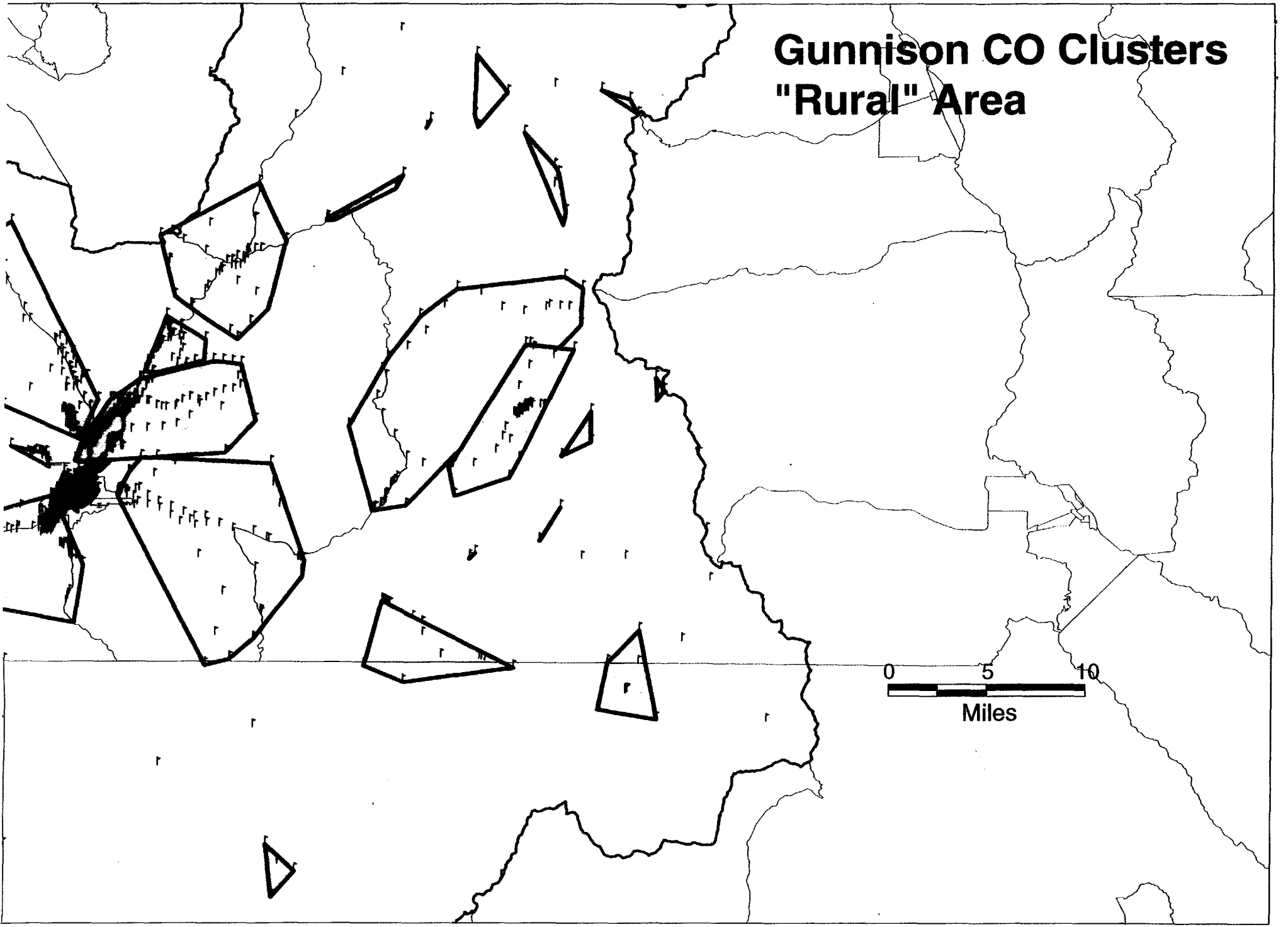
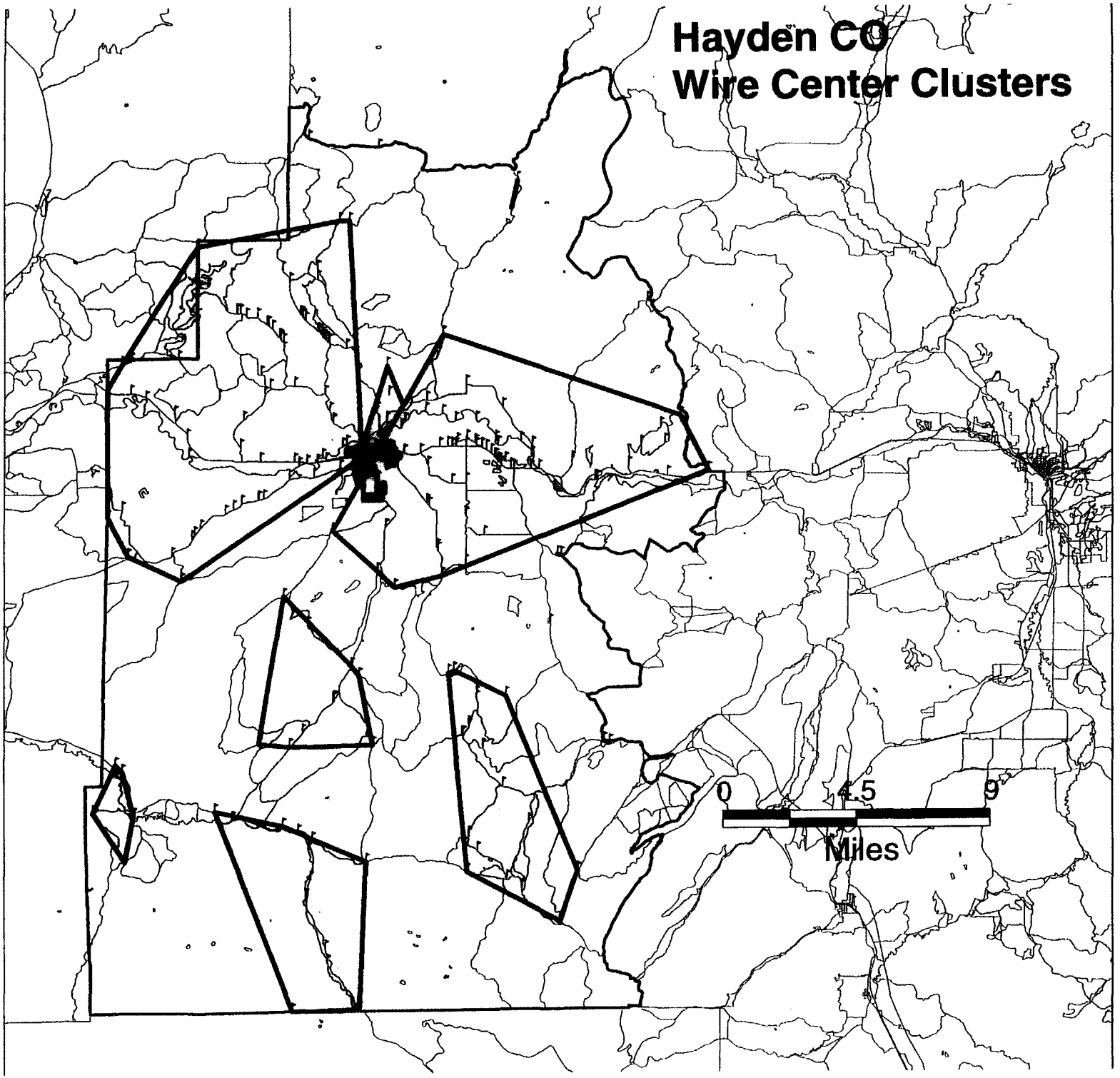
4.5
9
Miles

Vernon, Texas




Gunnison CO
Wire Center Clusters
Business Points
Residential Points
Surrogate Points
0
15
30
Miles


Gunnison CO Clusters
"Rural" Area
0
5
10
Miles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Wire Center Clusters
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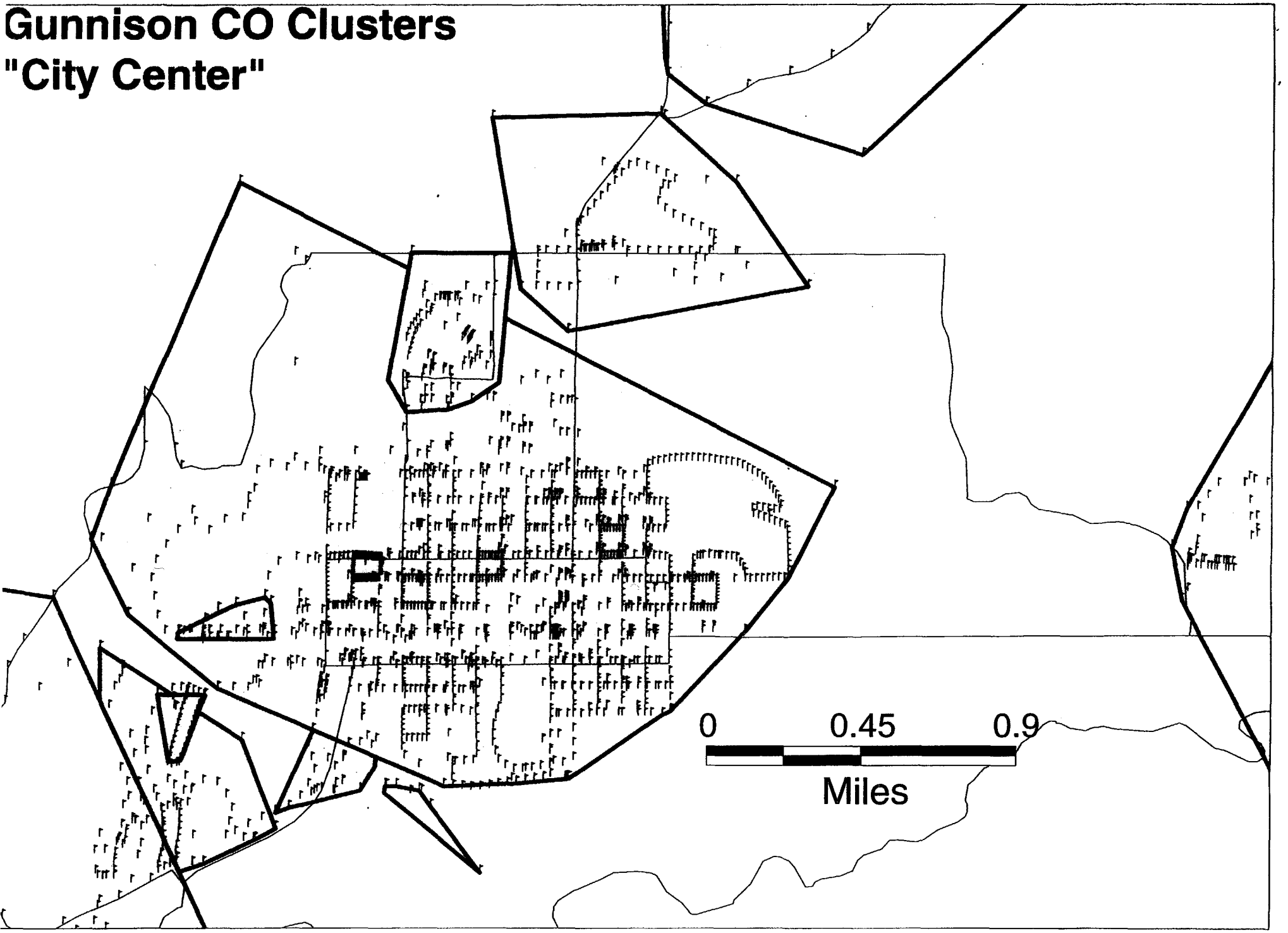
4.5
9
Miles

Gunnison CO Clusters
"City Center"