urban, suburban, and rural. In addition, it emphasized the importance of documentation for cost studies, requiring each study to be "complete, self-contained, and fully supported by documentation, work papers, and algorithms."[1]

On September 27, 1996, the U.S. Court of Appeals for the Eighth Circuit temporarily stayed the effectiveness of many provisions of the FCC's rules pertinent to this proceeding, including most of the pricing provisions, and on October 15 it made that stay permanent pending final decision on the merits of various challenges to the rules. On October 18, we invited comment on whether the stay warranted any procedural changes in this case, including a possible delay of the scheduled hearings to permit introduction of additional testimony. The responses disclosed no such need, and, on October 23, Judge Linsider issued a notice announcing that the hearings would go forward as scheduled. The case since then has proceeded in the absence of binding FCC rules on pricing, though the requirements of the Act of course remained in place and parties continued, in various degrees, to look to the FCC rules for guidance. On November 12, the Supreme Court of the United States declined to vacate the stay of the FCC rules.

Hearings before Judge Linsider began, as scheduled, on October 29, 1996 in Albany and continued daily (except for Election Day, November 5) until November 8. Testimony was received (in person or, where cross-examination had been waived, by affidavit) from witnesses on behalf of New York Telephone, Rochester Telephone, AT&T Communications of New York, Inc. (AT&T), MCI Telecommunications Corporation and MCImetro Access Transmission Services, Inc. (MCI), and MFS Intelenet of New York, Inc. (MFS)[2]. Also appearing at the hearings were Sprint

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[1] September 9 Ruling, p. 7.

[2] Counsel for MFS appeared as well on behalf of Residential Communications Network Inc. (RCN) and the two parties submitted a joint brief, but only MFS is referred to in the witness' testimony.

Telecommunications Company, L.P. (Sprint); Time Warner Communications Holdings, Inc., Cablevision Lightpath, Inc., Telecommunications, Inc., and the Cable Television and Telecommunications Association of New York, Inc. (Time Warner); the New York Clearing House Association (NYCHA); and LDDS Worldcom and the Empire Association of Long Distance Telephone Companies, Inc. The record (in addition to that previously compiled) consists of 2,096 transcript pages (numbered 2006-4302), 15 pages of transcript initially protected as proprietary, 25 pages of transcript initially protected as specially proprietary,[1] and 96 exhibits (numbered 128 through 225, except for 172, which was offered but excluded), of which three (numbers 139-P, 216-P, and 223-P) were initially protected as proprietary and one (number 160-PP) was initially protected as specially proprietary. (In a later ruling, Judge Linsider afforded final trade secret protection to only a limited number of the items initially protected; the remainder will be

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[1] Proprietary information was exchanged among the parties pursuant to a protective order, which provided for access to be afforded to counsel, outside experts, and designated in-house experts approved by the party claiming protection. Specially protected information was considered so sensitive as to be denied to all in-house experts and made available only to counsel and outside experts.

transferred to the public record.[1]) Thereafter, initial briefs were filed by New York Telephone, Rochester Telephone, AT&T,[2] MCI, Sprint, MFS/RCN, Time Warner, and NYCHA; all those parties except for Time Warner filed reply briefs.[3]

During the hearings, it came to light that New York Telephone had misstated the number of density zones it had used in conducting its cost studies and provided incorrect information regarding those zones in certain discovery responses.[4] As a result of those disclosures, New York Telephone provided

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[1] The portions of the record finally protected from public disclosure are (1) the portion of Exhibit 216-P comprising only the two pages immediately following the cover sheet of New York Telephone's response to information request ATT-NYT-243; (2) exhibit 160-PP (which remains specially protected); and (3) the following passages (described by page:line) of the specially proprietary transcript (which also remain specially protected): 6:17-8:22, 9:2-9:14, 10:4-10:15, and 10:19-18:2. In addition, the Judge afforded protection to one item not placed on the record; it consists of the specific percentage discounts set forth in New York Telephone's response to the on-the-record information request made by MCI at Tr. 3,015, lines 1-6. (Cases 95-C-0657 et al., Ruling Concerning Trade Secrets and Motion to strike Portions of a Brief (issued February 18, 1997).)

[2] AT&T refers to its briefs as "Supplemental Brief" and "Supplemental Reply Brief," referring back to the briefs filed last August, which treated link and port costs on a pre-FCC-decision basis. For uniformity in citing all parties' briefs, AT&T's current briefs will be referred to without the "Supplemental" designation.

[3] Positions and arguments described in this opinion often are presented by parties in addition to the ones to whom they are attributed, but, for the sake of brevity and simplicity, those parties are not necessarily referred to. Of the parties opposing New York Telephone, AT&T submitted the most comprehensive briefs, and positions taken by those parties are most often cited in its name. All briefs, of course, have been read and taken into account; and treating AT&T as, in some sense, a "spokesman" with regard to various issues does not imply that other parties would recognize it as such or that AT&T's and their interests necessarily coincide.

[4] The parties dispute the severity of the error and the degree of New York Telephone's culpability; these issues are considered below.

additional information,[1] and AT&T, supported by Sprint and MCI, requested the opportunity to depose New York Telephone witnesses. Judge Linsider denied that motion but authorized additional, post-record discovery and reference in brief to the discovered information.[2] The discovery process continued beyond the briefing dates, and parties were authorized to submit supplemental comments; MFS and NYCHA did so, and New York Telephone replied.

On January 22, 1997, AT&T moved to strike portions of New York Telephone's reply brief on the grounds that they "contain assertions of fact and opinion that are unsupported by, and unsupportable by, any evidence in the record."[3] Judge Linsider denied the motion.[4]

STANDARDS AND MEASURES OF COST

Before turning to the cost studies on which the parties based their pricing proposals, it may be useful to review briefly the applicable statutory standards and costing approaches. This section of the opinion does so; the next section presents overviews of the models that have been offered.

The Statute

Under §251(c)(3) of the Act, incumbent local exchange carriers such as New York Telephone and Rochester Telephone are obligated to provide

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[1] In addition to materials provided at the hearings, New York Telephone submitted two packages of documents, one on November 8 (Exhibit 224) and one on November 20 (Exhibit 225).

[2] Cases 95-C-0657 et al., Ruling on Request for Depositions (issued November 25, 1996) aff'd, Order Denying AT&T's Appeal of Judge Linsider's November 25, 1996 Ruling (issued February 18, 1997).

[3] AT&T's January 22 motion, p. 1.

[4] Cases 95-C-0657 et al., Ruling Concerning Trade Secrets and Motion to Strike Portions of a Brief (issued February 18, 1997).

> to any requesting telecommunications carrier for the provision of a telecommunication service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and non-discriminatory in accordance with the terms and conditions of the agreement [between the carriers] and the requirements of this section and §252 [of the Act].

The Act's pricing standard for network elements is set forth in §252(d)(1), which provides that

> determinations by a State commission of the just and reasonable rate . . . for network elements for purposes of subsection (C)(3) of [§251]--
>
> (A) shall be--
>
> (i) based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing . . . network element . . . and
>
> (ii) nondiscriminatory, and
>
> (B) may include a reasonable profit.

The rules adopted by the FCC with the First Report and Order define, at 47 C.F.R. §51.319, the specific unbundled network elements that an incumbent local exchange company (ILEC) is required to make available.[1] The elements at issue here are among those; as noted, the remainder will be considered in forthcoming hearings.

With respect to pricing, the FCC determined that the provisions of §252(d)(1) should be carried out by setting prices on the basis of the "total element long-run incremental cost" (TELRIC) of each element, along with a reasonable allocation of forward-looking common costs. TELRIC is a term coined by the FCC

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[1] This provision of the FCC's rules has not been stayed and remains in force.

in the First Report and Order to describe the version it was adopting of the more familiar total service long-run incremental cost (TSLRIC) method, and those costing procedures, along with others, are described below. The costing and pricing provisions of the FCC's rules are among those stayed by the Eighth Circuit and are no longer binding; nevertheless, the parties continued to refer to the TELRIC standard and to assess the studies in its light.

Four costing methods are pertinent here and need to be described: embedded costs, long-run incremental costs (LRIC), TSLRIC, and TELRIC.

Embedded Cost

The FCC offered the following definition of embedded costs: "Embedded or accounting costs are costs that firms incurred in the past for providing a good or service and are recorded as past operating expenses and depreciation."[1] New York Telephone believes that setting prices on the basis of embedded costs would be consistent with the requirements of §252(d)(1) of the Act, but neither New York Telephone nor any other party proposes doing so. In fact, prices based strictly on embedded costs are apt to be inconsistent with the prices set in a competitive market; for the latter reflect the interplay of demand and costs, such that prices tend, in the long run, toward incremental costs (next discussed). Thus, prices will approximate embedded costs only if, by coincidence, the interplay between demand and supply encourages such pricing behavior. Embedded costs, therefore, need not be further considered here, except as insofar as some parties disparage New York Telephone's study as being based on embedded costs notwithstanding New York Telephone's protestations to the contrary.

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[1] First Report and Order ¶ 675.

Long-Run Incremental Cost

Incremental costs are the additional costs incurred in producing an additional quantity of a good or service. Long-run incremental cost determines incremental cost over a period long enough so that all of the firm's costs become variable or avoidable. Our costing manual states that "the long-run incremental cost is calculated by estimating the total cost of the firm at the current level of demand and subtracting that from an estimate of the total cost of the firm when more of the service in question is produced."[1] New York Telephone submitted a LRIC study of its link costs in last July's hearings, before issuance of the FCC's decision; at this stage, it does not rely on that study, asserting that it would be improper to use that study for links while using TELRIC studies--the only other ones on the record--for other network elements.[2]

Total Service Long-Run Incremental Cost

TSLRIC is the costing method set forth in the Toll and Access Manual, which defines it as follows:

> The total service long-run incremental cost refers to the difference in the total cost of the company when it produces the service in question compared to when it does not produce any output of the service.

Thus, total service long-run incremental cost amounts to long-run incremental cost where the increment of service examined is the total demand for the service. The Toll and Access Manual goes on to state that

> Ideally, this cost measure should attempt to consider how the company would be efficiently structured if it did not have to produce the service in question. In other words,

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[1] Toll and Carrier Access Service Incremental Cost Study Manual (Toll and Access Manual), p. 4.

[2] New York Telephone's Initial Brief, p. 11.

> anything that would cause a change in total cost of the company should be studied. Notwithstanding this theoretical ideal of the proper way to measure the total service long-run incremental cost, . . . it would be impractical in most cases to estimate changes in cost that would result from changes in the entire structure of an LEC's network.[1]

Total Element Long-Run Incremental Cost

TELRIC is the term coined by the FCC to describe its adaptation of TSLRIC to the pricing of network elements rather than services. As the FCC describes it, the principal difference between TSLRIC and TELRIC is that services, the costs of which are measured by TSLRIC, are typically provided over shared network facilities, and determining the cost of the service requires the allocation of a significant amount of joint or common costs.[2] The costing of network elements requires less of the difficult process of allocating joint and common costs, for there typically are far fewer elements used to provide telecommunications services than there are services themselves.[3]

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[1] Toll and Access Manual, p. 6.

[2] The FCC offers the following definitions of these terms: "Joint costs" are "costs incurred when two or more outputs are produced in fixed proportion by the same production process (i.e., when one product is produced, a second product is generated by the same production process at no additional cost)." "Common costs" are "costs that are incurred in connection with the production of multiple products or services, and remain . . . unchanged as the relative proportion of those products or services varies (e.g., the salaries of corporate managers)." (First Report and Order, ¶ 676.)

[3] AT&T has suggested that network elements, in contrast to services, largely correspond to distinct network facilities, and that this suggests a further distinction between TSLIRC and TELRIC. While there may be some validity to that view, it clearly has limits, as the debate on use of narrowband or broadband (discussed later) indicates. Suffice it to say that the principles of TSLIRC continue to apply in a TELRIC study and the allocation of joint and common costs among elements remains a significant matter.

AT&T offers the following abstract of a TELRIC's study's qualities, culled from the FCC's rules:

1. The study must calculate the incremental cost not of a service, but of the total quantity of a "network element."

2. The study must be forward-looking.

3. The study must be long-run.

4. The study must be based on an efficient network configuration using least cost, generally available technologies.

5. The study must calculate the forward-looking cost of capital.

6. The study must calculate forward-looking, economic depreciation rates.

7. The study must determine a reasonable allocation of forward-looking common costs.[1]

New York Telephone, meanwhile, offers the following description of the FCC's TELRIC requirements:

(a) The increment that forms the basis for a TELRIC study shall be the entire quantity of the network element provided;

(b) All costs associated with providing the element shall be included;

(c) Only forward-looking, long-run incremental costs shall be included; and

(d) Costs must be based on the incumbent LEC's existing wire center locations and most efficient technology available.

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[1] AT&T's Initial Brief, p. 10, citing 47 C.F.R. §51.505 (a)-(c).

> Furthermore, a TELRIC study is to be based on a forward-looking cost of capital and economic depreciation rates.
>
> Finally, the [First Report and Order] and associated regulations require that the price of unbundled network elements include a reasonable portion of forward-looking common costs.[1]

The differences between the two descriptions are subtle, but, as will be seen, noteworthy. They pertain primarily to New York Telephone's addition, presumably for emphasis, of the requirement that all costs associated with the element be included (item (b)) and to the different characterizations of the system configuration and technology to be used (compare AT&T's item 4 with New York Telephone's item (d)). The system configuration premise adopted by the FCC, referred to a "scorched node," is accurately described by New York Telephone, in that it takes the ILEC's existing wire centers as the only given and then contemplates an efficiently reconstructed system to provide the element in question using those wire centers. (The alternative would have been to disregard even the existing wire center locations and hypothesize a wholly new system.) There is considerable disagreement, however, about the nature of the contemplated technology.

Notwithstanding the court's staying of the FCC's pricing rules, the parties continued to rely on the TELRIC standard. AT&T, which favors TELRIC, suggests that the three standards in fact can be reduced to one: "The relevant analysis is of the long-run incremental cost of an unbundled network element, based on total demand for the element. That definition satisfies this Commission's LRIC and TSLRIC definitions as well as the FCC's TELRIC standard."[2] It goes on to assert, accurately, that each of the cost studies submitted purports to

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[1] Tr. 2125 (New York Telephone Witness Curbelo.)

[2] AT&T's Initial Brief, p. 12.

comply with both the LRIC and TSLRIC/TELRIC cost standards and that the issue is whether they succeed in doing so.

AT&T offers the following questions as representing the standard to be applied in evaluating cost studies:

1. Is [the study] consistent with the TELRIC methodology and the Commission's incremental costing guidelines?

2. Is it designed to determine least cost calculations for an efficiently designed narrowband network for the provision of local exchange service, i.e., POTS [Plain Old Telephone Service]?

3. Is the input information accurate and auditable?

4. Will it permit this Commission to set rates that are pro-competitive?[1]

New York Telephone, in contrast, objects to TELRIC in principle "on the grounds that it understates costs by relying on a highly hypothetical model in which 'most efficient' technologies are assumed to be fully deployed in the Company's network, rather than a more realistic model in which newer technologies replace embedded network plant over a period of time."[2] It asserts that the Commission "should set network element rates based on the same considerations as it has always used in setting rates: the standards of the Public Service Law, the dictates of public policy, and the guidance of prior Commission rulings, in particular those orders approving the cost study manuals for loops and for toll and access services."[3] This is the standard to be applied in the absence of definitive and binding guidance from the FCC.

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[1] Ibid., p. 18.

[2] New York Telephone's Initial Brief, p. 7.

[3] Ibid., p. 11.

That said, as a practical matter New York Telephone would rely on the TELRIC standard because the only studies on the record are TELRIC based. It emphasizes, however, that its sponsorship of TELRIC-based cost studies does not imply endorsement of TELRIC but simply recognizes the state of the record in this proceeding and the need to avoid having interim rates in effect pending a long, reopened proceeding. It believes that its implementation of TELRIC in its study is consistent with both the FCC's First Report and Order and with our cost manuals and represents a result within the range that we are free to adopt.

MCI, meanwhile, contends that the FCC's adoption of a forward-looking TELRIC method is consistent with sound economic policy; that TELRIC is the only pricing standard that can result in rates complying with the Act, and that the Eighth Circuit did not question the standard itself but only the FCC's authority to promulgate it; and that we should adopt a TELRIC standard for the same reasons the FCC adopted it and consistent with our own recently reaffirmed preference for efficient prices based on forward-looking costs.[1]

Other than observing that prices based on embedded cost are apt to be inconsistent with prices determined by competitive markets, we need not evaluate the various costing methods on theoretical grounds, and we therefore decline to do so. The case was litigated on a TELRIC basis; all parties contemplate its being decided on that basis; TELRIC is certainly a reasonable approach to use, though just as certainly not the only one; and, as New York Telephone recognizes, as a practical matter there is no alternative other than the very unattractive one of temporary rates while a lengthy new case is litigated.

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[1] MCI's Initial Brief, p. 6, citing Case 96-C-0723, New York Telephone Company and AT&T Communications of New York, Inc. - Arbitration Proceeding, Opinion No. 96-31 (issued November 29, 1996), mimeo p. 32.

OVERVIEW OF STUDIES AND PARTIES' POSITIONS

Cost studies and proposed prices for all the elements at issue were submitted by New York Telephone, AT&T, and MCI. (The various pricing proposals of these parties are set forth in full in Attachment B.) In addition, Rochester Telephone submitted a study limited to its links and ports; as noted above, it is not considered here.

AT&T and MCI submitted versions of the "Hatfield Model," developed by Hatfield Associates, Inc. of Boulder, Colorado at the request of AT&T and MCI. According to AT&T, its Hatfield-based study is superior to MCI's because AT&T was able to customize the model to incorporate New York specific data;[1] MCI does not appear to contest this view. References to the Hatfield Model will refer to aspects of the model common to both versions or pertaining to AT&T's alone; should it be necessary to distinguish a reference to MCI's study, it will be so identified.

In this section of the opinion, we broadly describe the studies and their methods, as well as the positions taken by parties not submitting studies. We then describe our method for considering the many issues raised by the studies.

New York Telephone's Study

Assertedly following the TELRIC method, New York Telephone submitted studies that aimed to determine the price of network elements rather than of the services those elements may be used to provide. More specifically, New York Telephone sought to determine the forward-looking, long-run incremental costs of each element. To do so, it did not attempt to compare the costs

[1] AT&T's Initial Brief, p. 17.

of optimized networks with and without a particular element.[1] Instead, New York Telephone "simply assigned network facilities to particular elements based on common understandings of the definitions of those elements and what they included, as supplemented by the element definitions specified by the FCC. The investments associated with these facilities were then determined and assigned to the appropriate elements."[2] Where facilities served more than one element (such as poles and conduit that serve both loops and interoffice transport cables), appropriate allocations were made and common costs were allocated through the use of carrying charge factors.

The increment of demand assumed in New York Telephone's study was the current quantity of the element being studied; no attempt was made to project that demand into the future. To deal with the "lumpiness" of investment[3] New York Telephone levelized the investment over all units of demand in the increment.

Asserting that the long-run approach did not require a particular future study period or consideration of what it characterizes as "fantasy networks,"[4] New York Telephone maintains that, consistent with both the FCC's First Report and Order and the Commission's cost manuals, it considered neither "speculative future innovations nor changes in wire center locations."[5] Nor, it points out, did it seek to adjust costs for

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[1] In a series of briefing questions posed to the parties, Judge Linsider and the staff team inquired whether a properly conducted TELRIC study "would compare the cost of a network optimized to provide all elements and that of a network re-optimized to provide all elements except the one being studied." (Ruling Listing Questions for Briefs (issued November 12, 1996), p. 1.)

[2] New York Telephone's Initial Brief, p. 22.

[3] I.e., a need to respond to a one-unit increase in demand by installing equipment that can serve far more than that one unit alone.

[4] New York Telephone's Initial Brief, p. 25.

[5] Id.

inflation. In its brief, it offered the following illustrations of the forward-looking, long-run nature of its study; many of these, as discussed below, proved controversial:

- Network technology was unconstrained by that embedded in the existing network and 100% deployment was assumed for technology that the company believed was the most efficient available or would become available in the immediate future.

- Material costs and loading factors were based on currently available vendor discounts and on the latest jobs in the company's databases; no data were used for the period prior to calendar year 1995. New York Telephone thus took account of the economies of scale it had been able to achieve but did not undertake what it regards as the "speculative exercise" of attempting to determine the prices that would apply if the whole forward-looking network were purchased at once.

- Because forward-looking investment is below embedded investment, the study applied carrying charge factors, computed on the basis of current expense-to-investment ratios, to a smaller investment base. New York Telephone saw no need, however, to alter the ratios themselves except where it believed, as in the case of lower maintenance costs associated with fiber optic rather copper cables, that the nature of the future network specifically warranted a reduction in a carrying charge factor.

New York Telephone notes, however, that it specifically did not take account of what it regards as "speculative efficiencies" associated with the proposed NYNEX/Bell Atlantic Merger (noting, among other things, that the proposed merger may be approved, if at all, only subject to terms and conditions that might reduce its expected benefits), or with its ongoing process reengineering efforts (noting that the efficiencies already achieved through process reengineering have been incorporated in the study and

that forecasting future such gains is risky). In the event efficiencies did materialize by reason of the merger or the process reengineering efforts, they could be incorporated into future studies.

To recover common costs that cannot be assigned directly to particular elements, New York Telephone used carrying charge factors in a manner that, it maintained, avoided double counting and excluded, as contemplated by the FCC, common costs attributable to the provision of retail service. It suggests that economic efficiency would be maximized by allocating common costs in accordance with Ramsey pricing principles, which assign the bulk of the costs to the most inelasticly demanded elements, but that such an approach was rejected by the FCC and that New York Telephone adopted a method that complied with the FCC's requirements.

To determine the number of actual units over which the cost of a facility must be spread, it is necessary to estimate what is variously called the "fill" or "utilization" factor, identifying the percentage of the facility's total capacity that is actually being used. For reasons described later, in the consideration of this hotly contested input, New York Telephone used neither the "objective" fill level (that is, the level that triggers replacement or augmentation of the facility inasmuch as a higher fill factor would create an unacceptable risk of service outage), nor current actual fill levels, which it believed might not be representative of the forward-looking network. Instead, it used what it termed an engineering approach, in which engineering judgment was used to determine placement and augmentation strategies for various types of facilities, and the associated intervals were used to determine likely fill levels over the life cycle between successive augmentations. New York Telephone asserts that these fill levels represent "an intermediate level between the level that would be experienced immediately after augmentation, and the much higher level that would be experienced immediately before the following

augmentation,"[1] and thus correspond with the concept of average fill, as described in the staff memorandum that accompanied the Loop Cost Manual when it was submitted to us. They are consistent as well, it says, with the FCC's statement that per-unit costs should be calculated on the basis of "reasonable projections of the actual total usage of the element."[2]

Asserting that its study is necessarily somewhat hypothetical (in that, for example, it contemplates 100% deployment of forward-looking technologies), New York Telephone nevertheless maintains that it is grounded in real-world data inasmuch as, for example, materials prices are based on actual, current vendor prices, equipment installation loading factors are based on actual data for recent jobs, carrying charge factors are based on actual 1995 expense data, and cable and outside plant structure lengths are based on actual cable lengths reflecting detailed engineering consideration of local topography and other relevant factors. This grounding in the real world, according to New York Telephone, makes its study superior to a generic model such as Hatfield.

Finally, New York Telephone's study is geographically deaveraged to reflect costs for four density-based zones: rural (less than 150 access lines per square mile), suburban (150-500 access lines per square mile), urban (500-1,500 access lines per square mile), and "major city" (more than 1,500 access lines per square mile). New York Telephone performed that deaveraging in response to the FCC's requirement that each state establish at least three cost-based rate zones[3]; in the absence of that requirement, which is among those that have been stayed, New York Telephone, though not opposed in concept to geographic

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[1] New York Telephone's Initial Brief, p. 39.

[2] First Report and Order, ¶ 682, cited at New York Telephone's Initial Brief, p. 39.

[3] First Report and Order, ¶¶ 765-766.

deaveraging, believes deaveraged rates are impractical at this time. These issues, too, are discussed below.

The Hatfield Model

The Hatfield Model was developed to estimate "the forward-looking economic cost of unbundled network elements . . . based on . . . TELRIC principles," and, in an application not pertinent here, to estimate the forward-looking economic cost of the basic local telephone service that is the target of universal service funding mechanisms.[1] AT&T and MCI sponsored cost studies based on Version 2.2, Release 2 of the Hatfield Model.[2] According to MCI witness Mercer (the President of Hatfield Associates, Inc.), the Hatfield Model calculates the costs that would be "incurred by an efficient LEC to provide the specified elements using a network designed to provide narrowband, voice grade telephone services. [It] is adaptable to any LEC or geographic area, provided the appropriate state-specific and company-specific information is available and input into the model."[3]

The model is based in part on the various versions of the Benchmark Cost Model (BCM).[4] The data inputs for the model were selected by engineers and economists at Hatfield from

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[1] Hatfield Model, Version 2.2, Release 2, Model Description (Hatfield Model Description), p. 1. This document is included in MCI's Exhibit 138 and AT&T's Exhibit 164.

[2] In the July round of hearings, AT&T had sponsored a study based on Version 2.2, Release 1 of the Hatfield Model. According to AT&T, the basic method and approach remain unchanged, but Release 2 is easier to use and incorporates refinements that permit more precise identification of forward-looking economic costs. (Tr. 3,505-3,506 (AT&T witness Floyd).)

[3] Tr. 2,608-2,609.

[4] Version 1 of the BCM was developed by U.S. West, NYNEX, MCI, and the local services operation of Sprint; version 2 was developed by U.S. West and Sprint without the sponsorship of NYNEX and MCI; BCM Plus, derived from BCM-1, was developed by MCI alone.

publicly available information, where possible, and many data inputs are adjustable by the model's users. The data base includes Census Block Group (CBG) data from the U. S. Census Bureau, used to relate CBGs to LEC wire centers; information from Bellcore and the National Exchange Carrier Association to define existing LEC wire center locations; U. S. Geological Service satellite survey data; and Dun and Bradstreet census tract business employee counts, used to estimate the number of business lines in a CBG. These data inputs are processed through six functional calculation modules that, in general, calculate the total number of access lines in each CBG, the cable lengths required to serve those access lines, a loop investment calculation for each CBG, investment in switching, wire centers, signalling, transport, and operator services facilities, the investment costs for other network components and outside plant structures, and monthly capital carrying costs and expense figures.[1] Results are produced by density zone; AT&T's study deaveraged prices into four zones: Manhattan, the remainder of New York City, several counties near New York City, and the remainder of the State. MCI proposes six density zones for loop pricing; the resulting monthly prices range from $85.09 in the least dense zone to $8.94 in the densest zone, with a statewide average of $11.06.[2]

The Hatfield proponents contend that the model satisfies all applicable standards, including both the FCC's TELRIC requirements and the requirements of the New York cost manuals.[3] AT&T, for example, maintains that only the Hatfield model properly portrays the forward-looking economic costs for a local exchange network that efficiently provides basic narrow-

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[1] These modules are described in greater detail at Tr. 2,612-2,614 (MCI witness Mercer) and Exhibits 138 and 164.

[2] MCI's Initial Brief, p. 14.

[3] These arguments were presented in their August briefs as well as in the current round; the August briefs naturally were directed more toward the then-applicable FCC requirements.

band local telephone services. It argues that its study is a proper TELRIC study in that it:

- uses the best available demographic data for New York to determine the numbers of residential and business customers and their locations relative to New York Telephone's wire centers and then assigns end-users to the appropriate wire centers;
- estimates the amount of capacity needed to meet that demand and uses target fill factors to specify the needed reserve capacity for future growth;
- estimates the cost of needed investment in cable, switches, and other assets on the basis of publicly available data; and
- translates those investment costs into unit costs for each unbundled network element by applying proper cost of capital and depreciation charges and using forward-looking estimates of operating expenses.

AT&T goes on to show how its model, in its view, satisfies the FCC's criteria for a TELRIC study:

- It is an incremental study that takes as its increment the total current demand.
- It projects costs associated with building an efficient, forward-looking, least-cost network to accommodate that demand.
- It takes account of all demand for each network element, including that imposed both by New York Telephone's own retail customers and by customers of carriers purchasing the elements.
- It is long-run in that it treats all costs as variable or avoidable.
- It takes account of the type and quantity of all network components.

- It takes as given the existing locations of New York Telephone's wire centers and posits the use of the most efficient technologies now available to local exchange providers.
- It reflects all costs associated with an element, including the forward-looking cost of capital, suitable allocations of shared costs, and a 10% "variable support factor" to reflect administrative expenses, traditionally viewed as common costs, that vary with the provision of network elements.
- It uses a forward-looking average cost of capital of 9.8% and reasonable, even conservative, economic life depreciation assumptions.
- It incorporates reasonable fill factors.
- It is well documented.
- It includes a reasonable allocation of forward-looking common costs.[1]

AT&T asserts as well that its cost study properly follows the engineering approach set forth in the Loop Cost Manual and is consistent with the guidelines for toll and access TSLRIC studies. Finally, AT&T contends that the study is complete, self-contained, and fully supported by documentation, workpapers, and algorithms and that any interested party can use the model, vary its inputs, and replicate AT&T's study. It therefore believes the model satisfies the requirements set forth in Judge Linsider's September 9 ruling.[2]

MCI describes the model in similar terms.[3] It suggests, among other things, that the model's results are conservative, inasmuch as forward-looking expense studies are not available and recently published embedded data are used instead,

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[1] AT&T's Initial Brief, pp. 124-133.

[2] Ibid., 133-134.

[3] MCI's Initial Brief, pp. 7-13.

despite the declining-cost nature of the industry; that the model's operations can readily be scrutinized and that it frees regulators from relying on the ILECs as sources of information; that while it estimates costs for a forward-looking efficient network that takes as a given only the site of the existing wire centers and does not accept embedded technology and design decisions, it does not thereby produce a fictitious or fantasy network; and that it incorporates a reasonable profit and, via a 10% mark-up derived from AT&T data, a reasonable share of common costs.

Overview of Parties Not Sponsoring Studies

We here provide general information on the positions taken by the parties who did not sponsor studies of their own. To state it most broadly, Time Warner regarded the Hatfield model as so flawed as to be unusable; the other parties generally regarded it as reasonable or, at the least, less flawed than New York Telephone's study.

1. MFS

MFS criticizes New York Telephone's study on many grounds, most of them relating to inputs, and contends that it fails to satisfy the Loop Cost Manual, the FCC's TELRIC standard, or any other forward-looking cost method. It presents a series of new runs of New York Telephone's study in which it changes the inputs to what it views as more reasonable levels and seeks to show on that basis that New York Telephone offers an unduly inflated estimate of those costs. The cumulative effect of its runs is to reduce New York Telephone's proposed average monthly link rate from $19.37 to $9.13.[2]

MFS recommends adoption of the Hatfield Model; should we decline to do so, MFS would have us rerun New York Telephone's study with improved inputs. In that event, it would provide parties an opportunity to comment on how the study should be

[2] MFS' Initial Brief, Appendix D.

rerun and on the new results of doing so.[1] It urges that any such process be guided by the principle that links for copper-based digital services should be priced the same as links for voice-grade services.

MFS also stresses the importance of deaveraging link rates and properly reflecting, through lower prices, what it regards as the lower costs associated with the ultra-high-density zone of Manhattan. It sees AT&T's deaveraging scheme as preferable to New York Telephone's but proposes various modifications in AT&T's method as well.

Finally, MFS objects to any alterations, on the basis of this record, in New York Telephone's non-recurring charges, noting New York Telephone's withdrawal of its testimony on that subject. MFS is correct; non-recurring charges are not at issue here.

2. Sprint

Sprint suggests that because it is a long-distance carrier that also provides local service in other states and has received authority to do so in New York, its "perspective represents an accommodation of interests, similar to those the Commission must balance in this proceeding."[2] It directs most of its efforts to criticizing asserted flaws in New York Telephone's study and suggesting, for the most part qualitatively, how the study could be improved. It also criticizes the specific rates proposed by New York Telephone, noting they are higher than rates in other states or the proxy rates in the FCC's stayed rules.

3. Time Warner

Time Warner contends that the Hatfield model underestimates unbundled element costs, thereby reflecting a bias in favor of resellers and purchasers of network elements at the

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[1] Ibid., p. 59.

[2] Sprint's Initial Brief, p. 4.

expense of those who would construct their own alternative network facilities. It does not endorse New York Telephone's model (it does not comment on it at all) but asks that unbundled element rates be set at their cost and in a manner that does not deter investment in facilities. It also stresses the importance to it of collocation, interconnection, reciprocal transport, and mutual termination of traffic. Judge Linsider ruled that these issues were outside the scope of this phase of the proceeding,[1] and Time Warner asks for clarification with respect to where and when these issues will finally be resolved.[2] It contends that the uncertainty it must bear, in contrast to the certainty regarding the wholesale discount since our resolution of that matter in November, is a further disincentive to the facilities-based investment that offers the best prospect for competition with respect to local loops.

4. NYCHA

NYCHA regards New York Telephone's study as too flawed to be relied on. In particular, it objects to the study's approach to geographic deaveraging, seeing a need for a separate high-density, assertedly low-cost, zone. While it does not specifically endorse the Hatfield model, NYCHA contends that New York Telephone's criticisms of the model are unfounded. It asks us to set rates consistent with the FCC's guidelines which, it believes, provide sound guidance even though they are no longer binding.

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[1] September 18 Ruling, p. 3.

[2] Collocation is being considered in Case 96-C-0036. Mutual termination of traffic and reciprocal compensation are dealt with in New York Telephone's 914 tariff, submitted in compliance with previous orders and now in effect on a temporary basis pending issuance of an order disposing of comments on that compliance filing. Concerns related to interconnection are diverse and may be dealt with, as appropriate, in either of those proceedings or in other contexts where they arise.

Mode of Analysis

The parties devoted considerable attention to the theoretical merits of the models, and one way to approach the case would be to decide which model is superior in principle and then go on to specify its inputs and set prices on that basis.[1] As a practical matter, however, much of the difference between the parties' results stems less from their theoretical differences over the model than from differences regarding the inputs, whether or not so characterized. Some major items--cost of capital and depreciation lives, for example--are clearly input issues inasmuch as both models take account of them and they must be specified before either model is run. But even the disputes over whether the Hatfield model creates a hypothetical fantasy network or whether New York Telephone's study relies too heavily on New York Telephone's actual experience and current technology can be seen as relating more to what data are used in measuring the costs than to how those data are manipulated. And some parties recognize as much when they attempt to show, via sensitivity studies, that proper inputs cause their opponents' models to produce "better" results.

For these reasons, we consider input issues first. It turns out that, if the inputs are properly adjusted and specified, the results produced by the two models tend to converge and even cross. At that point we turn to the remaining theoretical and conceptual differences between the models and set rate levels within the narrowed range they turn out to suggest.

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[1] This is the method used recently by the Massachusetts Department of Public Utilities (DPU) in the proceeding described under the next subheading.