BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

In the Matter of the Commission, on its own motion, to investigate and seek comment on cost model(s) for the following: 1) unbundled network element (UNE) pricing; 2) developing zones to de-average rates on a geographical basis; 3) determining zones for Universal Service Fund (USF) payments; 4) establishing a permanent funding mechanism for USF payments; and 5) to determine whether all subsidies have been removed from access prices.	)	Application No. C-2256/PI-38 JOINT COMMISSION AND CONSULTANT PROPOSED ALTERNATIVES Entered: June 6, 2000

BY THE COMMISSION:

On March 28, 2000, the Commission opened this docket to investigate and seek comment on cost model(s) for the following: 1) unbundled network element(UNE) pricing; 2) developing zones to de-average rates on a geographical basis; 3) determining zones for Universal Service Fund (USF) payments; 4) establishing a permanent funding mechanism for USF payments; and 5) to determine whether all subsidies have been removed from access prices . In our March 28, 2000 order, this Commission stated that on or about May 31, 2000, Commission staff and its consultants would release an initial proposal with respect to how each of the cost models can be used to accomplish the tasks described above. This proposal labeled, *Initial Nebraska Public Service Commission Proposal with Respect to Cost Models,* is attached and made a part of the record hereto as Exhibit A.

The interested parties will now have an opportunity to submit separate sets of comments on the issues herein:

1. **UNE Pricing** - The Commission will propose a separate method- ology to use with each model for pricing unbundled network elements. The Commission requests comments on the commentor- perceived benefits and drawbacks of each cost model and proposed methodology. The Commission will also receive comments on possible new alternative methodologies associated with using each model.

2. **UNE Zones** - The Commission will propose a separate methodology to use with each model for creating unbundled network element zones. The Commission requests comments on the commentor-perceived benefits and drawbacks of each cost model and proposed methodology. The Commission will also receive comments on possible new alternative methodologies associated with using each model.

3. **NUSF Funding** - The Commission will propose a separate methodology to use with each model for funding the Nebraska Universal Service Fund. The Commission requests a third set of comments on the commentor-perceived benefits and drawbacks of each cost model and proposed methodology. The Commission will also receive comments on possible new alternative methodologies associated with using each model.

4. **NUSF Zones** - The Commission will propose a separate methodology to use with each model for creating zones to de-average Nebraska Universal Service Fund payments. The Commission requests a fourth set of comments on the commentor-perceived benefits and drawbacks of each cost model and proposed methodology. The Commission will also receive comments on possible new alternative methodologies associated with using each model.

5. **Implicit Subsidy** - The Commission will propose a separate methodology to use with each model for determining whether subsidies have been removed from access prices pursuant to the Commission findings and conclusions entered in Docket No. C-1628 (January 13, 1999). The Commission requests a fifth set of comments on the perceived benefits and drawbacks of each cost model and proposed methodology. The Commission will also receive comments on possible new alternative methodologies associated with using each model.

The Commission finds that initial comments on the staff proposals shall be filed no later than 5:00 p.m., on June 30, 2000. The Commission will then accept reply comments from interested parties after the June 30, 2000, deadline and on or before July 17, 2000, at 5:00 p.m.

Thereafter, the Commission staff shall have an opportunity to review the comments received. It will use those comments to revise its proposed methodologies for performing the above-mentioned tasks. The Commission staff shall present those revised proposals on or before September 29, 2000. Interested parties may comment in a manner similar to that described above by October 31, 2000. Reply comments will be due on November 17, 2000, by 5:00 p.m.

O R D E R

IT IS THEREFORE ORDERED by the Nebraska Public Service Commission that the staff proposal attached as Exhibit A be, and it is hereby entered into the record in Application No. C-2256 and subject to comment by all parties interested in this matter.

IT IS FURTHER ORDERED that all interested parties are invited to comment on the issues, concerns and recommendations they have prior to the adoption of the appropriate cost model and methodology for each defined task in the manner prescribed above. Parties commenting shall file five hard copies and one electronic copy on disk in WordPerfect 5.0 or later format. Filings will not be accepted via facsimile.

MADE AND ENTERED in Lincoln, Nebraska, on this 6th day of June, 2000.

NEBRASKA PUBLIC SERVICE COMMISSION

COMMISSIONERS CONCURRING:

Chairman

ATTEST:

Executive Director

Initial Nebraska Public Service Commission Proposal with Respect to Cost Models

Exhibit A

June 6, 2000

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UNIVERSAL SERVICE

General Methodology

Our proposal is to use a two-step process for determining Nebraska Universal Service Fund payments. The first step is to determine the overall dollar size of the Fund. The current surcharge, for example, is generating a fund of approximately $50 million. The second step is to allocate the dollars in the NUSF among high cost areas. Allocation will be on a relative basis. For example, if two percent of high costs are generated by customer in a certain area, than two percent of the fund goes to that area.

The steps are addressed individually below. Methodologies for accomplishing each step as well as the strengths and weaknesses of each model are discussed.

Sizing the Nebraska Universal Service Fund

There are three models proposed for sizing the Nebraska Universal Service Fund. They are HAI 5.2, HCPM and BCPM 3.1.

The Models

HAI

The Nebraska Public Service Commission (NPSC or Commission) reviewed the HAI 5.0 model in a previous docket (See C-1633). HAI uses geocoding to locate all the customers that have a geocodable address. It then equidistantly spaces the remaining ungeocodable addresses around the border of the census block in which they reside. These "border" locations are called surrogates.

HAI begins the process of designing loop plant by creating clusters of customers. HAI clusters are no more than approximately 18,000 feet on each side and have no more than 1,800 access lines. Note that HAI actually forms two types of clusters, main clusters with five or more customer locations and outlier clusters with from one to four customer locations. HAI considers each cluster as a distribution area. It assumes that customers are spread uniformly throughout a cluster when it forms its distribution system. The model then goes on to design feeder, switching, signaling, interoffice and other plant, determines the investment necessary to establish that plant, and then converts investments into expenses. These expenses ultimately are used to determine universal service needs.

A number of concerns were raised with respect to loop plant design in the HAI model. One concern was that the clustering occurred "outside" of the model and hence was not reviewable by model users. Another concern was that locating surrogates along the border of the census block was unreasonable. A third was that the technology used to supply service to customers in outlying cluster was substandard. Another concern was that placing lines uniformly across what could be large clusters moved customers too far from their geocoded or surrogate locations. This biased distribution plant results.

In May of this year AT&T submitted version 5.2 of the HAI model for consideration. Documentation accompanying the newer version indicates that the second concern of placing surrogates along census block borders has been addressed. In version 5.2 surrogates are uniformly distributed along the roads in the census block. It is not clear that the other three concerns were addressed in version 5.2.

HCPM

HCPM is a hybrid model that combines a new loop plant design algorithm with the interoffice and expense components of the HAI model. HCPM is an improvement over HAI in that it overcomes the loop design concerns raised above. The authors of the model write in documentation supporting their model that clustering "is an explicit component of the model which is open to inspection and review by all parties".[1] Surrogates are located along roads, a method preferred by the FCC. Old technologies are replaced with more current technologies. Finally, a much more efficient algorithm is used to cluster customers and design loop plant. According to the authors, using the HCPM algorithm, "[a]ll customer locations can therefore be determined with an error of not more than several hundred feet."[2]

HCPM designs distribution plant within each cluster and then calculates distribution investment within each cluster. It builds feeder plant, allocates a part of feeder plant to each cluster and calculates the investment in feeder plant to each cluster. Then it aggregates cluster, feeder and distribution (a.k.a. loop) investment into wire center loop investment. After loop investment it calculates all of the other wire center investments for switching, transport and other facilities. This is all collected in a worksheet called "total network inv by wirecenter" in the workfile. The workfile investment data are loaded into the main output spreadsheet where expenses are calculated.

To calculate USF, HCPM assigns support on a wire center basis. Annual support is the difference between the wire center average cost per line and the appropriate USF cutoff, multiplied by the number of qualifying lines in the wire center and then multiplied by 12 months. Support is aggregated across wire centers to get total company support.

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[1] C.A. Bush, D.M. Kennet, J. Prisbrey, W.W. Sharkey and Vaikunth Gupta (1999), *Computer Modeling of the Local Telephone Network*. FCC, Washington DC.: p. 3.

[2] *Ibid*., p. 1.

BCPM

The Commission also reviewed BCPM 3.1 in docket C-1633. BCPM uses census block data to place customers in microgrids via two alternative methods. For census blocks with an area of ¼ square mile or less, BCPM assumes customers are distributed uniformly. For larger blocks, BCPM assumes they are distributed the same as road miles.

BCPM begins the process of designing loop plant by creating Carrier Service Areas (CSA) as contiguous grids of varying sizes. The limits on grid size are based on both distance and population. The largest BCPM grid is approximately 12,000 feet by 14,000 feet. The goal is to limit the copper segment of the loop to less than 12,000 feet, although in some situations copper length can extend to 18,000 feet.

BCPM breaks a grid into four quadrants, with each populated quadrant representing a separate distribution area. The square-mile area of the distribution system within the quadrant equals road miles in the quadrant multiplied by a 500-foot buffer on each side of the road. BCPM designs distribution facilities, main feeder, switching, interoffice, signaling and other plant. For each grid, it calculates the investment in several components and converts that into a direct cost. Other costs are added and USF is calculated at the grid level.

Support is the difference between the grid average cost per line and the USF cutoff, multiplied by the number of qualifying lines in the grid and then annualized. Support is aggregated across grids to get wire center support. Wire center support is aggregated to get total company support.

Actual Sizing

The Commission has several alternatives to use in sizing the NUSF. It can use the wire center results generated by the models to size the fund. Alternatively, it can use sub-wire center results as described below. It can also simply specify a surcharge amount and let the fund equal the amount of revenues generated.

Future Technical Support

The Nebraska Public Service Commission would like comments regarding each model sponsor's plan to update and provide technical support in the future.

Inputs

All models have extensive user adjustable input sets. Once the Commission selects a model to use for sizing the permanent fund, some method will have to be developed for selecting the appropriate input values. If BCPM is selected, there is already a record with the NPUC's recommendation on input values to the FCC. This may or may not preclude new hearings to select input values relevant for the state's purposes. If either HCPM or HAI is selected, hearing will most likely have to be held and appropriate input values selected.

Allocating the NUSF

The goal of the NUSF is to target universal service support toward high cost customers. Support can be allocated at the wire center level. Costs also can be deaveraged within a wire center to target support more effectively to high cost lines.

Allocating Based on Relative Support Levels

Once the size of the fund is determined, those dollars have to be allocated to support high cost customers. Whether zones within wire centers or entire wire centers are used, the absolute USF dollars needed to support each area can be determined. Each area's absolute USF need can be compared to the total USF need to get a relative need for each area. This relative need can be applied to the amount of the fund to get the actual dollars flowing to each area.

As an example, suppose allocations are made on a wire center basis. Suppose also that customers in one particular wire center needs $1,000 in USF, and that telephone users in all wire centers as a whole need $100,000. Than 1/100th of the fund would be allocated to the customers in that particular wire center.

Sub Wire Center Level

All three models allow cost deaveraging below the wire center level. The HCPM and HAI models subdivide wire centers into clusters. BCPM subdivides wire centers into grids. Either cluster or grid information can be aggregated to form different zones within a wire center.

It should be possible to use statistical techniques to aggregate either clusters or grids into zones. Our favored approach is to create a data set comprised of either the cluster or grid information for the non-rural carriers. The data set would contain the density, feeder distance and average loop cost information. Statistical analysis could be used to form zones.

Statistical results may not guarantee that a zone is made up of contiguous grids or clusters. The NPSC seeks comment on this issue as well.

Loop Versus Total Cost

Loop costs are unique to each cluster or grid. Switching, interoffice, signaling and other costs are determined at the wire center level and are allocated to the clusters or grids. Hence, if wire centers are going to be disaggregated, it seems reasonable to focus solely on direct loop costs in trying to determine relative costs for universal support purposes.

Portability

As long as only one company serves a wire center, deaveraging is not a problem with respect to portability. Even if support is targeted to relatively high cost zones within the wire center, customers can be identified and payments can be made on a wire center basis. However, once competition and portability become issues, it is important to determine if a customer is within a support-receiving zone of the larger wire center. Currently we do not have a good methodology for identifying customer locations. Geocoding may be the answer. The NPSC seeks comment on this issue as well.

Impact on Competition

Deaveraging targets USF to high cost customers within a wire center. This prevents cherry picking. It provides support where it is needed. Basing allocations on wire center outcomes may create incentives for entrants to cherry pick relative low cost customers.

Determining Zones and Zone-Level Support

HCPM

HCPM designs loop plant by subdividing a wire center into clusters. In its workfiles, HCPM shows line counts, densities and feeder distances by cluster. It also shows each cluster's loop plant investment broken down into individual components. Table 1 below shows the worksheet name, cell identification and cell title for each of the components that make up loop investment. Rows 1 through 9 are investments in distribution plant. Rows 10 through 13 show investment in other loop components. Rows 14 through 26 show investment in feeder structure.

Table 1
Investment by Loop Element

	Worksheet	Cell	Title
1	"distribution output by cluster"	R	" distribution cable inv, underground "
2	"distribution output by cluster"	S	"distribution cable inv, buried"
3	"distribution output by cluster"	T	"distribution cable inv, aerial"
4	"distribution output by cluster"	U	"distribution conduit inv"
5	"distribution output by cluster"	V	"distribution conduit placement inv"
6	"distribution output by cluster"	W	"distribution poles inv"
7	"distribution output by cluster"	X	"distribution buried placement inv"
8	"distribution output by cluster"	AI	"terminal investment"
9	"distribution output by cluster"	AJ	"drop investment"
10	"distribution output by cluster"	AK	"NID investment"
11	"distribution output by cluster"	AH	" SAI investment "
12	"distribution output by cluster"	AD	"high-density RT investment"
13	"distribution output by cluster"	AF	"low-density DLC inv"
14	"feeder output by cluster"	O	"cpr fdr cbl inv, u/g"
15	"feeder output by cluster"	P	"cpr fdr cbl inv, buried"
16	"feeder output by cluster"	Q	"cpr fdr cbl inv, aerial"
17	"feeder output by cluster"	R	"fiber fdr cbl inv, u/g"
18	"feeder output by cluster"	S	"fiber fdr cbl inv, buried"
19	"feeder output by cluster"	T	"fiber fdr cbl inv aerial"
20	"feeder output by cluster"	U	"fdr conduit inv"
21	"feeder output by cluster"	V	"feeder manhole inv"
22	"feeder output by cluster"	W	"feeder u/g copper plcmt inv"
23	"feeder output by cluster"	X	"feeder u/g fiber plcmt inv"
24	"feeder output by cluster"	Y	"feeder buried copper plcmt inv"
25	"feeder output by cluster"	Z	"feeder buried fiber plcmt inv"
26	"feeder output by cluster"	AA	"feeder pole inv"

Once the investment information is obtained, the direct cost of each component is calculated as the investment times the factor in the expense module. The table below shows how direct cost is calculated. The direct cost for underground distribution cable, for example, is calculated as the investment in underground distribution cable times a "Capital Annual Charge" and an "Alternative Cable Maintenance Factor".

The first nine components in Table 2 make up distribution direct costs. NID is a unique component. SAI and digital terminal costs make up direct concentrator costs.

Table 2
Direct Cost by Distribution, NID and Concentrator Components

	Direct Cost =	Investment Element	X Direct Expense Factor
1	Dist cable u/g	Dist cable inv, u/g	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
2	Dist cable buried	Dist cable inv, buried	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
3	Dist cable aerial	Dist cable inv, aerial	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
4	dist conduit	dist conduit inv	"Capital Annual Charge" plus "Calculated Factor"
5	dist conduit placement	dist conduit placement inv	"Capital Annual Charge" plus "Calculated Factor"
6	dist poles	dist poles inv	"Capital Annual Charge" plus "Calculated Factor"
7	dist buried placement	dist buried placement inv	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
8	terminal	terminal inv	"Capital Annual Charge" plus "Calculated Factor"
9	drop	Drop inv	"Capital Annual Charge" plus "Calculated Factor"
10	NID	NID inv	"Capital Annual Charge" plus ("expense per line per year" times "number of NID")
11	SAI	SAI inv	"Capital Annual Charge" plus complicated adjustment for "Alternative Cable Maintenance Factor"
12	digital terminal	high-density RT + low-density DLC inv	"Capital Annual Charge" plus "Land & Building Expenditure" factor

Table 3 shows direct cost calculations for feeder components. They are calculated in the same manner as in Table 2. Investment is multiplied by a factor to get direct cost for each component. All of the costs in Table 3 together form direct feeder costs.

Table 3
Direct Cost by Feeder Components

	Direct Cost =	Investment Element	X Direct Expense Factor
1	Copper cable u/g	cpr fdr cbl inv, u/g	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
2	Copper cable buried	cpr fdr cbl inv, buried	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
3	Copper cable aerial	cpr fdr cbl inv, aerial	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
4	Fiber cable u/g	fiber fdr cbl inv, u/g	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
5	Fiber cable buried	fiber fdr cbl inv, buried	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
6	Fiber cable aerial	fiber fdr cbl inv aerial	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
7	Conduit	fdr conduit inv	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
8	Manhole	feeder manhole inv	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
9	Copper u/g placement	feeder u/g copper plcmt inv	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
10	Fiber u/g placement	feeder u/g fiber plcmt inv	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
11	Copper buried placement	feeder buried copper plcmt inv	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
12	Fiber buried placement	feeder buried fiber plcmt inv	"Capital Annual Charge" plus "Alternative Cable Maintenance Factor"
13	Poles	feeder pole inv	"Capital Annual Charge" plus "Calculated Factor"

Distribution, NID, concentrator and feeder direct costs can be added together to get direct loop cost. The direct loop cost can be divided by the number of lines and by 12 to get the monthly direct loop cost per line.

Statistical techniques can be used to aggregate clusters into zones based on the cluster monthly direct loop cost per line, line densities and feeder distances. To do this, the monthly direct loop cost per line is determined for each cluster using the methodology described above. A data set is formed using a cluster as a unit of observation. Data for each cluster include the monthly direct loop cost per line, number of cluster lines and cluster feeder distance. Then some type of statistical analysis is used to separate cluster into meaningful zones. The Commission seeks specific comments regarding statistical methodologies for forming zones from clusters.

Once zones are determined, cluster information can be used to determine USF requirements. First, cluster investment information can be aggregated into zone-level investments. As an example, if in one wire center, ten of 30 clusters are in one zone, the investment information in each of those ten clusters can be aggregated into zone-level investment information. Investment is multiplied by the factors in Tables 2 and 3 above to get direct costs. Zone distribution, NID, concentrator and feeder direct costs can be added together to get zone direct loop cost. Zone direct loop cost can be divided by the number of zone lines and by 12 to get zone-level monthly direct loop cost per line. The zone USF support is the difference between the direct loop cost and the loop support threshold, multiplied by zone lines and annualized. Note that a USF threshold will have to be used that reflects only direct loop costs, not total line costs.

Going beyond zones for a moment, to calculate total USF, HCMP also calculates the annual investment in other non-loop capital components. These include switching, signaling, transport, operator and general support. In the expense module it calculates, for each wire center, the annual direct cost associated with investment in each component. It then takes direct cost and adds an expense assignment to get the wire-center-level total cost of each component. HCPM then takes loop total cost, adjusts for general expenses and calculates the monthly loop cost per line. It also adjusts line port, end office, signaling and transport total costs for general expenses, calculates their monthly costs on a per line basis and adds that to monthly loop cost to get the wire-center-level "Total Monthly Cost per Line". To calculate wire center USF, it subtracts the USF threshold from the Total Monthly Cost per Line, multiplies by the number of supported lines in the wire center and annualizes. Wire center support amounts are added to get company support.

HAI

Since the HCPM and HAI models use the same expense and reporting algorithms, HAI can be used in exactly the same way as HCPM to determine USF by zone.

BCPM

BCPM designs loop plant by subdividing a wire center into grids. In its workfiles, BCPM shows line counts, densities and feeder distances by grid. It also shows investment in loop and non-loop components by grid. The actual design and investment data are calculated in several modules. Loop investments are calculated in the "Loop" module. This module uses several worksheets. The data from the loop module are finally output in the "Output" worksheet. The following table shows the cell and title of investment in each loop component.

Table 4
BCPM Grid Investments in Loop Components

Cell	Component
Z	Uncapped 2230 Total DLC, DS1 Electronic Investment
AD	UnCapped 2421 Aerial Copper Cable Investment
AE	UnCapped 2422 Underground Copper Cable Investment
AF	UnCapped 2423 Buried Copper Cable Investment
AG	UnCapped 2421 Aerial Fiber Cable Investment
AH	UnCapped 2422 Underground Fiber Cable Investment
AI	UnCapped 2423 Buried Fiber Cable Investment
AJ	UnCapped 2411 Pole Line Investment
AK	UnCapped 2441 Conduit Investment

BCPM passes these data to the "rpt calc" module. In the worksheet "Annual Cost Factors" BCPM calculates the annual direct expense associated with investment in each component. This calculation is the annual investment times an expense factor. The relevant cells and outputs are shown in Table 5.

Table 5
BCPM Expenses by Loop Component

Cell	Component
K	2230 Circuit
M	2421 Aerial Copper Cable
N	2422 Underground Copper Cable
O	2423 Buried Copper Cable
P	2421 Aerial Fiber Cable
Q	2422 Underground Fiber Cable
R	2423 Buried Fiber Cable
S	2411 Pole Line
T	2441 Conduit

The output from the cells shown in Table 5 can be aggregated to get annual direct loop cost. Direct loop cost can be divided by the number of lines and by 12 to get monthly direct loop cost per line.

Statistical techniques can be used to aggregate grids into zones based on the grid monthly direct loop cost per line, line densities and feeder distances. To do this, the monthly direct loop cost per line is determined for each grid using the methodology described above. A data set is formed using a grid as a unit of observation. Data for each grid include the monthly direct loop cost per line, number of grid lines and grid feeder distance. Then some type of statistical analysis is used to separate cluster into meaningful zones. The Commission seeks specific comments regarding statistical methodologies for forming zones from girds.

Once zones are determined, grid information can be used to determine USF requirements. The grid annual direct loop costs can be aggregated into zones to get zone annual direct loop cost. This can be divided by the relevant number of lines and by twelve to get zone-level monthly direct loop cost per line. The zone USF support is the difference between the loop cost and the loop support level, multiplied by zone lines and annualized. Note that creating zones from grids and then calculating USF requirements is different from the standard BCPM methodology where USF is calculated on a grid basis and then aggregated. The Commission feels the change is warranted for zone purposes. However, it seeks comment on this issue.

Going beyond zones for a moment, to calculate total USF, BCPM also calculates the annual investment in other non-loop capital components. It passes these to the "rpt calc" module as well where it calculates, for each grid, the annual expense associated with investment in each component. BCPM sums the annual cost for each investment component and divides by the number of grid lines times 12 to calculate the "Monthly Capital Cost" per grid line. It then uses the spreadsheets ""Expense Res" and "Expense Bus" to calculate additional plant and non-plant specific costs per grid line. These two items are added to the monthly capital cost to get the monthly total cost per grid line. This is compared to the USF threshold to get the monthly support per grid line. Monthly support is multiplied by the number of supported lines in the grid and by 12 to get annual grid-level support. This is added across grids to get annual wire center support. Wire center supports are aggregated to get company total support.

Statistical Techniques

One way to form zones is to use cluster analysis. Either the HCPM clusters or the BCPM grids would form the basic data set. Clusters would be formed based on similarities in average cost per line, density and distance. Statistical techniques could be used to see if three or more clusters were warranted.

Wire Center Level

HCPM, HAI and BCPM calculate support at the wire center level. Their wire center results can be used to determine relative USF payments.

Portability

Portability is straightforward at the wire center level. If USF is paid on a per line basis, each company serving a wire center gets support for each line it serves in the wire center. Lines in the wire center can be identified by the number prefix.

UNE ISSUES

Determining UNE Prices

Cost Principle

The question remains as to the appropriate cost basis for determining UNE prices. The FCC ordered the use of TELRIC pricing. All of the models below use TERLIC methodologies. The Commission seeks comment on this issue.

The Models

HCPM

Generally, to calculate UNE prices, HCPM starts with element direct cost (as calculated in the USF section above). For loop plant, a UNE expense assignment is added to direct cost. This expense assignment accounts for general support, network operations, other taxes and variable overhead. Those four items are added together and multiplied by the fraction that loop direct costs make up of total direct costs. The aggregate value is assigned to each wire center based either on wire center relative line counts or on wire center relative direct costs. Finally, if the user specifies values, a per-loop expense assignment can be made as well. The outcome of this calculation is element total cost. Note that in its default setting, HCPM adds approximately $7.90 per line, per month to NID cost to account for variable overhead. This amount, however, can be manually removed from the calculations.

For all other plant categories, to get element total cost, an allocation for support and other expenses and an allocation for inter-office switching network operations can be added to direct costs.

For loop plant, the final UNE price is element total cost plus an add-on for carrier-to-carrier customer service, adjusted for an expense factor. The add-on is total carrier-to-carrier customer service cost allocated to all of the elements based on the percentage each makes up of total cost across all elements. The expense factor accounts for other taxes and uncollectibles. This is divided by the number of lines and by 12 to get the monthly UNE price per line. The other plant element UNE prices are calculated in a similar manner.

If UNE prices are calculated at the wire center level, the HCPM results can be used directly. Alternatively, since the HCPM model shows how the UNE prices are calculated from element investment, it may be possible to change the algorithm to calculate UNE prices in a different manner.

If UNE prices are determined by zone, it only makes sense to calculate loop element UNE prices. HCPM investment data can be aggregated into zones rather than wire centers. Then, in theory at least, a procedure mirroring the one described above can be used to calculate loop element UNE prices for each zone.

HAI

Since the HCPM and HAI model use the same expense and reporting algorithms, HAI can be used in exactly the same way as HCPM to determine UNE prices.

BCPM

BCPM was not designed to calculated UNE prices. It does breakdown investment by category. It may be possible to use the investment data to calculate UNE prices.

ICM

U.S. West has presented the Integrated Cost Model (ICM) for consideration. ICM calculates and reports unbundled network element (UNE) rates for U S West facilities in Nebraska. The model default calculates rates for U S West statewide and for three zones established by U S West. However, the model can also be adjusted for use in calculating rates by wire center or for distance zones, up to five established by the user, both statewide and by wire center.

It is noted that ICM calculates the recurring costs for UNEs. U S West's submission also includes models that calculate nonrecurring UNE costs and collocation costs. These are known as the INCM and CM models. In addition to the ability to establish zones, users can modify input values in all the models.

ICM calculates UNE rates for unbundled loops, extension technology (technology that enhances signals when the loop is greater than 18,000 feet), analog line ports, local and tandem switching, tandem switched transport, entrance facilities (DS0, DS1, and DS3), database services, line information database, signaling, shared transport, and unbundled dedicated interoffice transport. The rates for individual elements are frequently disaggregated. For example, the unbundled loop cost is divided into costs for feeder, distribution, and NID.

The model builds costs from the ground up for each UNE or sub-UNE. The major subcategories of cost are Investment, Directly Assigned, Directly Attributed, and Common. The first three subcategories are grouped into Total Element Long Run Incremental Costs (TELRIC), so the total cost is identified as TELRIC + Common Costs. Each cost subcategory has several cost elements within it.

The costs for these elements are calculated using three investment modules, loop, switching, and transport; and two factors modules, capital cost and expense. The capital cost module translates investment expenditures into monthly recurring costs, while the expense factors module turns direct expenses into monthly operating expenses. The modules include a great deal of cost information and assumptions, but they reflect assumptions U S West has made regarding cost of materials, cost of labor, demand factors, cost of capital, and so forth. Costs are assigned to the several elements in accordance with the assumptions, then aggregated to find the subcategory and total costs.

Loop Rates

Feeder: The Loop Module builds feeder from the most distant point in each quadrant to a central office. Line length and demand are taken into account in establishing cable size along the feeder facility. Distance determines the technology, DLC or copper, used. The fill factor sets the cable or DLC size.

Distribution: One among several possible generic distribution designs for residential or business areas is selected for the distribution cable in a given area. The density of access lines is the criterion driving the choice. The average investment for components of a particular design are multiplied by the design percents to produced distribution investment per kilofoot within a wire center group.

NID: NID costs are added to the feeder and distribution costs to arrive at the total loop investment cost. One average NID cost is applied statewide.

Analog Line Port

The line for an end office port is assumed to be copper, not ISDN. Furthermore, switches without analog lines and 16 switches with low demand, and thus deemed atypical, were eliminated in calculating the port cost. It is noted that 76 percent of all lines are assumed analog in order to be consistent with the scorched node assumption. Usage sensitive costs are consistent with interconnection usage cost elements per minute.

Entrance Facilities

The Transport Module calculates a weighted-average installed investment cost for interoffice transport using various forward-looking interoffice facility configurations. The probability applied in the process is Nebraska specific.

Shared Transport

Costs for shared transport are based on a least-cost scorched node scenario, are forward-looking, assume digital equipment and facilities, use of SONET, and volume-sensitive standby capacity.

Determining UNE Zones

The Models

HCPM

It should be possible to use the HCPM model to calculate loop UNE prices for each cluster. Then some statistical technique can be used to identify relevant zones.

HAI

Since the HCPM and HAI model use the same expense and reporting algorithms, HAI can be used in exactly the same way as HCPM to determine UNE prices.

BCPM

BCPM disaggregates information to the grid level. If a methodology can be devised to calculate UNE prices at the grid level using BCPM, then it should be possible to analyze grid information to create zones.

ICM

ICM contains information for all U.S. West wire centers within Nebraska. U S West currently classifies these wire centers into three zones. The model calculates UNE rates for these zones as well as statewide UNE rates. Model users can accept these zones or select zones of their own choosing. Users can, for example, create groupings of wire centers different from those used by U S West, or even treat each wire center as a zone.

Users can also establish zones by distance. The model allows users to set up to five distance ranges, starting at the switch and working outward. The ranges can be any distance or combination of distances the user chooses; e.g., there could be four zones of 3,000 feet each, and a fifth zone for all loops greater than 12,000 feet; or three zones covering 0-5,000 feet, 5,000-15,000 feet, and all loops over 15,000 feet. The distances could be applied statewide or wire center-by-wire center at the user's discretion.

CROSS SUBSIDY

The Commission staff and its consultants tentatively conclude that there is little or no distinction between ILEC to CLEC and ILEC to IXC interconnection arrangements. Both types of arrangements use discrete elements of an ILEC's telecommunications network, such as switching and transport. Accordingly, it seems reasonable that the same cost model could be adopted for the determination and pricing of both UNEs and access charges. However, the Commission staff and its consultants believe that long term, no loop costs should be attributed to access charges. The entire portion of the loop cost should be assigned to the purchaser of the UNE. To the extent that the loop cost results in a local service rate deemed by the Commission to be unaffordable, the NUSF will support those loops.

General Recommendations

The Commission staff and its consultants are not recommending any particular model or methodology at this point. They are developing for comment viable alternatives for meeting the Commission's cost modeling needs. However, they are considering certain factors that may influence their ultimate recommendations.

HCPM combines a unique loop design algorithm with the HAI expense module. The staff and its consultants view the HCPM loop algorithm as superior to the HAI loop algorithm. In addition, the FCC has adopted HCPM for federal universal support. As a consequence, HCPM has received considerable scrutiny and is likely to continue to be supported by its developers. Therefore, a preference is already developing for HCPM over HAI.

U.S. West developed BCPM, and U.S. West seems very interested in working with the Commission on ways that BCPM can be used to meet the Commission's cost modeling needs. However, in its present form, BCPM does not address UNE issues. Some network elements are part of basic local exchange services supported by the NUSF. To ensure an equitable and non-discriminatory universal service fund, the staff and consultants suggest that it may be most reasonable to use the same cost model to determine UNE costs and universal service support. Furthermore, universal service support should be disaggregated to at least the same level as UNE costs to target more accurately universal service support. Both of these goals can be met by using the HCPM.

It is true that HCPM has not yet been endorsed for calculating UNE prices. However, for loop components at least, the HCPM algorithm seems to calculate reasonable UNE prices. Even if there are concerns about the methods used in the HCPM to calculate loop UNE prices, the algorithm is flexible enough so that it should be possible to address those concerns.

Another advantage of the HCPM is that it uses geocodable addresses when available. As the Commission moves toward geocoding, it can only improve HCPM results.