BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Petition for Arbitration	)	
of Unresolved Issues in a Section 251(b)(5)	)	Case No. TO-2006-0147
Agreement with T-Mobile USA, Inc.	)	Consolidated

Respondents' Reply to Petitioners' Revised Cost Studies

1. Introduction

Respondents, Cingular Wireless, LLC and T-Mobile USA, Inc., pursuant to the Arbitrator's Order of February 16, 2006, file their Reply to Petitioners' re-run cost studies.[1]

Petitioners have re-run their cost studies (by manipulating in particular the HAI 5.0a model regarding common transport) in a fashion that produces an average rate for all Petitioners virtually identical to the originally sought rate of 3.5 cents per MOU – 3.34 cents/MOU for Cingular and 3.45 cents/MOU for T-Mobile.[2]

For example, Cass County's original cost study computed common transport costs of $0.0163/MOU. The re-run cost study (using the "end office" scenario described below) computes a common transport cost of $0.0168 – a figure *higher* than the original study, even though the Preliminary Report specifically required the re-run studies to use the actual cable distances between Petitioners' end offices, which change should have substantially *reduced* common transport costs.[3]

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[1] Because of the compressed schedule, Respondents have had only two business days to review the information provided by Petitioners with their re-run cost studies. This reply points out those instances – that Respondents have been able to identify in this time frame – in which Petitioners' re-run cost studies do not comply with the directives of the Preliminary Arbitration Report. Respondents' failure to comment on an issue involving the re-run cost studies, however, should not be taken as acquiescence. Similarly, Respondents do not concur with or accept all the conclusions and rulings of the Preliminary Report, and they identified their concerns in their comments filed on February 24, 2006.

[2] *See* spreadsheet attached to Petitioners' Response to Order Directing Filing ("Petitioners' Response").

[3] Cass County's original cost study reflected 169.5 miles of interoffice cable, whereas its re-run reflected ** ____ ** miles of cable. Yet, the re-run study produces a *higher* common transport cost.

Respondents do not believe the Preliminary Report intended the rerun studies to produce common transport costs comparable to, much less higher than, the original studies. Respondents therefore request that Petitioners be required to run again the common transport and signaling portions of their studies, correctly following the intent of the Preliminary Report and correcting the following errors:

Common Transport Costs

- Re-run cost studies inappropriately raise the number or proportion of each Petitioner's common transport trunks without correspondingly increasing the minutes of use per trunk. This lowers trunk utilization, which was not directed by the Report, and therefore inappropriately overstates common transport costs.

- In their modified cost studies, Petitioners ran HAI 5.0a to model fiber rings connecting remote to host switches. This caused a different set of HAI model algorithms to be used in computing transmission equipment quantities. In reviewing work files that Petitioners provided, Respondents' cost expert found that transmission equipment quantities and costs are overstated in the re-run cost studies due to an algorithm error in HAI 5.0a.

- The method used by Petitioners in the re-run studies to estimate the distance from their switches to the nearest LEC switch may overstate the distance, thereby inappropriately increasing common transport costs.

Signaling Costs

- Petitioners' revised signaling costs suffer the same errors underlying the recalculated common transport costs.

2. Analysis of Petitioners' Re-Run Cost Studies

A. End Office Switching Costs

Respondents previously calculated a corrected end office switching cost for Petitioners of approximately $0.0012/MOU. Petitioners' revised switching costs are within $0.0005 per minute of the corrected cost. Based on these results, Respondents consider the revised end office switching costs reasonable.[4]

B. Common Transport Costs

On Issue No 7, the Preliminary Report adopted Respondents' position that Petitioners' interoffice cable lengths should reflect their current network designs. However, the Report conditioned this ruling "on cables going to the nearest switch; not necessarily the nearest SBC switch, but the nearest large LEC tandem switch." Petitioners have revised their common transport costs reflecting two scenarios – the "end office" scenario, in which cables are assumed to be placed from Petitioners' standalone and host switches to the nearest LEC end office switch, and the "tandem" scenario, in which cables are assumed to the nearest LEC tandem switch.

Clearly, the "tandem" scenario is not the most efficient network design, as Petitioners impliedly admit by running a second "end office" cost scenario; indeed, Petitioners' concede that the "nearest large LEC tandem switch" arrangement does "not make any sense."[5]

That the "tandem" scenario is not the least cost design is confirmed by the fact that for all 26 Petitioners, the common transport costs for the "tandem" scenario exceed those of the "end

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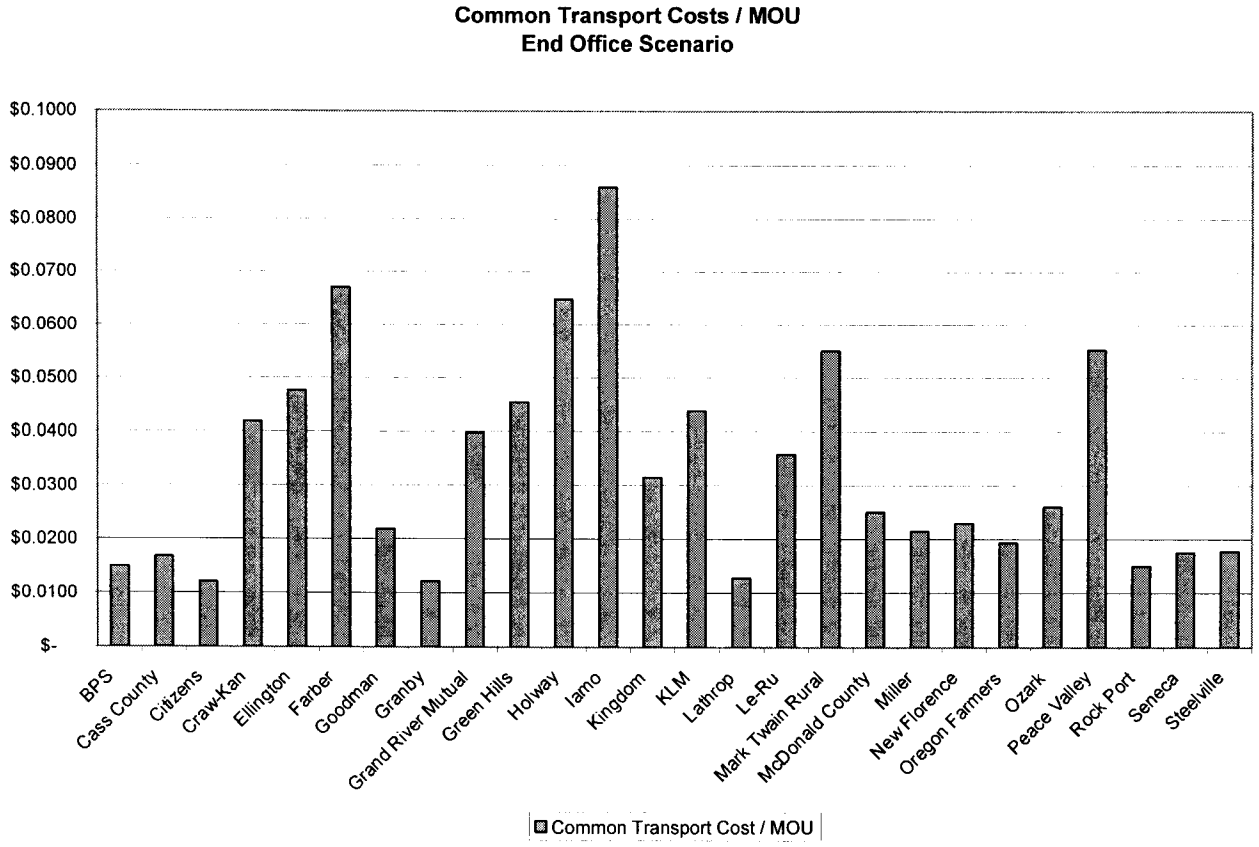
[4] Petitioners' re-run studies, in some instances, produce slightly different switching costs for the "tandem" and "end office" scenarios. Respondents do not understand why transport costs would have any bearing on switching costs. However, since Petitioners' re-run switching costs appear reasonable, Respondents have not attempted to identify the reason for this anomaly.

[5] Petitioners' Comments on the Arbitrator's Preliminary Report, p. 12.

office" scenario. The "tandem" scenario cannot be squared with FCC Rule 51.505(b)(1), so all comments that follow below are based upon the "end office" scenario.

Revised common transport costs for the "end office" scenario are illustrated in the graph below. Costs range from a low of 1.2 cents to a high of 8.6 cents per minute of use.



Respondents, in the limited time available to review the re-run studies, have identified three areas in the revised common transport costs that, they submit, do not comply with the requirements of the Preliminary Report.

1. Increasing Common Transport Trunks Without Increasing MOUs

The common transport trunk costs in the rerun studies are inflated because Petitioners increased the number or proportion of common trunks, and in the process, shifted interoffice

cable and transmission equipment costs from dedicated transport to common transport. This is inconsistent with the Preliminary Report, which did not require that the number of common transport trunks be increased and in fact specifically ruled that dedicated transport costs should not be included in Petitioners' transport and termination rates. More specifically, while increasing the number of common transport trunks, Petitioners did not correspondingly increase the common transport minutes of use. Consequently, the trunk utilization level (MOUs per trunk) which was low to begin with, has generally been significantly reduced, raising common transport costs per minute. [6]

** _____

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_____** miles (by eliminating Petitioners' assumption that each Cass County switch would be connected to the nearest BOC wire center). The effect of this error (increasing

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[6] Many Petitioners' trunk utilization levels were low to begin with. The HAI 5.0a model assumes that 30% trunk utilization represents forward-looking, efficient utilization of trunks. Mr. Conwell's corrections of 20 of the Petitioners' common transport costs reflected Cass County's **_____

_____

_____

_____** or below, which is less than half the utilization level that HAI 5.0a deems to be efficient.

common transport trunks while holding minutes of use steady) is shown in the following table.[7] Respondents have not found in Petitioners' supporting documentation an explanation for the lowering of trunk utilization. This certainly was not intended by the Preliminary Report.

**_____

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_____

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As this table demonstrates, even though Cass County reduced its interoffice cable length from 169.5 to **____** miles, and lowered annual costs per trunk, the cost improvement was almost completely offset by lower minutes per trunk. (And, as discussed in the Introduction, when the other errors in the re-run of the Cass County cost study are included, the re-run actually produces common transport costs *higher* than the original study.) Had Cass County maintained its previous trunk utilization, the common transport interoffice cable cost would have been significantly lower at **_____** per minute – a decrease of **____** percent. This error also affects the transmission equipment portion of common transport costs. If this error had not been

[7] Lowering the trunk utilization rate also has the effect of increasing Petitioners' costs for transmission equipment, because more equipment is used with more trunks, while the utilization level over each trunk is reduced.

made, Cass County's total transport and termination cost from the re-run cost study would be reduced 28 percent, from $0.0185/MOU to $0.0133/MOU. Petitioners should therefore be required to run again their cost studies and be prohibited from lowering their minutes of use per trunk. Minutes of use per trunk should remain constant (or be set at a level reflecting efficient trunk utilization (e.g., Cass County's **_____** annual minutes / trunk).

2. HAI 5.0a Algorithm Error Caused by the Assumption that all Petitioners Employ Ring Architecture

In their revised studies, Petitioners appear to have run HAI 5.0a to model for all Petitioners fiber rings connecting remote to host switches, although this was not required by the Preliminary Report. In some cases, it may be more efficient to reflect point-to-point circuits between remotes and hosts as some Petitioners' networks currently do. Nevertheless, Petitioners' new assumption of host-remote fiber rings caused different parts of the HAI model to be used in the cost study re-runs than were used in the original cost studies. In reviewing these new parts of the HAI model, Respondents found a significant error in the algorithm used to determine the quantities and costs of common transport transmission equipment.

In calculating the quantity of digital cross-connect system (DCS) ports (at DS3 level), HAI 5.0a determines the quantity of DS0s added to the ring at each remote and uses this to determine the necessary quantity of DCS ports.[8] The assumed, intended calculation is:

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[8] The algorithm for this calculation is in column BA, spreadsheet "host remote," of the work file "Cass Tel HAI Switch Cost Module" provided by Petitioners with their re-run cost studies. The HAI model documentation provides this algorithm for the "remote ADM inv – HR ring" as follows:
=IF(BF2=0,inputs!$C$159+(CEILING((BB2)*(1+transit_fac)/2/inputs!$C$165/7,1)-12)*inputs!$C$149,IF(CEILING(BB2*(1+transit_fac)/2/inputs!$C$165/28,1)<=12,inputs!$C$158,CEILING(BB2*(1+transit_fac)/2/inputs!$C$165/28/max_rate,1)*inputs!$C$157))+CEILING(BB2*(1+transit_fac)/2/inputs!$C$165/28,1)*inputs!$C$164
This computes transmission terminal investment for each remote wire center. Immediately after the term (1+transit_fac) is the division sign followed by '2'. Since the algorithm is determining the quantity of DS1s, it appears that the constant '2' should be '24'. BB2 represents the "total ring DS0s per remote." This DS0 quantity would be increased by (1 + transit_fac of 40%), and then divided by 24 DS0s per DS1. The result is divided by

> DS3 ports required = ((DS0s at the remote X 1.4 transit factor) / (24 DS0s per DS1 / 90% transmission terminal fill)) / 28 DS1s per DS3 (rounded to next DS3).

However, instead of dividing by 24 DS0s per DS1, the algorithm divides by only '2'. This can cause the number of DS3s to be overstated and result in excessive transmission equipment investment and costs.

For example, Cass County's OC-48 transmission equipment investment in its revised study amounted to _____ _____ _____ _____** percent, as is its transmission equipment cost per minute of use.[9]

The HAI model overstates DS0 requirements in a second way – specifically, in connection with the 1.4 transit factor in the algorithm. According to the model's documentation, the transit factor has the following purpose:

> Since rings are interconnected, traffic between wire centers on two rings may "transit" one or more additional rings. Thus, the calculated capacity of a ring, based on the traffic originating/terminating in wire centers on the ring, must be increased to reflect the requirement that the ring also be able to handle transiting traffic. ... The model increases the capacity of each ring to handle transiting traffic based on a user-adjustable "transiting factor," whose default value is 0.4. This factor represents the percentage of additional ring capacity consumed by transiting traffic. Thus; the model increases the calculated ring capacity requirement by (1 + transiting factor).

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inputs!$C$165 or 90% transmission terminal fill to allow for 10% spare DS0s per DS1. The DS1 quantity would then be divided by 28 DS1s / DS3 to determine the number of DS3s. This quantity determines the number of DCS ports and the investment in DCS. Dividing by '2' instead of '24' overstates the number of DS1s and may over state the number of DS3s and common transport transmission equipment investment and costs, depending on whether the error causes the DS3 quantity to "round up" to the next larger size. For Cass County, the erroneous algorithm caused the DS3 quantity for all remotes and the Peculiar host to be **_____**.

[9] Cass County's transmission equipment cost per minute of use in the revised study would decline from **_____** per minute – if the algorithm error were corrected.

Petitioners generally do not have multiple rings in their networks; therefore, increasing transmission equipment capacity for transiting is unnecessary and overstates Petitioners' transport costs under the Preliminary Report's assumptions and rulings.

These errors in the HAI model algorithm must be corrected to properly re-run Petitioners' common transport costs. Specifically, (a) all relevant algorithms should be changed to divide by 24 DS0s per DS1 instead of by only two, and (b) the 1.4 transit factor should be reduced to 1.0. Making these corrections would reduce Cass County's total transport and termination costs, after correcting for lowering trunk utilization, from $0.0133/MOU to $0.0123/MOU.

3. Computing Interoffice Distances in the Re-Run Cost Studies

The method Petitioners used to estimate mileage from their switches to the nearest LEC switch appears to overstate the distance (and, thereby, improperly increase claimed costs). Instead of calculating an airline distance between switches and applying a route-to-airline mileage ratio, or measuring the distance of a probable cable route, the Petitioners' re-run studies appear to assume that cable would be laid at right angles, resulting in interoffice cable lengths longer than necessary.

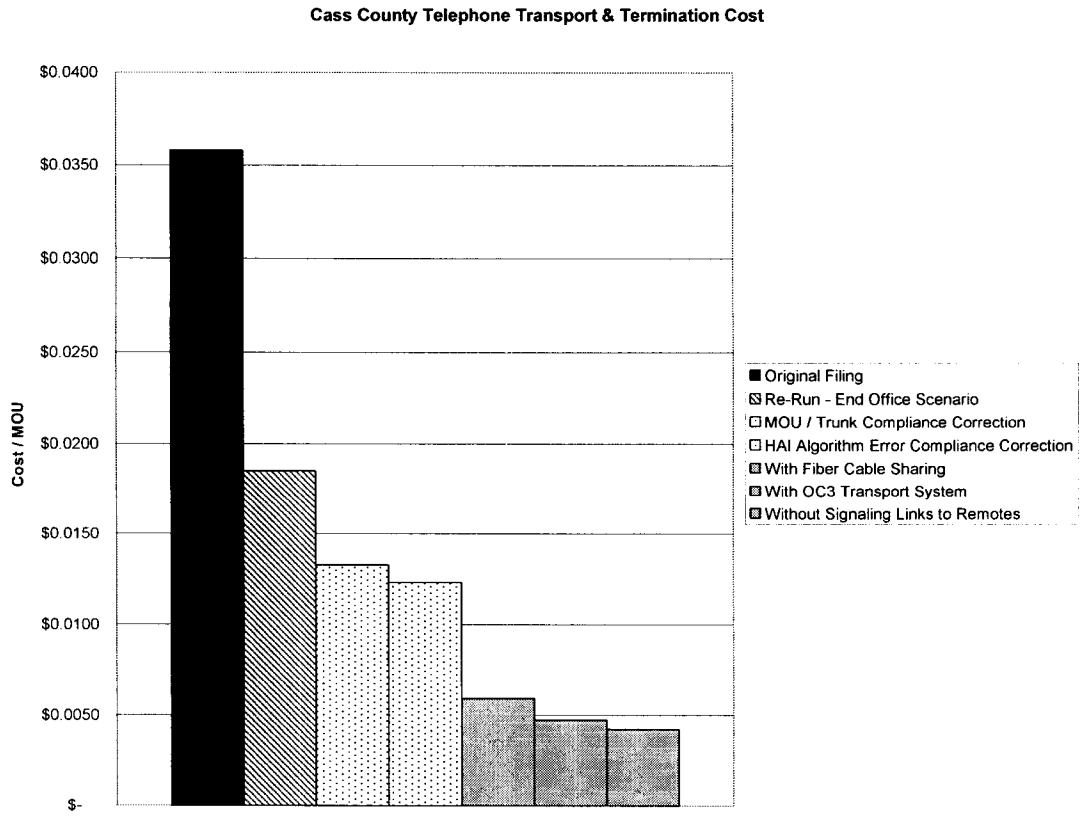
Importantly, the Preliminary Report's decision for Issue No. 7 called for host-remote interoffice cable distances to reflect the existing network. Petitioners have not demonstrated, and Respondents cannot tell from an analysis of the re-run studies, that the re-runs comply with this requirement. Respondents therefore request that Petitioners provide a simple schedule that shows for each Petitioner its actual total interoffice cable distances versus the cable distances reflected in the re-run cost studies. Only in this manner will the Commission be able to determine if the Petitioners have complied with the requirement that existing network cable distances be used.

4. SS7 Signaling Costs

In calculating signaling costs, Petitioners' re-run cost studies make the same three errors as described above for common transport costs, given that SS7 signaling link costs are based on the same interoffice transport costs as common transport. Thus, when Petitioners' studies are re-run to correct for common transport errors, the same corrections can be made for signaling costs.

Conclusion

The graph below illustrates the importance of further correcting Petitioners' cost studies. The graph uses Cass County's transport and termination costs as an example, but the principles apply to every Petitioner.



The first and second bars show transport and termination costs from Cass County's original study ($0.0358/MOU) and the re-run of the study for the "end office" scenario

($0.0185/MOU). There were two primary modifications between these studies – the lowering of end office switching costs to properly reflect today's usage-sensitive portion of switching, and the elimination of dedicated transport costs which were duplicative with common transport costs. Making these two corrections, as discussed, dropped Cass County's total transport and termination costs from $0.0358 to $0.0185/MOU.

Two additional modifications are necessary for Cass County (and all of the other Petitioners) to comply with the Preliminary Order – (1) reflect the original or an efficient level of trunk utilization, whichever is higher,[10] and (2) correct the HAI model algorithm error regarding host-remote ring transmission equipment. In addition, Petitioners' should provide a schedule showing that the interoffice distances used in the re-run studies correspond to the actual distances between Petitioners' end offices. If the re-run studies have not used actual distances, then this error must be corrected as well.

The third and fourth columns in the chart above show the effect of correcting (1) the trunk utilization error, and (2) the HAI 5.0a algorithm error. If those two errors are corrected, Cass County's total transport and termination costs drop to $0.0123/MOU.

In addition to these compliance corrections, Respondents have shown in previous filings, and will discuss at oral argument, the importance of three additional modifications – (1) the recognition of the sharing of interoffice cable fibers and costs, (2) the proper sizing of the interoffice transport system and (3) the proper counting of SS7 signaling links. The estimated effects of these corrections are shown in the last three bars in the chart above. Making these last

[10] Mr. Conwell used ** ** trunk utilization. The default values of HAI 5.0a require 30% or an even higher level of trunk utilization as a forward-looking, efficient level of utilization. Therefore, in re-running cost studies, those Petitioners with trunk utilization below the Cass County level should be required to achieve at least this level in order to reflect forward-looking efficient costs.

three corrections – all of which are required by FCC rules – would reduce Cass County's forward-looking economic cost of transport and termination from over 3.5 cents in the original cost study to approximately one-half cent per minute.

Finally, Petitioners in their Comments on the Preliminary Report made several allegations of facts that are unsupported or, in some instances, contradicted by the record. Because the procedural schedule does not allow Respondents' to otherwise refute these unfounded allegations, Respondents attached hereto as Exhibit 1 a table listing each allegation, followed by a brief discussion of what the record actually shows.

For purposes of this compliance filling, Petitioners' should be required to re-run their cost studies to correct the specific errors described above.

Respectfully submitted,

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Certificate of Service

I hereby certify that a true and final copy of the foregoing was served via electronic transmission on this 1st day of March, 2006, to the following counsel of record:

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Exhibit 1

Petitioners' Assertion	Facts
Issue 3: What is the Petitioners' forward-looking cost to purchase and install new switches?	
1. The FCC's *Tenth Report* "only addressed the switch costs of large companies, not small, rural telephone companies such as the Petitioners" (p. 3).	In fact, the FCC relied, among others things, on data involving 139 switches (including DMS-10s) owned and operated by rural telephone companies. Tenth USF Report, 14 FCC Rcd 20156, 20412 ¶ 3, Appendix C (1999). Witness Conwell validated the reasonableness of the FCC switch cost data by comparing switch investments produced using the data with actual switch costs for 38 rural switches (21 host and 17 remote switches) obtained from RUS comments filed in the USF proceeding. Conwell Direct, p. 42 l. 27 – p. 43 l. 17.
2. Witness Conwell's 12% "deflater" is "not competent evidence because it is based on hearsay" (p. 5).	In fact, Petitioners' witness Schoonmaker testified at the hearing that switch prices have decreased 10-20 percent over the past 10-15 years. Tr. Vol 3, p. 159 l. 6-19.
3. Petitioners' proposed switch costs are "28% less than their actual switch investments as of 2003" (p. 5).	In computing Petitioners' switch costs, witness Schoonmaker **raised** HAI 5.0a's default input switch value from $416.11 to $520.14, an **increase of 25%**. Tr. Vol 3, p. 160 l. 5-15. More importantly, witness Schoonmaker's comparison of embedded investment to HAI results was incorrect (different line capacities reflected). Petitioners' proposed switch costs actually are greater than their embedded switch investments by 21%. Conwell Direct, Schedule WCC-5, page 2 of 2.
4. "It is unreasonable to assume that Cass County's switches could be replaced at only 30% of their actual costs" (p. 5).	Cass County's embedded investment in switching reflects **_____ _____ _____ _____ _____** lines of capacity (Conwell Direct, Schedule WCC-7, page 1 of 2). Thus, a substantial portion of the difference between Cass County's embedded investment

Petitioners' Assertion	Facts
	and the forward-looking investment computed by Mr. Conwell is due to the Company's investment in excess line capacity, which would not be reflected in a forward-looking economic cost study.
Issue 4: What is the appropriate value for the usage-sensitive portion of Petitioners' forward-looking end office switching costs?	
5. Respondents' claim (that only a very small portion of a modern digital switch is usage-sensitive) is "unsupported by any record evidence of such changes in either switch technology or vendor pricing for small companies such as Petitioners" (p. 7).	In fact, Respondents addressed this point in some detail in their Post Hearing Brief (see pp. 61-66). Among the evidence cited included the following "We conclude above, for purposes of determining the appropriate switch discount, that the 'getting started' cost of the switch is a fixed cost, meaning that it does not vary with the number of ports or the level of usage on the switch." Virginia Arbitration Cost Order, 18 FCC Rcd 17722, 17903 ¶ 463 (2003). "If no additional costs are incurred, there is nothing to pay." Ace Telephone v. Koppendrayer, 432 F.3d 876 (8th Cir. 2005) (affirming the Minnesota Commission's imposition of bill-and-keep). "The Commission is of the opinion that the record is lacking clear evidence that the switch costs at issue [involving rural LEC switches] are usage sensitive . . ." Hamilton County Telephone Co-op, et seq., Petitioners for Arbitration to Establish Terms and Conditions with Verizon Wireless, Illinois Commerce Commission, Docket No. 05-0644 at 38 (Jan. 25, 2006)(adopting a zero percent usage sensitive switching factor in a rural LEC/ wireless carrier arbitration).
6. The Nortel letter indicates that "switch pricing and technology for small ILECs has not changed and a large portion of the switch remains traffic sensitive" (p. 8).	In fact, the Nortel letter, provides no analysis of the DMS-10 EF&I charges. The letter mentions only portions of the DMS-10 which are minor components representing little of the switch's total costs. *See* Respondents' Post Hearing

Petitioners' Assertion	Facts
	Brief, pp. 66-67. When witness Schoonmaker's associate asked Nortel for the letter, the associate did not ask for a price quotation for a new DMS-10 switch. Tr. Vol. 3, p. 176 l. 19-22. A similar Nortel letter was introduced in the recent Illinois arbitration proceeding involving transport and termination rates for rural LECs – cited in number 4 above. Despite the Nortel letter, the Illinois Commission adopted a 0% usage-sensitive factor for rural LEC switches. See Respondents' Post Hearing Brief, p. 67.
7. "Respondents have failed to show that the functions being performed by today's switches have changed such that these functions should now be classified as non-traffic sensitive" (p. 8).	Respondents have never claimed that the "functions" performed by today's switches have changed. Rather, their position is that the processing capacity of modern switches has grown so large that the costs of modern switches do not vary with the number of calls processed but rather are based on the number of lines to be served by the switch. "Given the record evidence that modern switches typically have large amounts of excess central processor and memory capacity, the usage by any one subscriber or group of subscribers is not expected to press so hard on processor or memory capacity at any one time as to cause call blockage, or a need for additional capacity to avoid such blockage. . . . Principles of cost causation, therefore, support a per line port cost recovery approach . . ." FCC Virginia Arbitration Cost Order, 18 FCC Rcd at 17903 ¶ 463.
Issue 5: What is the appropriate floor space attributable to switching?	
8. "Respondents fail to provide evidentiary support to meet the FCC standard of forward-looking costs" (p. 11).	Respondents are not required to "meet the FCC standard of forward-looking costs." That burden is *exclusively* on Petitioners. 47 C.F.R. §§ 51.505.
9. Instead of providing a forward-looking cost methodology, Respondents use existing or historic information on the Petitioners'	"Forward-looking" is not synonymous with "expansion." "Forward-looking cost methodologies, like TELRIC, are intended to

Petitioners' Assertion	Facts
current facilities" (p. 11).	consider the costs that a carrier would incur in the future." Local Competition Order, 11 FCC Rcd at 15848 ¶ 683. There is nothing in the record to support a claim that Petitioners' switches are likely to take up more floor space in the future. Moreover, as the Preliminary Report points out, Respondents' proposal "increases the floor space information provided by Petitioners, Cass County" (p. 7). Respondents' proposal is based upon space provided by Southwestern Bell in Missouri for a single bay of equipment in its Caged Collocation tariff. Conwell Direct, p. 52 l. 16-18.
10. "Mr. Conwell only allowed floor space of 100 square feet for the remote switches (i.e., 10' x 10') and 200 square feet for host switches (i.e. 10' x 20'). This fails to provide access to or maintenance of the equipment, including aisles between the equipment bays, entry facilities, space for heating and air conditioning equipment, and restrooms" (pp. 9-10)	Cass County, in response to data requests, indicated that its remote switches utilize between **_____ _____** square foot of space. Conwell Direct, p. 52 l. 10-12. The HAI 5.0a default assumptions of 500 square feet of floor space for switches up to 1,000 lines, and 1,000 square feet for switches between 1,000 and 5,000 lines, would thus mean that substantially more space is being used for aisles, hallway and common areas than is used by the switch itself.