Table 2
(Ex. 604 JWL-2, Table A13)
Recommended Structure Types For Distribution

		Recommended Values			Recommended Values		
Density Zone	% Distribution	Aerial	Buried	Under-ground	Aerial	Buried	Under-ground
0 to 5	16.61%	16.0%	79.0%	5.0%	2.7%	13.1%	0.8%
6 to 100	36.42%	12.0%	81.0%	7.0%	4.4%	29.5%	2.5%
101 to 200	6.52%	7.0%	83.0%	10.0%	0.5%	5.4%	0.7%
201 to 650	11.32%	5.0%	83.0%	12.0%	0.6%	9.4%	1.4%
651 to 850	2.22%	3.0%	84.0%	13.0%	0.1%	1.9%	0.3%
851 to 2550	14.65%	2.0%	85.0%	13.0%	0.3%	12.4%	1.9%
2551 to 5000	8.10%	1.0%	85.0%	14.0%	0.1%	6.9%	1.1%
5001 to 10,000	2.94%	1.0%	84.0%	15.0%	0.0%	2.5%	0.4%
> 10,001	1.23%	0.0%	84.0%	16.0%	0.0%	1.0%	0.2%
Total	100.00%				8.4%	82.2%	9.4%

Table 3
(Ex. 604 JWL-2, Table A14)
Recommended Structure Types for Copper Feeder

		Recommended Values			Weighted Average		
Density Zone	% Distribution	Aerial	Buried	Under-ground	Aerial	Buried	Under-ground
0 to 5	37.61%	11.0%	84.0%	5.0%	4.1%	31.6%	1.9%
6 to 100	39.79%	8.5%	84.0%	7.5%	3.4%	33.4%	3.0%
101 to 200	2.46%	7.0%	83.0%	10.0%	0.2%	2.0%	0.2%
201 to 650	4.42%	6.0%	81.0%	13.0%	0.3%	3.6%	0.6%
651 to 850	1.05%	5.0%	79.0%	16.0%	0.1%	0.8%	0.2%
851 to 2550	7.44%	4.0%	76.0%	20.0%	0.3%	5.7%	1.5%
2551 to 5000	4.23%	3.0%	73.0%	24.0%	0.1%	3.1%	1.0%
5001 to 10,000	1.86%	2.0%	70.0%	28.0%	0.0%	1.3%	0.5%
> 10,001	1.15%	0.0%	68.0%	32.0%	0.0%	0.8%	0.4%
Total	100.00%				8.4%	82.2%	9.4%

Table 4
(Ex. 604 JWL-2, Table A16)
Recommended Structure Types For Fiber Feeder

		Recommended Values			Weighted Average Values		
Density Zone	% Feeder	Aerial	Buried	Under-ground	Aerial	Buried	Under-ground
0 to 5	37.61%	0.1%	78.0%	21.9%	0.0%	29.3%	8.2%
6 to 100	39.79%	0.2%	65.0%	34.8%	0.1%	25.9%	13.8%
101 to 200	2.46%	0.5%	54.0%	45.5%	0.0%	1.3%	1.1%
201 to 650	4.42%	1.0%	44.0%	55.0%	0.0%	1.9%	2.4%
651 to 850	1.05%	1.0%	34.0%	65.0%	0.0%	0.4%	0.7%
851 to 2550	7.44%	0.0%	25.0%	75.0%	0.0%	1.9%	5.6%
2551 to 5000	4.23%	0.0%	20.0%	80.0%	0.0%	0.8%	3.4%
5001 to 10,000	1.86%	0.0%	15.0%	85.0%	0.0%	0.3%	1.6%
> 10,001	1.15%	0.0%	10.0%	90.0%	0.0%	0.1%	1.0%
Total	100.00%				8.4%	82.2%	9.4%

111. HAI allows users to input structure mix percentages. HAI also includes a structure shifting feature that, under certain conditions, changes the user specified structure mix and shifts plant from buried to aerial.[127] This feature must be disabled to ensure that a recommended structure mix is actually implemented. The ALJ recommends the Commission adopt the Department's recommended structure mix. The Commission should also direct that the structure shifting feature be disabled.

Structure Sharing

112. Structure sharing refers to the possibility that telephone companies may be able to share construction costs for placing outside plant with other companies. Utility poles may support power cables and CATV coaxial cable in addition to telephone lines. Similarly, trenches can be dug wider or deeper, or larger conduits installed, to permit multiple parties to share costs. For reasons similar to those discussed in the modeling of plant mix and installation costs, the FCC has tentatively concluded that the chosen model should permit sharing levels to vary according to installation activity, terrain conditions, and line density zones.[128] The FCC's conclusion in the context of universal service is also applicable, although certainly not binding, to this proceeding.

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127 Ex. 615 at 41-42.
128 FNPRM, ¶ 79.

113. HAI permits sharing to vary by line density zone.[129] The structure sharing assumption has a significant impact on outside plant costs.[130]

114. The FCC tentatively concluded that 100% of the costs of plowing in buried cable should be borne by the telephone company and that generally, 66% is an acceptable aggregate default value for the percentage of structure costs borne by the telephone company.[131] Again, these percentages are just as relevant to this proceeding as they are to universal services.

115. The telephone network is not going to be scorched and we will never know what structures might have evaporated along with the cable and other equipment. Although the scorched node concept of the FCC provides useful guidance for cost modeling on many issues, the FCC has not developed the concept in the context of structure sharing. This lack of direction permits the parties to this proceeding to take very different positions as to the sharing opportunities available to carriers in a scorched node framework.

116. The HAI sponsors contend that an efficient carrier would aggressively seek out sharing opportunities and would need to absorb only 33% of structure costs. U S WEST assumed to the contrary that there would be little sharing in the scorched node context because only telephone facilities are "scorched."[132]

117. It is appropriate to set UNE prices so as to minimally distort the economic signals that guide the decisions of entering carriers to place facilities while not diminishing the incentive for incumbent carriers to improve the efficiency of their operations.[133] In light of these goals, it is inappropriate to have little structure sharing and have high UNE prices simply because pavement has been laid over cable buried years ago. It is more expensive to bore under a road than it is to plow cable in a green field, it is economically irrational to bore in cable when existing cable is perfectly serviceable, and it is economically irrational to reward an incumbent carrier higher UNE prices to compensate for costs the incumbent never incurred. The decision on this issue should be based on what efficient forward-looking carriers are experiencing in the way of structure sharing today.[134]

118. On this basis, the Department contends the appropriate percentage of structure cost the telephone company should absorb in aggregate is 66%. Ex. 603 at 48. This is the roughly the midpoint of the percentage range of sharing that Mr. Kaalberg, Network Service President of McLeod USA, testified to the Iowa Commission that his company was able to achieve as a result of its aggressive search for sharing opportunities. It is also the sharing percentage recommended by Sprint and by the Federal-State Joint

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129 Ex. 615, Appendix B at 13, 18.
130 Ex. 623 at 6.
131 FNPRM, ¶¶ 80-81.
132 Ex. 603 at 48.
133 See, e.g., First Report and Order, ***Implementation of the Local Competition Provisions in the Telecommunications Act of 1996***, CC Docket No. 96-98 (Aug. 8, 1996) at 620; Ex. 621 at 30.
134 Ex. 621 at 10.

Board in the universal service context. FNPRM, ¶ 78. The ALJ recommends the Commission adopt the sharing percentage of 66%.

Buried Placement

119. The costs of placing cable underground are significant and include the costs of trenching, filling, and restoring the surface to its original condition. These costs will vary by density zone. It will be more expensive to dig and restore as the distribution area becomes more dense.

120. HAI permits placement costs to be varied by density zone. The record however does not support the adoption of HAI's default proposed costs for buried placement. The Department advocates averaging placement values of HAI with those of BCPM across the lowest seven density zones and accepting the BCPM values in the two highest density zones to avoid a major discontinuity in the rate at which costs increase with density. The more gradual rate of increase is consistent with Mr. Legursky's experience of how such costs should vary across density groups.[135] Table 5 provides the Department's recommended values. Mr. Legursky developed these values by appropriately changing the underlying parameters of percentages of installation by installation method.

Table 5
(Ex. 604 JWL-2 Table A20)
Recommended Buried Placement Cost Targets

Density Group	HAI Default	Distribution	Feeder
0 to 5	$1.77	$1.62	$1.60
6 to 100	$1.77	$1.79	$1.79
101 to 200	$1.77	$3.12	$2.62
201 to 600	$1.93	$3.83	$3.53
601 to 800	$2.17	$5.22	$4.64
801 to 2550	$3.54	$5.90	$5.32
2551 to 5000	$4.27	$6.49	$6.45
5001 to 10,000	$13.00	$9.47	$9.72
10,000 +	$45.00	$10.41	$10.80

121. Dr. Fitzsimmons criticized Mr. Legursky for placing equal weight on the unsupported national default values in the HAI model with the values in BCPM, which are based on U S WEST's actual contracted prices in Minnesota.[136] However, Dr. Fitzsimmons did not verify the placement costs used in BCPM,[137] is not experienced in placing cable, and is not an outside plant engineer.[138] Again, the ALJ finds

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135 Ex. 603 at 49-50.
136 Ex. 108 at 11.
137 Tr. Vol. 3 at 24.
138 Tr. Vol. 2 at 229.

Mr. Legursky's position more acceptable. The ALJ recommends the Commission adopt the placement costs advocated by the Department.

Channel Unit Investment

122. Fiber cable requires digital loop carrier (DLC) to convert optical signals into electrical impulses. Although HAI appropriately models DLC deployment, its default values for the DLC POTS channel unit is too high. Mr. Legursky obtained information about U S WEST's actual cost for such cards in August 1997. On this basis, Mr. Legursky recommended reducing the HAI POTS channel unit price. His recommendation is proprietary and is set forth in Legursky Direct Testimony, Ex. 603 at 53-54. The ALJ supports this recommendation.

Recommended Modifications To HAI

Dedicated Idle

123. Dedicated idle lines should be included in the model. Their existence permits customers to move among existing locations without requiring the construction of new access lines. Although the costs of these lines should be included in computing total UNE costs, these lines should not be counted in computing average costs because they do not generate revenue. The count of dedicated idle lines could be added to current demand and the resulting costs could be divided by current demand only.[139] Dedicated idle lines are the difference between the total count of assigned lines and the total count of working lines.[140] Dr. Fagerlund applied this definition to data submitted with U S WEST's RLCAP study to determine that approximately four percent of U S WEST's lines are dedicate idle lines.[141] The ALJ accepts this estimate.

Treatment Of Special Access Lines

124. This second line count issue involves how special access lines should be counted. Special access lines are non-switched lines that provide high speed digital services, analog and digital data circuits, private-line, and other services. Some special access lines require a single pair, but others, including all digital services, require two pairs. The HAI permits the user to input the number of special access lines. The number of special access lines is important because of economies of scale in the construction of telephone networks. Larger numbers of special access lines will result in lower average costs per line.[142]

125. It is the Department's position that special access lines should be counted one way in the distribution plant and another way in the feeder plant. In the distribution plant, special access lines should be counted on a "pair-equivalent" basis. That is, two pairs of wires (a four-wire circuit) should be counted as two lines regardless of how many circuits may actually be provided to customers over that facility. For example, a

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139 Ex. 623 at 14-15.
140 Ex. 504 at 10, n. 1.
141 Ex. 623 at 15.
142 Ex. 603 at 43.

DS1 circuit is capable of providing up to 24 circuits or "lines" for customers but it only requires two pairs of wires in the distribution plant.[143] Since only two pairs of wires need be installed in the distribution plant to provide a DS1 circuit, only the costs of installing those pairs should be included in total facilities costs and not the cost of installing a cable of 24 or more pairs or lines. On a pair equivalent method of calculation, there are about 170,000 special access lines in U S WEST's territory in Minnesota.[144]

126. In the feeder plant, however, a different counting method, a "circuit-equivalent" method, is appropriate. Special access lines provisioned over fiber-fed digital loop carrier do not require cable pairs. For example, to operate at full capacity, a DS1 circuit in the feeder plant requires that 24 channels of the fiber's total channel capacity be available to it. Unlike distribution plant where a two-pair cable may provide 24 "lines" of services, in the feeder plant, 24 channels are needed to provide 24 "lines" of services. On a circuit-equivalent method of calculation, there are about 616,000 special access lines in U S WEST's territory in Minnesota. *Id.*

127. HAI permits special access lines to be input on either a pair or voice grade channel basis. However, the model will use that number both in the distribution and in the feeder plant. *Id.* The Department accordingly advocated in the universal service cost model selection proceeding that AT&T and MCI as HAI model sponsors be directed to change the model to permit special access lines to be counted one way in the distribution plant and another way in the feeder plant.

128. In response to the Commission's order recommending the HAI model to the FCC for use in calculating Minnesota universal service costs, AT&T developed a method to run the HAI model twice to get the correct result. This method also incorporates the modification for dedicated idle discussed above. The ALJ recommends the Commission approve the Department's approach and the method to implement it developed by AT&T. The Commission should direct U S WEST to provide the necessary information.

The Model Should Correctly Calculate Line Card Costs.

129. U S WEST witness Dr. Fitzsimmons and AT&T/MCI witness Mr. Denney agreed that the HAI underestimates the cost for the line cards in the distribution model.[145] Although not part of the record in this proceeding, Mr. Denney has developed a simple fix for the model where the line card investment is developed for the same number of lines that are used in the denominator to develop the per line cost estimates. This correction will add on average from about $.05 to $.10 to the monthly cost of the loop. The ALJ recommends that the compliance run of the HAI model include this correction.

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143 Ex. 603 at 44.
144 *Id.*
145 Tr., Workshop, at 181.

The Model Should Be Run With Accurate Line Count Data

130. The ALJ also adopts the Department's position that the HAI model can be run with actual line counts by wire center.[146] The use of accurate line counts at the wire center level will improve the accuracy of the model's cost estimates.[147] U S WEST should supply the special access line counts data to be used in the model.[148] Finally, the 32 exchanges recently sold by U S WEST should be removed from the model.

GEOGRAPHIC DEAVERAGING

131. The HAI estimates costs at the cluster level. It can then report those costs by cluster or, by accumulating appropriate clusters, by CBGs, wire centers, density levels, or company wide. In theory, it is possible to set prices at any of those levels or groupings. Pricing at the cluster level would be very difficult because it would be very difficult to identify customers to the appropriate PNR cluster. Moreover, as discussed above, there is not sufficient accuracy of the cost estimates at the cluster level; sufficient confidence in the cost estimates only exists when clusters are accumulated to the wire center level. Similarly, actual line counts exist only at the wire center level. Similar accuracy problems exist for CBGs, which may be about the same geographic size or only slightly larger than an HAI cluster. Density levels cannot be used because they are not geographic areas at all, but physically separate clusters with similar densities that may be located anywhere in the company's service area. To use them would also require the ability to identify customers to particular HAI clusters and confidence in the accuracy of individual cluster cost estimating. Thus, at the present time, prices can only be "deaveraged" (actually, accumulated) to the wire center level or must be set on a company-wide basis.

132. Deaveraging UNE rates without deaveraging retail rates would allow CLECs to capture U S WEST's low cost customers and leave U S WEST serving only its high cost customers. Such a situation would create pressure to deaverage retail rates. In the absence of Universal Service support, high cost customers, primarily rural customers, would pay significantly more for service than low cost, primarily urban customers. This situation would violate section 254(b)(3) of the Act, which requires rates in rural areas be reasonably comparable to urban rates. Development of geographically deaveraged UNE prices must be coordinated with Minnesota's Universal Service Support program, which has not yet commenced.[149]

COST FACTORS

HAI Overhead Cost Factor.

133. The corporate overhead or common overhead factor represents those costs that are common to the production of all elements of the firm and do not vary based on the

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146 Tr. Vol. 3 at 18-19.
147 Ex. 621 at 28.
148 Ex. 641.
149 Ex. 622 at 7.

quantity produced of any single element. The network operations factor recovers cost associated with power, provisioning, engineering, and network administration expenses.[150]

134. AT&T developed a 10.4% overhead cost factor based on data filed on Form M of AT&T's annual report to the FCC for the year ended December 31, 1994. However, the telecommunications industry is rapidly changing. Changes in the industry will result in changes in costs. Data from 1994 is stale and should not be used as the basis for developing forward-looking costs in a 1997 cost study. Moreover, there is no reason that the common overhead factor advocated by AT&T based on its costs as an interexchange carrier is a reasonable proxy for the common overhead factor of an efficient local exchange carrier in a competitive market.[151]

135. The HAI 10.4% overhead factor is applied against annual capital costs plus network expenses, support expenses, and other taxes. Yet, the overhead factor is calculated as a percentage of revenue. Department witness Doyle testified that since the overhead cost factor is applied to an expense number, the factor should be developed as a percentage of total expenses plus return on equity and debt capital rather than total revenue. Mr. Doyle noted that the HAI model allows the input factor for the corporate overhead factor to be changed to a factor based on total expenses without making other changes to the model.[152]

136. While there are various accounts included by U S WEST in its common cost factor that are not included in the HAI common overhead factor, these accounts have not been ignored by the HAI model. Rather, HAI includes these accounts in other parts of the model such as "Supporting Network Expenses, Network Support." The HAI model includes all the appropriate expense accounts in the cost of network elements.[153]

Overhead Factor.

137. Department witness Doyle developed a common overhead factor of 13.09% based on allowable common overhead costs as a percentage of total expenses plus return on equity and debt capital less common overhead costs.[154]

138. Mr. Doyle developed the factor by compiling each of the accounts that U S WEST uses in the development of its common, attributed, and administrative cost factors. He identified the dollar amount associated with each of the accounts based on 1996 ARMIS data from Minnesota, eliminated accounts that are recovered elsewhere, excluded unrelated accounts, and made adjustments to account for costs that are attributable to the provision of retail service. Mr. Doyle then appropriately calculated the overhead expense factor as a percentage of total expenses plus return on equity and debt capital.

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150 Ex. 609 at 14.
151 *Id.* at 15.
152 Ex. 609 at 15.
153 *Id.* at 16-17.
154 Ex. 613 at 6.

139. The overhead factor developed by Mr. Doyle accounts for efficiencies that are anticipated to result from competition for local service. The overhead factor is a percentage applied to annual capital costs plus network expenses, support expenses, and other taxes. To the extent that any of the components to which the factor is applied have been reduced, the total overhead costs are also reduced.[155]

140. In addition, uncollectibles are included in the annualized direct cost of the unbundled network elements. To recover uncollectibles in the common overhead factor would result in double recovery of this account and thus, this account must be excluded.

141. The overhead expense factor calculation should include return on equity and debt capital in the denominator since the factor is applied to expenses plus return on equity and debt capital in the HAI model. The calculation should also reflect a return on rate base using the 9.60% overall cost of capital and a rate base of $1,207,192,007.00 as reported by U S WEST in its 1996 annual report filed with the Department. These modifications result in a common overhead factor of 13.09%.[156] The ALJ finds that the overhead factor calculated by Mr. Doyle is appropriate and recommends that the Commission adopt it.

Network Operations Expense.

142. Network operations consist of provisioning expenses, power expenses, network administration, testing, plant operations administration expense, and engineering. Of these accounts, testing, plant operations administration expense and engineering make up approximately 85% of the total of network operations expenses. While the parties all agree that U S WEST's historical data should be used as the proxy to determine network operations expense, they disagree on the network operations factor to be applied to that data to reflect the expense that should be used in a forward-looking cost study.

143. The HAI model adjusts U S WEST network operations expenses by 50% to reflect efficiencies in network operations that may occur in a competitive environment. The HAI sponsors support their proposal for a 50% reduction of U S WEST's network operations expense factor by contending that new technologies being used will reduce labor costs. The HAI sponsors also state that network operations expenses have declined over the past several years and that this trend should continue as modern systems and technologies are deployed. While they have demonstrated that some of amount of savings should be recognized, they provide no quantitative support for their proposal of a 50% factor.[157]

144. U S WEST claims that it is an efficient operator and that no reduction from its historical cost should be made. That extreme position is contrary to the evidence here.

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155 *Id.* at 21.
156 Ex. 613 at 7.
157 Ex. 609 at 23.

145. The Department's position is that the value should represent the network operations expenses of an efficient firm operating with the best available technology.[158] To make such a determination, Department witness Doyle compiled Minnesota-specific data for each of the accounts included in network operations expenses for the years 1990 through 1996, as presented in U S WEST's annual report filed with the Department.

146. The 1996 ARMIS data reflect approximately $90 million in network operations expenses. If the Commission were to adopt the 50% factor advocated by AT&T and MCI, the network operations expenses used in the HAI model would be approximately $45 million dollars. Even if U S WEST were operating efficiently with the best available technology, to set network operations expenses at $45 million for the purpose of establishing the cost of unbundled network elements is not reasonable given the historical experience of the accounts. The history of network operations expenses in Minnesota revealed that the total expense has generally increased each year, contrary to the claims of the HAI sponsors. There have been reductions in testing and engineering expense accounts, but such reductions have been offset by significant increases in plant operations administration expenses.[159]

147. A reasonable estimate of the network operations factor to use in the HAI model should be closer to the position of U S WEST than AT&T/MCI. Based on the past experience of these accounts, a value of 85% of the 1996 ARMIS data is reasonable data for use in the HAI model. Mr. Doyle came to the opinion based on his review that a factor of 85% provides a reasonable estimate of network operations expenses.[160] The ALJ agrees.

Cost Of Capital

The Department's Analysis

148. Based upon the testimony of Department witness Stephen Hill, the ALJ Finds U S WEST's Forward-Looking Cost Of Capital Is 9.60% which is based upon consideration of 1) two sample groups of market-traded firms whose operational risk brackets that of U S WEST's local loop operations (gas distribution companies and the former-Bell regional holding companies) and 2) a reasonable range of capital structures based on both book and market values of similar-risk firms.[161]

149. Interest rates and capital costs have declined and remained very low relative to the interest rate levels that existed in the mid 1980s. Long-term interest rates remain well below the levels that existed during the interest rate lows of 1986 and 1987 (the last substantial trough in interest rates) and the Federal Reserve's monetary policy

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158 Ex. 613 at 9; Ex. 621 at 7.
159 Ex. 613 at 8.
160 *Id.* at 10-11.
161 Ex. 602 at 2-3.

continues to be more accommodative than it was at that time.[162] In addition, inflation levels are expected to continue to remain at relatively low levels in the future.[163] Simply put, the low levels of inflation and the relatively low interest rates that currently exist are expected to be maintained through the end of the decade. These economic data indicate than the cost of capital is, and will continue to remain, relatively low.[164]

150. Both a market-based capital structure and a book value-based capital structure should be used for calculating a reasonable range of overall long-run incremental capital costs in this proceeding. While there is theoretical support for the exclusive use of a market-based capital structure in a capital budgeting decision process, a more reasonable approach is to consider both market-based and book value-based capital structures to develop a range of overall long-run incremental costs, with the market-based capital structure establishing an upper bound of that range and the book value-based capitalization establishing a lower bound of the range.[165]

151. For an estimate of the market-based capitalization of U S WEST-Minnesota, Mr. Hill accepted the Company's recommended capital structure of 72% common equity and 28% debt. He also accepted, for costing purposes, the Company's estimate of its incremental debt cost, 7.53%.

152. Mr. Hill used the average book value capital structure of the former Bell regional holding companies (RHCs). The RHCs and U S WEST are currently capitalized, on average, with 47.10% common equity and 52.90% debt capital. Mr. Hill uses this current average book value capital structure ratio as well as the Company's requested market-value capitalization in determining an overall long-run incremental cost of capital. The two capital structures (market and book) along with the Company's estimated incremental cost of debt, 7.53%, are shown on page 2 of Schedule 2 of Ex. 601.[166]

153. While a market-based capital structure should be considered in setting long-run incremental costs for the local exchange network, a market-based capital structure should not be given sole consideration in this proceeding. Book-value capital structure must also be given some consideration in determining the Company's long-run incremental capital costs for several reasons.[167] But, capital structure selected for use in this proceeding should be representative of the manner in which U S WEST will actually finance its local loop operations. While the Company could elect to finance its plant investment with the capital ratios evident in its market-based capital structure, the Company is also free to select any other financing mix. In order to estimate a reasonable, forward-looking cost of capital, the actual book value capital structure of similar-risk firms must also be considered.

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162 Ex. 600 at 5-6.
163 Ex. 600 at 4.
164 *Id.* at 6-8.
165 *Id.* at 18.
166 *Id.* at 20.
167 *Id.* at 11-12.

154. First, the literature of corporate finance supports the use of book-value capital structure as well as market-based capital structure in determining the overall cost of capital.[168] Even advocates of the use of market-based capital structures in theoretical approaches, such as Professor Erhardt (an authority cited by U S WEST witness Cummings), also recognize that book value capital structures can be used to estimate overall capital cost rates for capital budgeting purposes.[169]

155. Second, surveys of financial managers who actually make capital budgeting decisions indicate that they use book-value weights as well as market-value weights for that purpose.[170]

156. Third, investors are exposed primarily to book-value capital structure information in making their assessment of equity investment opportunities, since book-value capitalization data is prevalent in financial reporting, and market-value capital structure information is not. Moreover, the book value capital structure that the Company reports to the financial community is reasonably associated with the forward-looking costing paradigm at issue in this proceeding because that capital structure reflects the discontinuance of regulatory accounting. Since investors rely on book-value information in making their decisions, and markets are assumed to be informationally efficient, the book-value capital structure data deserves consideration in the estimation of an overall cost of capital.[171]

157. Fourth, U S WEST's actual use of external debt and equity funds in recent financing operations does not support the use of a market-based capital structure as the sole determinant in this proceeding. In capital budgeting, the purpose of a weighted average capital structure is to estimate the overall cost of capital of the particular project being evaluated. The fundamental assumption is that the proportions of the types of capital used in the weighted cost of capital are equivalent to the capital actually used to fund the project. Therefore, the assumption implicit in the use of U S WEST's market-based capital structure is that new plant investment will be made with the same proportion of capital that exists in the market-based capitalization.

158. Mr. Hill reviewed U S WEST's cash flow statement over the last three years to test this assumption. It indicates that the Company has financed its plant with a mixture of capital which is substantially different than its market-based capitalization. The data indicates a ratio of external financing consisting of 27.32% equity and 72.02% debt--almost precisely the reverse of the market-based capital structure with which the Company requests it marginal capital costs be set.[172] Therefore, the assumption implicit in the use of a market-based capital structure, i.e., that the incremental plant added by the Company will be financed in precisely the same proportions as that which currently exists in the market-based capitalization, is not necessarily an accurate assumption.

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168 *Id.*
169 Ex. 602 at 6.
170 Ex. 600 at 12.
171 Ex. 600 at 12.
172 *Id.* at 14-15.

This makes sole reliance on a market-based capital structure for estimating the Company's long-run marginal cost not necessarily representative of those costs. A more balanced approach considers both market-based and book value-based capital structures to estimate the reasonable long-run overall cost of capital.[173]

159. Fifth, book value-based capital structures, as well as market-based capital structures, should be considered in this proceeding because the nature of the costs included in the process of estimating the total element long-run incremental costs in the proceeding are not all forward-looking incremental costs. For instance, the local loop cost estimates presented by the Company, and to a lesser extent by the Department, depend, in part, on embedded costs and factors, not incremental costs. To the extent that costs included in the estimate of local loop costs are embedded costs, consideration of a book value rather than a capital value capital structure is required. Indeed, U S WEST has stated that it believes that it is entitled to the difference between embedded costs and TELRIC in order to have an opportunity to earn a reasonable profit on its book value investment. Therefore, the book value of the Company's local loop assets remains an important decision tool for management.[174]

160. In summary, for the many reasons set out above, the ALJ has considered both market-based capital structures and book value-based capital structures in determining the Company's long-run incremental capital costs. For an estimate of the market-based capitalization, the ALJ recommends the Commission use the Company's recommended capital structure of 72% common equity and 28% debt. The Commission should also use the Company's estimate of its incremental debt cost rate, 7.53%. For an estimate of the book value capital structure, the Commission should use the average book value capital structure of the former RHCs. The average for the RHCs is 47.10% common equity and 52.90% debt capital.

161. Department witness Hill estimated U S WEST's cost rate of common equity capital for the company's telecommunications operations using a discounted cash flow (DCF) model analysis as well as three corroborative analyses. The three corroborative analyses used by Mr. Hill were the modified earnings-price ratio (MEPR) analysis, the market-to-book (MTB) ratio analysis, and the Capital Asset Pricing Model (CAPM) analysis. These independent analyses led Mr. Hill to conclude that a reasonable range for the cost of equity capital for U S WEST ranges from 10.75% to 11.25%, with a mid-point of 11.00%.[175]

162. Under the DCF model, the total return to the investor, which equals the required return, is the sum of the dividend yield and the expected growth rate in the dividend. The growth rate variable in the traditional DCF model is quantified theoretically as the dividend growth rate investors expect to continue into the indefinite future.[176]

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173 *Id.* at 16.
174 Ex. 600 at 17.
175 Ex. 600 at 49-50.
176 *Id.* at 20

163. Mr. Hill used the sustainable growth rate approach to develop an estimate of the expected growth rate in the DCF model. Mr. Hill calculated both the historical and projected sustainable growth rate for samples comprised of the former Bell Regional Holding Companies (RHC) and natural gas-distribution companies. To supplement the sustainable growth rate analysis, Mr. Hill also analyzed published data regarding both historical and projected growth rates in earnings, dividends, and book values for all the companies under study.[177]

164. Mr. Hill selected the RHCs for analysis for the cost of equity capital of U S WEST's Minnesota operations even though there are significant changes occurring in the telecommunications industry that make the RHCs more risky and their equity costs higher than those of local exchange telephone operations such as U S WEST-Minnesota. He did so because an equity cost analysis of the RHCs still offers useful information in estimating the equity capital cost of a telephone utility operation. For example, U S WEST, Inc.'s 1996 Securities and Exchange Commission Form 10-K reports that 78% of its revenues and 82% of its operating income were generated by U S WEST Communications. Since the local exchange operation is a fundamental portion of the business of an RHC, the stock price of those firms should be representative of the risk entailed in those operations. Of course, since the RHCs have stepped up diversification efforts by entering such markets as cellular telephone and the entertainment industry, that increased risk and the concomitant higher return expectation is also impounded in the RHC's stock prices. Therefore, while local exchange operations remain at the core of the RHCs and their market data provide a reasonable indication of the cost of equity of that type of firm, those companies also have invested in riskier operations which will raise the market required return for those firms above that of a local exchange telephone company.[178]

165. Because the cost of equity capital estimate derived from RHCs would be greater than is required for a local exchange telephone operation, it is necessary to also analyze a group of companies that are relatively similar in risk to local exchange telephone operations, but have somewhat lower overall risk. Natural gas distribution companies fulfill this requirement. Mr. Hill therefore also analyzed the market data of a sample of gas distribution companies in conducting his DCF analysis.[179]

166. The similarities between gas distribution companies and local telephone companies include the bifurcation of the gas industry and the telephone industry, the ability of customers to bypass both industries in certain circumstances, and similar operational risks. The similarity in operational risks is borne out by the bond rating benchmarks Standard & Poor's publishes for both types of companies. Standard and Poor's interest coverage benchmarks delineate an area in which the risks are essentially the same for gas distribution companies and local telephone companies or telecommunications firms. Natural gas distribution utilities experience some of the

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177 *Id.* at 21.
178 *Id.* at 23.
179 *Id.* at 24.

same competitive pressures that are expected to exist in the local exchange telephone market. The gas distribution companies are currently unbundling their services to facilitate their customers' purchase of gas from competing companies. However, many of those firms are also retaining aspects of utility operations in that they will be the entity that actually delivers the commodity to the end user. The quasi-competitive/utility situation in the gas distribution industry is similar to that in the local exchange telephone industry. Even though some CLECs may in the future be able to construct parallel telecommunications networks, the traditional local exchange carriers such as U S WEST are expected to remain dominant in the market for local exchange telephone services, and like the gas distributors, will be the conduit through which most end users purchase their telecommunication services. These and other similarities between gas distribution operations and local exchange telecommunication companies described in Mr. Hill's testimony support the use of market data regarding gas distribution operations as useful information in confirming the reasonableness of the lower end of an equity cost estimate range for U S WEST.[180]

167. After determining the companies in his two similar-risk sample groups, Mr. Hill then conducted a sustainable growth rate analysis to determine an internal growth rate from earnings retention for both the RHCs and the gas distribution companies. He then considered investor expectations regarding growth from external sources (sales of stock) to complete his final DCF growth rate for use to estimate the cost of equity capital. A complete discussion of Mr. Hill's growth rate analysis for each company studied is contained in Exhibit 601, Appendix C.

168. Mr. Hill's DCF growth rate estimate closely approximates publicly available data. Mr. Hill found an average sustainable growth rate estimate for the RHCs to be 8.01%. This compares with Value Line's projected average growth rate in earnings, dividends and book value of 7.99% for the same companies and the average projected Institutional Brokers' Estimate System (IBES) earnings growth rate for those companies of 7.92%. Also, the growth rate average used in Mr. Hill's analysis is much higher than either historical growth rate series shown in his growth rate analysis for all of the companies included in the similar-risk sample group.[181] This indicates that Mr. Hill's analysis is not based only on historical data but takes into account the RHC's increased future growth expectations. Moreover, the data indicates that investors expect higher growth from their telephone company investments than they have achieved in the past.[182]

169. Mr. Hill's average growth rate estimate for the gas distribution companies he analyzed is 5.49%. This figure is higher than Value Line's projected five-year growth rate in earnings, dividends and book value for the same companies (4.95%). The average growth rate used in Mr. Hill's DCF analysis of the gas distributors is substantially higher than Value Line's projected dividend growth for those companies

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180 Ex. 600 at 9.
181 Ex. 601, Schedule 4 at 1-4; Ex. 600 at 31-32.
182 *Id.*

(3.09%) and higher than the projected book-value growth rate (4.55%). On the other hand, his growth rate estimate is lower than IBES's average projected five-year earnings growth rate for those same companies (5.82%). As noted below, some of the earnings growth rate projections are exaggerated by the use of poor earnings years used as a base in the growth rate calculation methodology. Mr. Hill's recommended growth rate is above historical and earnings dividend rates as reported by Value Line as well as the compound historical earnings growth rate shown in his Ex. 601, Schedule 4 at 4.[183]

170. Following his determination of growth rates, Mr. Hill estimated the next quarterly dividend payment of each utility and annualized them to determine the dividend yield. The DCF dividend yield is presented in Schedule 5 of Ex. 601. In deriving the dividend yields presented in Mr. Hill's Schedule 5, he did not adjust the dividend yield to account for quarterly compounding of the dividends because such an adjustment results from an improper interpretation of the theory on which the DCF model is based and serves only to inflate a DCF-determined equity capital cost estimate. The DCF model is a quarterly model, not an annual model, because the dividends are paid quarterly rather than annually. The DCF model implicitly recognizes the quarterly payment of dividends. It does not require any "adjustment" to account for one year's expected growth. *Id.* at 33-36.

171. Mr. Hill's cost of equity capital estimate for the sample group of telecommunications firms and gas distribution utilities using the DCF model shows the average DCF cost of equity capital for the group of diversified telecommunications firms as 11.61% while the DCF result for gas distribution utilities companies studied is 10.53%.[184]

172. Mr. Hill conducted a modified earnings-price ratio (MEPR) analysis to corroborate his findings and because such an analysis can be a reliable indicator of the proper range of equity costs. The earnings-price ratio, which is one portion of the MEPR analysis, is calculated as the expected earnings per share divided by the current average market price. Further, the earnings-price ratio, itself, is an accurate indicator of equity capital cost rates when the market price of a stock is near its book value. When the market value of a stock is below its book value, the earnings-price ratio overstates the cost of equity capital. Conversely, the earnings-price ratio understates the cost of equity capital when the market price of a stock is above book value.[185]

173. Because of these problems with the earnings-price ratio, Mr. Hill did not use the ratio alone without modification as an indicator of equity capital cost rates. Mr. Hill modified the earnings-price ratio by averaging that parameter with an investor-expected return on equity. This equity cost estimation technique is also termed the "mid-point

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183 *Id.* at 32.
184 Ex. 600 at 36; Ex. 601, Schedule 6 at 1-2.
185 Ex. 600 at 36.

approach" because the equity cost estimate is the mid-point between the earnings-price ratio and the expected return on equity.[186]

174. The Federal Energy Regulatory Commission used this technique in its generic rate of return hearings indicating that under the circumstances of market-to-book ratios exceeding unity, the cost of equity is bounded above by the expected equity return and below by the earnings-price ratio. The mid-point of these two parameters produces an estimate of the cost of equity capital which, when utilities market-to-book ratios are different from unity, is far more accurate than the earnings-price ratio alone.[187]

175. Mr. Hill testified and the ALJ agrees that the result of the modified earnings-price ratio analysis for telephone companies is not useful because of the accounting changes those firms have undertaken during the last few years. One of the tenets of the modified earnings-price ratio analysis is that the earnings base of the firm is consistent. The telephone companies' election to discontinue regulatory accounting for their utility assets violates that tenet. Therefore, while Mr. Hill testified that the modified earnings-price ratio analysis is a reliable corroborative methodology for utility operations that earn and report equity returns on the same basis such as gas distributors, it is not currently reliable for telephone firms.[188]

176. Mr. Hill shows his results of his modified earnings-price ratio analysis of the cost of equity for the sample groups under study on pages 1 and 2 of Schedule 8 of Exhibit 601. The MEPR results for the telecommunications holding companies are well above the DCF results previously derived by Mr. Hill. In the gas distribution sample group, the mid-point of the current earnings-price ratio is 6.98% and the 2000-02 projected equity return is 10.04%. These results are below the DCF equity cost estimates for the gas distributors derived by Mr. Hill.[189]

177. Mr. Hill conducted a market-to-book (MTB) analysis of the cost of common equity capital for his sample group. This technique of analysis is a derivative of the DCF model that attempts to compensate the capital cost derived for inequalities which might exist between a firm's market price and its book value per share. Although this method of analysis is derived from the DCF model and therefore cannot be considered a strictly independent check of that method, the MTB analysis is useful in a corroborative sense in that it seeks to determine the cost of equity using market-determined parameters in a different format than that employed in the DCF analysis. In the DCF analysis, the available data is "smoothed" to an extent to identify investor's long-term sustainable expectations. The MTB analysis employed by Mr. Hill relies instead on point-in-time-data projected one year and five years into the future and thus offers a practical corroborative check of the traditional DCF.[190]

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186 *Id.*
187 *Id.* at 38.
188 *Id.*
189 *Id.* at 39-40.
190 *Id.* at 40.

178. Mr. Hill derived the MTB cost of equity capital for the RHCs as 12.13% using data from 1997 and 10.84% using data from the 2000-2002 period. The MTB cost of equity for the sample of gas distribution utilities is 10.71% using the current year data and 10.32% using projected data.[191]

179. Finally, Mr. Hill used the Capital Asset Pricing Model (CAPM) to corroborate his estimate of the rate of equity capital for U S WEST. The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium which is proportional to the systematic risk of a security. Systematic risk refers to the risk associated with movements in the macro-economy and thus cannot be eliminated through diversification by holding a portfolio of securities. The beta coefficient is a statistical measure which is an attempt to quantify the non-diversifiable risk of the return on a particular security against the return inherent in general stock market fluctuations.

180. Mr. Hill used the CAPM in his analysis as one of several checks of the DCF cost of equity estimate. Although he testified that the CAPM is generally useful in estimating the cost of equity capital, certain theoretical shortcomings of this model reduce its usefulness as a stand-alone analytical technique. Ex. 601. According to the National Association of Regulatory Utility Commissioners' annual survey of regulation, the number of utility regulatory commissions in the United States and Canada that list the CAPM as one of the equity cost estimation methodologies to consider is 11, whereas the DCF is utilized by nearly every single regulatory body.[192] Also, beta is the only risk measure used in the CAPM and it is calculated from historical data. Yet, the cost of capital is forward-looking.[193]

181. Under the CAPM design, the risk-free rate is that short-term rate of return investors can utilize with certainty. Mr. Hill used the 13-week U.S. Treasury Bill from ***Stock, Bonds, Bills And Inflation: 1997 Yearbook*** by R. G. Ibbotson Associates to determine the market risk premium for his CAPM analysis. That source indicates that the average market risk premium between stocks and T-Bills over the 1926-1996 time period is 8.9% based on an arithmetic average and 7.0% based on a geometric average.[194]

182. Both arithmetic and geometric means are recognized in the financial literature and the financial media as measures of historical returns. Mr. Hill used data coefficients published by Value Line to conduct his CAPM analysis. This data are derived from a regression analysis between weekly percentage changes in the market price of a stock and weekly percentage changes in the New York Stock Exchange Composite Index over a period of five years.[195]

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191 *Id.* at 40-42.
192 Ex. 600 at 42-43.
193 Tr. Vol. 2 at 111.
194 *Id.* at 45.
195 *Id.*

183. The results of Mr. Hill's CAPM analysis of the cost of equity for the RHCs and the gas distributors shows a range of CAPM equity cost estimates for the RHC sample group of 11.30% to 13.01% with a mid-point of 12.16%. His CAPM analysis for the gas distribution group produced a range of equity cost estimates from 9.20% to 10.34% with a mid-point of 9.77%.[196]

184. The results of Mr. Hill's equity capital cost analysis for the sample group of telecommunications holding companies and gas distribution companies is as follows:

METHOD	RHCs	GAS DISTRIBUTORS
DCF	11.61%	10.53%
MEPR	16.62%/13.92%	9.14%/10.04%
MTB	12.13%/10.84%	10.71%/10.32%
CAPM	12.16%	9.77%

185. Mr. Hill's best estimate of an appropriate range of cost of equity capital for a gas distribution operation similar in risk to the companies analyzed is 10.25% to 10.75%. In the case of the gas distributors, the corroborative equity cost estimation analyses produce results which are, for the most part, lower than the DCF estimate. A range of 10.25% to 10.75% gives primary weight to the DCF estimate for the gas distributors and recognizes that the corroborating methodologies produce results both below and above the DCF.[197]

186. As can be seen from the table above, the corroborative methodologies produce estimates for the RHCs that are also both above and below that sample group's DCF equity cost estimate. For reasons of consistency, the Modified Earnings Price Ratio (MEPR) results for the RHCs are reported in the table above, but should be afforded little weight due to the systematic aberrations in reported book returns for those firms. The average of the remaining corroborative methodologies (MTB and CAPM) for the RHCs is 11.71%, approximating the DCF result of 11.61%. Therefore, a range of equity capital cost estimates around the DCF result for the RHCs is indicated. Rounding the DCF result up to the nearest 1/4 percentage point, 11.75%, and establishing a 50 basis point range around that equity cost estimate produces a range of equity cost estimates for the RHCs of 11.25% to 12.25%.[198]

187. As noted above, diversified telecommunications holding companies are riskier than local exchange telephone operations. And gas distributors have similar but somewhat less risk than a local exchange telephone operation. Therefore, an appropriate equity return for U S WEST's local exchange operations in Minnesota is below that derived for the RHCs but above that appropriate for a gas distribution

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196 *Id.* at 48.
197 *Id.* at 49.
198 *Id.*

operation. Mr. Hill testified that an equity cost range of 10.75% to 11.25% (midpoint = 11.00%) encompasses the equity capital cost estimates of both the gas distribution sample and the RHCs in that it includes the top of the range of the gas distributors (10.75%) and the bottom of the range of equity costs for the RHCs (11.25%). Mr. Hill recommended that the mid-point of that range, 11.00%, be used for cost-setting purposes.[199]

188. Mr. Hill's Schedule 11 shows that, with an allowed return on equity capital of 11.00%, using both a book value capital structure and a market value capital structure, U S WEST-Minnesota's overall cost of capital would range from 9.16% to 10.03%. The mid-point of that range is an overall return of 9.60%.[200] The ALJ recommends the Commission adopt a 9.60% cost of capital rate for U S WEST in this proceeding.

U S WEST's Analysis

189. U S WEST witness Cummings relied on an equal weighting of the results of a DCF analysis and a CAPM analysis to estimate U S WEST's equity capital cost rate. Mr. Cummings' DCF methodology is unsound and his CAPM analysis is flawed. Mr. Cummings' corroborative analyses are similarly flawed and should be rejected by the Commission.[201]

190. U S WEST terms its version of the DCF the "quarterly DCF" model. This version of the DCF model produces cost of equity results which are higher than the standard DCF model.[202] Its complexity makes it doubtful that the average investor actually uses it. It implicitly assumes that dividends increase every quarter, but, that is not the manner in which dividends are actually paid out by utilities.

191. Mr. Hill testified that the projected earnings growth rate should not be used as the only source of a DCF growth estimate as Mr. Cummings did in this case because projected earnings growth rates are influential in, not necessarily determinative of, investor expectations. Moreover, exclusive reliance on analysts' projected earnings growth rates in a DCF equity cost estimate can produce unreliable results, and the IBES "consensus" growth rate estimates for Mr. Cummings' telecommunications firms are based on projected earnings growth rates which, overall, show a divergence rather than a consensus of investor opinion.[203]

192. In addition to his DCF analysis of telecommunications companies, Mr. Cummings performed a "comparable company" DCF. Mr. Cummings' "comparable company" DCF cost of capital study examines the market data of a group of firms selected by a risk parameter screening process, but only a few of the firms in Mr. Cummings' "comparable risk" group enjoy anything approaching the dominant market position of a local exchange telephone operation and the DCF cost of equity for the competitive firms

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199 *Id.* at 50.
200 *Id.* at 51.
201 Ex. 600 at 53.
202 Ex. 660 at 54.
203 *Id.* at 55-56.

included in Mr. Cummings' sample group is statistically significantly different from the similar companies which are regulated.[204]

193. The ALJ concludes that the U S WEST DCF analysis should not be relied upon in this proceeding.

194. Mr. Cummings uses the CAPM as a co-equal analytical method to the DCF. In addition to the earlier stated shortcomings of CAPM, there are also aspects of Mr. Cummings' application of the CAPM which causes the result to be overstated.[205]

195. In his testimony, Mr. Hill points out that the use of a long-term Treasury security as the risk-free rate in the CAPM includes a level of inflation-related systematic risk which is not called for in the theory on which the CAPM is based. Brealey & Meyers, a source on which Mr. Cummings relies in his direct testimony in this proceeding, in ***The Principles of Corporate Finance, 4th Ed.*** (McGraw-Hill, New York, p. 194), indicate that the difference between the historical average annual return of T-Bonds and T-Bills should be subtracted from the current T-Bond rate to produce what amounts to a forward-looking T-Bill rate--the proper risk-free rate to be included in the CAPM. Mr. Cummings fails to make such an adjustment, and, in so doing, overstates his CAPM cost of equity by approximately 50 basis points.[206]

196. The betas published by Value Line and Merrill Lynch on which Mr. Cummings relies in his CAPM analysis are "adjusted." That is, once the "raw" beta coefficient is determined through a regression analysis of the relative returns of a stock with a market index (e.g., NYSE or S&P 500), those "raw" betas are adjusted toward 1.0, the market average. This is done to account for a theorized tendency for beta coefficients to approach the broad market average (1.0). So, the betas reported by Value Line and Merrill Lynch are adjusted upward if the raw beta is below 1.0 and downward if the raw beta is above 1.0. Mr. Hill points out in his testimony that unadjusted betas are also published and are available to investors and thus must be considered in the analysis. Standard & Poor's publishes unadjusted betas and those unadjusted beta coefficients are below the adjusted betas used by Company witness Cummings. Consideration of unadjusted betas would cause Mr. Cummings CAPM results to decline by over 100 basis points.[207]

197. As a corroborative analysis, Mr. Cummings performed a DCF analysis on a sub-set of the S&P 500 Index and determined that the cost of capital of the "average" stock is higher than his recommendation for U S WEST-Minnesota and, therefore, he concluded his recommendation is reasonable. Mr. Cummings verified his result that the Company has "slightly" less risk than average by relying on telecommunications firms' beta coefficients, which are below the definitional beta for the market--1.0. As Mr. Hill noted in testimony, in recently published research in the field of theoretical finance, beta

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204 *Id.* at 55-58.
205 *Id.*
206 *Id.* at 59.
207 *Id.*

has been shown to be an unreliable indicator of relative risk. Therefore, this corroborative analysis suffers from the same shortcomings as the CAPM, i.e., a heavy reliance on the accuracy of beta.[208]

198. In estimating the required return on the market, Mr. Cummings uses a DCF analysis. He uses the IBES projected earnings growth rates for each of the companies in the S&P 500 for which data are available, along with the dividend yield of each and sums the result according to the market weights of each. His result is a DCF cost of equity estimate of about 14%. However, IBES also publishes an earnings growth rate projection for the S&P 500, in aggregate. Currently, that investor service projects that the earnings growth of the S&P 500 over the next five years to be approximately 6%. That growth rate added to an average dividend yield of 3% produces a IBES-supplied DCF cost of equity for the S&P 500 of only 9%--substantially different than the 14% produced by Mr. Cummings' analysis. Widely disparate equity cost estimates arise from witness Cummings' individual-company analysis of the S&P 500 and that produced by considering the S&P 500 in the aggregate, using the same source of growth rate information--IBES. This shows that analysts' projected earnings growth rates are not the only input that needs to be considered when framing the growth rate estimated in a well-reasoned DCF analysis. The difference in the DCF results for the S&P 500 described above is evidence that an unquestioning reliance on one source--without consideration of any other factors--is unwise in equity capital cost analysis.[209]

199. U S WEST witness Cummings' second "corroborative" methodology is another version of his first and suffers from the same shortcomings. The witness subtracts bond yields from his estimate of the market return, multiplies that risk premium by a telecommunications-type beta to arrive at a range of results which coincide with the upper end of his recommended return. As with the previous analysis, however, this risk premium/CAPM analysis does not constitute a check of the reasonableness of the witness' equity cost estimation techniques; it merely indicates that the equity cost he estimates for the market is higher than the cost rate he recommends in this proceeding.[210]

Conclusion

200. The ALJ adopts the Department's recommendation to set U S WEST's forward-looking cost of capital at 9.6%. Department witness Hill's reasoned analysis supports such a finding. The parameters used to obtain the 9.6% cost of capital are: 7.53% cost of debt; 11% cost of equity; and a capital structure that is 40.36% debt. Using the 9.6% cost of capital in place of the HM 5.0a default of 10.01% results in a reduction of 17 cents in the average loop cost.

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208 *Id.* at 60.
209 *Id.*
210 *Id.*

SPOT FRAME

201. Where a physical connection is required to provide access to US WEST's local network, CLEC equipment is connected to US WEST's equipment at US WEST's central office facilities (CO). Some of the specifics of the connections to be made are described in the discussion on collocation, below. MCI and AT&T argue that the network connection should be accomplished by direct connection between with the ILEC circuits for voice grade, DS-1, DS-3, and OC-x (for dark fiber).[211] The connection, as proposed by MCI and AT&T, occurs on the same ILEC equipment used for serving the network.[212]

202. US WEST proposes that the connection between networks be accomplished with a Single Point of Termination frame (SPOT frame). The SPOT frame uses the same sort of equipment used by US WEST in its main distribution frame (MDF). The difference between the two frames is that while the MDF is the direct link between customer loops and the switching equipment of the CO, the SPOT frame is run off of the MDF by jumper cables and tie pairs and connected to US WEST's switching equipment in the same manner. Under that design, the MDF remains undisturbed by activity on the SPOT frame and the SPOT frame may be placed at a distance from the MDF.

203. US WEST asserts that the SPOT frame is needed because:

> Allowing CLECs access to UNEs that is equal to what U S West provides itself would mean that every piece of equipment in U S West's network would be open to dozens of different CLECs. Such direct access would compromise both the security and integrity of U S West's network. Nothing in the Act requires CLECs to have direct or equal access to U S West's switches, main distribution frame ("MDF"), or operational support systems. Access to U S West's network must be restricted.[213]

204. MCI and AT&T identified ten problems that arise from the use of SPOT frames.[214] Service quality problems arise if the SPOT frame is located too far from the MDF. Termination blocks on the SPOT frame must be ordered in blocks of 100, which is a barrier to entry. Capacity will be lacking and no procedures exist to deal with limited space. The process for connecting at the SPOT frame is cumbersome and wasteful. There is no disconnect process in place. US WEST's OSS would require modifications that are not yet defined. Service to integrated digital loop carrier (IDLC) customers could be impaired. Lack of security will cause customer reluctance to choose CLEC service. The potential for delays in order service processing is created. Unnecessary trunking buildout could be required of CLECs.

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211 Ex. 326, SET-2, Part II, at 12-18.
212 Ex. 326, SET-2, Part I, at 47.
213 US WEST Brief, at 91.
214 MCI and AT&T Brief, at 114-115.

205. DPS asserts that the use of a SPOT frame will change the nature of the services obtained by CLECs from POTS to a designed service, thereby increasing costs to CLECs and delay in starting service to consumers.[215] Further, DPS asserts that the differences in service resulting from the use of SPOT frames constitutes discrimination prohibited by the 1996 Act.[216]

206. US WEST cites ***Iowa Utilities Board v. FCC***, 120 F.3d 753 (8th Cir. 1997), for the proposition that an ILEC's obligation to provide "nondiscriminatory" access "merely prevents an incumbent from arbitrarily treating some of its competing carriers differently than other; it does not mandate that incumbent LECs cater to every desire of every requesting carrier."[217] US WEST concludes from this language that US WEST "is not required to provide access that is in all respects equal to what it provides itself."[218]

207. US WEST's interpretation of the holding in ***Iowa Utilities Board*** is contrary to the language cited by US WEST from the 1996 Act.[219] The issue being decided in the ***Iowa Utilities Board*** decision was whether the FCC could require ILECs to provide service superior to service in the existing network. Regarding what access is required by the 1996 Act, the 8th Circuit held:

> While the phrase "at least equal in quality" leaves open the possibility that incumbent LECs may agree to provide interconnection that is superior in quality when the parties are negotiating agreements under the Act, this phrase mandates only that the quality be equal--not superior. In other words, it establishes a floor below which the quality of the interconnection may not go. Because the Commission's rule requires superior quality interconnection when requested, see 47 C.F.R. § 51.305(a)(4), the rule is not supported by the Act's language. **We also agree with the petitioners' view that subsection 251(c)(3) implicitly requires unbundled access only to an incumbent LEC's existing network**--not to a yet unbuilt superior one.[220] ***Iowa Utilities Board v. FCC,*** 120 F.3d, at 812-13 (emphasis added).

Many of US WEST's arguments are based on the premise that ILECs are not obligated to provide unrestricted access to its network elements for the benefit of CLECs. The 8th Circuit has interpreted the 1996 Act to require that widespread access be provided. For example, the 8th Circuit stated:

> We have upheld the remaining unbundling rules as reasonable constructions of the Act, because, as we have shown, the Act itself calls for the rapid introduction

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215 DPS Brief, at 142-143.
216 DPS Reply, at 21.
217 US WEST Brief, at 91 (quoting ***Iowa Utilities Board v. FCC***, 120 F.3d, at 813.)
218 US WEST Brief, at 91.
219 US WEST Brief ,at 90.
220 ***Iowa Utilities Board v. FCC***, 120 F.3d, at 812-13 (emphasis added).

> of competition into local phone markets by requiring incumbent LECs to make their networks available to their competing carriers.[221]

And in another area, the 8th Circuit noted:

> Interconnection and unbundled access are distinct from exchange access because interconnection and unbundled access provide a requesting carrier with a direct hookup to and extensive use of an incumbent LEC's local network that enables a requesting carrier to provide local exchange services, while exchange access is a service that LECs offer to interexchange carriers without providing the interexchange carriers with such direct and pervasive access to the LECs' networks and without enabling the IXCs to provide local telephone service themselves through the use of the LECs' networks.[222]

The language in ***Iowa Utilities Board*** undercuts US WEST's assertion that restricted access is in compliance with the 1996 Act. Using the SPOT frame for interconnection keeps the connections of CLECs at "arm's length" from the MDF. The SPOT frame proposal is not consistent with the "direct hookup to and extensive use of an incumbent LEC's local network" required by the 8th Circuit. The SPOT frame constitutes discriminatory access prohibited by 47 U.S.C.A. § 251(c)(2)(C) of the 1996 Act.

208. If US WEST is correct that CLECs' access to a frame will "compromise the security and integrity" of its network,[223] placing all CLECs on a SPOT frame apart from US WEST's MDF means that US WEST will have a service quality advantage over all CLECs. Where SPOT frame access will be subject to network failures (potentially affecting all CLECs accessing network elements through that SPOT frame), US WEST service will be unaffected. From a consumer's point of view, reliability of service will be a purchasing factor consistently demonstrated by US WEST and not available from CLECs. ***This*** is a competitive advantage that the 1996 Act itself denies to each ILEC by requiring that the quality of service available to CLECs be "at least equal in quality to that provided by the local exchange carrier."[224]

209. In response to MCI and AT&T's assertion that SPOT frames introduce additional points of failure, US WEST maintained that a loop provided to CLECs may have fewer splices than one of US WEST's ***own*** loops connected to the MDF.[225] Also, US WEST indicated that there are many "theoretical points of failure in the average loop."[226] While true, these facts are not relevant to the particular likelihood of failure through use of SPOT frames and the impact of such failures on CLECs.

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221 ***Iowa Utilities Board v. FCC***, 120 F.3d, at 816-17.
222 ***Iowa Utilities Board v. FCC***, 120 F.3d, at 799 (footnote 20).
223 US WEST Brief, at 91).
224 47 U.S.C.A. § 251(c)(2)(C).
225 US WEST Brief, at 92.
226 US WEST Brief, at 93.

210. Due to the discriminatory access resulting from the use of a SPOT frame, that mechanism cannot be used as the means for interconnecting CLEC facilities to the MDF. The SPOT frame does not comport with the requirement of the 1996 Act that the interconnection must be "at least equal in quality to that provided by the local exchange carrier."[227] To meet the 1996 Act requirement regarding quality, a CLEC must be allowed to connect directly to the MDF. US WEST is free to manage access to the MDF to ensure that service is not adversely affected. But such management must be limited to legitimate security and integrity concerns and cannot be used as a means of impairing the quality of service provided by CLECs.

RECOMBINING OF SERVICES

211. An issue closely related to the means of network access is whether services will be provided as unbundled network services or combined by US WEST. MCI, AT&T and DPS maintain that requiring US WEST to provide bundled services is the most efficient means of delivering those services.[228] US WEST asserts that the only obligation placed upon it by the 1996 Act in this area is the provision of unbundled services.[229] Further, US WEST asserts that providing recombined services on the loop level erodes the distinctions between resale of telephone services and UNE.[230]

212. The SPOT frame proposal was proposed by US WEST to give CLECs a single location, apart from the US WEST network, to perform the recombination of the unbundled elements. US WEST cites ***Iowa Utilities Board v. FCC*** for the proposition that the only obligation on an ILEC is providing unbundled services.[231] MCI, AT&T and DPS maintain that the ***Iowa Utilities Board v. FCC*** decision does not preclude local ***commissions*** from requiring only unbundled services, only that such services are not mandated on a federal level.[232]

213. In ***Iowa Utilities Board v. FCC***, the 8th Circuit held that the 1996 Act did not require recombining of ***services***, even if that method of providing services was more efficient. In arriving at that holding, the Court stated:

> The FCC and its supporting intervenors argue that because the incumbent LECs maintain control over their networks it is necessary to force them to combine the network elements, and they believe that the incumbent LECs would prefer to do the combining themselves to prevent the competing carriers from interfering with their networks. Despite the Commission's arguments, the plain meaning of the Act indicates that the requesting carriers will combine the unbundled elements themselves; the Act does not require the incumbent LECs to do all of the work. **Moreover, the fact that the incumbent LECs object to this rule indicates to**

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227 47 U.S.C.A. § 251(c)(2)(C).
228 MCI and AT&T Brief, at 115; DPS Reply Brief, at 21.
229 US WEST Brief, at 93.
230 US WEST Reply, at 62.
231 US WEST Brief, at 93.
232 DPS Reply Brief, at 21; MCI and AT&T Reply Brief, at 137.

us that they would rather allow entrants access to their networks than have to rebundle the unbundled elements for them.[233]

214. As discussed above on the issue of SPOT frames, US WEST would rather not provide any CLEC access to any part of its network nor provide recombined elements to CLECs. The SPOT frame proposal by US WEST was an effort to keep CLECs off of the network while not ***providing*** recombined services. The holding in ***Iowa Utilities Board v. FCC*** may be construed as requiring ILECs to choose between providing network access or recombining services. Since US WEST has expressed an unambiguous desire to keep CLECs off of the network for purposes of recombining network elements in order to preserve the "security and integrity" of the network,[234] US WEST must provide recombined elements to CLECs. This outcome is consistent with the ***Iowa Utilities Board v. FCC*** decision and provides US WEST with the assurance of controlling access to its MDF.

215. The 8th Circuit's language in ***Iowa Utilities Board v. FCC*** suggests that the unbundling/recombining of elements was a burden on the ILEC. The process of unbundling network elements creates an economic cost and the process of recombining network elements creates an economic cost.[235] The imposition of such costs for no reason other than to comply with one reading of the 1996 Act is the equivalent of requiring ***holes*** be dug, only to fill them back in. Such a result is contrary to the legislative intent to foster competition in the local exchange market. Without the intent in the 1996 Act for such activity to occur, there is no reason for ILECs to engage in unbundling, and there is no basis for imposing the cost of that activity on CLECs.

216. US WEST asserts that requiring recombined network elements be made available is contrary to the 1996 Act requirement that resale also be made available. Under this view, the requirement that the purchase of resale services (at wholesale rates) is undercut by selling the same services as recombined services (at cost). DPS maintains that the PUC has authority to order recombining of elements "to promote fair and reasonable local service competition." DPS points out that using the existing combinations is more efficient than using SPOT frames.[236]

217. US WEST cites ***US WEST Communications, Inc. v. AT&T Communications of the Pacific Northwest, Inc.***, No. C97-132OR (consolidated), slip op. at 7 (W.D. Wash. July 21, 1998) as support for its analysis that requiring recombination (or restraining from separation) of elements by ILECs is violative of the 1996 Act.[237] MCI and AT&T cite ***Southwestern Bell Telephone Company v. FCC***, 153 F.3d 597 (8th Cir. 1998) for the proposition that the combination of network elements does not violate the 1996 Act.[238] In ***Southwestern Bell***, the FCC's designation of "shared transport" as a

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233 ***Iowa Utilities Board v. FCC***, 120 F.3d, at 813 (emphasis added).
234 US WEST Brief, at 91.
235 Ex. 307 at 7-8.
236 DPS Reply, at 20-21.
237 US WEST Reply, at 59.
238 MCI and AT&T Reply Brief, at 157-158.

single network element that must be made available to CLECs was challenged.[239] The challengers asserted that the FCC had no authority to aggregate the parts that constitute shared transport and require that such an aggregation be made available to CLECs. The 8th Circuit noted that its holding in ***Iowa Utilities Board v. FCC*** was consistent with the FCC's requirement. Regarding the difference between unbundled elements and resale, the 8th Circuit stated:

> Indeed, we believe that our decision in Iowa Utilities Board supports our decision in the case at hand. As discussed *supra* under subheading A, we expressly upheld the FCC's section 251(d)(2) determination that various "functions" should be provided on an unbundled basis, notwithstanding the fact that these functions could also be considered finished services purchasable for resale pursuant to section 251(c)(4). *See* ***Iowa Utils. Bd.***, 120 F.3d at 809 (acknowledging that "a competing carrier may have the option of gaining access to features of an incumbent LEC's network through either unbundling or resale"). If the FCC may require incumbent LECs to provide unbundled access to functions and capabilities which may also be purchasable at retail as "finished services" (e.g., caller I.D., call waiting, call forwarding, operator services, and directory assistance), it certainly may require LECs to provide unbundled access to a separate function or capability such as shared transport which, when combined with other network elements, enables a new entrant to provide local telecommunications service.[240]

218. The 1996 Act sets out the role of local public utilities commissions as follows:

> (3) Preservation of State access regulations
>
> In prescribing and enforcing regulations to implement the requirements of this section, the Commission shall not preclude the enforcement of any regulation, order, or policy of a State commission that -
>
> > (A) establishes access and interconnection obligations of local exchange carriers;
> >
> > (B) is consistent with the requirements of this section; and
> >
> > (C) does not substantially prevent implementation of the requirements of this section and the purposes of this part.[241]

219. In this matter, the recombining of network elements constitutes a lesser burden on ILECs and provides greater efficiency and lower costs for CLECs. Recombining also protects networks from service interruptions created by unnecessary work on the

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239 ***Southwestern Bell Telephone Company v. FCC***, 153 F.3d 597 (8th Cir. 1998).
240 ***Southwestern Bell***, 153 F.3d, at 606.
241 47 USC § 251(d)(3).

MDF. Under 47 USC § 251(d)(3), the Commission has the authority to determine the access and interconnection requirements for ILECs and CLECs. That authority must be consistent with the provisions of the 1996 Act and must not substantially prevent implementation of the 1996 Act and its purposes.

220. MCI, AT&T and DPS maintain that requiring recombination is consistent with the Commission's authority. US WEST's assertion that recombining is the same as resale, at lower cost, is an assertion that recombining network elements undermines the 1996 Act.

221. In ***Southwestern Bell***, the 8th Circuit expressly addressed the argument that resale is undermined by ***recombining*** of network elements, as follows:

> Where, as it has here in § 251(d)(2), Congress expressly delegates to an agency the power to formulate policy and fill gaps in a statutory scheme, we defer to agency regulations promulgated pursuant to such delegation "unless they are arbitrary, capricious, or manifestly contrary to the statute." ***Chevron***, 467 U.S. at 843. Here, Congress limited the FCC's authority only by directing it to consider "at a minimum" the two above-described factors, and petitioners do not argue that the FCC failed to give adequate consideration to either one. 47 U.S.C.A. § 251(d)(2). In fact, petitioners do not assert that the FCC violated the express language of section 251(d)(2) or any other provision of the Act. Rather, petitioners argue that the FCC's decision that incumbent LECs must provide shared transport on an unbundled basis is inconsistent with Congress's overarching intention of maintaining a meaningful distinction between unbundled access to network elements and resale.
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> The distinction between unbundled access and resale is important, petitioners argue, because sections 251(c)(3) and 252(d)(1) require incumbent LECs to provide unbundled access at cost-based rates, while sections 251(c)(4) and 252(d)(3) allow incumbent LECs to provide retail services for resale at a higher price, equal to the LEC's retail subscriber rates less avoided costs. Petitioners argue that, if use of all of an incumbent LEC's shared transport facilities may be collectively purchased on a per-minute-of-use basis, entrants will effectively be able to purchase preassembled platforms for resale at the lower cost- based price reserved for unbundled access to network elements. Petitioners argue that if this is allowed to occur, the distinction between resale and unbundled access will be obliterated.
>
> This argument is predicated on petitioners' speculative assumption that shared transport will be priced on a usage-sensitive basis. Because the pricing scheme for shared transport (and all other unbundled elements) will be determined by the state commissions, see 47 U.S.C.A. § 252(c)(2); ***Iowa Utils. Bd.***, 120 F.3d at 818, it is impossible for this court to determine at this time whether shared transport will be priced in such a way as to erode the distinction between resale and unbundled access. Since, as in ***Iowa Utilities Board***, "we do not know what the state-determined rates [or even what the rate structure] will be," it follows that

> petitioners' arguments regarding the actual costs that entrants will incur are "speculative at best." 120 F.3d at 816. Until the state commissions exercise their authority to determine how shared transport will be priced (i.e., whether on a flat, use-sensitive, or other basis, and at what price), we could do no more than conjecture as to whether the unbundled sale of shared transport will erode the careful distinction between resale and unbundled access. Accordingly, we decline at this time to consider petitioners' argument to this effect. There will be time enough to do so once a state commission has compiled a record, applied its expert analysis, and rendered a decision, and an appeal has been taken to a federal district court pursuant to § 252(e)(6).[242]

222. Thus, the mere fact that recombined services are available to providers on a resale basis does not preclude requiring recombining of those services as part of the interconnection ***standards*** to be set by the Commission. The distinction between recombining and resale is, under ***Southwestern Bell***, determined by pricing, not by the similarities of the services obtained.

223. MCI and AT&T point out that CLECs are obligated to: 1) establish points of connection for local exchange traffic; 2) establish reciprocal compensation arrangements with carriers in the geographic area; 3) establish access service for interexchange carriers (IXCs); 4) establish 911/Operator Service for customers; 5) engineer the network created from UNEs and other interconnections to ensure sufficient facilities and transport capacity; 6) establish (to the extent desired) different capacities than the ILEC's service; 7) integrate CLEC facilities with leased or purchased ILEC elements; and 9) establish billing systems.[243] Under resale, these requirements are either included in the ILEC service purchased for resale or not required for engaging in the resale of telephone service.

224. The ALJ concludes that imposing an unbundle/***recombine*** requirement on UNEs is to "substantially prevent implementation" of local competition provisions of the 1996 Act in violation of 47 USC § 251(d)(3)(C). US WEST's proposal to unbundle combined network elements solely to burden CLECs with the need to rebundle those elements violates the 1996 Act. US WEST must provide UNEs in combination as requested by CLECs and, if necessary, recombine them on behalf of CLECs.

COLLOCATION

225. Collocation is the practice of placing equipment belonging to a CLEC in close proximity to ILEC equipment for the purpose of interconnecting each provider's system. The direct connection between the CLECs and US WEST can be managed through physical collocation or virtual collocation, which are discussed below. Physical collocation will require interaction with CLEC and US WEST technicians at the MDF with each party working on its own equipment at the MDF. Virtual collocation will place

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[242] ***Southwestern Bell***, 153 F.3d, at 604-605.
[243] Ex. 307, at 5-7.

that burden solely on US WEST, since the title to the equipment (and the obligation for its maintenance) will vest with US WEST.[244]

226. In the case of physical collocation, the CLEC rents space at an ILEC facility, the CLEC pays the ILEC for any resources used (such as electricity and cooling) and the CLEC is responsible for maintenance of its own equipment. In virtual collocation, the CLEC purchases the same equipment, but the title is transferred to the ILEC (typically with the CLEC retaining the right to repurchase the equipment). The impact of the transfer is to place maintenance responsibility with the ILEC, paid for by the CLEC, and to restrict the access of CLEC staff to the equipment.[245]

227. Generally speaking, US WEST proposes that collocation costs be determined by their Total Element Long Run Incremental Costs (TELRIC).[246] US WEST suggested three categories for such costs, costs common to both physical collocation and virtual collocation, costs unique to physical collocation, and costs unique to virtual collocation. The rate design advanced by US WEST uses the TELRIC for the option chosen plus an allocation of common costs.[247]

228. MCI and AT&T assert that both physical and virtual collocation costs should be established by TELRIC. For physical collocation the TELRIC would be the cost of central office space and the connection to US WEST's equipment. For virtual collocation, the TELRIC for the equipment maintained on behalf of each CLEC would be the appropriate cost.[248]

229. If the distance from the MDF to the collocation point is too long, additional equipment is necessary to strengthen the signal. US WEST includes the cost of regeneration as both a recurring cost and, where required, a nonrecurring cost.[249] A later estimation of costs included a recurring charge of $27.61 per manhole and $15.22 per handhold under the category of "Entrance Enclosure".[250] The schematics sponsored by MCI and AT&T for CLEC interconnection show a manhole providing access to the route for cable to enter the central office.[251]

230. A Collocation Cost Model (CCM) is proposed by MCI and AT&T to arrive at standard cable lengths incurred by an ILEC when virtual collocation is made at a site. MCI and AT&T assert that the imposition of standard cable lengths prevents ILECs from manipulating costs by placing collocation equipment at a distance from the interconnection.[252] Other costs cited by MCI and AT&T as manipulated by ILECs include "demolishing existing walls, removing doors, electrical and mechanical

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244 Ex. 325, at 4.
245 Ex. 196, at 10; Ex. 325, at 4-5.
246 Ex. 233 at 30.
247 Ex. 233 at 30; Ex. 241.
248 Ex. 341 at 11-12.
249 Ex. 241.
250 Ex. 248, U S West Interconnection Price List, at 4.
251 Ex. 326, SET-2, Part I, at 3 (Figure 1A).
252 Ex. 325 at 8.

components, . . . new corridors, hallways, doors, and sometimes even a costly new external entrance to the building, allegedly to provide a 'secure environment.'"[253] The CCM incorporates maintenance and security costs for service and further breaks those costs out by type of facility where the interconnection occurs.[254] The CCM White Paper describes the access process as follows:

> The collocation of competitive equipment in ILEC central office buildings includes fiber connectivity between the first manhole and the CLEC collocation area, using CLEC-provided, fire-retardant cable for routing cables through the CO [ILEC Central Office]. Ideally, the pulling and splicing of fiber cable between the manhole and the cable vault, and the subsequent routing of fiber riser cable between the cable vault and collocation area, would be performed by the CLEC. In the event that this is not permitted, however, the CO model layout incorporates assumptions (which are outlined below) to calculate the costs that an efficient ILEC would incur to perform these functions in a competitive environment.[255]

231. US WEST includes a recurring cost for a manhole or handhold premised on the assumption that such an access point will be needed outside the CO for passing CLEC fiber into the building. The assumption in the CCM is that the CLEC fiber will parallel ILEC fiber (running toward the central office) from the location of the first existing access point.[256] The MCI and AT&T schematic shows such a facility as needed for interconnection. An ILEC is entitled to reimbursement for the use of the manhole or handhold by the CLEC. Proposing the reimbursement as a collocation cost is appropriate only where the cost is not being paid to the ILEC from another source. Both the HAI and BCPM models include "underground structure" costs that include manholes and handholds.[257] The cost of these structures is included in the cost of the loop being charged to CLEC. The cost of the manhole or handhold must be excluded altogether from either recurring or nonrecurring costs of collocation because to do otherwise would result in the ILEC being compensated twice for the use of the same asset.

232. US WEST identifies floor space, enclosure, building entrance facilities, security, cable and cross connect terminations (for SPOT frames), power, and grounding as network components for physical collocation. The only differences for virtual collocation are the lack of an enclosure[258] and the need for escorts to meet ILEC security requirements when CLEC staff come onsite.[259] US WEST maintains that the building entrance facilities are a special construction that should be recovered on a nonrecurring

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253 Ex. 326, SET-2, Part I, at 53.
254 Ex. 325 at 11.
255 Ex. 326, SET-2, Part I, at 43.
256 Ex. 196.
257 Tr. Vol. 5b at 5; Tr. Vol. 10 at 215.
258 Ex. 196 at 15.
259 Ex. 326, SET-2, Part II, at 27.

charge. Card scanners are proposed by US WEST as an appropriate charge for security.[260]

233. MCI and AT&T propose the use of the physical collocation rate design prepared for, but not adopted by, the Oregon Public Utilities Commission (Oregon PUC).[261] US WEST asserts that its collocation model is needed to recover costs that have been identified through their experience in delivering local telephone service in Minnesota.[262] The US WEST model would recover costs that have been incurred in the past, but are not incurred through the use of forward-looking technology. These embedded costs are the principle point of contention between the cost models advanced by the parties.

234. US WEST proposes to break out the costs of collocation into both recurring and nonrecurring costs. The Physical and Virtual Collocation Recurring and Nonrecurring Cost Study (US WEST collocation study) identifies specific items that may be included in the collocation process, sets a price for those items, and charges out those items as used. The use of an "individual case basis" (IBC) approach encourages manipulation of collocating equipment to maximize the cost to competitors and thereby reduce the ability of CLECs to enter the local exchange market. US WEST criticizes the CCM cost model as unsuitable for "25 of the 26 central offices that were most likely to experience collocation demands in the Minneapolis-St. Paul area."[263] This criticism is made without adequate investigation of the actual CO conditions (floor plans were relied upon).[264]

235. US WEST's approach demonstrates too narrow a focus in the proper calculation of collocation costs. The introduction of competition, while sure to occur first in the higher density areas, will not be limited to those areas. As the competitive local market matures, collocation will expand beyond the urban areas described by US WEST. Using the MCI and AT&T collocation model removes the ability of an ILEC to manipulate costs as a barrier to entry. Since US WEST will be able to exercise discretion in assigning collocation facilities, US WEST will be able to avoid undue costs.

236. Moving local telephone service into a competitive market creates the expectation that processes will change to reflect the need for efficiency. Building costs into the collocation rate that are based on inefficient processes raise barriers to entry into local competition for CLECs and reduce the incentive to update processes for ILECs. Since the movement of customers will, over time, go between CLECs and ILECs, there is a need for forward-looking service methods to be favored over embedded costs. US WEST's incorporation of embedded costs in its collocation model does not afford any reasonable measurement of costs in a competitive market.

237. MCI and AT&T assert that their collocation model is conservative, that is, the costs it calculates are actually higher than the actual costs an ILEC will incur over the

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260 Ex. 196 at 19-20.
261 Ex. 341 at 12.
262 US WEST Reply Brief, at 53-54.
263 US WEST Brief at 67.
264 MCI and AT&T Reply, at 113-115.

life of the model.[265] Examples of the costs assumed for all COs are a three-floor design (increasing cable length costs), larger power reserve, and costs for power available, rather than actually used.[266]

238. US WEST objected to the CCM as having cost items that are unrealistic. Unavailability and cost of space, location of power supply, number of collocation bays sited to share expenses, and need for additional facilities, such as manholes, are identified as flaws in CCM.[267] The manhole objection is discussed above. The other cost items are appropriately included in the methodology of the MCI and AT&T collocation model to prevent manipulation of the collocation process to increase costs for CLECs. Some adjustments to the CCM are needed to more closely reflect actual conditions in collocating equipment. The US WEST collocation study overemphasizes worst case conditions and should not be used for calculating collocation costs.

239. The assumed cost of land ($20.00 per square foot) for calculating the facility cost in the CCM is criticized by US WEST as unrealistic. Using the default land cost in the CCM, the cost of land for a 30,000 square foot building is $600,000.[268] Despite its criticism, there was no alternative figure proposed by US WEST to calculate the cost of land. US WEST did propose a monthly rental charge of $6.24 per foot.[269] CCM uses a building cost calculation to arrive at a land plus building cost of $164.38 per assignable square foot.[270] The rental cost derived from that cost is $3.92 per square foot.[271] Without a breakout of the data used by US WEST to calculate its rental charge, there is no basis for preferring US WEST's higher monthly charge to the lower charge proposed in the CCM. MCI and AT&T have demonstrated that the facility cost calculation in the CCM is appropriate.

240. MCI and AT&T maintain that the cost of card readers is included in the rental charge for the portion of the building used for collocating equipment.[272] US WEST asserts that card readers are not currently installed in many COs.[273] MCI and AT&T acknowledged that card readers are not standard security devices and proposed modifying the space rental charge to account for the cost of installing those devices. The cost of such devices is not substantial and can be meaningfully recovered by an ILEC through an adjustment to the facility cost.

241. Cable costs are determined in large measure by the distance collocated CLEC equipment is placed from ILEC equipment. The CCM proposed by MCI and AT&T calculates an average of the minimum distance reasonably achievable and a "worst

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265 MCI and AT&T Brief, at 100.
266 *Id.*
267 US WEST Brief, at 71.
268 Ex. 326 at BU #18.
269 Ex. 253, Ex. H, at 3).
270 Ex. 326 at BU #18.
271 MCI and AT&T Reply Brief, at 116.
272 Ex. 326 at 55.
273 US WEST Brief, at 72-73.

case scenario" of a three-floor model of a downtown CO.[274] US WEST asserts that five floors are needed at its downtown Saint Paul CO.[275] For outlying COs, a one- or two-floor design is the norm. Additional costs that will be paid by CLECs collocating equipment at outlying COs as the competitive market matures will offset any potential undercompensation to the ILEC in a single, urban CO. Additionally, the control exercised by the ILEC in siting the collocation equipment encourages the ILEC to adopt the most efficient system possible, rather than keeping in-place outdated equipment or administrative space.[276]

242. US WEST maintains that the CCM calculation is an effort to exclude urban COs from the calculation of cable costs. The methodology used in the CCM averaged the minimum required length with the "worst case scenario", with no other factors included.[277] The methodology does not weight the calculation against urban COs. The three-floor model (worst case scenario) used in the CCM anticipates location of the collocating equipment two floors and at opposite corners from the ILEC equipment.[278] The distance calculated in the three-floor model in the CCM may actually be longer than the distance required in a five-floor CO, should the collocating equipment be situated directly above or below the ILEC equipment.[279] With the potential for collocating equipment in spaces smaller than the assumed four 100 square-foot bay configuration, MCI and AT&T have demonstrated that the CCM does not understate cable costs.[280]

243. MCI and AT&T maintain that the CCM describes the collocation costs for power conservatively (*i.e.* overstating the actual cost), by calculating costs by the power delivered to CLEC equipment rather than power actually consumed. US WEST maintains that the potential for locating collocated equipment far from power sources imposes a cost not recognized in the CCM. The CCM anticipates the fuse bay of the electrical power supply will be located within 35 feet of the collocated equipment of four 100 square foot CLEC bays.[281] US West correctly asserts that the CCM assumes that sufficient space is available for collocation of CLEC equipment because it can be sited in smaller configurations apart from the ILEC equipment.[282] However, the four bay configuration is merely an assumption for calculating costs, not a prediction of actual construction conditions to be encountered when physical collocation is requested in any particular CO. By setting the sharing factor for fuse bays at four 100 square foot collocation bays, US West is encouraged to make the changes in its existing equipment configurations and usage of space to reduce collocation costs. The imposition of higher costs on CLECs for power is inappropriate as it encourages inefficient siting decisions.

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274 Ex. 326, SET-2, Part I, at 18.
275 US WEST Reply, at 56.
276 Tr. Vol. 7 at 24-25.
277 Tr. Vol. 7 at 62-63.
278 Ex. 326 at 17.
279 See, Ex. 326 at 18 (cable drops of 20 feet per floor would amount to less than the 220 feet of distance assumed for traversing the CO); MCI and AT&T Brief, at 101.
280 Ex. 326, SET-2, Part 1, at 13.
281 Ex. 326, SET-II, at 34 (figure 5c).
282 Ex. 326, SET-2, Part 1, at 13.

US West has made no showing that undercompensation is likely to occur through modeling based on efficient siting configurations. In many COs, there will be no difficulty in finding adequate space for the collocation configuration assumed in the CCM. The financial incentives remain for ILECs to situate such equipment close to power supplies.

244. The CCM assumes that the cost of grounding will be shared between four 100 square foot CLEC collocation facilities.[283] As discussed above, the CCM appropriately assumes sharing the cost of power connection between four 100 square foot CLEC collocation facilities. The cost of grounding equipment is appropriately shared in the CCM. Similarly, costs for holes and racking are also appropriately assessed in the CCM.

245. US WEST argues that the cost of regenerating signals for distances over 450 feet for DS3 circuits and 655 feet for a DS1 circuit should be included in collocation cost charged to CLECs.[284] Since ILECs control the location of the collocating equipment and such equipment can be placed to maximize the cost to competitors, some incentive must be built into the cost model to promote the most efficient placement of equipment in the CO. The distances to be traversed by these circuits, occurring within a building, are substantial before this cost would be incurred. US WEST is in complete control of all its COs. US WEST introduced no evidence of any existing CO that would require this equipment to be installed. US WEST's burden is not met by suggesting that collocation over these distances might be required. Given the ability to place equipment in smaller configurations on different floors in a multi-floor CO, regeneration is unlikely to be required and the cost of regeneration is appropriately excluded from the costs to be paid by CLECs.

246. The CCM includes an occupancy factor of 75 percent to compensate an ILEC for collocation space built and not occupied. The assumption behind the factor is that collocation space built for a CLEC would be fully occupied for the first several years after the equipment was installed, then have a much lower rate of occupancy for the remaining decades of the life of the equipment.[285] The assessment by MCI and ATT as to the likelihood of unoccupied space (under the CCM) is rather speculative. But the space need not be occupied by collocators to be put to gainful use.[286] With the tendency to overload cable racks, ILECs that have efficiently sited collocation facilities close to their own equipment will be able to use the facilities for ILEC equipment.[287] No alternative occupancy factor has been proposed for use in the CCM. The occupancy factor proposed for the CCM, 75 percent, is sufficient to protect the property interests of ILECs.

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283 Ex. 326, SET-2, Part 1, at 63.
284 US WEST Brief, at 71; Tr. Vol. 7 at 30.
285 Tr. Vol. 9 at 9.
286 Tr. Vol. 9 at 12.
287 Tr. Vol. 7 at 82.

247. The overhead factor proposed by MCI and AT&T in the NRCM is 10.4 percent. The CCM should be modified to use the 13.09 percent figure used for UNE costs as the appropriate overhead percentage for nonrecurring costs. With that modification, the ALJ recommends that the CCM be used for estimating collocation costs.

NONRECURRING COSTS

248. The costs incurred to provide ongoing services are reflected in recurring charges. Such charges recover the costs associated with the service at the same time the costs are incurred. Nonrecurring charges recover the costs associated with the establishment of a service. Usually, such charges are one-time costs and are related to the work required to initially connect the customer. Costs arising from capital investment must be recovered as recurring costs to accurately reflect the manner in which the expense is incurred. Imposing a nonrecurring charge to recover recurring costs distorts the costs of entry into local markets. Such distortions constitute a barrier to entry by competitors to the ILEC.[288]

249. An accurate and reliable nonrecurring cost study must include all activities associated with the establishment of service. Once identified, the time that must be expended to perform each task is measured and the probability that it will be performed upon a request for service is assessed. Multiplying the time required to perform an activity by the probability and by the appropriate labor rate results in the cost of each activity. The nonrecurring charge is the sum of the cost for the applicable activities. The modeling advanced by MCI and AT&T and by US WEST all use this methodology to arrive at the costs they advocate.[289]

Operational Support Systems Interfaces

250. MCI and AT&T maintain that nonrecurring costs for the provisioning of services to new or transferring customers should be minimal due to the increasing reliance upon electronic methods controlled by computer.[290] These methods, know as Operational Support Systems (OSS), eliminate manual intervention for all orders that are successfully completed by computer (known as "flow through"). Orders that are not successfully completed by computer (known as "fallout") are completed by service personnel, requiring more time before the service is available to the customer and imposing higher cost on the service provider.[291]

251. MCI and AT&T claim that two Regional Bell Operating Companies (RBOCs) are currently using OSS with a fallout rate as low as 1 percent.[292] The experience of NYNEX (an RBOC) in proposing the reduction of NRCs for rates for changes to

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288 See, First Interconnection Order, §§ 745-747; Ex. 615 at 26.
289 Ex. 615 at 26.
290 Ex. 335 at 5.
291 Ex. 335 at 7.
292 Ex. 335 at 8.

customer service to $1, is cited by MCI and AT&T as the impact of an efficient OSS on NRCs.[293]

252. MCI and AT&T recognize that fallout is inevitable and manual intervention must be provided for in the NRC for customer services changes. US WEST's proposed NRC for such intervention is criticized by MCI and AT&T as treating every instance of fallout as requiring the same degree of intervention and allowing for no economies of scale. MCI and AT&T asserts that orders will be placed in "batches" and fallout will result in multiple orders being manually processed, thus reducing costs incurred by the ILEC to perform such work.[294] Further reduction in full-cost manual intervention can be achieved through the use of additional software that detects fallout and provides a troubleshooting report that, in some instances, can remove any need for a service trip.[295]

253. The fallout rate assumed by MCI and AT&T in their Nonrecurring Cost Model (NRCM) is two percent. The lower fallout rate is based on MCI and AT&T 's assumption that forward-looking and efficiently managed systems will incur lower costs.[296] MCI and AT&T indicate that the low fallout rate depends upon the use of local digital switches, integrated digital loop carriers, digital cross-connect systems, and Synchronous Optical Network (SONET) rings.[297] US WEST points out that approximately 28 percent of its network, mostly in rural areas, is not equipped to conduct OSS on an automated basis.[298] It bears noting that, in its collocation arguments, US WEST indicates that these areas are not likely to be the subject of competition.[299]

254. The OSS interface proposed by US WEST consists of three parts. The Interconnect Mediated Access system (IMA) is a web-based interface that takes the customer information entered by CLEC personnel and presents that information to a US WEST service representative.[300] The service representative reviews the information and enters the information into the US WEST computer. The order will then be processed by computer or manually, depending upon the particular service requested and US WEST's OSS capabilities.

255. The second part of the OSS interface proposed by U S WEST is the Electronic Data Interchange (EDI) based system, which is a computer-to-computer system rather than a human-to-computer system utilized by the IMA. All CLEC orders processed through the EDI interface are required to be reviewed by a U S WEST representative or retyped into the U S West system in the same manner as are orders processed using IMA.[301] As currently used, EDI is at present only available for POTS resale orders and

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293 Ex. 335 at 5.
294 Ex. 335 at 11-12.
295 Ex. 335 at 17.
296 Ex. 335 at 14.
297 Ex. 335 at 15.
298 US WEST Brief, at 85.
299 US WEST Brief, at 67.
300 Ex. 615 at 16.
301 Ex. 619 at 9.

two preorder transactions.[302] The third part of the OSS interface is Electronic Bonding Trouble Administration (EBTA), which works with EDI to access repair functions.[303] IMA and EDI are the parts of the OSS at issue in this proceeding.

256. US WEST described the IMA as "substantially the same as US WEST's service representatives enjoy." The IMA, according to US WEST, provides for "flow-through" and does not require double entry of information if "screen scraping" is used.[304] MCI, AT&T and DPS dispute this characterization, pointing out that manual intervention is required for any CLEC order, whereas US WEST orders are directly input into the computer.[305] No CLEC order is provided immediate feedback as to acknowledgement, success, or failure.[306] IMA, in MCI and AT&T 's opinion, does not meet industry standards for interfaces, because only computer-to-computer interfaces are sufficient to meet those standards.[307]

257. In the implementation of the OSS process, US WEST intends to stop any order placed through the EDI to allow US WEST personnel to examine the order.[308] DPS maintains that such intervention raises costs.[309] US WEST maintains that this practice is required for "catching order errors before CLEC orders are submitted to U S West's OSS."[310] US WEST maintains that IMA meets national standards by using hypertext markup language (HTML) and transmission control protocol/internet protocol (TCP/IP).[311]

258. US WEST's assertion that the IMA does not require entering information twice is incorrect.[312] US WEST's own description of the IMA system makes clear that CLECs are placed in the same position as a retail customer calling for service.[313] The obligation to provide a forward-looking and efficiently managed access to OSS is not met by, in essence, opening the retail order system to CLECs.

259. US WEST argues that MCI and AT&T have "absolutely no legal basis" for claiming that requiring a US WEST service representative be involved "in reviewing CLEC orders" is discriminatory.[314] The issue is not a question of law, but of fact. Customers calling US WEST for new or altered service deal with a single person over the telephone. The single US WEST service representative makes, in most cases, real

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302 Tr. Vol. 10 at 105-7.
303 US WEST Reply Brief, at 32.
304 US WEST Reply Brief, at 31-32.
305 MCI and AT&T Reply Brief, at 86; DPS Reply Brief, at 19.
306 MCI and AT&T Reply Brief, at 86.
307 *Id.*
308 Ex. 220 at 19 ("processed through a set of business rules"); Tr. Vol. 10 at 72.
309 Ex. 616 at 13.
310 US WEST Reply Brief, at 33.
311 Ex. 222 at 13-14.
312 Ex. 220 at 29; Ex. 222 at 11-12.
313 Ex. 220 at 19 (computer-to-computer shown as a "future interface" and subject to review for business processes); Ex. 222 at 11-12.
314 US WEST Reply Brief, at 32.

time changes to the customer's service. The proper codes for assigning services are available in English rather than Universal Service Order Code.[315] By contrast, the IMA method for CLECs requires that a customer call a CLEC service representative who submits a change order to US WEST. No confirmation is received by the CLEC that the order was received by US WEST, so the customer cannot be assured that the order was received. At some unspecified time later, a US WEST representative reviews the change order and enters the request into the US WEST OSS. If any problems occur at that point, the US WEST representative would have to contact the CLEC service representative to report the problem or clarify what services were requested.[316] The "mediated" portion of IMA has no counterpart in US WEST's own customer service system and constitutes discriminatory access to US WEST's OSS.

260. US WEST's stated reason for requiring 100 percent fallout, checking to prevent ordering errors, is not supported in the record of this proceeding. Transfers of customers without any alteration of vertical features are unlikely to have errors. No mechanism is identified for correcting errors where an incorrect vertical feature is mistakenly selected. Where errors occur that prevent mechanized transfer, the system itself generates the fallout of the order and initiates human intervention.

261. US WEST maintains the ***Iowa Utilities Board*** decision holds that ILECs need not "cater to the desires of requesting carriers."[317] As discussed above, that language was directed toward compelling quality for CLECs superior to that the ILEC provides for itself. Here the equating of quality for access to the US WEST OSS requires that CLEC customer representatives enter data into a computer system that treats the data in the same fashion with the same number of steps that US WEST service representatives must follow. Requiring that CLECs use a system requiring 100 percent fallout is, by definition, discriminatory. Requiring that CLECs receive identical access to US WEST's OSS is meeting the requirements of the 1996 Act, not catering to a CLEC's desires.

262. DPS points out that IMA was rejected for interim use as an OSS interface by the Commission in two recent arbitrations.[318] The Commission expressly found that IMA was not consistent with "the national standards that are taking shape and not at parity with its own internal interfaces."[319] US WEST maintains that IMA meets national standards.

263. The national standards that the US WEST OSS interface is asserted to meet are not for OSS systems. HTML and TCP/IP (the other cited national standards) are the fundamental standards for utilizing any web-based application, not real-time database connectivity. To achieve database connectivity meeting national standards for OSS,

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315 Ex. 615 at 13-14.
316 *See* Ex. 223 at 6-7 (manual processing needed due to errors and edits).
317 US WEST Reply Brief, at 35 (quoting ***Iowa Utilities Board***, 120 F.3d at 813).
318 Ex. 615 at 4 (citing Consolidated Arbitration, Docket Nos. P442, 421/M-96-855, P5321, 421/M-96-909, and Docket No. P3167, 421/M-96-729, and ATT and GTE arbitration, Docket No. P442, 407/M-96-939).
319 Ex. 615 at 4-5 (quoting Docket Nos. P442, 421/M-96-855, Order Resolving Arbitration Issues, at 37 (December 2, 1996)).

the web application must be able to input required information into the database without intervention by a US WEST representative and receive immediate confirmation that the information was received and the status of the change order.[320] The methodology proposed by US WEST demonstrates that IMA and EDI do not use available means of providing nondiscriminatory access to US WEST's OSS.

264. The FCC has ordered US WEST to develop a nondiscriminatory interface to its OSS and make it available by January 1, 1997.[321] The type of interface that would meet the requirements of the Order was expressly described as follows:

> 523. We thus conclude that an incumbent LEC must provide nondiscriminatory access to their operations support systems functions for pre-ordering, ordering, provisioning, maintenance and repair, and billing available to the LEC itself. Such nondiscriminatory access necessarily includes access to the functionality of any internal gateway systems the incumbent employs in performing the above functions for its own customers. **For example, to the extent that customer service representatives of the incumbent have access to available telephone numbers or service interval information during customer contacts, the incumbent must provide the same access to competing providers. Obviously, an incumbent that provisions network resources electronically does not discharge its obligation under section 251(c)(3) by offering competing providers access that involves human intervention, such as facsimile-based ordering.** [322]

265. The "human intervention" required by the IMA interface does not meet the standard expressly set for OSS interconnection. US WEST cannot benefit from having failed to comply with the FCC Order. US WEST cannot impose a cost on CLECs for developing a method of discriminatory access to its OSS. CLECs are entitled to a rate determined through forward-looking and efficient systems. Other RBOCs have achieved integration with their OSS systems for resale (with fallout rates approaching 99 percent for typical residential service) and have proposed rates accordingly.[323]

266. U S WEST has developed the EDI interface to meet national standards, but it does not do so. As noted above, all orders processed through the EDI interface must still be reviewed by a U S WEST representative or retyped into U S WEST's LEGACY system in the same manner as are orders processed using IMA and is presently only available for POTS resale orders and two preorder transactions. Clearly, EDI is deficient in providing non-discriminatory access to CLECs.

267. Because the systems fail to provide non-discriminatory access, the "start-up recovery cost" of $4.1409 per order proposed by US WEST is inappropriate and cannot

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320 Ex. 223 at 4-6.
321 First Interconnection Order, ¶ 525.
322 FCC First Interconnection Order, 96-325 (August 28, 1996), ¶ 525 (footnotes omitted, emphasis added).
323 Ex. 223 at 4.

be imposed. Similarly, the $0.6396 per order charge proposed for the operation and maintenance cost recovery for electronic data interfaces cannot be charged, since the charge is for a system that does not meet the applicable standard. Because the charge cannot be imposed, there is no reason to impose a "true-up" of the charge as proposed by US WEST.

268. The ALJ recommends that U S WEST be denied recovery of any costs associated with the development of its OSS interfaces until the Company makes a showing that the interface provides non-discriminatory access as required by Section 251(c)(3) of the 1996 Act and until the Company provides reliable cost support for its proposed rates. If U S WEST makes such a showing, the Commission should order cost recovery using the same methodology it approved in the Consolidated Arbitration.

U S WEST's Non-Recurring Cost Studies

269. U S WEST's non-recurring cost studies implicitly assume that its existing business processes are efficient and cost-effective and therefore forward-looking.[324] U S WEST's non-recurring cost study methodology also assumes all unbundled loop orders will be designed circuits rather than POTS services. A designed circuit requires more human intervention and time for provisioning than does POTS service.[325] In addition to these issues, Department witness Susan Pierce found several other flaws in the studies including outdated time studies, improper fallout rates, duplicative processes, and the like.[326]

270. US WEST has proposed a customer transfer charge (CTC) as a nonrecurring cost that would be imposed whenever a retail customer account is transferred.[327] Depending on the type of customer and the line involved, the CTC would range between $11.16 to $22.05.[328] DPS objected to the inclusion of the CTC as an inappropriate recovery of costs as nonrecurring.[329] As DPS pointed out, most of the cost of the CTC for residence-mechanized customer transfer charge for first lines was for OSS development costs.[330] MCI and AT&T have suggested the appropriate level of customer transfer charge as $1.69 for manual service required for order processing.[331] MCI and AT&T suggest that CLECs and ILECs pay their own cost for OSS gateway development.[332]

271. In a competitive environment, customers will change back and forth among all the providers in a service area, including the ILEC. An efficient OSS benefits every

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324 Ex. 615 at 29.
325 *Id.* at 33-34.
326 *Id.* at 33-35.
327 US WEST Brief, at 58.
328 US WEST Brief, at 65.
329 Ex. 615 at 18.
330 Ex. 615 at 19.
331 Ex. 341 at 36.
332 Ex. 341 at 30.

provider in the service area by facilitating customer choice and eliminating barriers to efficient initiation of service. An inappropriately high customer transfer charge may encourage "churn" of customers to impose costs on CLECs not borne by the ILEC. Including OSS development costs in the CTC charged only to CLECs is inappropriate. OSS development costs must be measured across all providers, including the ILEC. The time over which the costs should be calculated is the anticipated life of the OSS.[333] Measured in that fashion, the CTC should include the costs of development of a nondiscriminatory OSS. At this point in time, such an OSS does not exist.

272. U S WEST's non-recurring installation charge includes the cost of disconnection. MCI and AT&T assert that an ILEC should only be compensated for disconnection when disconnection actually occurs because ILECs have developed efficient processes for handling disconnection orders without performing any manual action.[334] The Department agrees.[335] In such an instance, an electronic order disconnecting the service is placed through the ILEC OSS and the service is terminated to the customer.[336] This process is a logical, rather than physical disconnection.[337] Approving a fee based on the cost of physical disconnection to be paid when a customer is provided a logical disconnection would, in essence, be charging a fee for a process that does not occur. With the advantages to renewing service inherent in maintaining the physical link between the customer and the CO, logical disconnection is an efficient practice. Thus, disconnection charges should be modeled separately from connection charges.

MCI and AT&T's Non-Recurring Cost Study

273. MCI and AT&T submitted two versions of their non-recurring cost model (NRCM) during the proceeding. It develops 46 non-recurring charges for the functional activities associated with installation, disconnection, and migration of a customer from one carrier to another. The NRCM assumes the efficient use of existing operational support systems. The fallout rate resulting from errors in the ordering process, whether due to human error, mismatches in the data bases, or other problems with the process, is assumed to be 2%. The NRCM also makes the assumption that any travel time necessary for technician dispatch would average 20 minutes and that each trip would result in four work activities being resolved.

274. NRCM default values assume 58% of the lines are served by copper feeder and the remaining 42% with fiber. The use of copper results in additional manual steps in the provisioning process, thereby increasing the non-recurring cost.[338] This copper/fiber

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333 Ex. 615 at 23.
334 Exs. 308 at 6 and 335, at 23-24.
335 Ex. 615 at 34-35.
336 Ex. 335 at 24.
337 Ex. 308 at 6-7.
338 Ex. 615 at 40.

ratio is consistent with the assumptions contained in the HAI Model that Digital Loop Carrier is used for loop feeder over nine kilofeet.[339]

275. NRCM uses 1997 labor rates as the default value in its cost study whereas U S WEST used 1996 labor rates. Ms. Peirce's analysis found that the rates proposed by AT&T are generally higher than those used by U S WEST even when comparing AT&T's rates to U S WEST's 1997 rates. Ms. Peirce's testimony provides an example of the higher rates used by AT&T for the switch control center.[340]

276. NRCM separates connection and disconnection costs unlike U S WEST's model which combines them. NRCM recognizes that the increased use of soft dialtone reduces the actual physical disconnection of the lines when service is changed.[341]

277. NRCM assumes the initial ordering and provisioning process is handled completely electronically. Therefore, the initial steps do not include any provision for fallout, errors, or service center assistance. The only cost incurred is computer processing time which is recovered from recurring rates under AT&T's model. This contrasts with U S WEST's assumption that the initial order process is entirely manual.[342]

278. While MCI and AT&T did not provide any work papers supporting its assumption that certain costs could be recovered through a recurring charge or of its time estimates and probabilities of certain work activities occurring, it indicated that these assumptions were based on the professional judgment of its experts.[343] At the hearing, AT&T witness Petti testified that the small team of subject matter experts that determined the times used in the time studies had experience with numerous local exchange companies including U S WEST. These time study determinations were made beginning in the summer of 1997.[344]

279. NRCM utilizes an overhead cost factor of 10.4% for each of the 46 non-recurring charges it develops.

280. NRCM accounts for travel time in its model by including the average trip time in minutes as an input into the model. The default travel time is 20 minutes. By comparison, U S WEST's non-recurring cost studies estimate travel time at 21 minutes in the unbundled loop study, 20 minutes in the cable unloading and bridge tap removal study, and at 26 in the Switched Transport and Network Interface Device studies. The NRCM differs from U S WEST's non-recurring model in the method it uses to spread travel cost among orders or work activities. The NRCM assumes travel costs to the central office are averaged over four work activities per trip. The number of work activities per trip is an input that can be adjusted into the NRCM; however, the input

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339 Ex. 617 at 8.
340 Ex. 615 at 40.
341 Id. at 41.
342 *Id.*
343 *Id.* at 41-42.
344 Tr. Vol. 8A at 8.

affects only activities performed at the central office and not other activities for which travel may be required.[345]

281. The NRCM assumes that 80% of lines are served by a staffed central office. This figure is in line with information presented by U S WEST during the proceeding stating how its central offices are staffed.[346]

282. The appropriate fallout rate is much contested in this proceeding. AT&T recommends a two percent fallout rate be utilized for all activities. AT&T supports this recommendation on two grounds. First, AT&T asserts that a two percent fallout rate is reasonable given the use of highly efficient operations support systems. Second, AT&T argues that other operations support systems have achieved a similar fallout rate.[347]

283. The evidence provided by U S WEST in this proceeding indicates that it does not maintain fallout by service categories but it did identify the number of total service order errors at 308,910 for 1996 for Iowa, Minnesota, Nebraska, North and South Dakota. U S WEST also presented evidence that a total number of service orders for these same states was 6,757,667 for the same time period. These figures result in a fallout rate of 4.6%.[348] The historical fallout rates experienced by Bellsouth and U S WEST provide support for the two percent fallout rate proposed by AT&T for POTS services.[349]

284. As noted above, the NRCM does not assign any time or cost to customer service activities. While U S WEST's contention that every order should require manual intervention and customer service support is unreasonable, so too is the contention of NRCM that such human intervention will never be necessary. AT&T recognizes in its testimony that some service center support will occur at least minimally. While the NRCM anticipates such assistance being available, the model fails to reflect any costs associated with the assistance.[350] The non-recurring cost associated with service ordering should be included in the NRCM.[351]

Recommendations Concerning Non-Recurring Costs.

285. The ALJ recommends that the Commission adopt the &T's NRCM with modifications as described below. U S WEST's non-recurring cost studies should be rejected because they rely on outdated time studies, and are not forward-looking. Further, U S WEST's fallout rates, if adopted, would result in U S WEST providing CLECs with discriminatory access to its OSS.

286. The ALJ further recommends that the Commission adopt a two percent fallout rate for POTS and resale services and a 4.6% fallout rate for complex or designed

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345 Ex. 617 at 6.
346 Id. at 8.
347 Ex. 615 at 38.
348 *Id.* at 39.
349 *Id.*
350 Ex. 617 at 4-5.
351 Id. at 15; Ex. 300 at 36; Ex. 338 at 26; Ex. 619 at 15.

services. Use of the two percent rate for POTS and resale is supported by the experience of Southwestern Bell, Bellsouth, the numbers provided by U S WEST in response to AT&T information request number 23 and DPS information request number 45.

287. While the evidence supports a two percent fallout rate for POTS and resale orders, even AT&T witness Petti recognized that orders for designed services require more manual intervention than POTS or resale orders.[352] Therefore, a two percent fallout rate would be inappropriately low for other than POTS and resale services.

288. The NRCM common overhead factor should be adjusted to 13.09%, as recommended for the other studies.

289. The NRCM should be amended to reflect the cost of customer service assistance in accordance with the appropriate fallout rates.

INTERIM NUMBER PORTABILITY

290. US WEST objected to using the "bill and keep" method of allocating costs for interim number portability.[353] In its place, US WEST proposes adoption of a system negotiated with a competitor. DPS pointed out that bill and keep was adopted as the cost allocation method by the Commission.[354] MCI and AT&T pointed out that having each carrier pay its own cost has been adopted by the FCC.[355] While US WEST maintains that the outcome of bill and keep is to deny any significant compensation to the ILEC, there is no evidence that the adopted bill and keep method has been ruled invalid in any other proceeding regarding Minnesota rates. Bill and keep remains the methodology that should be used to compensate all carriers for costs regarding interim number portability.

Based upon the foregoing findings and conclusions, the Administrative Law Judge makes the following:

RECOMMENDATIONS

The Administrative Law Judge respectfully recommends that the Public Utilities Commission:

1. Use the HAI model to estimate U S WEST's UNE costs, but do not deaverage UNE prices at this time. If the Commission decides to deaverage prices, that should be done only for geographic areas no smaller than wire centers.

2. Set the common overhead factor at 13.09%.

3. Set the network support factor at 85%.

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352 Ex. 335 at 11.
353 US WEST Brief, at 58.
354 Docket No. P421,442/M-96-855; Order Resolving Arbitration Issues, at 41-42 (December 2, 1996).
355 Ex. 341 at 23.

4. Set cost of capital at 9.6%.

5. Spread loop related overhead expenses on a per loop rather than a per dollar of investment basis.

6. Set depreciation parameters for projection lives and salvage percentages at the values recommended by the Department in its August 15, 1997 Comments in Docket No. P421/D-891.

7. Use HAI default regional labor adjustment factor for Minnesota (.99).

8. Adopt the drop lengths and drop placements by density zone as set out in Mr. Legursky's testimony.

9. Use the distribution structure mix parameters described by Mr. Legursky and set the fraction available for shifting away from the preassigned structure mix equal to zero.

10. Use the structure sharing parameters described by Mr. Legursky at Ex. 603 at 48-49; Ex. 604, JWL-2, Tables 18-19.

11. Use the buried placement cost parameters described by Mr. Legursky at Ex. 603 at 50; Ex. 604, JWL-2, Tables 20-21.

12. Change the weighted average price for channel units to that recommended by Mr. Legursky at Ex. 603 at 53-54.

13. Adjust the model to allow for dedicated idle.

14. Adopt AT&T's methodology for estimating the costs of special access lines on a pair-equivalent basis in the distribution plant and on a circuit-equivalent basis in the feeder plant.

15. Fix the error in calculating the line card costs related to special access lines.

16. Use actual line count data including the special access line count data requested by Dr. Fagerlund and remove the 32 sold exchanges.

17. Reject the SPOT frame proposal and require U S WEST to provide unbundled network elements in combination as requested by CLECs and to recombine them on behalf of CLECs.

18. Use the MCI/AT&T Collocation Cost Model to estimate collocation costs, but with its overhead factor modified to 13.09%.

19. Deny any U S WEST recovery of OSS costs until U S WEST provides CLECs non-discriminatory access to OSS interfaces and until the Company provides reliable cost support for its proposed rates.

20. Use the MCI/AT&T NRCM to estimate non-recurring costs with the following modifications:

a. Use a two percent fallout rate for POTS resale services and a 4.6% fallout rate for complex or designed services;

b. Use an overhead factor of 13.09%;

c. Account for the cost of customer service assistance with an appropriate fallout rate.

21. Adopt Bill and Keep as the cost recovery methodology for Interim Number Portability.

Dated: November 17, 1998

STEVE M. MIHALCHICK
Administrative Law Judge

NOTICE

Notice is hereby given that, pursuant to Minn. Stat. § 14.61, and the Rules of Practice of the Public Utilities Commission and the Office of Administrative Hearings, exceptions to this Report, if any, by any party adversely affected must be filed within 20 days of the mailing date hereof with the Executive Secretary, Minnesota Public Utilities Commission, 350 Metro Square, 121 7th Place East, St. Paul, Minnesota 55101. Exceptions must be specific and stated and numbered separately. Proposed Findings of Fact, Conclusions and Order should be included, and copies thereof shall be served upon all parties. If desired, a reply to exceptions may be filed and served within ten days after the service of the exceptions to which reply is made. Oral argument before a majority of the Commission will be permitted to all parties adversely affected by the Administrative Law Judge's recommendation that request such argument. Such request must accompany the filed exceptions or reply, and an original and 15 copies of each document should be filed with the Commission.

The Minnesota Public Utilities Commission will make the final determination of the matter after the expiration of the period for filing exceptions as set forth above, or after oral argument, if such is requested and had in the matter.

Further notice is hereby given that the Commission may, at its own discretion, accept or reject the Administrative Law Judge's recommendation and that the recommendation has no legal effect unless expressly adopted by the Commission as its final order.