BENCHMARK COST MODEL 2

STRUCTURE COST

- Structure Cost =

  Density Group/Terrain Specific Cost Per Foot * Cable Length * Copper Cable Size Factor + Number of Maximum Size Cables * Cable Length * Cost Per Foot to Pull Underground Cable Through Conduit

BENCHMARK COST MODEL 2

Structure Activities

- Mix Of Activities Developed Separately for Each Density Group and Each Level of Terrain Difficulty
- Activities Include:

Activity
Plow
Rocky Plow
Trench & Backfill
Rocky Trench
Backhoe Trench
Hand Dig Trench
Bore Cable
Push Pipe & Pull Cable
Cut & Restore Asphalt
Cut & Restore Concrete
Cut & Restore Sod
Conduit

- Developed Weighted Cost Per Foot Based On Percentage of Each Activity and Cost Per Foot of Each Activity
- Cost Per Foot for Activities Based on National Average of Available Contractor Prices

BENCHMARK COST MODEL 2

SWITCHING COSTS

- CLLI Common Switching Costs Per Line =

  (Total CLLI Common Cost * Land & Building Factor * Switch Engineering Factor * Basic Local Service Factor)/(Total Lines Associated With CLLI)

Where:

» Total CLLI Common Cost =

CO Switch Type	Fixed/StartUp $
Remote	250,000
1 - 10,000	400,000
10,001 - 60,000	600,000
60,001 -100,000	900,000
100,000+	1,500,000

BENCHMARK COST MODEL 2

SWITCHING COSTS

- Line Sensitive Switch Costs Per Household =

  Per Line Switch Cost * Land & Building Factor * Switch Engineering Factor / Switch Fill Factor

  Where:

  » Per Line Switch Cost = $100.00

BENCHMARK COST MODEL 2

Circuit Equipment Costs

- Fixed Digital Subscriber Loop Carrier Electronics Remote Terminal Cost Per Line =

  Fixed Terminal Cost/Total Lines Per Terminal

  48 Line Terminal = $ 7,700
  120 Line Terminal = $ 8,500
  240 Line Terminal = $10,500
  672 Line Terminal = $77,330
  1334 Line Terminal = $94,909

- Per Line Costs = $250 for Terminals for < 240 Lines
  $184 for Terminals for > 240 Lines

- Per Line Costs Include Remote Terminal Line Cards, Shelves, Virtual Tributary Units, and All Circuit Equipment at the Central Office

Annual Cost Factors

Convert Investment to Annual Cost

- 3 Investment Related Factors
  - Cable and Wire Investment Factor
  - COE Switching Investment Factor
  - COE Circuit Investment Factor
- Non-Plant Related Expense Factor

Annual Cost Factors

Investment Related Factors Reflect Relationship of:

+ Return on Investment @ 11.25%
+ FIT, State, and Local Taxes
+ Plant Specific Expenses
+ Plant Non-Specific Expenses
+ Depreciation/Amortization

To Total Plant for Each Plant Category

Annual Cost Factors

Non-Plant Related Expense Factor

ARMIS Expenses Include:

- » Customer Operations - Marketing
- » Customer Operations - Services
- » Corporate Operations
- » Other Depreciation / Amortization

Non-Plant Related Expense Per Line = Above Expenses / Total Access Lines

A User Adjustable Factor (Default = .75) is Applied to the Non-Plant Related Expense Per Line.

BENCHMARK COST MODEL 2

BCM2 Input List

USER INPUTS TO MODEL		
Variable	**Value**	**Description**
NormalUGDepth	24	Normal Placement Depth in inches for Buried/Underground Copper Cable
NormalFiberDepth	36	Normal Placement Depth in inches for Buried/Underground Fiber
CriticalWaterDepth	3	Depth in feet at which water impacts placement costs
WaterFactor	30	% Cost increase for presence of water within critical depth
ResLinesMultiplier	1.21	Residence Lines per household multiplier
MaxFiberSize	144	Maximum Fiber Cable Size
MaxFeederSize	4200	Maximum Copper Feeder Cable Size
Max DistSize	3600	Maximum Copper Distribution Cable Size
CprMaxDistr	12000	Maximum length of copper cable in the CBG distribution area
NewTerrainTrigger	5	Value that triggers new terrain variable multiplier
NewTerrainFactor	1	Cost multiplier when new terrain variable exceeds trigger point
MinSlopeTrigger	12	Point at which minimum slope effects placement distance
MinSlopeFactor	1.1	Change in distance due to increased average slope
MaxSlopeTrigger	30	Point where presence of very high slope causes yet more cable distance
MaxSlopeFactor	1.05	Change in distance due to a maximum only slope presence
CombSlopeFactor	1.2	Secondary change in distance due to substantial slope presence
EngrInstall	35	Engineering and installation loading factor for electronics
ElectronicFill	0.85	Fill Factors for Electronics
HiCapFill	0.95	Fill Factors for High Capacity Optic Multiplexers
SpecAccRatio	0.13	Ratio of Special Access Lines to Business and Special Access
DensAdjUnits	10	Average Number of Business lines per location
OpticsCost	162000	Average cost for each DS-3 for CO and field DS3 to DS1 multiplexers
CopperT1	1133	Average Cost per DS-1 on copper (both terminals & repeater)
InterofficeSwRatio	1.03	Multiplier to add interoffice trunking cost
	20	Digital Switching Discount % (Enter whole %)
	20	Fiber Cable Discount % (Enter whole %)
	20	Copper Cable Discount % (Enter whole %)
	10	AFC Electronics Discount % (Enter whole %)
	20	SLC Electronics Discount % (Enter whole %)
DropCostPerFoot	0.1	Drop Cost per FT
PedestalCost	48.22	Cost of Pedestal
NidCost	30	Cost per NID

BENCHMARK COST MODEL 2

BCM2 Input List (Con't)

Input Variables for switching and overheads[1]		
SwitchEngrFactor	1.07	Loading Factor for Switch Engineering
SwitchFillFactor	0.8	Switch Fill Factor
SwLandBldgFactor	1.043	Sw Land & Buliding Factor
NonTrfSen	70.00%	% Non Traffic Sensitive (Enter as decimal)
TrfSen	73.93%	% of Traffic Sensitive that is local (Enter as decimal)
OSPEngrFactor	1.05	Loading Factor for Outside Plant Engineering
FiberSpliceRatio	0.045	Loading Factor for splicing of fiber cable (Enter as decimal)
FiberInLineRatio	0.07	Additive for in line pedestals, cross connects, etc. (fiber)
CopperSpliceRatio	0.07	Loading Factor for splicing of copper cable (Enter as decimal)
CopperInLineRatio	0.1	Additive for in line pedestals, cross connects, etc. (Copper)
CableWireFactor1	0.2328	Factor 1 for cable & Wire Facilities
ElectronicsFactor1	0.2424	Factor 1 for circuit Facilities
SwitchingFactor1	0.257	Factor 1 for Switching facilities
OtherFactor1	133.39	Factor 1 for other loading per line served
OtherAllocRatio1	0.75	Allocation Factor 1 applied to non-plant related expenses
CableWireFactor2	0.2328	Factor 2 for cable & Wire Facilities
ElectronicsFactor2	0.2424	Factor 2 for circuit Facilities
SwitchingFactor2	0.257	Factor 2 for Switching facilities
OtherFactor2	133.39	Factor 2 for other loading per line served
OtherAllocRatio2	0.45	Allocation Factor 2 applied to non-plant related expenses
CprSizeFctr1	1.2	Structure Cost multiplier for cables 401 to 900 pr versus < 400 pr
CprSizeFctr2	1.3	Structure Cost multiplier for cables 901 to 1500 pr versus < 400 pr
CprSizeFctr3	1.4	Structure Cost multiplier for cables 1501 to max size versus < 400 pr
FbrSizeFctr	1.2	Structure Cost Multiplier for fiber cables >60 fibers versus < 60 fibers
UGPullCost	0.77	Cost per ft to pull UG cables into conduit duct

BENCHMARK COST MODEL 2

BCM2 Input List (Con't)

Distribution UG/Aerial Mix Table		
Density	Below Ground %	Aerial%
0-5	90	10
5-200	80	20
200-650	70	30
650-850	70	30
850-2550	80	20
>2550	90	10

Copper Feeder UG/Aerial Mix Table		
Density	Below Ground %	Aerial%
0-5	70	30
5-200	72	28
200-650	75	25
650-850	75	25
850-2550	80	20
>2550	90	10

Fiber Feeder UG/Aerial Mix Table		
Density	Below Ground %	Aerial%
0-5	95	5
5-200	85	15
200-650	70	30
650-850	70	30
850-2550	80	20
>2550	90	10

Density/Fill Table		
Density	Feeder	Distribution
0	0.75	0.4
5	0.8	0.45
200	0.8	0.55
650	0.85	0.65
850	0.85	0.75
2550	0.85	0.8

BENCHMARK COST MODEL 2

BCM2 Input List (Con't)

Plant Type	Urban/RuraL	Density	Surface Category	Weighted Cost Factor
Distribution	Urban	>2550	RockH	23.59262
			RockS	17.56779
			Normal	13.31148
Distribution	Urban	850-2550	RockH	16.58868
			RockS	10.07238
			Normal	7.62624
Distribution	Rural	650-850	RockH	13.13253
			RockS	7.76892
			Normal	6.07944
Distribution	Rural	200-650	RockH	12.43557
			RockS	6.43722
			Normal	3.48428
Distribution	Rural	5-200	RockH	11.922
			RockS	4.95988
			Normal	2.45968
Distribution	Rural	0-5	RockH	11.95461
			RockS	4.83508
			Normal	1.77132
Feeder	Urban	>2550	RockH	23.59262
			RockS	17.56779
			Normal	13.31148

BENCHMARK COST MODEL 2

MODEL NOTES:

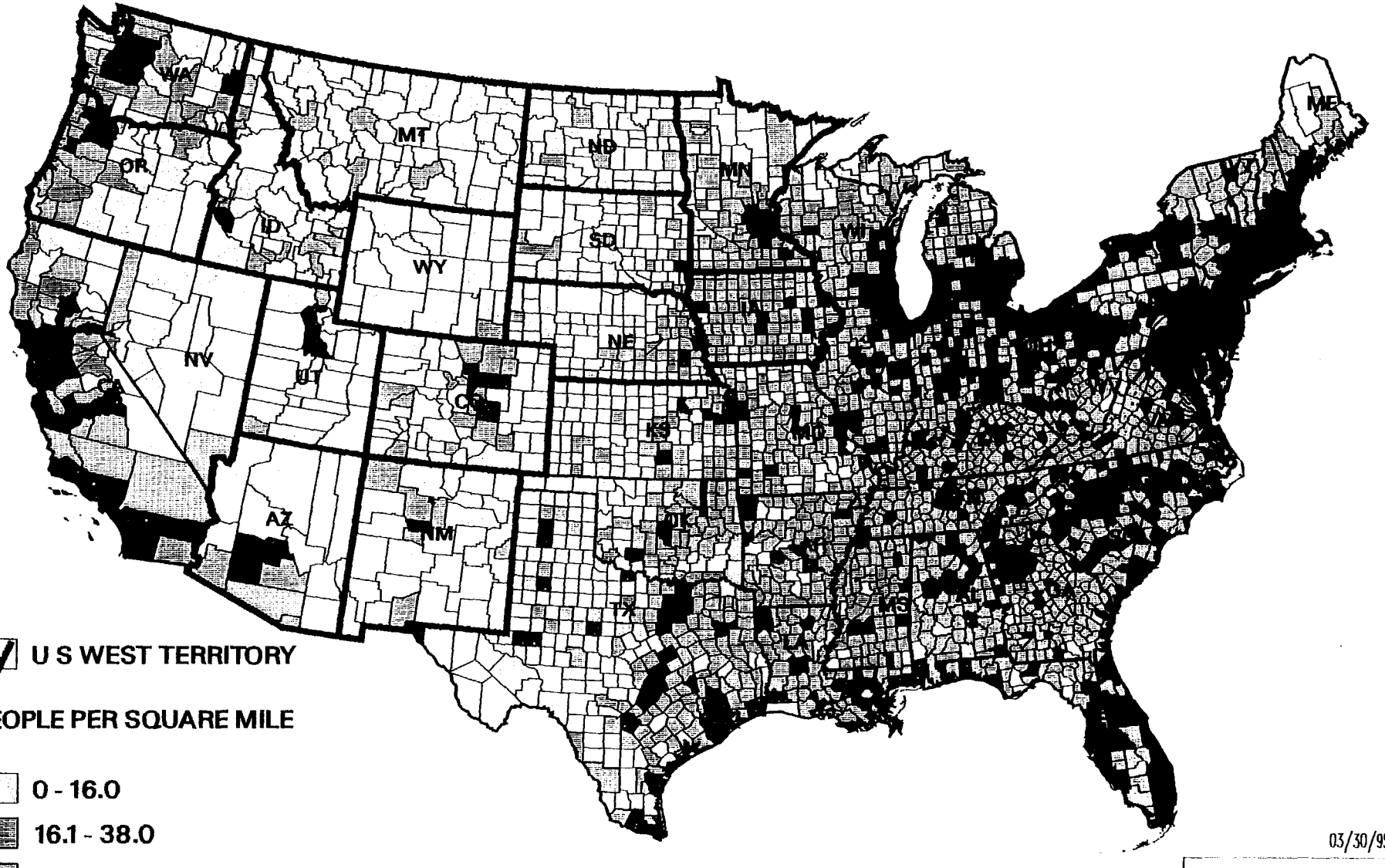
BENCHMARK COST MODEL 2

MODEL NOTES:

BENCHMARK COST MODEL 2

MODEL NOTES:

USA 1990 POPULATION DENSITY BY COUNTY



U S WEST TERRITORY

PEOPLE PER SQUARE MILE

- 0 - 16.0
- 16.1 - 38.0
- 38.1 - 94.0
- 94.1+

03/30/95

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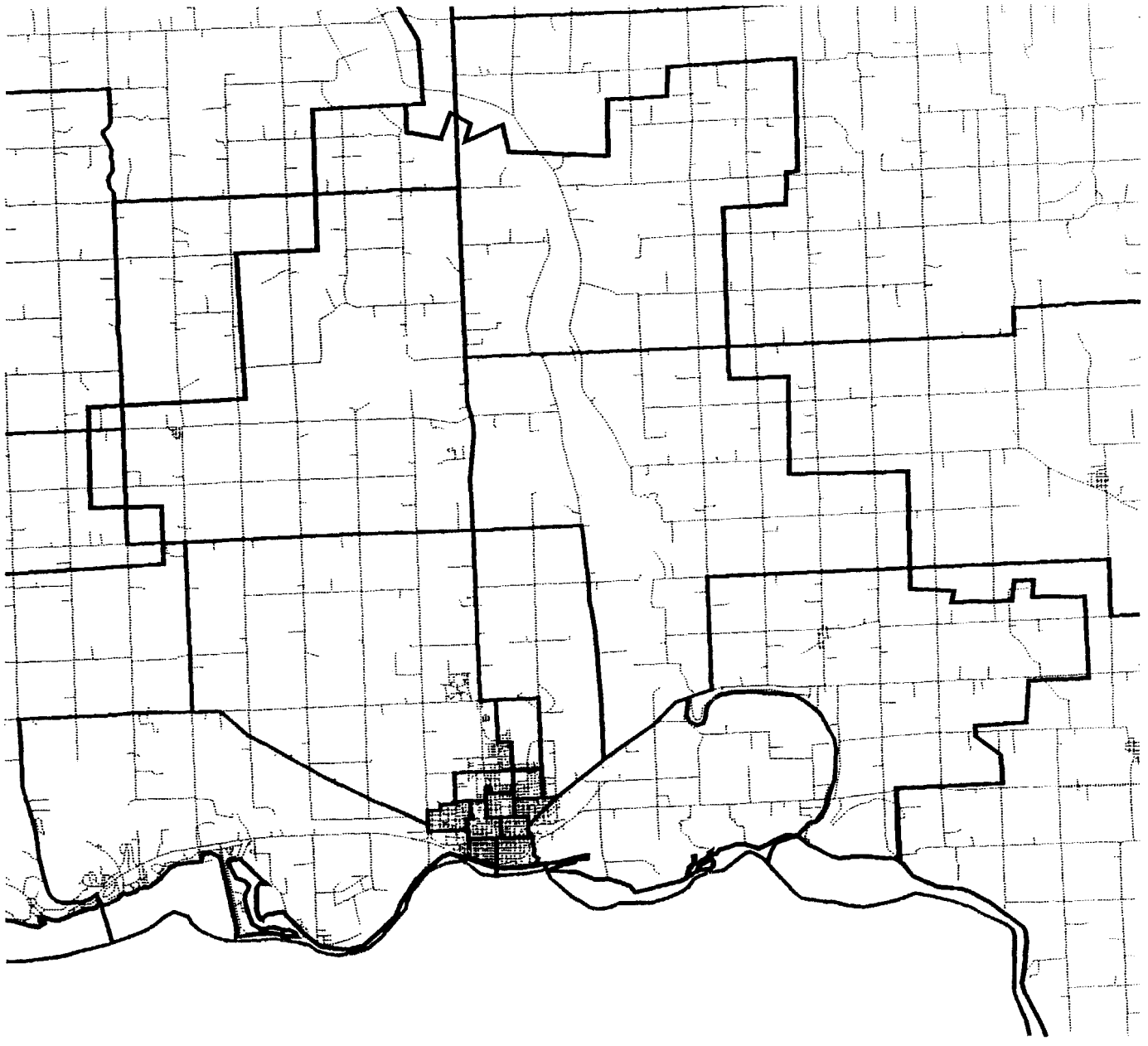

RURAL CENSUS BLOCK GROUPS

YANKTON SOUTH DAKOTA

LEGEND

- CENSUS BLOCK GROUP
- WIRE CENTER
- STREETS
- CENTRAL OFFICE

0 3 6

MILES

06/11/96

USWEST MAGIC LWA

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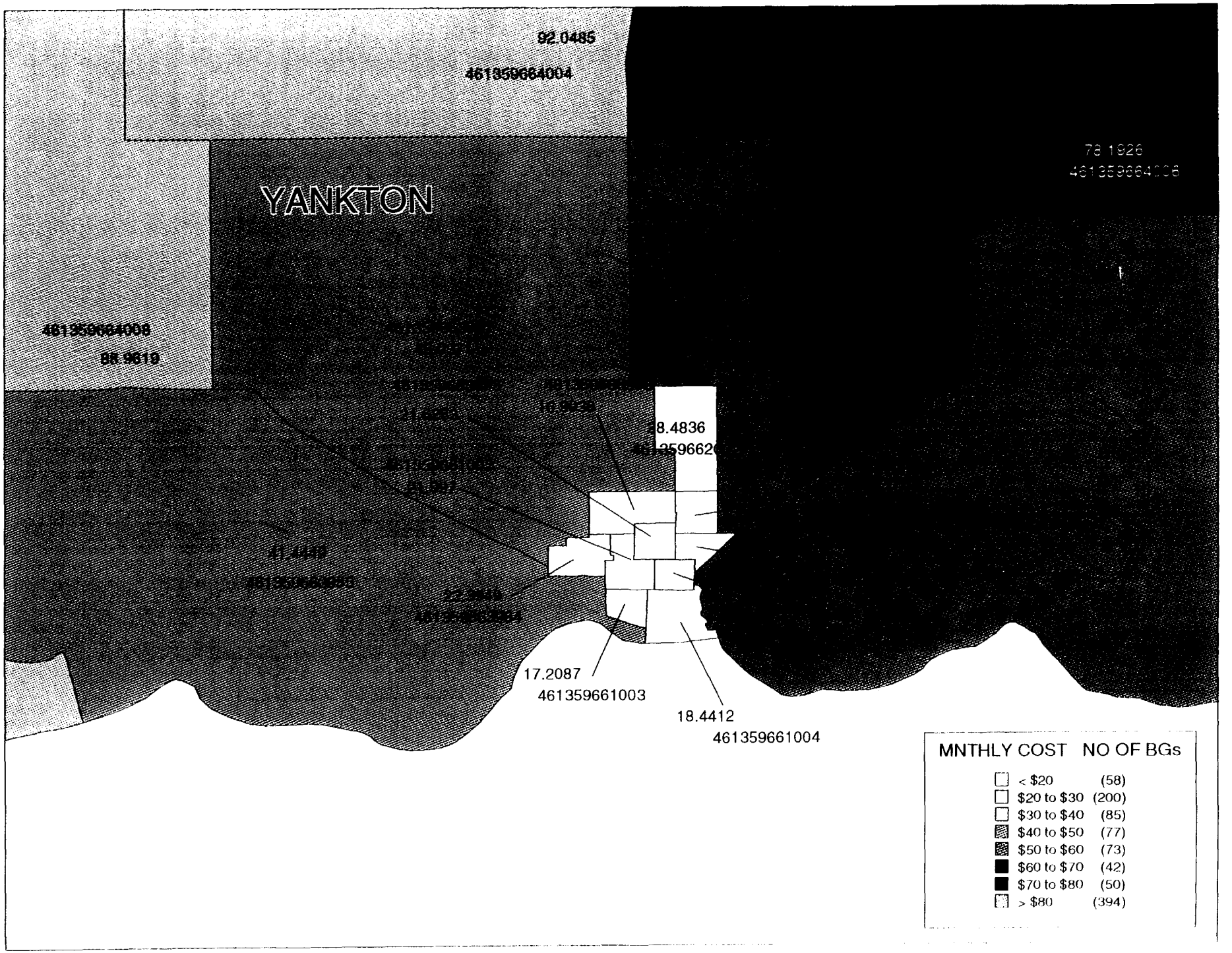
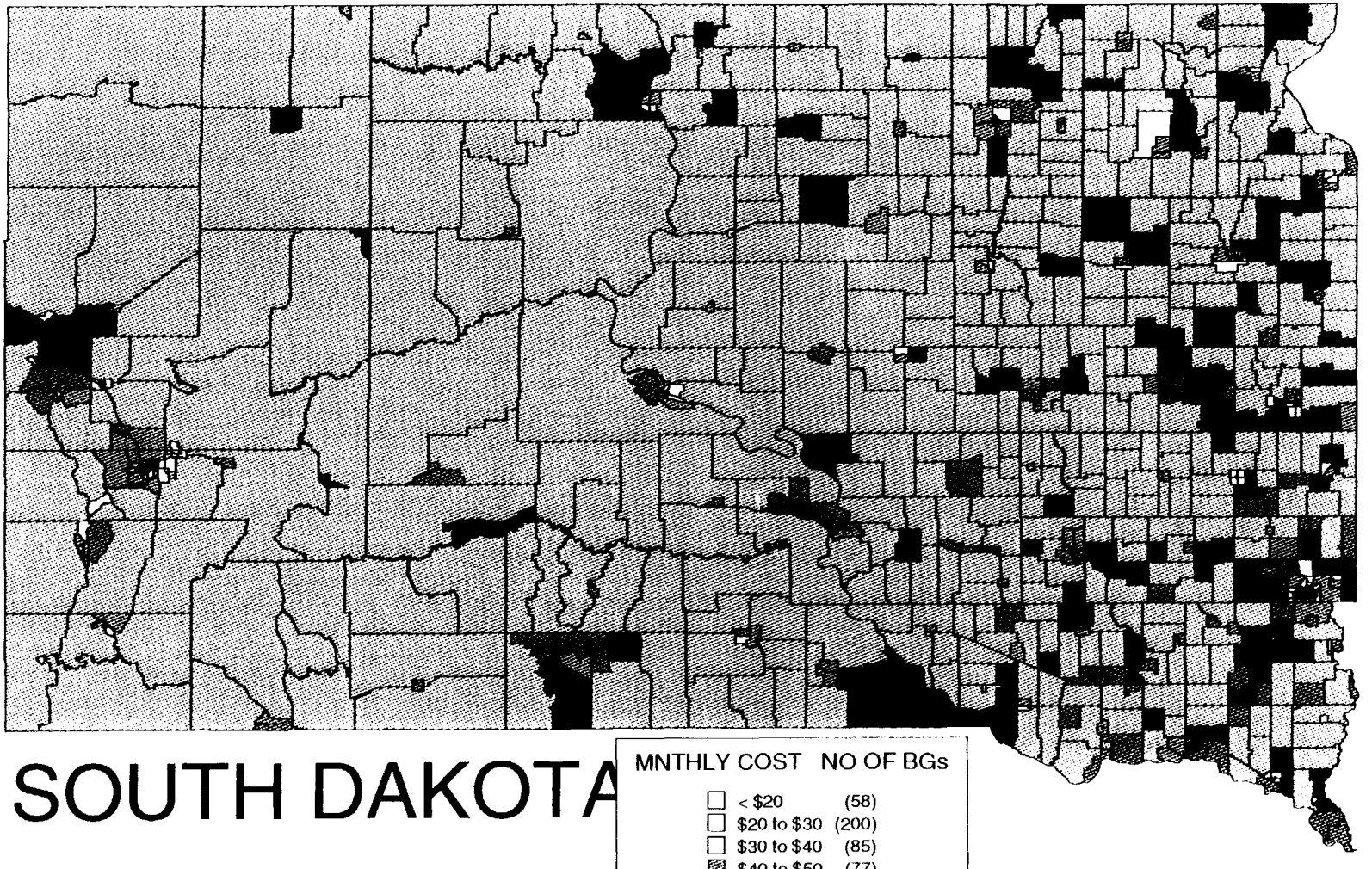
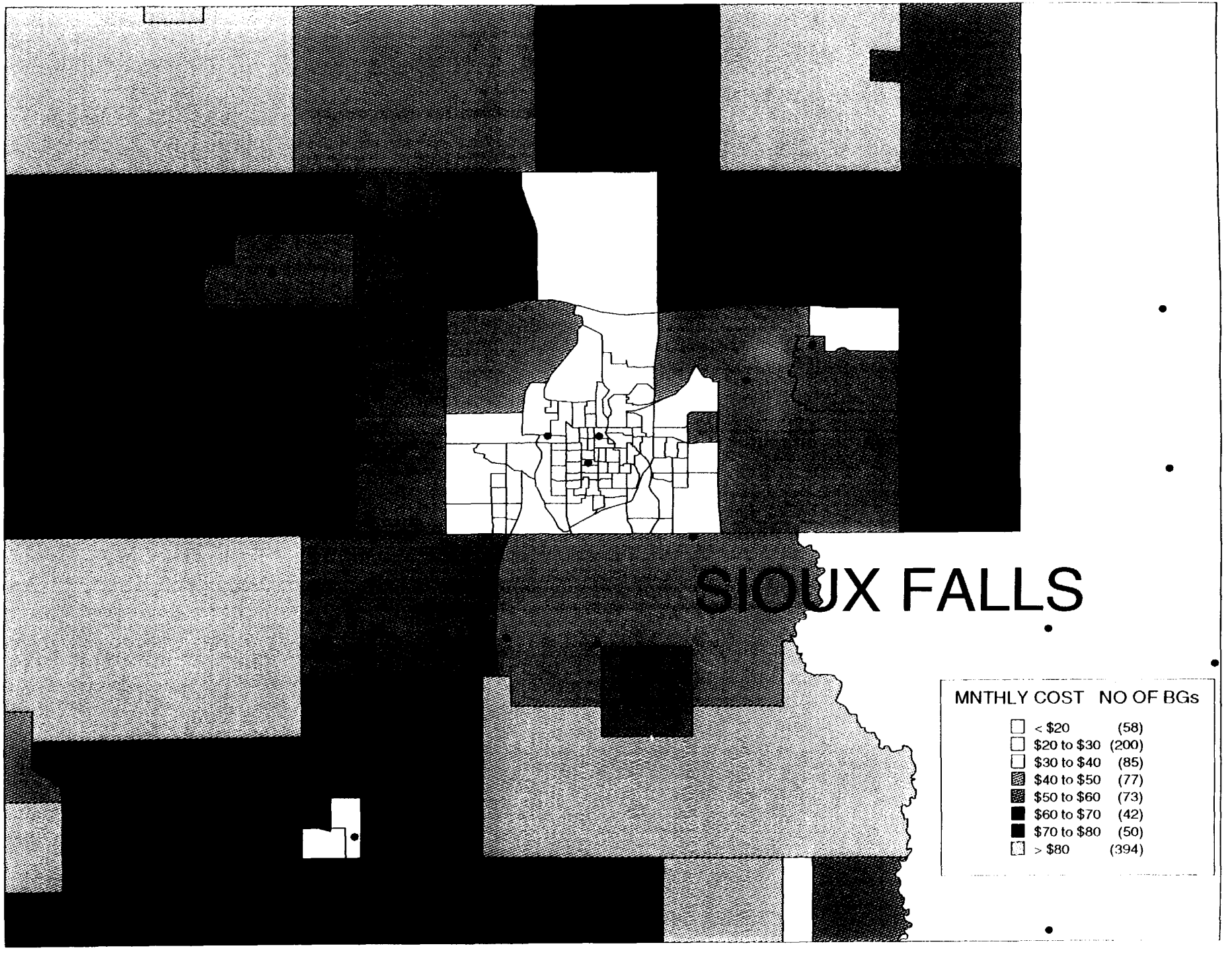


92.0485
461359664004
YANKTON
78.1926
461359664006
461359664008
88.9619
28.4836
17.2087
461359661003
18.4412
461359661004
MNTHLY COST NO OF BGs
< $20 (58)
$20 to $30 (200)
$30 to $40 (85)
$40 to $50 (77)
$50 to $60 (73)
$60 to $70 (42)
$70 to $80 (50)
> $80 (394)



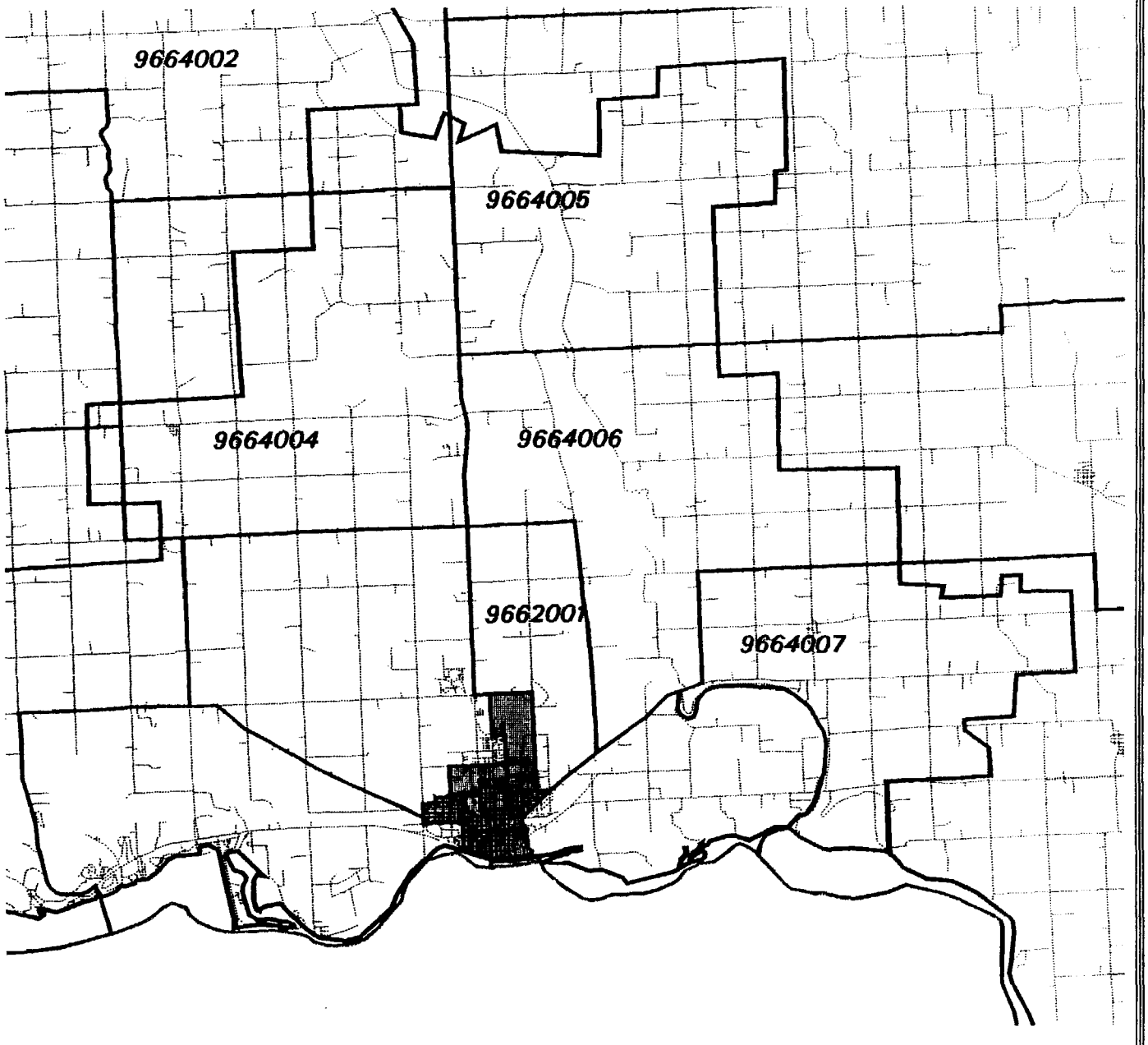
SOUTH DAKOTA

MNTHLY COST	NO OF BGs
< $20	(58)
$20 to $30	(200)
$30 to $40	(85)
$40 to $50	(77)
$50 to $60	(73)
$60 to $70	(42)
$70 to $80	(50)
> $80	(394)


SIOUX FALLS
MNTHLY COST NO OF BGs
< $20 (58)
$20 to $30 (200)
$30 to $40 (85)
$40 to $50 (77)
$50 to $60 (73)
$60 to $70 (42)
$70 to $80 (50)
> $80 (394)

RURAL CENSUS BLOCK GROUPS

YANKTON SOUTH DAKOTA



LEGEND

- CENSUS BLOCK GROUP
- WIRE CENTER
- STREETS
- CENTRAL OFFICE
- LOW DENSITY
- MEDIUM DENSITY
- HIGH DENSITY

0 3 6

MILES

06/11/96

USWEST MAGIC LWA

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FCC ORDER OVERSTEPS BOUNDS OF CONGRESSIONAL INTENT

Earlier this year, Congress passed and President Clinton signed the "Telecommunications Act of 1996" -- a law promising a new era of communications competition where competing providers deliver more service choices and added convenience to American consumers.

The point at which all competitors converge and where Congress said the communications revolution must begin is the public telephone network. This multi-billion-dollar resource is the linchpin of the local economy and the foundation of communications in our country. On August 1, the Federal Communications Commission (FCC) adopted nearly 1,000 pages of prescriptive interconnection rules that threaten the future viability of the public telephone network and upset the competitive balance House and Senate Members worked so hard to achieve.

In an effort to ensure that owners of existing telephone networks do not have a competitive advantage going forward, the FCC's order went overboard and made such ownership a distinct disadvantage, thereby discouraging continued investment in and maintenance and enhancement of the very backbone of America's communications network.

Despite the intentions of Congress, the Commission issued rules that preordain winners and losers in the communications marketplace of the future. While Congress envisioned the development of a world-class, high-tech communications infrastructure accessible to all Americans, the FCC's rules serve to undermine investment in facilities-based local networks, deny customers real choice, create a two-tiered information society that hurts small towns and rural areas, and severely jeopardize universal telephone service.

Here are some examples of how Congress intended communications competition to evolve, how the FCC interpreted the law, and the impact of the FCC's August order....

- **Resale of Local Telephone Service**

What Congress said: To give new entrants the opportunity to compete in the local phone market while they build their own networks, Congress mandated incumbent telephone companies to resell their services at wholesale rates to anyone wishing to buy them. The Act defines the wholesale rate as the retail rate charged to customers minus avoided costs such as marketing, billing and collection.

What the FCC did: In its order, the Commission greatly expanded the Act's unbundling language and, in effect, created a second form of resale. The FCC's rules allow resellers to bypass the wholesale rate defined by Congress and instead pay significantly lower unbundled prices for the network pieceparts that constitute a retail service. New entrants simply may resell an existing consumer service that is not unbundled at all, at the rock-bottom unbundled price, with no network investment or modification on their part.

Impact: If Congress had intended to create two forms of resale, distinguished only by a reseller's ability to arbitrage different prices, it would have made that point clear. The Commission's creation of a new form of resale based on "phantom unbundling" subverts the intent of Congress and makes it possible for new competitors to resell consumer services at a fraction of their retail rate. In setting the retail prices for services like Call Waiting and Three-Way Calling as well as intraLATA (short-haul) toll and business service, state commissions deliberately have priced the services higher than cost to subsidize residential rates. The FCC's order places these local phone subsidies at extreme risk, forcing state regulators to fill the revenue gap by sharply raising residence rates.

- **Joint Marketing**

What Congress said: To promote competition on an equal footing, the Act prohibits long distance carriers like AT&T, MCI and Sprint from jointly marketing resold local service with long distance service until the local Bell Company is authorized to provide interLATA long distance service, or until February 1999, whichever is earlier.

What the FCC did: The Commission ruled that the new law's joint marketing prohibition applies only when long distance companies resell telecommunications services at a discount off the retail price. The prohibition does not apply, however, when long distance companies purchase these same services at the lower unbundled rate. By allowing the long distance giants to buy retail services at cost based on the fiction that they are unbundled (i.e., phantom unbundling), the FCC order undermines Congress' carefully considered joint marketing provision.

Impact: The basis of real competition is letting every competitor compete in every market at the same time. The FCC's expanded unbundling rules compromise the Act's commitment to competitive parity as long distance carriers can buy network elements at cost, circumvent the law's joint marketing provision, and offer one-stop shopping before Bell Companies have a chance to do so.

- **Price-Setting**

What Congress said: Recognizing that a one-size-fits-all approach is not conducive to local ratemaking in states as diverse as South Dakota and New York, Congress assigned state public utility commissions the task of determining just and reasonable rates for interconnection and unbundled elements. The law requires that the rates be cost-based, nondiscriminatory and may include a reasonable profit.

What the FCC did: The FCC preempted state pricing prerogatives by mandating that state commissions use a cost methodology that sets strict parameters around how they calculate unbundled network element prices and how they determine reasonable profit. Based solely on forward-looking costs, the methodology precludes states from considering existing network investment. The FCC also put forth "default proxy prices" for network elements that are far below actual cost, stray from the cost plus reasonable profit equation adopted by Congress, and are not based on the very methodology dictated by the Commission. The order allows states to adopt these arbitrary prices on a temporary or permanent basis.

Impact: U S WEST Communications' actual costs are anywhere from **30% to 300%** above the FCC's default proxy prices, depending on the state. The suggested prices do not adequately reflect cost differences from region to region and state to state, nor do they take into account the significant capital dollars already invested in the public telephone network. The Commission's pricing approach further devalues facilities-based networks and discourages capital investment in both existing and future networks. The FCC's rules prohibit proprietary ownership of public network enhancements while compelling that such enhancements be sold to competitors at declining, forward-looking costs, which generally are less than actual investment. The combined effect of the rules will put a stranglehold on technical innovation as well as the new services, economic development opportunities and quality jobs that flow from it.

- **Access to Advanced Communications Services**

What Congress said: The Act mandates the availability of advanced communications services to all Americans, "including low-income consumers and those in rural, insular and high cost areas" at rates "that are reasonably comparable to those services provided in urban areas."

What the FCC did: In its cost methodology, the FCC required that wholesale rates for consumer services be deaveraged, even though state commissions generally require averaged retail rates and the Act requires "reasonably comparable" retail prices in urban and rural areas.

Impact: The Commission's rules create an untenable situation where wholesale rates must be deaveraged while retail rates remain averaged. Such a dichotomy preempts state authority, undermines congressional intent, and produces inequities between consumers in large cities and small towns. New entrants with their eyes on profit will flock to metropolitan areas and resell services based on the deaveraged wholesale rates. Meanwhile, customers in rural areas will pay higher prices, leading to a two-tiered society of information haves and have nots.

- **Negotiation - Mediation - Arbitration**

What Congress said: The Act spells out procedures for negotiation, mediation and arbitration to facilitate private interconnection agreements among incumbent phone companies and new entrants.

What the FCC did: By suggesting artificially low proxy default prices, the FCC's rules have skewed the negotiation process. The Commission also imposed an unprecedented "most favored nation" requirement in which any provision of any new entrant's interconnection agreement must be made available to any other new entrant.

Impact: The "most favored nation" rule creates a one-way downward effect in which all prices, terms and conditions are continually driven to the lowest common denominator. Instead of give and take on both sides of the negotiating table, this requirement paralyzes an incumbent telco's ability to strike a bargain. As such, the FCC's rules undercut the good faith negotiations encouraged by Congress in the Act.

When it passed the Telecommunications Act of 1996, Congress did not intend legislation opening up the local telephone network to stymie network investment and job creation, slow the delivery of new services, and drive a wedge between urban and rural consumers.

Congress must take the opportunity to reaffirm its legislative intent by re-balancing the scales of communications competition, restoring the value of network investment and innovation, and promoting the development of new services that enhance our daily lives and the communities in which we live.

Benchmark Cost Model 2
Methodology

Introduction

The purpose of the model is to estimate a benchmark cost of providing basic local telephone service for both business and residence customers in small geographic areas for the entire U.S. and its territories. Small geographic areas are used because the cost of providing basic telephone service varies greatly even within the geographic unit of the wire center. Thus, the use of small geographic areas allow the model to identify specific areas which are high cost to serve because of the physical characteristics of the area.

The BCM2 assumes all plant is placed at a single point in time. All facilities are created as if the entire country is a new service area. Therefore, the BCM2 reflects the costs a telephone engineer faces installing new service to existing population centers.

BCM2 is a geographically-based high level engineering model of a hypothetical local network. The basic geographic units used by the model are Census Block Groups (CBGs), as designated by the U.S. Bureau of the Census. There are over 226,000 covering the entire U.S.[1] The basic data provided by the Census Bureau are the geographic boundaries of the CBG, the geographic center (centroid) of the CBG, and the number of households in the CBG. In addition to the Census data, terrain information from the U.S. Geologic Survey (U.S.G.S.) is developed by CBG. This information includes data which impacts the cost of placing telephone plant into service. The terrain data includes water table depth, depth to bedrock, hardness of the bedrock, surface soil texture, and the slope of the terrain. Another data item developed by CBG is an estimate of the number of business lines. This number is developed based on a third party data base of employees by CBG. These preceding items contain all the CBG characteristics necessary for input to BCM2.

The BCM2 starts with the existing central office locations throughout the country. The source of the central office locations is Bellcore's Local Exchange Routing Guide (LERG). This data is input into a geographic information system where each CBG is associated with the closest central office. Once all CBGs are associated with central office locations, this information plus the relative physical locations and CBG information are input to the BCM2. This basic input information allows the BCM2 to design a local exchange network utilizing a tree and branch topology.

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[1] BCM2 is capable of using any small geographic unit, such as a census block or the "grid". Utilized by the Cost Proxy Model (CPM) developed by Pacific Telesis and INDETEC.