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UNITED STATES GOVERNMENT

memorandum

DATE: December 19, 2006

TO: Donna Gregg

FROM: William W. Sharkey

SUBJECT: Peer Review of Phoenix Center Public Policy Paper Number 22, *The Consumer Welfare Cost of Cable "Build-out" Rules*

At your request, I have reviewed the Phoenix Center Paper entitled "*The Consumer Welfare Cost of Cable 'Build-out' Rules.*" This study was submitted in the context of a Commission proceeding (MB Docket No. 05-311) which may prohibit local franchise authorities from requiring that a new entrant build out its cable facilities as a condition of receiving a franchise. The Phoenix Center study concludes that build-out requirements are very likely to lead to lower consumer welfare.

The study contains both a theoretical model and a numerical simulation based on that model. The intuition behind the theory is straightforward. It is assumed that an incumbent supplier has already deployed a broadband network which is capable of providing video service to all households in a given geographic area (though not all households necessarily subscribe to this service). A single entrant is assumed to be interested in building a new broadband network to offer similar services to households in the same geographic area. The area is assumed to contain markets in which customer density varies, so that the cost of constructing new facilities varies by household passed. The analysis then compares two entry possibilities. In a "free entry" model, the entrant is assumed to be free to choose which households to provide access to the new service. A rational entrant in the free entry mode would rank the submarkets within the franchise area according to cost and choose which households to serve on the basis of long run expected profits. In a second "restricted entry" mode, the entering firm is assumed to be required by local authorities to provide all households within a given market access to the new service. The analysis is interesting only in those cases in which fewer households are served under the free entry mode.¹ Under these conditions, build-out requirements clearly result in lower expected profits. As such, they can correctly be seen as an entry barrier. The interesting question, however, is whether entry will occur in spite of the reduction in expected profit. In any given market, prices are assumed to be lower and consumer welfare higher under free entry (in which some but not all households are served) than under no entry. Similarly, if the entrant chooses to enter a market subject to build-out requirements, then prices are assumed to be lower and consumer welfare higher than under the free-entry scenario. The consumer welfare impact of build-out requirements therefore hinges on the number of markets that an entrant would choose to enter if build-out is required. At a theoretical level, no firm conclusions can be drawn. That is, build-out requirements can either increase or reduce welfare.

While the general structure of the theoretical model is correct, and useful for policy makers in the Commission proceeding, there are serious flaws in the details of this analysis. Overall, the theoretical

¹ Otherwise entering firms would not object to build-out requirements, and in addition local authorities would have no reason to impose such requirements.

analysis does not meet minimal professional standards. The authors of the study define long run expected post-entry profits to be $d(h)$ if entry occurs passing h households out of a total of H households in the entire geographic area. Entry costs, which reflect investments in the new network, are given by $e(h)$ when h households are passed. Elementary reasoning then implies that under free entry, a rational entrant would choose to enter at a level h^* such that $d(h) - e(h)$ is maximized - i.e. so that $d'(h^*) = e'(h^*)$. Letting $r(h) = d(h)/h$ represent the average profit per household, the first order profit maximizing condition becomes $r(h^*) + h r'(h^*) = e'(h^*)$. Inexplicably, in Figure 1 of the paper, the free entry condition is reported as $r(h^*) = e'(h^*)$.

More serious flaws in the theoretical analysis are due to its simplistic approach to post-entry competition. The study simply assumes that the function $r(h)$ is a declining function of h . While this is a plausible result that could be justified in a more rigorous setting, it is by no means the only possible solution. Clearly, the post entry price results from the strategic interaction of firms after entry occurs. Quite possibly, the incumbent would compete more vigorously if only a few homes are passed by the entrant, in order to deter subsequent entry. Similarly, once significant build-out has occurred, it is possible that a collusive duopoly outcome would be more likely to occur. Since the Phoenix Center study is designed to inform policy makers about the practical implications of build-out requirements, it would have been desirable to highlight the underlying economic issues, even if the study itself does not attempt to address them in a serious way.

The remainder of the study is devoted to a numerical simulation of the consumer welfare and profit implications of entry under both the free entry and restricted entry (build-out) scenarios. The authors acknowledge that "this is only a simulation, and [they] adopt a number of simplifying assumptions to ease the implementation and evaluation of the simulation." Moreover, "[a]ll the markets evaluated are hypothetical, as are the costs and demand relationships." Given these caveats, the simulation seems to be generally well done, and the results are mildly interesting for the policy issues under consideration. The authors consider a hypothetical area consisting of 100 markets with 1000 homes in each. The cost of serving each home is assumed to be a random variable with a lognormal distribution. The simulation is calibrated so that average capital cost per home passed is equal to \$600. Overall market penetration of the video service (by both the incumbent and entrant if present) is assumed to equal 60%. In a benchmark case, the market share of the entrant is assumed to be equal to 35% in any market in which it enters. In later sensitivity analysis, this percentage is allowed to vary between 20% and 50%. In the benchmark case, the impact of price competition is assumed to result in a 20% price reduction when the entrant passes all households.² In the sensitivity analysis this percentage is assumed to vary between 0 and 50%.

The reported results of the simulation strongly suggest that build-out requirements reduce consumer welfare and increase incumbent profits relative to free entry. In fact, these results occur not only in the benchmark case, but also in *each* of the cases reported in the various sensitivity analyses. In the absence of further information about the details of the simulation (both its computational aspects and the various calibrations used) I think that it would be premature to use these results as definitive evidence that build-out requirements are *always* harmful. If the authors of the study really believe that *any* plausible model of costs and duopoly competition would lead to these results, then it would have been desirable to refocus their study in order to defend this position. I am particularly concerned about the lack of supporting data on the cost of network investments. The results of the sensitivity analyses are nevertheless useful for

² As in the theoretical discussion, the price reduction is assumed to decline in a linear fashion as the number of households passed by the entrant increases from 0 to the maximum possible, which is in this case equal to 100 x 1000.

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indicating relative differences in consumer welfare when assumptions about entrant market share and the intensity of competition change. These results could conceivably be useful to local franchise authorities is deciding whether to impose build-out requirements at a local level. Conceivably they could be useful to the Commission in reaching a decision in MB Docket No. 05-311.

Respectfully submitted,

William W. Sharkey