ORIGINAL

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

REBUTTAL TESTIMONY OF

RICK BISSELL

AT&T COMMUNICATIONS OF THE SOUTHERN STATES, INC.

AND

MCI TELECOMMUNICATIONS CORPORATION

AND

MCI METRO ACCESS TRANSMISSION SERVICES, INC.

REDACTED VERSION

DOCKET NO. 960833-TP/960846-TP/971140-TP/960757-TP/960916-TP

DECEMBER 9, 1997

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Q. PLEASE STATE YOUR NAME, ADDRESS, AND OCCUPATION.

A. My name is Rick Bissell and my business address is 13-99 Edgevalley Road, London, Ontario, Canada N5Y 5N1. I am a telecommunications consultant.

Q. ARE YOU THE SAME RICK BISSELL WHO FILED DIRECT TESTIMONY ON NOVEMBER 13, 1997?

A. Yes I am.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY TODAY?

A. I have been retained by MCI Communications Corporation (MCI) and AT&T Communications of the Southern States, Inc. (AT&T) to review and comment on the investment inputs contained in the BellSouth Telecommunications (BST) TELRIC Calculator used to develop the costs for Physical and Virtual Collocation in the state of Florida.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. The BST TELRIC Calculator is replete with examples of excessive investments and

incorporates regressive and inefficient planning scenarios with little regard for parity between incumbent local exchange companies (ILECs) and competitive local exchange companies (CLECs). The overstated investments result in higher than necessary charges for CLEC collocation. My testimony will focus on BST's space planning and engineering strategies, common systems infrastructure components, and cage construction strategies and manpower requirements. I have not, however, adjusted BST's proposed cost studies, as reflected in its TELRIC Calculator. A summary of my conclusions follows. (A number of these issues relate to both physical and virtual collocation, while others are associated with physical collocation only.)

⇒ *First, the BST study incorporates an undefined Space Preparation Charge based on an Individual Cost Basis (ICB) approach, which can easily be manipulated to increase CLEC costs. This ICB approach is not only discriminatory toward CLECs, but also permits double recovery by BST for the delivery of –48V power.*

⇒ *Second, cage and construction related costs are excessive.*

⇒ *Third, average cable lengths are drastically overstated and represent existing worse case scenarios and regressive planning strategies.*

⇒ *Fourth, the study includes unnecessary mid-span repeater equipment for physical collocation.*

⇒ *Fifth, the length of cable racking is significantly overstated.*

⇒ *Sixth, the utilization factor for cable racking (expected number of cables to be placed on a rack) is significantly understated.*

⇒ *Seventh, cable rack investments are overstated because they do not take into account shared use by BST and CLECs.*

⇒ *Eighth, investments for joint use Point of Termination (POT) bays are unusually high and can only be purchased through BST.*

⇒ *Ninth, BST manpower requirements included in the application charge for physical collocation do not take into account that some planning activities only apply to the first collocation request in a particular central office (CO).*

⇒ *Lastly, using security escorts does not reflect a forward-looking approach to physical collocation.*

Q. CAN YOU EXPLAIN YOUR CONCERNS REGARDING THE SPACE PREPARATION CHARGE?

A. Yes. The BST study includes an ICB for space preparation. This type of undefined charge can easily be manipulated to discourage new entrants, which already face substantial up-front investments. Not only does this approach create a barrier to entry, it also discriminates against the first collocator, because no competitor will want to be the first to collocate in a BST CO for fear of having to pay huge space

preparation fees. And since this charge is only identified on a case by case basis, it is very difficult for a CLEC to forecast its collocation costs or prepare a business case to enter BST local markets. This situation is aggravated by the fact that BST retains exclusive control over the placement, size, and design of collocation areas. In effect, BST has "carte blanche" to dictate the building construction charges a collocator must pay, with absolutely no requirement to define these costs in advance. As long as BST has arbitrary control over the placement and sizing of a new collocation area, the opportunity to inflate costs will exist. Moreover, BST will have strong incentives (and the ability) to exploit this opportunity by over provisioning the amount of space and facilities required to accommodate future collocators.

For example, in a particular BST CO adequate space may in fact be available to accommodate up to four CLECs in existing convenient equipment space in close proximity to BST cross-connects with almost no requirement for building renovations. However, if BST arbitrarily chooses to size the collocation area for more than four CLECs it may have to locate the collocation area five floors away in some remote area of the CO -- perhaps in an area that requires extensive building renovations and is far from the cross-connects, creating the need for excessive and costly cable lengths.

The issue of sizing a collocation area and its impact on the space preparation ICB is of particular concern in light of the fact that Section 4 of BST's Property Management Guidelines for Physical Collocation indicates that collocation areas should be sized using a tentative rule of thumb of at least 3000– 5000 square feet.

Assuming an average of 270 square feet per CLEC request (200 square foot requirement, plus 70 square feet for common space), a collocation area sized at 3000 – 5000 square feet is likely suitable for between 11 and 18 CLECs. On the surface, a long-term space planning strategy for collocation may appear sound. However, in most cases, it will result in larger than necessary spaces being prepared for collocation in BST COs and billed to the CLEC under an ICB charge.

In short, this type of undefined space preparation charge creates the opportunity for barriers to entry and can be used to unreasonably discriminate against collocation in BST COs. It also rewards BST for over-estimating the number of competitors that will collocate in their COs with higher than necessary collocation charges.

Q. WHAT IS YOUR POSITION REGARDING THE ESTABLISHMENT OF CLEC COLLOCATION AREAS?

A. In my opinion the best planning practice strategy for establishing new collocation areas in existing COs is to size the collocation area to ensure optimum placement in relation to cross-connects. This can be accomplished with smaller collocation areas placed as close as possible to cross-connects. Most COs have various sized pockets of space which are convenient and can be made available for CLEC collocation by adopting best practice space planning strategies. In a CO environment these smaller pockets of space are typically made available by:

⇒ *Ongoing equipment modernization and/or removals;*

⇒ *Staff reductions due to remote testing and surveillance;*

⇒ *Relocation of administration staff to areas of the CO that are less convenient for equipment.*

While the exact size of any specific collocation space may vary from case to case, when estimating the investments associated with collocation, a good basic assumption would be a collocation space of 550 square feet, which would be applicable for four small collocators (of 100 square feet each), two average collocators (of 2000 square feet each) or one large collocator (of 400 square feet)– that is, for virtually all collocation scenarios. However, as I indicated above, 550 square foot spaces are likely to be consistently available in BST COs.

In summary, the dynamics of a progressive switching center is one of constant change. Therefore, to establish large and costly collocation areas in locations that are less than optimum represents regressive planning practice. Collocation areas should be sized small enough to take advantage of existing convenient space and allocated on a first come first served basis as directed by FCC guidelines Para. 585 and 5.323 (f). Proceeding in this manner would promote parity by providing CLECs with the same opportunity to benefit from the ongoing dynamics of a constantly changing CO rather than being located in a remote area of the CO with large initial ICBs and ongoing cost penalties for connectivity.

Q. DO YOU BELIEVE THAT DEMOLITION AND OTHER CONSTRUCTION COSTS TO PREPARE CO SPACE FOR CLEC EQUIPMENT SHOULD BE CHARGED TO COLLOCATORS?

A. No. Central offices were originally constructed to house telecommunications

equipment. Therefore, the best practice planning strategy used by most ILECs is to ensure that any non-equipment group placed in the CO understands its tenure is only until the space is required for equipment growth. The reason for this is two-fold. First, CO equipment space costs much more to build than administration buildings. Second, placing equipment in a space that is less than optimum in terms of connectivity (that is, far from cross connects) results in ongoing cost penalties for longer cable lengths.

While it may have been in BST's best interest to temporarily defer the cost of expanding administrative space elsewhere by using portions of its COs for non-equipment functions or by leaving redundant technologies in place, it should be the responsibility of BST to restore that space for equipment use prior to renting it to a CLEC. This is no different from any tenant/landlord relationship in which the landlord assumes the responsibility to provide a tenant with 'clean space' suitable for whatever use for which it is being leased. For example, if a landlord was temporarily using one apartment in a large complex to store unused appliances and decided to lease it as a residence, it would have to be restored to its original use by the landlord. This would likely include removing redundant appliances, demolishing temporary shelving units, painting, fixing damaged floor tiles, etc. Furthermore, if the landlord had temporarily located an administrative employee in that apartment space this person would have to be relocated to some other space in the complex. But the new tenant would not bear the associated costs, and would only pay the fair market determined rent.

In summary, the CLEC should not be required to bear the burden of space

preparation expenditures associated with restoring space to its intended use or for the costs required to make CO equipment space suitable for the purpose for which it is being rented. Indeed, BST includes a rental charge for building space that effectively includes any such costs.

Q. DO YOU HAVE CONCERNS REGARDING THE POTENTIAL FOR DOUBLE RECOVERY UNDER BST'S SPACE PREPARATION ICB?

A. Yes, BST's Property Management Guidelines for Collocation highlight numerous scenarios when the CLEC may be assessed substantial space preparation charges for items such as new walls, corridors, Heating, Ventilation and Air Conditioning (HVAC) expansion, -48V Power Plant extensions, etc. While BST should not be permitted to burden the CLEC with any unidentified ICB charges, the proposal to assess CLECs an ICB to expand the –48V power plant (as outlined in the Power Section of BST's Property Management Guidelines) is of particular concern since, if implemented, it would result in double recovery.

BST's proposed monthly power price of $7.64 per ampere for physical collocation is developed in part based on an investment of $165.80 per ampere for DC power equipment plus a per ampere component for AC usage. Since the $165.80 per ampere investment is sufficient for a complete new –48V power plant, permitting BST to also charge CLECs an ICB to expand the power plant would allow for double recovery of power costs. The impact of collocation on the –48V power plant is no different than the impact of any other tariffed service on BST equipment, such as the switch or network equipment. In short, since BST has chosen to recover its –48V power investment via a monthly per ampere charge any expansion of the –48V

power plant cannot be passed on to CLECs.

Q. CAN YOU SUMMARIZE YOUR POSITION REGARDING ICBs FOR –48V POWER AND HVAC EXTENSIONS?

A. Yes. BST should eliminate all references to ICBs associated with power plant expansions from its Property Management Guidelines for Collocation. In fact, by pricing –48V power according to the number of amperes delivered, the CLEC is already paying BST a 30% premium for power. This is because manufacturers of telecommunications equipment, like manufacturers of all types of household electrical appliances, typically recommend that their equipment be fused about 30% higher than its expected drain at full capacity.

With regard to HVAC expansions, the Commission should instruct BST to develop a pre-determined cost for HVAC rather than using an undefined ICB. This can be accomplished, for example, by including a separate HVAC rate element. Since almost all the DC power used to operate telecommunications equipment in a CO environment is dissipated in heat, this new rate element should be tied to the amount of power requested by a CLEC. The design options for CO mechanical systems can vary between large building systems that are typically used to cool multiple areas of the CO and smaller stand-alone units to cool a specific area. However, according to a mechanical systems design consultant used during the development of the MCI/ATT&T collocation cost model, the average 'installed' cost of providing HVAC in a telecommunications environment is $1785.00 per ton of air-conditioning, or $24.41 per DC ampere. By using this all-inclusive investment figure of $24.41 per DC ampere to develop a new rate element for HVAC, BST would

always be remunerated proportionally for the HVAC used by CLECs while at the same time ensuring that it retains optimum flexibility in terms of CO air conditioning designs. The Commission should therefore instruct BST to develop a rate element for HVAC using the investment of $24.41 per DC ampere requested by the CLEC. HVAC costs would then be tied to the amount of power and associated heat dissipation generated by CLEC equipment. CLECs with large installations would correctly pay more for HVAC while smaller CLECs would pay less. Most important, however, all CLECs would know in advance how much HVAC would cost, rather than being assessed an arbitrary ICB.

Q. CAN YOU PROVIDE COMMENTS REGARDING BST'S PROPOSAL TO PERMIT CLECs TO ARRANGE THEIR OWN CAGE CONSTRUCTION?

A. Yes. BST Property Management Guidelines permit CLECs to accept responsibility for constructing their cages. However, in choosing this option, the CLEC must agree to construct to BST specifications. For example, CLECs must use an area of the CO that has been arbitrarily selected by BST and hire a BST approved contractor.

The use of a single approved contractor is of particular concern since BST does not utilize competitive tendering. Rather, it selects a number of contractors and places them on its exclusive master agreement. This type of arrangement does not reflect today's competitive environment and can only lead to higher costs for CLECs, whether they assume responsibility for the work themselves, or allow BST to manage the project for them. Interestingly enough, there is no mention of any reduction in BST manpower if the CLEC assumes responsibility for arranging

construction. In short, there appears to be absolutely no advantage to the CLEC whatsoever.

Q. WHAT IS YOUR POSITION REGARDING CLECs ARRANGING THEIR OWN CONSTRUCTION WORK?

A. The best practice and least cost approach for arranging building renovations in a competitive environment is to tender the project to a number of competing contractors. It is difficult to conceive why BST does not want collocation projects to be tendered in order to ensure a least cost installation. Furthermore, BST's argument that tendering would drastically increase intervals is inaccurate since this type of project is quite small (and "low tech") in terms of building construction work and competitive tenders should not add more than a few weeks to the overall project. If fact, it is conceivable that in addition to lower costs, competitive tendering to multiple contractors could very well reduce the overall interval. For example, if one of the contractors has a temporary surplus of resources it wishes to keep busy pending some larger project, it may agree to a shorter interval or a lower cost.

It has been my experience that master agreements tend to create longer intervals since the need to be competitive is eliminated from the process. The Commission should therefore instruct BST to tender collocation projects to a minimum of 3 reputable contractors on BST's approved contractor list. In addition, if the CLEC chooses to arrange for the construction work, BST should be instructed to reduce its manpower requirements to reflect this reduced involvement.

Q. PLEASE EXPLAIN WHY THE ENCLOSURE INVESTMENT IS EXCESSIVE.

A. The space construction investment shown in the BST study identifies an input of _____ for materials (using drywall) and contract labor associated with the first 100 square foot and a further investment of _____ for each additional 50 square feet. This results in an overall investment input of _____ for a CLEC that requests 400 square feet of collocation space.

Since the vast majority of ILECs across the country use metal cages at a fraction of this cost, I must conclude that BST has consciously ignored this least cost solution. Indeed, a cage can be provided at a cost of $2738.00. (The $2738.00 figure uses price information from Wireway/Husky Company, Inc. of Sterling, Massachusetts for a 400 square foot (20x20) four-sided, 8-foot high cage, with sliding door and lock, together with an installation component of 16 hours labor.) The _____ difference between a 400 square foot metal cage at $2737.81 and BST's _____ space construction investment for a 400 square feet area is therefore directly attributable to BST's proposed method of providing collocation enclosures using drywall.

Q. IS BST'S METHOD OF PROVIDING ENCLOSURES FOR PHYSICAL COLLOCATION EFFICIENT AND COST EFFECTIVE?

A. No. BST proposes an approach to physical collocation that adds substantial unnecessary costs through the use of drywall. For example, BST's proposal to install drywall with gaps at the top and bottom of walls closed off with security mesh restricts the overall ambient lighting and air conditioning. Although openings are provided, air flow is restricted, resulting in the need for increased air conditioning capacity and ducting. Similarly, the installation of drywall restricts the

overall ambient level of light, resulting in the need for additional light fixtures. Using drywall construction materials also requires mandatory processes that add to the overall cost of providing collocation. For example, the use of drywall requires that a plaster-like compound be placed on all seams and joints. This compound must then be wet sanded and the entire wall painted with more than one coat of paint. Anyone who has worked with new drywall can attest to the fact that this compounding, sanding and the requirement for multiple coats of paint is not only extremely messy but also time-consuming and dictates lengthy construction intervals.

BST also proposes to install a security mesh to close off the space between the top of the drywall and the concrete ceiling. The use of a security mesh above 8'-0" is completely unnecessary. Most of the collocation areas I've visited in ILEC COs use 8'-0" cage material with no additional security mesh requirement above that level. It is unlikely any individual will attempt to scale an 8'-0" drywall (gypsum) partition. In addition, the use of mesh above 8'-0" interferes with cable rack installations and makes ongoing equipment cabling activities more complex.

Q. DOES BST PROVIDE ANY REASON FOR BUILDING ENCLOSURES WITH DRYWALL RATHER THAN WIRE MESH?

A. BST has stated that its decision to use drywall enclosures was made in the interest of safety and telecommunications equipment performance. However, safety concerns and equipment performance do not require drywall.

According to BST, one of the factors that influenced its decision to require

drywall enclosures was the potential placement of switching equipment in CLEC collocation space. BST contends that most switching modules require an isolated ground plane and, in the interest of safety and network protection, wire mesh should not be placed within the central office.

BST is correct in its statement that switching equipment must be connected to an isolated ground. However, this is only one of the ground planes included in the isolated bonding network recommended by major suppliers of switching equipment. The overall design of an isolated bonding network as proposed by major switching suppliers such as Nortel incorporates the following:

⇒ *Metal equipment relay racks isolated from both the floor and overhead superstructure*

⇒ *Isolated (separate) ground leads for equipment and ironwork (relay racks) using the battery return bar of the BDFB or DC power plant*

⇒ *All ironwork such as cable racks, framing bars, ventilation ducts, etc. within seven feet of equipment are grounded to an integrated collector bar which is also connected to the single point ground*

This seven foot rule ensures the safety of maintenance personnel by eliminating the possibility of anyone coming in contact with two different ground planes. With a wire cage installation the cage material would be grounded in the same manner as the overhead ironwork and cable racks. If grounded correctly the installation of

wire mesh poses no more risk to personnel than the cable racks and overhead ironwork technicians come into contact with constantly when running cable.

Q. DO YOU HAVE ANY ADDITIONAL COMMENTS REGARDING THE USE OF GYPSUM DRYWALL FOR COLLOCATION ENCLOSURES?

A. Yes. The use of drywall enclosures requires the use of a temporary dust partition to protect adjacent equipment during construction. BST intends to use a short-term type of partition to protect working telephone equipment from airborne contamination during construction. This costly temporary dust partition (consisting of metal studs covered with fire retardant anti static polyethylene) would not be required with a wire mesh cage. BST has indicated this dust protection will cost _____ per linear foot. To demonstrate the excessiveness of BST's estimate, I developed the cost of a permanent drywall partition using the latest (1997) RS Means Building Construction Cost Data (RS Means) publication. (RS Means is an estimating tool commonly used in the construction industry throughout the United States and Canada. In fact, BST uses RS Means in the preparation of its own cost model.) Using RS Means, the cost of a permanent eight foot high wall constructed with 25 gauge, 3 5/8" wide metal studs, with 1/2" drywall taped and sanded on both sides would be $18.08 per lineal foot. Thus, the _____ cost input for a BellSouth 'temporary' dust partition made from polyethylene is more costly than a "permanent" drywall partition.

Q. CAN YOU EXPLAIN HOW METAL CAGES OFFER GREATER FLEXIBILITY?

A. Yes. Cage material is manufactured in various sizes that correspond to the enclosure sizes CLECs might use to house their equipment. It is supplied in

prefabricated modules, which include all the required installation hardware. Systems can be shipped as a complete unit, including sliding door with lock. This material can be installed in short intervals with no requirement for dust partitioning. In addition, wire mesh cages offer much better security since it provides increased visibility over solid drywall installations.

Q. PLEASE SUMMARIZE YOUR POSITION REGARDING THE USE OF DRYWALL, RATHER THAN WIRE MESH ENCLOSURES.

A. Wire mesh is cleaner, easier to install, safe, and is the most cost efficient method of providing for collocation. If grounded correctly, wire mesh poses no more risk than the overhead ironwork that is within a few inches of the top of equipment racks and in contact with technicians each time they run cables. ILECs such as Bell Atlantic and Nynex have been using wire mesh collocation enclosures in their COs without any reported safety or transmission problems. The Commission should therefore instruct BST to use least cost wire mesh cage enclosures for physical collocation. However, if the Commission chooses to allow BST to proceed with its costly proposal to use drywall for collocation enclosures in its COs, then at the very least, BST should be directed to replace its existing Space Preparation investments with least cost cage investments. Suggested costs based on a price list from Wireway/Huskey of Sterling Massachusetts are as follows:

100 SQUARE FOOT CAGE:	***$1678.84***
200 SQUARE FOOT CAGE:	***$2208.31***
300 SQUARE FOOT CAGE:	***$2520.98***

400 SQUARE FOOT CAGE: ***$2737.8***

Q. ARE THERE ANY OTHER CONSTRUCTION COMPONENTS IN BST'S COST MODEL YOU QUESTION?

A. Yes. BST refers to a spreadsheet of estimated charges used by its Property Management Services Personnel to establish physical collocation spaces. After examining these cost figures, I find the costs estimated by BST to be excessive. For example, BST uses a cost figure of _____ per lineal foot for a 1-hour fire rated gypsum wall. This is high in comparison to a figure reflected in RS Means, which indicates that an 8'-0" high, 1½ hour rated wall with 25 gauge metal studs, spaced at 16" centers and covered with 2 layers of 1½ hour rated gypsum board, costs $3.39 per square foot, or $27.12 per lineal foot, including an overhead profit margin of 38 percent. BST is suggesting that a 1-hour rated wall costs more than four times the national average in RS Means for a 1 ½ hour rated wall.

Other examples of BST's high pricing practices include a gypsum wall at a cost of _____ per lineal foot and a fluorescent light fixture at _____. RS Means suggests a similar gypsum wall should not cost more than $2.17 per square foot, or $18.08 per lineal foot, including a 41% overhead and profit markup and a pendent type (chain hung) 4'-0" long, 2 tube fixture should cost $95.47.

Using the same spreadsheet, BST's Property Management Services Personnel indicate the cost to replace vinyl flooring is _____ per square foot. This figure is much higher than the $1.78 per square foot shown in RS Means. Again the RS

Means figure of $1.78 incorporates a more than reasonable overhead and profit margin of 21 percent. With regard to floor repair, it has been my experience that replacement/repairs are only necessary after the removal of telephone equipment. In a telecommunications environment floor repairs rarely involve the installation of a complete new floor. Typically only those tiles with extensive damage due to the removal of anchor bolts from previous technologies are replaced. As previously noted, this type of repair undertaken simply to return equipment space to an acceptable level prior to renting to the CLEC should remain an ILEC responsibility, and would already be paid in the building rental charge.

Q. PLEASE EXPLAIN WHY YOU USE RS MEANS TO ANALYZE BST'S CONSTRUCTION COST INPUTS?

A. RS Means publications consist of a series of text publications commonly used to produce building construction estimates by engineers, architects, and estimators in the construction industry. The national average figures contained in this in-depth publication are based on inputs from ILECs and other companies across North America and updated yearly to ensure cost components remain current. In fact, BST also refers to RS Means publications in its cost study. However, it is clear through interrogatory responses that BST fails to use RS Means for estimating the cost of collocation construction components such as gypsum wall, vinyl flooring, and fluorescent light fixtures. In short, the best and most commonly used construction-estimating tool demonstrates that BST has used inflated estimates to exaggerate the costs associated with providing physical collocation.

Q. WHAT IS YOUR PROPOSAL FOR ESTIMATING BUILDING CONSTRUCTION COMPONENTS?

A. Since RS Means is recognized as the foremost construction estimating tool in the construction industry across North America, and its figures incorporate substantial profit and overhead margins, it is the best way to develop estimates for building construction components for a forward looking competitive environment.

BST should replace all its historical estimates for building construction components with the costs shown in the 1997 publications of RS Means entitled "Building Construction Data" and "Electrical Cost Data". Proceeding in this manner would provide all parties with the assurance that a degree of parity has been incorporated into the process while at the same time ensuring that BST is provided with a level of remuneration that accurately reflects current market conditions.

Q. CAN YOU EXPLAIN WHY YOU FEEL CABLE LENGTHS HAVE BEEN OVERSTATED IN THE BST STUDY?

A. Based on my experience in planning and provisioning cable routes for telecommunications buildings, the cable lengths shown in BellSouth's study are excessive and the result of regressive and not forward-looking planning strategies - planning strategies that support the establishment of huge collocation areas in locations far from the cross-connects. Cable lengths in BST's study should be forward looking and incorporate progressive best practice planning strategies that include:

⇒ *Using vacant pockets of space in close proximity to cross-connects*

⇒ *Relocating administration staff and other non-equipment entities to areas of the CO less convenient for equipment use*

⇒ *Removing redundant equipment temporarily retired-in-place*

Furthermore, the lengths shown in this study are not even representative of the 'average' cable lengths likely to be encountered for collocation in BellSouth COs. Based on my 30+ years experience planning and provisioning cable routes in ILEC COs, it is obvious to me that BST has developed its average cable lengths using only existing large downtown COs. Thus, CLECs will be forced to bear the cost of connectivity to BST cross-connects based solely on a blend of worse case scenarios. The following table provides a summary of BST cable length assumptions.

SUMMARY OF AVERAGE CABLE LENGTHS IN BELLSOUTH STUDIES		
DESCRIPTION	***PHYSICAL***	***VIRTUAL***
Entrance Cable – Manhole to Collocation Area	400 feet	350 feet
2 Wire & 4 Wire Cross-connects	400 feet	300 feet
DS-1 Cross-connects	300 feet	300 feet
DS-3 Cross-connects	300 feet	300 feet
Repeaters for DS-1	600 feet	NA
Repeaters for DS-3	400 feet	NA

Recent studies I have undertaken to develop forward-looking average cable lengths identified that a three floor central office with an equipment footprint of 120 feet x 100 feet produced average cable lengths of 165 to 175 feet. An explanation of the process used to develop these forward-looking average cable length recommendations is included in my pre-filed testimony dated Nov. 13, 1997. BST's 'average' cable lengths of 300 and 400 feet (if these are proprietary, so is the chart above) could only be produced by using extremely large telecommunications buildings exclusively. Typically most cities will have one, and possibly two, large multi-floor buildings in the major downtown core. Outside the downtown core, however, the size of telecommunications buildings is dramatically smaller. In fact, most COs located in urban communities immediately adjacent to the downtown core have only one or two floors. Therefore, it is obvious that BST has developed its average cable lengths based on a few existing worse case building scenarios while ignoring the remaining 95%+ buildings in its network. This is particularly disturbing since these existing downtown buildings are oversized because they were built to house less space-efficient technologies that in most cases are no longer used, so vacant space exists in these COs. The resultant cable lengths are therefore much longer than would be required in a forward looking building which was correctly sized for technologies currently being deployed. It is simply unreasonable for BST to develop cable lengths based on these over-sized downtown buildings while ignoring the vast majority of one and two floor buildings in its network – or the available space within the downtown buildings.

Q. WHY DO YOU DISAGREE WITH INCLUDING REPEATERS IN THE PHYSICAL COLLOCATION STUDY?

A. Repeaters are only required to regenerate the signal for cable lengths longer than 450 feet for DS-3 and 655 feet for DS-1.Even the excessive average cable lengths contained in the BST study do not extend beyond these trigger points. Furthermore, the fact that repeaters are not included in BST's virtual study provides evidence that BST anticipates no situations where repeaters would be required for its own equipment areas. Therefore, to include any repeaters for signal regeneration in the physical collocation study is discriminatory -- particularly since BST has arbitrary control over placement of the collocation area within the CO. Furthermore, the FCC found, in its Second Report and Order on Physical Collocation, dated June 13, 1997, that it was unreasonable for LECs to charge interconnectors the cost of repeaters in a physical collocation arrangement.

It should also be noted that the overall investment as a result of including repeaters is significant since it includes a repeater bay and a repeater shelf, as well as the actual repeater. In addition, BST includes another 400 feet of cable for DS-3 cross-connects and 600 feet for DS-1 cross-connects when a repeater is used. Naturally, these longer cable lengths also increase associated cable rack support charges.

Q. WHAT IS YOUR POSITION REGARDING REPEATERS?

A. BST should remove all investments associated with the use of mid span repeaters from its physical collocation cost study.

Q. CAN YOU PROVIDE AN ESTIMATE OF THE CABLE LENGTHS THAT SHOULD BE USED TO CALCULATE COLLOCATION COSTS?

A. Yes. As explained in my pre-filed testimony, dated Nov. 13, 1997, before this Commission, the average cable lengths should be developed using a forward looking three floor CO layout with best practice space planning strategies. Even this typical three floor building layout is likely much larger than the 'average' BST CO, making resultant average cable lengths extremely generous toward BST. The Commission therefore should instruct BST to replace its excessive average cable lengths with the following forward looking average lengths.

SUMMARY OF FORWARD LOOKING AVERAGE CABLE LENGTHS		
DESCRIPTION	***PHYSICAL***	***VIRTUAL***
Entrance Cable – Manhole to Collocation Area	300 feet	300 feet
2 Wire & 4 Wire Cross-connects	165 feet	165 feet
DS-1 Cross-connects	165 feet	165 feet
DS-3 Cross-connects	165 feet	165 feet
Repeaters for DS-1	0 feet	0 feet
Repeaters for DS-3	0 feet	0 feet

Q. DO YOU AGREE WITH THE CABLE RACK LENGTH AND UTILIZATION INPUTS INCLUDED IN THE BST STUDY?

A. No. First, BST's cable rack lengths are identical to their cable lengths. This is not possible since point to point telecommunications cabling must always be longer than the cable rack to account for the cable that descends ("drops") from the overhead cable rack to the equipment. For new 7 foot telecommunications

equipment, this distance is typically calculated at 15 feet (7'-6" at each end). Therefore, the cable rack input must be at least 15 feet less than the cable input. Second, the utilization factors (estimated number of cables that will be placed on a rack) is too low. The following table provides a summary of the cable rack utilization factors used by BST.

BELLSOUTH CABLE RACK UTILIZATION INPUTS	
DESCRIPTION	***UTILIZATION***
_____	_____
_____	_____
_____	_____
_____	_____

Having spent much of my career in ILEC COs designing new cable routes and developing recommendations to alleviate existing overhead cable congestion, I can attest to the fact that the average utilization of cable racks in the CO is significantly greater than the figures reflected in the BST study. (In fact, in some areas of the CO, such as above the cross-connects, one can routinely find cable pile-up on the order of 12" to 18", which represents a utilization exceeding 100%.) BST should be required to increase the cable rack utilization factors to be consistent with a best practices engineering approach -- at least 80-85% in both the physical and virtual studies.

Q. DO YOU HAVE ANY ADDITIONAL CONCERNS WITH REGARD TO CABLE RACK INVESTMENTS?

A. Yes. First, the investments used for cable racking are about twice what they should be in a competitive environment using least cost suppliers. BST uses an investment of _____ per linear foot for cable racking. Recent studies and actual projects performed by me indicate that the average price for cable racking should be in the $17.00 to $18.00 per linear foot range for the material alone. In fact, I have received quotes and estimates from contractors and suppliers to support an all-inclusive cost of about $40.00 per linear foot to Engineer, Furnish and Install. These figures were developed using quotes from Central Steel Fabricators, a supplier of cable racking to numerous ILECs, and Primal Communications, a contractor specializing in overhead ironwork, cable rack and telecommunications power equipment installations, and include all necessary labor time in addition to the material price alone.

Second, the modeling of cable rack investments in the BST study does not incorporate the fact that BST will also use these same cable racks once the cabling extends beyond the collocation area. Anyone who has visited a CO can attest to the fact that it is very difficult and not economically viable to provide dedicated cable racks – particularly in areas where cross-connects are installed. Therefore, except for a small portion of the cable rack within the collocation common area, cable racking between the collocation area and BST cross-connect equipment will be used by BST as well as CLECs.

Q. WHAT ARE YOUR RECOMMENDATIONS WITH REGARD TO CABLE RACK INVESTMENTS?

A. BST should be required to reduce its cable rack investments in both the physical

and virtual studies costs by about 50% to reflect the use of least cost suppliers and a competitive environment. Since the BST model charges CLECs the entire amount for cable racking, when in fact BST will use a portion of this same cable racking, BST should also be required to incorporate an occupancy factor of at least 25% in the modeling of cable rack investments to reflect a portion of the rack used by BST for its own cabling.

Q. DO YOU AGREE WITH THE INVESTMENTS ASSOCIATED WITH THE POINT OF TERMINATION BAY INCLUDED IN THE BST PHYSICAL COLLOCATION STUDY?

A. No. BellSouth proposes that the demarcation point between the ILEC and CLEC in a physical collocation arrangement will be at a Point of Termination Bay (POT). While I concur with the use of a POT bay as a means of isolating troubles and re-routing circuits, the _____ for a DS-0 and _____ for a DS1 or DS-3 POT bay included in this cost study is excessive for a simple relay rack to house passive cross-connect equipment. This relay rack is no different from the many relay racks used by BST to mount DSX panels and other miscellaneous equipment shelves. It has been my experience that this type of relay rack can be obtained from numerous least cost suppliers for less than $200.00. Indeed, while preparing my technical report for collocation I received an all-inclusive quote of $390.00 from a contractor to Engineer, Furnish and Install this type of relay rack.

BST also uses extremely low utilization figures that further increase POT bay costs in the study. For example, the projected utilization for 2 Wire and 4 Wire POT bays, DS-1 POT bays, and DS-3 POT bays is _____ respectively.

Incorporating these utilization factors has a dramatic effect on increasing the ultimate cost for the POT bay. In addition, BST does not provide the CLEC with an opportunity to install its own POT bays. The result is that CLECs are forced to absorb excessive POT bay charges with no alternate.

Q. WHAT IS YOUR POSITION REGARDING POT BAYS?

A. BST should be required to provide CLECs with the option of installing their own POT bays in the common space selected by BST.This will permit CLECs to pursue a least cost installation using suppliers who specialize in ironwork and miscellaneous relay rack equipment.

Q. DO YOU FEEL THAT THE MANPOWER INPUTS INCLUDED IN BST'S APPLICATION CHARGE FOR PHYSICAL COLLOCATION IS REASONABLE?

A. No. The concern I have with both the physical and virtual application charges is that neither addresses the reduced manpower required for subsequent requests in the same CO. I will deal with each separately. With a physical collocation arrangement, the manpower required to implement a second collocation request in the same CO will be much lower since many of the overall planning activities are completed with the first request. For example, once the first CLEC is in place in a CO the overall collocation area has already been established, cable routes providing connectivity to cross-connects are installed, the entrance fiber route has been established, and ILEC processes are in place. The BST application charge has been developed using a single manpower input of 87.5 hours. Thus the same 87.5 hour application charge will be levied over and over on each CLEC.

Q. DO YOU HAVE SIMILAR CONCERNS WITH THE APPLICATION CHARGE PROPOSED BY BST FOR VIRTUAL COLLOCATION?

A. Yes. The virtual application charge includes a 45.0 hour BST manpower requirement for each virtual request even though it is likely that many subsequent requests by CLECs will only be to install additional cable between previously installed virtual equipment and BST cross-connects. If BST estimates that the manpower required to provide for the first collocation arrangement by a CLEC includes equipment, plus power and equipment connectivity to BST cross-connects, it is only reasonable that subsequent requests for cable only would require less manpower.

Q. DO YOU HAVE A SOLUTION TO THESE PHYSICAL AND VIRTUAL APPLICATION PROBLEMS?

A. Yes. For physical collocation, BST should be required to determine what percentage of the 87.5 hours is for planning activities that will not be required once the first collocator is in place in a particular CO. BST should then be required to incorporate a second application fee into its physical study for subsequent collocation requests to reflect the reduced BST involvement for subsequent requests in the same CO. Based on my experience planning CO space I would suggest a 30% reduction would be reasonable.

For virtual collocation, BST should be instructed to incorporate an application fee to reflect the reduced manpower requirement associated with smaller virtual requests for additional cable only. Based on experience I would suggest that the manpower requirements associated with engineering a small cable installation as opposed to

an installation involving equipment, power and cabling would be on the order of at least 50% less

In summary, the Commission should instruct BST to include a second application charge in both their physical and virtual collocation studies to be implemented as follows:

Physical: *The second application charge consisting of a 30% reduction in manpower would be assessed to all subsequent CLECs requesting physical collocation in a specific CO*

Virtual: *The second application charge consisting of a 50% reduction in manpower would be assessed to any CLEC requesting a simple cable installation to provide connectivity for previously installed virtual equipment*

Q. IS BELLSOUTH CORRECT TO INCLUDE SECURITY ESCORTS IN ITS COST STUDY?

A. Security escorts are perfectly acceptable with virtual collocation, since CLEC equipment is located in the same space as BST equipment. However, with physical collocation CLECs are separated from BST equipment and in a best practice planning strategy should be located off a corridor. Therefore, in a forward looking study the use of security access cards should be included rather than escorts. Access card readers have become the preferred method of providing security in the telecommunications industry.

To ensure that this study is forward looking the Commission should instruct BST to

eliminate security escorts from its physical collocation study and replace it with a one-time charge for access cards. If the Commission chooses not to instruct BST to eliminate security escorts from its physical collocation study, then at the very least BST should be required to submit a list of COs where security card readers have been installed. Security escort charges would then only be valid for COs not on the list. Naturally, a process would also have to be put in place to ensure this list is updated on an ongoing basis as additional COs are fitted with card readers.

Q. PLEASE SUMMARIZE YOUR TESTIMONY

A. In summary, I recommend that the Commission adopt the MCI/AT&T collocation model layout investments and cost model as presented in pre-filed testimony by myself and Mr. John Klick on Nov. 13, 1997. However, if the Commission does not decide to choose the MCI/AT&T study in its entirety, it must at the very least, adjust the BellSouth physical and virtual collocation model to correct the obvious flaws summarized in Exhibit RB-1 of this testimony.

Q. DOES THAT CONCLUDE YOU TESTIMONY?

A. Yes it does.

SUMMARY OF REVISIONS TO BELL SOUTH COLLOCATION STUDIES		
COMPONENT	**PHYSICAL STUDY**	**VIRTUAL STUDY**
Space Preparation ICB (Demolition & Construction)	• Eliminate from study	Not applicable
Space Preparation ICB (Power)	• Eliminate from study	Not applicable
Space Preparation (HVAC)	• Include a new rate element using an investment of $24.41 per DC ampere requested by CLEC	Not applicable
Cable Lengths	• Replace with forward looking cable lengths -Manhole>Collo Area = 300 ft. -2W/4W X-connects = 165 ft. -DS1/DS3 x-connects = 165 ft.	• Replace with forward looking cable lengths -Manhole>Collo Area = 300 ft. -2W/4W X-connects = 165 ft. -DS1/DS3 x-connects = 165 ft.
Cable Racks	• Reduce investment by 50% • Reduce lengths to 15 feet less than cable • Include BST occupancy factor of 25% • Increase utilization factors to 85%	• Reduce investment by 50% • Reduce lengths to 15 feet less than cable • Include BST occupancy factor of 25% • Increase utilization factors to 85%
Cage	• Use metal cages with 'installed' investments of: 100 sq. ft. = $1678.84 200 sq. ft. = $2208.31 300 sq. ft. = $2520.98 400 sq. ft. = $2737.81	Not applicable
Competitive Bidding	• Incorporate competitive bidding	Not applicable
Application Charge	• Introduce application fee with 30% less manpower for subsequent requests in same CO	• Introduce application fee with 50% less manpower for small requests in the same CO involving cable only
POT Bays	• Permit CLECs to Engineer, Furnish and Install	Not applicable
Repeaters	• Remove repeaters and all associated investments	Not applicable
Security Escorts	• Replace with security cards	Not applicable