Exhibit C

REDACTED FOR PUBLIC INSPECTION

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Petition of ACS of Anchorage, Inc. Pursuant to	)	
Section 10 of the Communications Act of 1934,	)	WC Docket No. 05-281
as amended, for Forbearance from	)	
Sections 251(c)(3) and 251(d)(1)	)	
In the Anchorage LEC Study Area	)	
_____	)	

Declaration of

William P. Zarakas

January 9, 2006

REDACTED FOR PUBLIC INSPECTION

I, William P. Zarakas, under penalty of perjury, hereby state the following:

I. Introduction

1. My name is William P. Zarakas. I am a Principal with The Brattle Group, an economic consulting firm, where I am responsible for the firm's work in the area of telecommunications economics. My work at The Brattle Group has primarily involved economic and regulatory-related analysis pertaining to the telecommunications industry. Among other issues, I have had significant involvement in the modeling of economic feasibilities, economic impacts of regulatory initiatives, and valuation of telecommunications related businesses and assets. I have performed economic analyses on behalf of both telecommunications carriers and regulatory agencies in the United States and in other parts of the world. I have testified before a range of regulators on issues associated with economic, cost and rate analyses. My curriculum vita is attached as an appendix to this declaration.

2. The purpose of this declaration is to provide the Federal Communications Commission (FCC or Commission) with the results of my analysis concerning the economic feasibility of General Communication, Inc. (GCI) serving its local exchange customers in the Anchorage study area exclusively over its own facilities. The results of this analysis are important for the FCC to consider as it weighs the merits of ACS's petition for forbearance from Sections 251(c)(3) and 251(d)(1) of the Communications Act in the Anchorage study area. Under the forbearance requested by ACS, ACS would be relieved of the regulatory requirement to provide GCI and/or other competitive local exchange carriers (CLECs) in Anchorage with access to unbundled network elements (UNEs) at rates based on total element long run incremental costs (TELRIC). In order to provide telecommunications services to customers in Anchorage under the forbearance requested by ACS, GCI and/or other CLECs would have to rely upon their own facilities, ACS service obtained at wholesale rates (discounted from retail prices), and/or upon leasing ACS facilities at unregulated rates (if ACS chose to make those available at all).

3. As Dr. David Sappington discusses in his declaration, forbearance from unbundling requirements is appropriate only when the incumbent local exchange carrier (ILEC) is unable to exercise market power because competition prevents the ILEC from raising prices above the costs of an efficient supplier of telecommunications services. ILEC market power can be

eliminated if either multiple efficient suppliers (including self-provisioning suppliers) of relevant inputs are present in the market (*i.e.*, alternatives to ILEC facilities) or efficient CLECs have access to UNEs at regulated rates (*i.e.*, reflecting the cost of an efficient supplier). In this declaration, I discuss whether or not GCI is able to self-provision an economically feasible alternative to the incumbent's network in the Anchorage local exchange market.

4. In Anchorage, which Dr. Sappington points out is actually comprised of multiple product and geographic markets, approximately 85% of the switched voice lines and **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched circuits are currently provisioned over ACS facilities – either directly by ACS or through GCI using ACS's lines through wholesale arrangements (including both UNEs and resale). GCI is largely dependent on ACS (through regulated wholesale arrangements) for the majority of switched and non-switched lines that it provides to its retail customers. As a result, ACS has substantial control over the wholesale local exchange markets in Anchorage wherever GCI does not have such network capabilities in place, and will continue to hold such control until GCI (or another competitive local exchange carrier) has sufficient network capabilities in place throughout Anchorage to serve customers in each relevant product and geographic market over its own facilities.

5. In this declaration, I specifically examine the economic feasibility of GCI extending its cable and fiber optic networks to serve that portion of its current customer base which it currently serves over lines leased from ACS. GCI currently has a cable network in place across much – but not all - of Anchorage,[1] and has announced plans to continue to upgrade this plant to provide digital local phone service (DLPS).[2] GCI also has a fiber optic network located in parts of Anchorage[3] over which it provides high capacity services to customers with sufficient demand and proximity to this network. As Exhibit BB1 to the Declaration of Blaine Brown illustrates, this fiber network is not ubiquitous. My analysis concerns the economics of GCI extending, and in the case of the cable network, upgrading, these network assets (and incurring additional

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[1] For the purposes of this declaration, Anchorage is defined as the ACS LEC study area. As is reflected in Exhibit E to the Opposition of General Communication, Inc. to the Petition for Forbearance from Sections 251(c)(3) and 252(d)(1) of the Communications Act filed by ACS of Anchorage, GCI's Opposition, GCI's authorized cable service area does not cover the entire Anchorage LEC service area.

[2] DLPS refers to the telephony services that GCI provides over its cable network.

[3] GCI fiber network is deployed in metropolitan sections of Anchorage. Such an arrangement is frequently referred to as a metropolitan area (fiber) network, or MAN.

investment to do so) in order to serve its customers that it currently provisions over facilities leased from ACS.

6. The remainder of my declaration is organized as follows. In Section II, I summarize the overall findings and conclusions which I derive from my analysis of the economic feasibility of GCI being able to upgrade and, in the case of fiber, extend its facilities to self-provide an alternative telephony network to ACS's in the Anchorage local exchange markets. In Section III, I provide an overview of the local exchange markets in Anchorage, with particular focus on GCI's customer and provisioning mix. In Section IV, I discuss the methodology that I employed to determine whether or not, and the extent to which, GCI is able to provide an economically feasible alternative to ACS's network in the Anchorage local exchange markets. I discuss the specific application of this methodology to GCI's residential and small business customer markets (to which GCI provides less than eight switched voice lines)[4] and to GCI's medium and large business market (to which GCI provides non-switched high capacity services and/or switched voice services of eight or more DS-0 equivalents) in Sections V and VI. I also provide an analysis of the sensitivities of my results to the key variables that I include in my analysis in these sections. I summarize my findings in Section VII.

II. Conclusions

7. My analysis indicates that although GCI can economically feasibly reduce its use of leased facilities from ACS – as GCI is already doing in carrying out its existing, ongoing cable telephony upgrade efforts – even following the conversion of **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of switched lines and **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched circuits onto GCI facilities, ACS will continue to control a significant percentage of both switched and non-switched lines to retail customers in Anchorage and GCI will still need to lease ACS facilities in order to serve the full range of customers across the various relevant Anchorage product and geographic markets. Put another way, my analysis indicates that GCI will not be able to provide an economically feasible alternative to the ACS network in Anchorage for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its current customers. As is further discussed in the Declaration of Dr.

[4] Home offices and small offices (SOHO) are included in either the residential or small business segments depending on the tariff under which the service is provided.

Sappington, where GCI does not have economically feasible alternatives that can be operationally implemented and permit GCI to deliver service to a requesting customer within a commercially reasonable period of time, forbearance as requested by ACS would result in ACS being able to exert market power in both retail and wholesale markets. As Dr. Sappington and Ms. Gina Borland further point out, this is especially true in the business market in which customer arrangements are generally individually negotiated.

8. I examined switched voice services separately from non-switched services. I found this to be a conservative approach, especially with regard to estimating the extent to which GCI can economically self-provision to its medium and large business market. This approach assumes that GCI can use DLPS to provide switched voice service to all of its switched voice line market, including medium and large business. As Gary Haynes suggests in his declaration, however, technologically this may not be the case. Thus, my analysis may yield optimistic results concerning the economic feasibility of GCI being able to self-provision switched voice services to the medium and large business market.[5] (Later in my declaration, I summarize my analysis concerning GCI's self-provision of combined switched and non-switched services over a single platform).[6]

9. I turn first to switched voice lines. If GCI over time converts the switched voice lines that it currently provisions over facilities leased from ACS (primarily through leases of UNE-L) to its own loop facilities to the extent that my analysis suggests is economically feasible, I estimate that the percentage of retail switched voice lines that are served over ACS lines in Anchorage – either directly by ACS or through GCI using ACS's lines through wholesale arrangements – would decline from the current level of approximately 85% to **[BEGIN**

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[5] The solution to the telecommunications demands of many medium and large business customers are frequently complex, involving more than simply arranging for connections to separate switched or non-switched lines. For example, switched voice services for medium and large business customers may be provided through a private branch exchange (PBX) which involves connection to one or more non-switched circuits.

[6] As I will explain in this declaration, I show the economic feasibility analysis of switched voice lines over cable plant in **Exhibit I** and the analysis of non-switched lines over fiber optic plant in **Exhibit II**. The medium and large business market includes a portion of the switched voice lines (served over cable plant) included in **Exhibit I** and all of the non-switched circuits (served over fiber plant) included in **Exhibit II**. In **Exhibit IX**, I conduct an alternate sensitivity by assuming that the switched demand in medium and large business locations can only be served over fiber plant, because of the technological issues discussed in footnote 5. I summarize the economic feasibility of serving this demand (as well as locations with non-switched services) over GCI's fiber network.

CONFIDENTIAL][END CONFIDENTIAL]. Put another way, GCI would still need to lease ACS loops[7] to serve **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** (**[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**) of its switched voice lines – a percentage that, as discussed below, will vary in different areas of Anchorage and by customer classes. A summary of the results of my analysis of the switched voice lines is included in **Exhibit I.**

10. My analysis confirms the economic viability of GCI's current plans for cable plant upgrades. I find that it is economically feasible for GCI to upgrade its cable network to provide switched voice services to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** – of its mass market (*i.e.*, residential and small business) customers. GCI will not be able to upgrade cable plant for DLPS in those areas where it does not already have cable plant in place.[8] Also, based on its past experience with mass market customers, a small number of customers will not allow GCI access to their premises, stymieing the final step of the conversion process. Together, these factors result in GCI not being able to economically serve **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** (or **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**) of its **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** residential switched voice lines over its cable plant. However, as **Exhibit I** reflects, there is a marked difference between GCI's ability to self-provision service to residential and small business customers. GCI will not be able to economically self-provision to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its switched voice lines in its small business customer segment, primarily because its cable plant does not pass many of these customer locations. It is not correct, therefore, to treat residential and small business markets as facing equivalent market circumstances.

11. For the medium and large business customer segment, I find that there will be **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of customer locations for which GCI cannot economically self-provision loop facilities. Even assuming that a medium or large sized business customer would be willing to split its purchase of switched and non-switched services and that switched voice services could be technologically provided over DLPS, my analysis indicates that GCI would be unable to economically self-provision service to **[BEGIN**

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[7] For the purposes of this declaration, the phrase "leases" or "leased from ACS" encompasses any method by which GCI secures the use of ACS facilities to serve GCI retail customers, including UNEs and resale.

[8] Cable plant "in place" means that a drop to a customer premise is already there (even though it may need to be upgraded) or a drop can easily be added (typically aerially).

CONFIDENTIAL][END CONFIDENTIAL] of the switched voice lines taken by the medium and large business segment. This is also summarized in **Exhibit I**.

12. I also find that the economic feasibility of GCI being able to convert leased switched lines onto its own network is sensitive to the initial capital expenditures required to upgrade GCI's cable plant, particularly with regard to the residential customer segment. I applied GCI's capital expenditures included in its current cable plant upgrade schedule in my economic feasibility analysis. The incremental per line cost of upgrading its cable plant could increase if GCI is required to accelerate its upgrade schedule. As I discuss later in this declaration, a substantial increase in per line incremental costs would serve to make GCI's cable upgrade program uneconomic.

13. GCI's ability to serve its customers with switched local voice service over its own facilities varies by geography within Anchorage, and therefore the entire Anchorage LEC study area is not properly a single relevant geographic market. The economic viability of GCI being able to provide DLPS requires that basic cable facilities be in place. However, GCI does not have ubiquitous cable plant facilities throughout Anchorage, especially in certain non-residential areas. As I show later in my declaration, in only two wire centers does GCI's cable plant pass **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of GCI business switched local voice lines. In the other wire centers, GCI's cable plant does not pass from **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its business switched local voice lines.[9] Serving these customers with DLPS would require a complete build-out of cable infrastructure – and, in some cases, could require securing a cable franchise - not simply an upgrade to its existing cable plant. Changing the level of incremental investment from that associated with upgrading existing cable plant to a comprehensive cable plant build-out could make GCI's provision of DLPS uneconomic.

14. I turn next to non-switched services. A summary of the results of my analysis of the non-switched market is included in **Exhibit II. Exhibit II** indicates that GCI currently provisions **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** DS-1s to business customers at **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** locations. Of these, **[BEGIN**

[9] Estimates of cable plant coverage are based on GCI studies of switched voice line customer addresses compared to GCI cable plant homes passed addresses.

CONFIDENTIAL][END CONFIDENTIAL] DS-1s (**[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the total DS-1 circuits that it provides to its business customers) serving **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** locations are provisioned using circuits leased from ACS. If GCI was not able to lease circuits from ACS, my analysis indicates that GCI will not be able to economically self-provision loops to reach **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** of the total **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** (or **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**) of the medium and large enterprise business locations to which GCI provides non-switched services, or **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** circuits that it currently leases from ACS.[10]

15. I show later in this declaration that economic preclusion is particularly strong for locations with demand of less than about 2 DS-1s, which is the demand level for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of GCI's medium and large business customer locations taking non-switched circuits.

16. Because many business customers demand more complex telecommunications services than can currently be provided over DLPS, I also consider the economic feasibility of GCI providing non-switched services and/or switched voice over its fiber optic network. I show later in my declaration (and in **Exhibit IX**) that GCI can economically serve through its fiber optic network **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the medium and large business locations that it currently provisions over lines leased from ACS – leaving **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** that must be served (if it all) over ACS facilities. If I assume a higher level of risk associated with constructing facilities to serve these customers

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[10] **Exhibit II** provides two estimates of GCI non-switched circuits following economically feasible conversion. GCI leases **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** DS-1 circuits in **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** locations that are on its fiber network because of customer requests for network diversity and/or data security, as well as scheduling or convenience considerations. Assuming all of these circuits are converted onto GCI's network, GCI will be unable to serve a total of **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched demand (in **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched locations). This is a conservative assumption. Alternatively, assuming GCI is unable to convert the **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** leased circuits in the **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** locations, GCI will be unable to serve a total of **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched demand (in **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched locations).

(from the 8.5% weighted average cost of capital that I used as a base case in my analysis up to 15%), my analysis indicates that GCI would only be able to serve economically **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the medium and large business locations that it currently provisions over lines leased from ACS – leaving **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** that can only be served over ACS facilities.

III. Anchorage Local Exchange Markets

17. **Exhibit III** provides a summary of the number and proportionate shares for retail switched local voice lines in Anchorage, taken as a whole. As discussed in the Declaration of Dr. Sappington, such an aggregate approach is not the correct way to view the product or geographic market; however, it confirms ACS's general contention that GCI has achieved an overall retail share of about 49% in Anchorage's retail switched local voice lines, and has captured **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** the share (**[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**) of residential switched local voice lines.[11] While informative, these statistics reveal little to assist the Commission in gauging the degree of market power currently realized by ACS. Review of the method of line provisioning employed by GCI indicates that GCI remains highly dependent upon ACS to deliver its telecommunications services to its customers. Therefore, under forbearance and in the current state of the Anchorage markets, as Dr. Sappington explains, ACS could raise substantially the prices GCI must pay for the inputs it requires to serve the vast majority of its customers. This conclusion is even stronger with respect to non-switched services, for which, as **Exhibit II** shows, ACS has approximately a **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** retail market share, in addition to its control of wholesale facilities.[12]

18. **Exhibit IV** shows the method of provisioning for GCI's retail switched lines, and indicates that currently **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of GCI's switched local voice lines provided to its residential customers and **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of switched lines provided to its business

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[11] The majority of the switched local voice lines that GCI provides to its residential customers are located in single family and multi-family homes. **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of GCI's residential switched local voice lines are located in multi-dwelling units (MDUs), which are roughly equivalent to apartment buildings, with eight or more lines.

[12] Based on data reported by ACS in Form M filed with the Regulatory Commission of Alaska.

customers are provisioned using lines that have been leased from ACS.[13] As shown in **Exhibit V** (which summarizes the method of provisioning used by GCI in serving switched voice residential customers by ACS wire center), the degree to which GCI relies on ACS for leased lines, as well as the extent to which GCI has its cable plant in place to be upgraded, varies based on specific geography. **Exhibit VI** provides a similar summary for GCI's switched voice business customers. In the residential market, GCI relies on ACS to provide service (over leased lines) to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the switched lines that it provides to its residential customers in two of the seven largest wire centers, as well as in the remaining wire centers taken together.[14] In the business market, this is the case in four of the seven largest wire centers, as well as in the remaining wire centers taken together. GCI plans on continuing with its plan to upgrade its cable plant to provide DLPS, but the extent of cable plant upgrade will also vary by geography. In the residential market, cable plant is not in place for upgrade for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the switched voice lines in the Rabbit Creek wire center, while in the business market GCI cable plant does not pass **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of switched voice lines in five of the seven largest wire centers, as well as the remaining wire centers taken together (and in only one wire center does GCI cable plant pass **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of switched business lines).

19. **Exhibit VII** summarizes the total scope of switched and non-switched services that GCI provides to its business customers. GCI provides **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** switched local voice lines and **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** non-switched circuits (*i.e.*, DS-1s) to these customers in Anchorage. **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**, or **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**, of GCI's switched local voice lines that are provided to its business customers are leased from ACS. Furthermore, **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the non-switched services that GCI provides to its business customers are

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[13] Based on November 2005 data provided by GCI.

[14] Based on the data provided me by GCI, I use 7 specific wire centers: Central, East, North, South, West, O'Malley, Rabbit Creek. All other wire centers (Elemendorf, Ft. Richardson, Girdwood, Hope, and Indian) are aggregated into the category labeled "Other."

leased from ACS. On a combined DS-0 equivalent basis,[15] **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of GCI's circuits that are provided to business customers are provisioned over ACS facilities.

IV. Methodology

20. I use net present value (NPV) analysis to determine whether or not GCI is able to provide an economically feasible alternative to ACS's local exchange network in Anchorage.[16] Specifically, I use an NPV framework to assess the economic feasibility of GCI fully serving its customers over its own network (*i.e.*, without leasing network components from ACS, whether through UNEs or resale). This NPV analysis estimates the benefit (in dollars) that GCI could realize by serving telephony customers directly over its own facilities, compared to not serving these telephony customers at all. A positive NPV indicates that it is economically accretive for GCI to invest in upgrading its network to serve its customers, while a negative NPV indicates that GCI would suffer losses if it made such investments.[17]

21. GCI uses two different types of networks to directly serve its customers. GCI uses its cable network to provide DLPS to its residential and some of its business switched voice customers. In order to convert the customers that it currently serves over lines leased from ACS onto its own cable network, GCI needs to invest in upgrading its cable facilities so that it can provide DLPS. As described by Gary Haynes, cable networks and cable standards were developed primarily for voice and high speed internet service for mass market customers, and

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[15] Lines of different capacities are frequently normalized by converting them to a common denominator. Typically, this is in voice grade equivalents (VGEs) which are measured as DS-0 (digital service level zero). A DS-1 line has a transmission speed of 1.544 Mb/s and is equal to 24 DS-0s. A DS-3 line has a transmission speed of 44.736 Mb/s and is equal to 28 DS-1s (or 672 DS-0 circuits).

[16] I use 15 years of cash flows in this analysis which reflect GCI's current per line economics. However, the analysis does not reflect a specific time frame for converting lines leased from ACS over to GCI facilities.

[17] Calculating NPV generally involves deducting an initial investment (cash outflow, "C_0") or series of investments from the present value of revenues (cash inflow over time, "C_1", "C_2", "C_3"…. "C_N".). The present value of cash inflows is calculated by discounting these inflows by the opportunity cost of capital ("r"). The general formula for calculating net present value is:

$$\mathrm{NPV} = C_0 + \frac{C_1}{1+r_1} + \frac{C_2}{(1+r_2)^2} + \frac{C_3}{(1+r_3)^3} + \ldots\ldots + \frac{C_2}{(1+r_N)^N}$$

As I discuss later in this declaration, I use net cash inflows in this NPV analysis, which reflects the revenues received less the various costs incurred in each time period. For additional discussion of NPV analysis, see Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance (Boston: Irwin-McGraw Hill, 2000).

were not designed to support the types of high capacity services commonly provided over DS-1 or fractional DS-1 circuits. There is no industry standard that would allow GCI to use its DOCSIS-based[18] cable plant to provide the high capacity services that are demanded by its medium and large business (*i.e.*, enterprise) customers. Instead, when GCI self-provisions high capacity services, it uses its fiber optic network. In order to serve over its own facilities the medium and large business customers taking non-switched and high capacity switched DS-1 service that it currently serves over lines leased from ACS, GCI would need to invest in extending its fiber plant in order to connect these customers.

22. I use two separate NPV models in order to appropriately reflect GCI's network solutions to providing switched and non-switched services. I use a cable plant NPV model for analysis of the residential segment and businesses whose switched voice lines can be served using DLPS. I assume that all switched services, including those to medium and large business locations, can be provided over GCI's cable plant - provided that this plant passes customer locations. I believe that this is a conservative assumption, because it is possible that the switched demands of GCI's enterprise customers may be too large or complex to be provided over GCI's cable plant. I also believe that this is a conservative assumption because enterprise customers typically require that carriers provide an integrated switched and non-switched service. My analysis allows for GCI to serve switched demand over its cable plant, which is a less expensive alternative to extending its fiber plant - which is what would be required to provide an integrated switched and non-switched solution.[19]

23. I used a fiber plant NPV model to analyze the economic feasibility of GCI self-provisioning non-switched service to its medium and large business customer locations. GCI currently serves **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** locations with non-switched service, which when also including their switched circuits contain **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** DS-0 equivalents. I used the fiber plant NPV

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[18] DOCSIS refers to the Data Over Cable Service Interface Specification that was developed by CableLabs and approved by the ITU. It defines the interface requirements for cable modems involved in high-speed data distribution over cable television system networks.

[19] In practice, barriers to self-provisioning a customer's non-switched services could create a substantial impediment to serving that customer's switched voice services. Review of GCI customer location data indicates that it will be unable to provide both switched and non-switched service for certain of its medium and large business customers because GCI cannot economically serve non-switched demand with its fiber plant (although cable plant is nearby to serve switched demand).

model to determine the economic feasibility of GCI extending its own fiber network to serve the **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** non-switched locations which it currently provisions over facilities leased from ACS.[20] The distinction between "customer" and "location" is an important one in analyzing the economics of extending GCI's fiber optic network to serve business customers. Business customers are frequently concentrated at locations which may create enough demand in aggregate to justify constructing facilities to serve them in total (*e.g.*, a multi-tenant office building), while the individual demands of any single customer may not be enough to justify the capital expenditures required to extend GCI's fiber based network. I analyze the economic feasibility of extending GCI's fiber plant based on an NPV estimated for each business customer location.[21] If the model predicts that GCI can provide service to this business location with a positive NPV (or it "passes" GCI's business case analysis), I assume that GCI will migrate all of the non-switched circuits at that location to fiber-based facilities. If the location "fails" the fiber plant business case (*i.e.*, the model predicts that GCI can only serve this business location at a negative NPV), I assume that GCI could not economically serve that location over its own fiber facilities.

24. I also used the fiber plant NPV model to estimate the economic feasibility of GCI providing combined switched and/or non-switched solutions to its medium and large business customer locations. GCI provides services to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** locations which each demand eight or more switched lines and/or at least one DS-1 line. (The **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** non-switched locations that I referenced above are a subset of this group.) GCI provides these locations with **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** equivalent DS-0 circuits. This analysis reflects the economic feasibility of GCI using its fiber network to provide services to its larger customers, which may have complex demands beyond the capacity of its current cable plant technology. I use the more conservative bifurcated approach (*i.e.*, cable plant NPV model and

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[20] As I discuss later in Section IV, in addition to the non-switched demand in these locations, I include the switched circuits as relevant demand for calculating the NPV of these locations.

[21] Business locations may contain both small business as well as medium and large *(i.e.*, enterprise) business customers. For purposes of this analysis, the term "medium and large business locations" does not necessarily imply that the customers at these locations are by themselves considered to be medium or large business customers. There may be some instances in which a medium and large business location contains only a number of small business customers. Therefore, I refer to the relevant demand unit in the following discussion as "location" or "customer location."

fiber plant NPV model separately) to develop my conclusions concerning the extent to which GCI can economically convert lines that are currently leased from ACS onto its own facilities (as shown in **Exhibits I** and **II**).

25. I applied only incremental revenues and costs in both of the cable and fiber plant NPV analyses. GCI's incremental revenues are those associated with providing local exchange service in the case of switched voice lines and revenues associated with high capacity (*i.e.*, DS-1) service in the case of non-switched services. In the cable plant NPV model, I use revenues that GCI receives from provision of local exchange service (including the revenues that GCI receives from revenue from universal service funding). In the fiber plant NPV model, incremental revenues includes revenues associated with non-switched services as well as switched service revenues, including applicable universal service support (provided the specific location receives switched services in addition to non-switched services).

26. Incremental costs include those operating and capital costs associated with expanding GCI's current cable and fiber plants to connect the customer locations that are now served by GCI through lines leased from ACS. Incremental capital expenditures are a particularly important element of this NPV analysis, because it involves the single most significant cost that GCI will need to incur in upgrading and/or extending its networks. I include only those capital expenditures associated with upgrading GCI's existing cable plant to provide DLPS to customer locations currently provided service over leased lines and the cost of extending GCI's existing fiber plant to provide non-switched service to customer locations currently served through leased DS-1s. I do not include embedded network costs in my analysis.

27. GCI's fiber plant does not have the same coverage that its cable plant has. The "upgrade" to GCI's fiber plant actually involves extending the fiber optic based network so that it passes the medium and large business locations that GCI currently serves over facilities leased from ACS (primarily UNE DS-1). The incremental capital expenditures associated with connecting medium and large business locations to GCI's fiber network reflect these costs of extending GCI's current fiber network.

28. The above analyses assume that GCI is able to upgrade and/or extend its networks in a technically and operationally feasible time frame, but without defining that time frame. I use

GCI's average costs (based on its current implementation schedule) for cable and fiber plant upgrades.[22] I also conduct a sensitivity analysis which estimates the impact of GCI incurring higher levels of capital expenditure in its conversion onto its own facilities – which could be caused by accelerated plant upgrade and/or extension schedules and/or higher costs for resources.[23]

V. GCI's Residential and Small Business Segment Economics

29. The level of capital expenditure associated with upgrading GCI's cable plant for DLPS is a primary factor in estimating an NPV. GCI has been upgrading its cable plant to provide DLPS to its residential (as well as to some of its business) customers over the past several years. In general, upgrading GCI's cable plant involves installing new equipment specifically associated with providing local voice service and modifying the common cable plant to accommodate this additional demand. Upgrading the cable plant includes: modifications and expansions at GCI's central switch (which involves the addition of voice gateways, cable modem termination systems, narrowcast lasers, wave division multiplexers, and optical splitters); construction of new (or splitting of existing) optical nodes which are located throughout GCI's cable network,[24] and construction and installation work associated with connecting customers (primarily involving modifying or replacing the drop and installing a multimedia terminal adapter, or MTA, at the customer's premises). The specific technical and engineering issues associated with such an undertaking are discussed by Gary Haynes in his declaration. In my economic feasibility analysis for GCI's switched voice market, I used GCI's projections of the average incremental per line capital expenditure to upgrade its cable plant to provide DLPS assuming its current

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[22] GCI does not have a schedule for extending its fiber plant. The costs used in the fiber plant NPV model are based on averages of GCI's various technical analyses, and assume that GCI will not experience an undue acceleration of fiber plant extension.

[23] Cable plant NPV analysis is conducted on an average basis (separately for residential and small business segments). I do not project how GCI would prioritize its cable plant upgrade (and therefore the percentage of customers that would be upgraded) if it were not able to fund the entirety of its upgrade program.

[24] Currently, there are **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** nodes in GCI's cable plant. Upgrading the cable plant to provide DLPS will require many of these nodes to be modified, as well as construction of new nodes.

network powered method of provisioning.[25] These GCI projected costs of upgrading its plant are lower than the historical upgrade costs per line that GCI experienced in 2004 and 2005.[26]

30. I modeled the cash flows associated with self-provisioning service to mass market customers, such that recurring cash flow equals: monthly local voice revenue less network and customer care costs[27] less taxes[28] less replacement-related capital expenditures.[29] I did not include the initial customer acquisition costs as a cost in this model, because GCI is already serving these customers (and is only converting the method of provisioning).[30] I also accounted for the extension of customer life through marketing and promotion efforts and the addition of new customers by adding a terminal value to the NPV calculation.[31] The recurring cash flows included in the discounted cash flow (DCF) analysis were discounted by a weighted average cost of capital (WACC) of 8.5%, based on the discount rates that have been used by several equity researchers in valuing GCI stock prices.[32]

31. I applied this DCF model separately to each of GCI's mass market segments for which I had segregated data (*i.e.,* residential and small business) to reflect differences in assumptions for residential versus small business customers. Many of the assumptions included in the DCF are the same for both the residential and small business segments, notably assumptions relating to

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[25] It is undoubtedly the case that the actual per line cost varies by customer. While the cost of connecting a specific customer will almost certainly include the cost of installing a MTA, it may or may not include the cost of modifying or installing a drop and/or a portion of the costs associated with installing a new or splitting an existing node.

[26] Cable plant upgrade costs may actually increase on a per line basis as GCI upgrades its cable plant in areas that are less dense than the areas upgraded in 2005.

[27] Only operating costs that are incremental to GCI's existing video and cable modem operations are included. Allocations of shared network costs and of general and administrative costs are not included.

[28] I take depreciation into account when estimating taxes. I do not include interest expense in this calculation.

[29] This capital expenditure is a modest contingency amount which covers the costs associated with replacing equipment which fails prematurely.

[30] Customer acquisition costs are typically quite high for CLECs that do not already have customers in place. Inclusion of this cost would likely lower the NPV greatly.

[31] The terminal value is calculated by estimating an NPV of acquiring a new customer following the churn of the previous (churned) customer. I assume that GCI would acquire future customers (after churn) in the same proportion as its current market share in Anchorage. Customer acquisition costs are included in the NPV calculation of additional customers after churn.

[32] Jeffries & Company, Inc. in its December 13, 2005 research report ("General Comm. Providing True Triple-play in Alaska") uses a DCF model to value GCI share prices and applies a discount rate of 8.5%. Oppenheimer Equity Research in its November 3, 2005 research report also used an 8.5% discount rate in its DCF analysis.

the incremental capital expenditure per line for cable plant upgrades. However, based on GCI historical data, these two segments have had different experiences with respect to average recurring monthly revenues and levels of customer churn.

Residential Segment

32. My analysis indicates that GCI's decision to upgrade its cable plant to provide telephony service to its residential customers, on average, yields a positive NPV. GCI has estimated that **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** switched residential lines are passed by its cable plant. GCI also has found that **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its residential customers have not authorized GCI to make the final arrangements for converting them from UNE-L to DLPS.[33] Taking both these factors into account, it is likely that GCI will not be able to convert **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its residential lines that are now served using leased ACS lines onto DLPS. Thus, even after GCI has been able to fully upgrade its cable plant, it is likely that GCI will not be able to provide an economically feasible alternative to ACS's network for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its residential lines.

33. The economic feasibility of GCI constructing an alternative network to ACS's network, however, is sensitive to the average per line level of capital expenditure involved in the cable plant upgrade. Increases in the level of incremental capital expenditures per line - stemming from accelerating the pace of cable telephony upgrades to the extent that is even operationally feasible (as Gary Haynes discusses in his declaration) – can change the positive NPV to a negative value. I estimate that **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** in such costs would serve to make GCI's cable plant upgrade program uneconomic. This sensitivity does not specifically quantify, however, the costs associated with overcoming the operational impediments described by Mr. Haynes (such as weather, seasonal constraints on permitting,

[33] GCI understands that this reluctance by customers is due to scheduling issues and customer inconvenience. This explains why some of GCI's residential customers that are located in areas where cable plant has been upgraded are still served over facilities leased from ACS, even though GCI has invested in the facilities required to provide DLPS. In these cases, GCI has both made the investments required to self-provision and continues to pay monthly lease fees to ACS.

network design and equipment procurement timeframes, and difficulties obtaining additional workers), or whether or not such impediments can be overcome at all.

Small Business Segment

34. GCI can generally provide DLPS to its small business customers by upgrading its cable plant – similarly to its provision of DLPS to residential customers – provided that its cable plant passes these small business customers. I used the same cable plant model that I used to determine whether or not GCI could provide an economically feasible alternative to ACS's network to residential customers (above) in my analysis of the small business market. I used the same assumptions concerning the capital expenditures required to upgrade GCI's cable plant for DLPS[34] and the incremental operating costs that GCI would incur following the upgrade. I used higher levels of monthly recurring revenues for switched voice lines and lower levels of customer churn in the small business analysis, however, reflecting GCI's experience with this customer segment.

35. I find that GCI can economically upgrade its cable plant network to deploy DLPS to its small business customers, provided that cable facilities run past the specific business location being considered. Margins in the small business segment are stronger than is the case in the residential segment, primarily because of the higher levels of monthly revenues and lower levels of churn.

36. GCI estimates that its cable plant passes **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** switched local voice lines that it provides to its small business customer locations. In those areas in which GCI has already upgraded the plant to provide cable-based telephony, **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its business customers whose services can be provisioned over cable telephony have not authorized GCI to make the final arrangements for converting them from leased ACS lines to DLPS. For business customers, this reluctance may reflect customers' concerns about reliability and the risk of loss of service during conversion, as

[34] This is likely a conservative assumption. Unlike residential premises, business premises require additional work to provide service even if cable plant runs past it, such as adding an underground drop.

well as inconvenience and scheduling concerns.[35] Taking these factors into account, it is likely that GCI will not be able to convert **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** or **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of switched voice lines used by its small business customers.

37. The above analysis concerning GCI's small business market may be slightly optimistic, however. The economics of GCI serving its small business customers over its own facilities would likely be less favorable if GCI found it uneconomic to serve its residential customers over its own cable facilities. This is because the calculation of NPV for GCI's small business segment included here assumes the average per line level of capital expenditure that GCI projects it will incur if it continues to upgrade its cable plant in its entirety (*i.e.*, serving residential and business customers.) If GCI were to upgrade its cable plant for its small business customers only (either because cost increases from an accelerated deployment rendered the residential upgrade uneconomic or because the particular service area contained few residential customers), it is likely that average cost per line would increase because there would be fewer lines across which to spread common costs.

VI. GCI's Medium and Large Business Segment Economics

38. GCI defines its medium and large business segment[36] as locations with eight or more GCI switched local voice lines and/or one or more DS-1s at a single business location.[37] As I discussed earlier, I applied the cable plant NPV model to analyze the economic feasibility of GCI providing this segment switched services over its own facilities. I used similar assumptions concerning revenues, cost and churn that I used in analyzing the small business segment. I find that GCI can economically provide switched services to many of its medium and large business locations over its cable plant, provided that cable facilities runs past business customer locations

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[35] Service diversity requirements are considerations for larger sized customers. This is likely less of an issue for small business customers.

[36] For purposes of this analysis, large business is grouped with medium business. It may be appropriate to treat larger businesses (*i.e.*, enterprises demanding DS-3 services and above) as a separate market. However, there appear to be only a small number of DS-3s in all of Anchorage (served by either ACS or GCI).

[37] This segmentation reflects GCI's own internal analysis, and reflects the specific customer demographics of the Anchorage markets. Generally, customers and/or locations with eight switched lines would not be classified as "medium business." More typically, customers and/or locations of this size would be considered "small business." This segmentation reflects the low level of telecommunications demand in Anchorage compared to many other metropolitan areas in the United States.

and the switched demands at a location do not exhaust cable plant capabilities. Taking into account locations which are not passed by GCI's cable plant and GCI's experience with customer reluctance to permit the completion of the conversion process,[38] I estimate that GCI will not be able to economically self-provision **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** (or **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**) of its switched lines in medium and large business locations.

39. Determining whether or not GCI can provide an economically feasible alternative to ACS's network in the Anchorage local exchange markets for non-switched services requires examining the incremental capital and operating costs that it would incur in extending its current fiber optic plant in order to directly connect the customer locations that it currently provisions over leased DS-1s from ACS. The initial capital expenditure needed to connect each location to GCI's fiber network is a function of distance (over which GCI needs to bring its fiber optic cable) and equipment. GCI provided me with a sample of their technical analyses concerning the distances and other issues associated with connecting "off-net" locations (*i.e.*, locations not passed by GCI's current fiber plant) onto its fiber network. I used the average distance derived from my review of GCI's technical analyses.[39] I estimated the capital expenditure for electronic equipment based on GCI's historic cost associated with such equipment, adjusted to reflect the specific demand levels at each location and the average length of lateral fiber.

40. GCI provided me with the locations of all of its business customers which demand non-switched services. I aggregated the customer data by locations, which provided the levels of revenue and demand for each location. I performed a DCF analysis for each location. I calculated the recurring monthly cash flow in the same manner as I did in the DCF model that I used for analysis of the switched voice market. I assumed that the recurring monthly cash flow remained constant over the duration of the customers' contracts.[40] I also assumed that a percentage of customers will remain with GCI after the end of their contracts, based on GCI's historical experience with contract renewals.

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[38] In addition to the aforementioned concerns about reliability, risk of loss of service during conversion, and inconvenience and scheduling, many customers in this segment require diversity in their mix of telecommunications services.

[39] At this time, data is not available to provide specific fiber distances for specific locations.

[40] I use GCI's average historical contract lengths for this assumption.

41. **Exhibit VIII** summarizes the results of my economic feasibility analysis of GCI's non-switched customer locations. It also highlights the economic challenge associated with extending facilities to serve locations with relatively low levels of demand for telecommunications services. The majority of the business customer locations served by GCI in Anchorage demand less than 2 DS-1 equivalent circuits, which represents a relatively low level of telecommunications demand compared to various other metropolitan markets in the United States.[41] The prevalence of customer locations with relatively low levels of demand has a major effect upon GCI's ability to provide an economically feasible alternative network to these locations. My analysis indicates that GCI cannot economically self-provision **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its non-switched customer locations (currently provisioned over lines leased from ACS) which have demand of less than 2 DS-1 equivalent circuits.

42. As I discussed earlier in **Exhibit II**, I estimate that GCI will be able to economically self-provision **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its non-switched locations. **Exhibit VIII** provides additional insight into the **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched locations which reside off of GCI's fiber network.[42] It indicates that GCI can only economically self-provision **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its off-net non-switched customer locations. If GCI could not lease lines from ACS to provision service to the remaining **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its off-net non-switched customer locations, it would be unable to serve **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its off-net non-switched demand.

43. I examined the sensitivity of the NPV analysis for non-switched customer locations to changes in the cost of capital.[43] Changing the WACC from 8.5% to 15% greatly reduces the

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[41] I base this statement on review of demand in Anchorage compared to several major telecommunications markets. I have not conducted a study which benchmarks the Anchorage market against a panel of markets.

[42] As shown in **Exhibit VIII**, **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of GCI's **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** non-switched locations are off of its fiber network.

[43] As I introduced earlier, I performed the DCF-based economic feasibility analysis using a WACC of 8.5%. Extending a fiber optic network may involve additional risk above this level, however. GCI uses a WACC of 15% in its internal economic feasibility analysis when determining whether or not to extend its network to a new location. This discount rate is in line with the practices of other carriers (that I have reviewed) when evaluating the feasibility of extending fiber plant to serve an off-net building.

economic feasibility of GCI serving its non-switched customer locations over its own network, lowering the passing off-net locations from **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** down to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**.

44. The economic feasibility analysis for switched voice service for GCI's medium and large business customer locations summarized in **Exhibit I** assumes that GCI can serve these locations with its cable plant, provided that it passes these locations and is appropriately upgraded. This is likely a conservative assumption given the complex demands of many medium and large business customers combined with the lack of any DOCSIS-based standard for providing DS-1 service over a cable telephony network, as is more fully discussed in the Declaration of Gary Haynes. **Exhibit IX** summarizes my analysis of the economic feasibility of GCI self-provisioning both switched and non-switched services to its medium and large business customer locations by extending its fiber optic network. GCI provides either switched and/or non-switched services to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** medium and large business customer locations in Anchorage.[44] The majority of these locations (**[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** out of **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**) are currently served off of GCI's network. If GCI had to rely on a fiber optic solution to serve its medium and large business customer locations, it would only be able to economically serve **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of these off-net locations, which account for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its off-net medium and large business telecommunications demand. The remaining **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of locations, accounting for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its off-net medium and large business demand, would have to be served over ACS facilities. Increasing the WACC to reflect a higher level of risk associated with such an undertaking (to 15%, as I did in **Exhibit VIII**) serves to reduce the economic feasibility of GCI serving these locations. Under that case, GCI could only economically self-provision **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its off-net locations, which would leave unserved **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of the locations and **[BEGIN CONFIDENTIAL][END**

[44] That is, for customers who demand at least eight switched access lines and/or at least one DS-1.

CONFIDENTIAL] of demand (assuming that GCI could not economically lease facilities from ACS).

VII. Summary

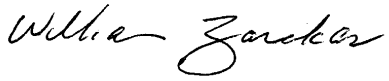
45. In summary, my analysis projects that GCI will be able to provide an economically feasible alternative to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**, of its mass market switched voice services. This finding appears to be in agreement with GCI's current cable plant upgrade program. Even with the assurance of GCI's plans to convert residential and small business customers to DLPS, however, it is likely that GCI will not be able to self-provision **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its current residential customers and **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its small business customers' switched voice lines. This analysis does attempt to quantify the time required to self-provision.

46. The degree to which GCI will be able to economically self-provision switched voice services varies significantly by geography and customer class, primarily because of the uneven nature of GCI's cable plant coverage. GCI's cable plant does not pass **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of business locations in at least five of the seven largest ACS wire centers, as well as in the remaining wire centers taken together, making it unlikely that GCI will be able to economically serve these switched voice customers over its own facilities.

47. The economic feasibility of GCI provisioning switched voice services over its own cable plant is contingent upon its current projections for the capital expenditures required for upgrading its plant. My analysis indicates that GCI will not, on average, be able to economically convert the lines that it currently leases from ACS onto DLPS if capital expenditures for cable plant upgrade increase by **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]**. This finding is particularly important for the Commission to consider as it evaluates ACS's arguments for a rapid elimination of loop unbundling. Requiring GCI to accelerate its cable upgrade schedule could lead it to incur higher capital costs, which could change the economics of its cable upgrade program.

48. The area of greatest potential economic preclusion, however, involves the market for non-switched services, which may also affect medium and large business switched voice services. I estimate that GCI will be unable to economically self-provision non-switched services to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its non-switched customer locations (responsible for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of non-switched demand). A majority of GCI's non-switched customer locations are off of its fiber optic network, and have relatively low levels of demand (below 2 DS-1s). I estimate that GCI will be unable to economically self-provision non-switched services to **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its current off-net medium and large business customer locations (responsible for **[BEGIN CONFIDENTIAL][END CONFIDENTIAL]** of its off-net demand in non-switched locations).

Respectfully submitted,



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William P. Zarakas

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Exhibit I
Summary of Economic Feasibility Analysis of
Serving GCI Switched Voice Lines over GCI Cable Plant
Anchorage LEC Study Area
As of November 2005

Customer Segment	ACS Retail Lines	GCI Retail Lines	Total Anchorage Lines	GCI Leased Lines	Percent GCI Leased Lines	Total ACS Retail and Wholesale Lines [5]	% Lines Served by ACS - Retail and Wholesale [6]
Current Switched Voice Lines							
Residential Segment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Small Business Segment	N/A	[redacted]	N/A	[redacted]	[redacted]	N/A	N/A
Medium and Large Business Segment	N/A	[redacted]	N/A	[redacted]	[redacted]	N/A	N/A
Total Business Segment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	91,476	88,614	180,090	61,333	69%	152,808	85%
Estimated Number of Lines without Nearby Cable Plant [1]							
Residential Segment				[redacted]			
Small Business Segment				[redacted]			
Medium and Large Business Segment				[redacted]			
Estimated Number of Lines Failing Business Case [2]							
Residential Segment				-			
Small Business Segment				-			
Medium and Large Business Segment				-			
Estimated Number of Lines Customer will not Permit Conversion [4]							
Residential Segment				[redacted]			
Small Business Segment				[redacted]			
Medium and Large Business Segment				[redacted]			
Potential Switched Voice Line Mix Following Conversion Based on Economic Feasibility Analysis							
Residential Segment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Small Business Segment	N/A	[redacted]	N/A	[redacted]	[redacted]	N/A	N/A
Medium and Large Business Segment	N/A	[redacted]	N/A	[redacted]	[redacted]	N/A	N/A
Total Business Segment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Sources: GCI; 2005 ACS CASBB Report; Brattle Analysis.

Notes:

[1] GCI estimates that [redacted] of GCI residential lines and [redacted] of GCI business lines are not near cable facilities. [redacted] of the business lines not near cable facilities are in medium and large business locations.

[2] We assume that all addressable lines can be economically served over GCI's facilities when the average NPV per switched line is positive. This analysis assumes that GCI's switched voice customers can be served using DLPS. This assumption, however, does not reflect a judgment that it is technically feasible to serve all switched voice customers, particularly those in the medium and large business segment, with a DLPS solution.

[3] Some locations have both DS-1s and switched lines and fail the fiber business case. We assume that customers would not split their service between two providers (i.e., GCI for switched over DLPS and ACS for non-switched DS-1s). This results in a small number of switched lines ([redacted]) that GCI would not be able to serve. A similar number ([redacted]) of switched voice lines are in locations not near cable plant but that pass the fiber business case. These two groups of lines [redacted].

[4] GCI estimates (based on actual experience) that [redacted] of its residential and [redacted] of its business lines could not be converted because some customers will not allow GCI access to complete the conversion process.

[5] Sum of ACS retail lines and GCI leased lines.

[6] Sum of ACS retail lines and GCI leased lines divided by total Anchorage lines.

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Exhibit II
Summary of Economic Feasibility Analysis of
Serving GCI Non-switched DS-1 Circuits over GCI Fiber Plant
Anchorage LEC Study Area
As of November 2005

Segment	ACS Retail [1]	GCI Retail [5]	Total Anchorage	GCI Leased	Percent GCI Leased DS-1s	Total ACS Retail and Wholesale [6]	Percentage Served by ACS - Retail and Wholesale [7]
Current Non-switched DS-1 Circuits							
Non-switched DS-1 Circuits	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Locations with Non-switched DS-1 Circuits [2]	N/A	[redacted]	N/A	[redacted]	[redacted]	N/A	N/A
Number of Leased Non-switched DS-1s in GCI On-net Locations [3]				[redacted]			
Number of Non-switched DS-1s Failing Fiber Feasibility Analysis [4]				[redacted]			
Number of Locations Failing Fiber Feasibility Analysis							
Potential Non-switched DS-1 Circuit Mix Following Conversion Based on Economic Feasibility Analysis (assuming GCI converts its leased DS-1s in on-net buildings) [8]							
Non-switched DS-1 Circuits	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Locations with Non-switched DS-1 Circuits	N/A	[redacted]	N/A	[redacted]	[redacted]	N/A	N/A
Potential Non-switched DS-1 Circuit Mix Following Conversion Based on Economic Feasibility Analysis (assuming GCI does not convert its leased DS-1s in on-net buildings) [8]							
Non-switched DS-1 Circuits	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Locations with Non-switched DS-1 Circuits	N/A	[redacted]	N/A	[redacted]	[redacted]	N/A	N/A

Sources: GCI; Brattle Analysis.

Notes:

[1] Based on ACS-Anchorage special access lines from "Form M" annual report filed with the Alaska commission. Form M special access lines were provided as DS-0 equivalents. Dividing this value by 24 yielded an estimate of ACS' DS-1 equivalents in Anchorage.

[2] GCI serves [redacted] locations with non-switched service. This number of locations is a subset of the total number of locations at which GCI provides either switched and/or non-switched services to its medium and large business customer ([redacted] medium and large business customer locations, as is shown in Exhibit IX)

[3] The lines included in this category are non-switched circuits at GCI on-net locations that remain provisioned over ACS leased circuits because of customer requests concerning diversity or where the customer has not given GCI access to complete the conversion.

[4] As discussed in my declaration, "failing" or "passing" the economic feasibility analysis was based on a net present value (NPV) analysis. The results summarized here are based on a weighted average cost of capital (WACC) of 8.5%. Using a higher WACC (e.g., 15%) results in far fewer locations passing the feasibility analysis.

[5] GCI data includes [redacted] non-switched DS-1 circuits used by GCI for internal purposes.

[6] Sum of ACS retail lines and GCI leased circuits.

[7] Sum of ACS retail lines and GCI leased lines divided by total Anchorage circuits.

[8] This Exhibit provides two estimates of GCI non-switched circuits following economically feasible conversion using GCI fiber plant. GCI leases 292 DS-1 circuits in 279 locations that are on its fiber network because of customer requests for network diversity and/or data security, as well as scheduling or convenience considerations. Assuming all of these circuits are converted onto GCI's network (in addition to the off-net locations that pass the fiber feasibility analysis), GCI will be unable to serve a total of 18% of non-switched demand. Alternatively, assuming GCI is unable to convert the 292 leased circuits in the same 279 locations (in addition to the off-net locations that pass the fiber feasibility analysis), GCI will be unable to serve a total of 35% of non-switched demand.

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Exhibit III
Retail Switched Voice Lines
By Segment
Anchorage LEC Study Area [1]
As of November 2005

Segment	GCI Switched Voice Lines	GCI Switched Voice Line Share	ACS Switched Voice Lines	ACS Switched Voice Line Share	Total Switched Voice Lines [2]
Residential	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Business	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	88,614	49.2%	91,476	50.8%	180,090

Source: 2005 ACS CASBB Report; GCI.

Notes:

[1] For purposes of this analysis, we use the ACS LEC Study Area definition of Anchorage, which includes the following geographic areas:

Anchorage	Elmendorf	Fort Richardson
Girdwood	Hope	Indian
Portage	Rainbow	Sunrise

[2] Sum of GCI and ACS lines. Other CLECs have minimal switched voice line share in Anchorage.

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Exhibit IV
GCI Residential and Business Switched Voice Lines
By Provisioning Method
Anchorage LEC Study Area
As of November 2005

Provisioning Method	GCI Residential Switched Voice Lines		GCI Business Switched Voice Lines		Total GCI Switched Voice Lines	
	Number	As % of Total	Number	As % of Total	Number	As % of Total
GCI DLPS Facilities	[redacted]	[redacted]	[redacted]	[redacted]	19,725	22.3%
GCI Fiber Facilities	[redacted]	[redacted]	[redacted]	[redacted]	7,556	8.5%
GCI Fiber Facilities with Leased ACS Last Mile	[redacted]	[redacted]	[redacted]	[redacted]	11,094	12.5%
ACS UNE-L	[redacted]	[redacted]	[redacted]	[redacted]	44,845	50.6%
ACS UNE-P	0	0.0%	0	0.0%	0	0.0%
ACS Wholesale	[redacted]	[redacted]	[redacted]	[redacted]	5,394	6.1%
Total	[redacted]	100.0%	[redacted]	100.0%	88,614	100.0%
Lines Leased from ACS	[redacted]	[redacted]	[redacted]	[redacted]	61,333	69.2%
Lines Over GCI Network	[redacted]	[redacted]	[redacted]	[redacted]	27,281	30.8%

Source: GCI.

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Exhibit V
GCI Residential Switched Voice Lines
By Provisioning Method By Wire Center
Anchorage LEC Study Area
As of November 2005

Provisioning Method	Central	East	North	O'Malley	Rabbit Creek	South	West	Other Wire Centers [3]	Total
GCI DLPS Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
GCI Fiber Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
GCI Fiber Facilities with Leased ACS Last Mile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ACS UNE-L	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ACS UNE-P	0	0	0	0	0	0	0	0	0
ACS Wholesale	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lines Leased from ACS	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lines Over GCI Network	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI DLPS Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Fiber Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Fiber Facilities with Leased ACS Last Mile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% ACS UNE-L	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% ACS UNE-P	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% ACS Wholesale	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Lines Leased from ACS	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% Lines Over GCI Network	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Estimated Lines Not Near Cable Plant [1]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Lines in Wirecenter Not Near Cable Plant [2]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Lines in Wirecenter Near Cable Plant [2]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: GCI.

Notes:

[1] Percentage from GCI study applied to GCI total lines.
[2] Based on GCI study of sample of residential addresses passed by cable plant.
[3] The other wire centers are Elemendorf, Ft. Richardson, Girdwood, Hope, and Indian. These have been combined here for presentation purposes only.

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Exhibit VI
GCI Business Switched Voice Lines
By Provisioning Method By Wire Center
Anchorage LEC Study Area
As of November 2005

Provisioning Method	Central	East	North	O'Malley	Rabbit Creek	South	West	Other Wire Centers [3]	Total
GCI DLPS Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
GCI Fiber Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
GCI Fiber Facilities with Leased ACS Last Mile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ACS UNE-L	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ACS UNE-P	0	0	0	0	0	0	0	0	0
ACS Wholesale	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lines Leased from ACS	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lines Over GCI Network	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI DLPS Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Fiber Facilities	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Fiber Facilities with Leased ACS Last Mile	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% ACS UNE-L	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% ACS UNE-P	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% ACS Wholesale	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Lines Leased from ACS	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% Lines Over GCI Network	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Estimated Lines Not Near Cable Plant [1]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Lines in Wirecenter Not Near Cable Plant [2]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
% GCI Lines in Wirecenter Near Cable Plant [2]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: GCI.

Notes:

[1] Percentage from GCI study applied to GCI total lines.
[2] Based on GCI study of sample of business addresses passed by cable plant.
[3] The other wire centers are Elemendorf, Ft. Richardson, Girdwood, Hope, and Indian. These have been combined here for presentation purposes only.

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Exhibit VII
GCI Business Switched Voice Lines and Non-switched Circuits
By Provisioning Method
Anchorage LEC Study Area
As of November 2005

Provisioning Method	GCI Business Circuits	DS-0 Equivalents [3]	As % of Total DS-0 Equivalents
Switched Voice Lines			
GCI DLPS Facilities	[redacted]	[redacted]	[redacted]
GCI Fiber Facilities	[redacted]	[redacted]	[redacted]
GCI Fiber Facilities with Leased ACS Last Mile	[redacted]	[redacted]	[redacted]
ACS UNE-L	[redacted]	[redacted]	[redacted]
ACS UNE-P	0	0	0.0%
ACS Wholesale	[redacted]	[redacted]	[redacted]
Total Switched Access Lines	[redacted]	[redacted]	100.0%
Lines Leased from ACS	[redacted]	[redacted]	[redacted]
Lines Over GCI Network	[redacted]	[redacted]	[redacted]
Non-Switched DS-1 Circuits [1]			
Over Leased ACS Facilities [2]	[redacted]	[redacted]	[redacted]
Over GCI Facilities	[redacted]	[redacted]	[redacted]
Total Non-Switched DS-1 Circuits	[redacted]	[redacted]	100.0%
Totals			
Total Leased from ACS	[redacted]	[redacted]	[redacted]
Total Over GCI Network	[redacted]	[redacted]	[redacted]
Total Switched Voice Lines and Non-Switched Circuits	[redacted]	[redacted]	100.0%

Source: GCI.

Notes:

[1] Non-switched circuits are defined as DS-1 or fractional DS-1 circuits taken by GCI customers for local or long distance connectivity. This includes [redacted] non-switched DS-1 circuits used by GCI for internal and intercompany purposes.

[2] Leased DS-1s are provisioned primarily by UNE DS-1s, but also wholesale and UNE HDSL DS-1s.

[3] A minority of GCI DS-1 circuits are fractional or carry 3 MB. This analysis assumes all DS-1 circuits are 24 eDS-0s as a conservative and simplifying assumption, although the weighted average is slightly less than 24 eDS-0s.

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Exhibit VIII
Economic Feasibility Analysis of
Serving GCI Non-switched DS-1 Circuit Locations over GCI Fiber Plant
Anchorage LEC Study Area
As of November 2005

Number of GCI eDS-1s per Location	GCI Medium and Large Business Customer Locations		On-net GCI Medium and Large Business Customer Locations	Off-net GCI Medium and Large Business Customer Locations	% Off-net GCI Medium and Large Business Customer Locations with Positive NPV	
	Number	As % of Total			At 8.5% WACC	At 15% WACC
GCI Medium and Large Business Locations with Non-switched DS-1 Circuits						
Less than 2 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2 to 3 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3 to 4 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4 to 8 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8 or more eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	100%	[redacted]	[redacted]	[redacted]	[redacted]
GCI DS-0 Equivalents in Medium and Large Business Locations with Non-switched DS-1 Circuits [1]						
Less than 2 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2 to 3 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3 to 4 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4 to 8 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8 or more eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	100%	[redacted]	[redacted]	[redacted]	[redacted]

Source: GCI.

Notes:

[1] Leased switched lines and non-switched circuits in on-net buildings are included in the on-net eDS-0s values.

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Exhibit IX
Economic Feasibility Analysis of
Serving GCI Medium and Large Business Locations over Fiber Plant
Anchorage LEC Study Area
As of November 2005

Number of GCI eDS-1s per Location	GCI Medium and Large Business Customer Locations		On-net GCI Medium and Large Business Customer Locations	Off-net GCI Medium and Large Business Customer Locations	% Off-net GCI Medium and Large Business Customer Locations with Positive NPV	
	Number	As % of Total			At 8.5% WACC	At 15% WACC
GCI Medium and Large Business Locations with Switched Voice Lines and / or Non-switched DS-1 Circuits						
Less than 2 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2 to 3 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3 to 4 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4 to 8 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8 or more eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	100%	[redacted]	[redacted]	[redacted]	[redacted]
GCI DS-0 Equivalents in Medium and Large Business Locations with Switched Voice Lines and / or Non-switched DS-1 Circuits [1]						
Less than 2 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2 to 3 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3 to 4 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4 to 8 eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8 or more eDS-1s	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	100%	[redacted]	[redacted]	[redacted]	[redacted]

Source: GCI.

Notes:

[1] Leased switched lines and non-switched circuits in on-net buildings are included in the on-net eDS-0s values.

Appendix

Curriculum Vita of

William P. Zarakas

WILLIAM P. ZARAKAS **Principal**

William P. Zarakas is an economist with expertise in economic, strategic and regulatory analyses in the telecommunications and utility industries, and has worked extensively with telecommunications carriers, utilities, industry associations, regulatory commissions, corporate entities, and various governmental bodies around the world. His work in the telecommunications industry has included analyses associated with business case and economic feasibility; valuations of wireless spectrum and wireline networks; industry structure; market share and competition; regulatory frameworks; network access and unbundling; cost and pricing; cross subsidization; universal service and provider-of-last-resort; rate structure; productivity; as well as affiliate structure and transfer pricing. Mr. Zarakas has also worked in the analyses of emerging telecom providers, including emerging transport carriers, competitive local exchange carriers (CLECs) and electric utility entry into telecommunications markets. His work in this area has included the feasibility of deploying broadband networks, market segmentation and revenue projections, capital and operating cost analysis, margin analysis, and business case development.

Mr. Zarakas has also worked in the utility industry, in the areas of mergers, acquisition and divestiture; cost and rates; market size; and affiliate structure and transfer pricing. Mr. Zarakas has provided testimony and reports used in regulatory proceedings concerning the efficiencies anticipated to be gained or lost as a result of utilities mergers and divestitures; economic feasibility, rate and cost-of-service analysis; and affiliate structure, cost allocation and transfer pricing.

Mr. Zarakas has testified before state and federal regulatory commissions, and has authored reports submitted to the U.S. Securities and Exchange Commission as well as to state regulatory commissions. He has also headed numerous regulatory and management and operations audits of utilities and telephone companies, performed on behalf of state regulatory commissions.

Prior to joining *The Brattle Group*, Mr. Zarakas was a Member of PA Consulting's Management Group and was a Senior Vice President at PHB Hagler Bailly. Prior to his tenure with PHB Hagler Bailly, Mr. Zarakas was a Managing Director with Theodore Barry & Associates (TB&A) in charge of the firm's telecommunications practice, and a member of TB&A's Board of Directors. Mr. Zarakas was also an Economist for the New York Power Authority and a Consultant for Ebasco Business Consulting Company.

Mr. Zarakas received his M.A. in Economics from New York University and his B.A. in Economics from the State University of New York.

AREAS OF EXPERTISE

Telecommunications

- Directed, authored reports, and/or provided expert testimony in cases involving valuation of wireless spectrum. Cases involved applying market comparable, discounted cash flow (DCF) and econometric-based analyses. Cases also involved detailed analysis of market composition, services and prices.

    - Report author concerning market comparable analysis of U.S. PCS market.

    - Testifying expert regarding potential value of wireless spectrum in the 700 MHz band.

    - Report author regarding estimating value of wireless spectrum designated (by the FCC) as Mobile Satellite Service (MSS) spectrum.

    - Report author concerning valuations of wireless spectrum in the Middle East - North African region for an international wireless operator.

    - Report author and expert concerning impact of additional wireless operators on spectrum values for the telecommunications regulator for a Middle Eastern country.

- Author of white paper (on behalf of an international wireless operator) which analyzes the relationships between the number of telecommunications operators in mobile markets and levels of short-term and long-term consumer welfare, using a panel of mobile markets in approximately 50 countries.

- Engagement Director and report author for study of the impact of spectrum licensing regimes and property rights on economic efficiency in mobile telecommunications markets.

- Engagement Director and expert for multi-country analysis of originating and terminating tariffs in mobile telecommunications markets.

- Engagement Director for multiple valuation analyses of telecommunications assets and businesses. Projects included valuations of wireless spectrum and optical fiber networks in multiple markets worldwide. Projects required comprehensive discounted cash flow and net present value analyses, as well as regression and statistical analyses of comparable market transactions. Projects resulted in valuations used in support of negotiations and/or in commercial and/or regulatory proceedings.

- Engagement Director and white paper author of project analyzing the empirical relationships between the price of wholesale access and levels of investment in the U.S. wireline telecommunications market.

- Engagement Director and report author for forensic analysis of the economics, financial reporting and accounting associated with the bankruptcy of a major international telecommunications provider. Project involved contemporaneous review and analysis of market structure and trends, capacity and pricing projections in international markets, and the appropriateness of accounting for major transactions. Project also involved econometric event study analysis, estimating the impact that quarterly earnings announcements had on equity prices and enterprise value. Study was used by counsel and the Board of Directors.

- Engagement Director, Lead Consultant and Expert Witness for multiple cost and rate analyses. Work included cost modeling, cost allocations, and revenue modeling on behalf of carriers and regulators.

- Engagement Director for analysis of wholesale access performance measurement systems for a U.S. Regional Bell Operating Company. Project scope included analysis of the statistical validity of performance measures applied to the RBOC as a result of agreements made between the RBOCs and regulators as part of the approval of RBOCs into long distance businesses (*i.e.,* as part of proceedings concerning Section 271 of the Telecommunications Act of 1996) or are the outcome of negotiations among various parties regarding proposed mergers. Work focused on detailed statistical testing of performance measures to determine whether measures reflected RBOC performance and supported regulatory goals of increased consumer welfare in local exchange markets.

- Engagement Director, Lead Consultant and Expert Witness for comprehensive analysis of unbundled network elements (UNEs), undertaken in fulfillment of requirements

associated with the Telecommunications Act of 1996, using the Total Element Long Run Incremental Cost (TELRIC) methodology. Scope of work spanned all unbundled network elements, field-tested technology applications, and geographic specific network and demographic characteristics. Testimony regarding TELRIC costs were presented to state regulatory commissions in eight states.

- Engagement Director and report author for multiple engagements concerning estimation of economic losses associated with damages to telecommunications businesses and/or assets. Projects involved analysis of changes in market values as a result of price volatility and market restructuring Projects also involved damages associated with cable breaks and/or disruption of wholesale transport businesses.

- Engagement Director for comprehensive analysis of local exchange telecommunication market composition and feasibility of competitive entrant success under multiple market entry strategies. Analysis required detailed modeling of ILEC and CLEC market shares and cost structures.

- Engagement Director and report author for economic analysis of damages associated with accidental break in a fiber optic cable. Analysis required modeling of SONET ring traffic and costs of replacing a portion of the ring using available alternative services. Study was used in state court proceeding.

- Engagement Director and Lead Consultant for a comprehensive analysis of the current level and projections of market shares and competition in the consumer and business markets of an RBOC's local exchange area. Scope of work included segmentation of geographic markets, customers (business and consumer), competitors (facilities- and non-facilities-based), and technologies. Analysis employed scenario-based methodologies. Conclusions involved future market shares on a segment basis, as well as the impact of declining market shares upon RBOC revenue streams and margins by customer class, geography and product line. Report used in a regulatory proceeding before a state regulatory commission.

- Engagement Director and Lead Consultant for multiple projects involving analyses of regulatory framework options that could be applied to the local exchange telecommunications industry. Scope of work included theoretical and quantitative analysis of earnings-based and price-based incentive rate plans. Scope also included

development of productivity offset options to be included in price cap formulas. Work was used in testimony delivered before multiple state regulatory commissions.

- Engagement Director for analysis of access pricing options, performed on behalf of an RBOC. Scope of work also included the analysis of "flow-through" of RBOC access rate reductions through inter-exchange carriers, ultimately to end-use consumer and business customers. Study included analysis of calling patterns, discount plans and surveys of end-use customers in multiple geographies. Conclusions were used in several state regulatory proceedings concerning intra-state access pricing.

- Engagement Direct, Lead Consultant and Expert Witness in the determination of the rates for pole attachments under the FCC's Cable Rate and Telecom Rate Formulas as applied to electric utility distribution assets. Scope of work included development of utility-specific data in place of FCC rebuttable presumptions based on following the FCC's requirements for introduction of statistical data (47 CFR §1.363).

- Engagement Director of demand analysis for telecommunications services by business and enterprise customers, performed on behalf of a state legislative body. Scope included customer segmentation of the state's telecommunications market and market research and analysis regarding prospective telecommunications platforms and products. Report was included in legislative deliberations in developing the state telecommunications legislation.

- Lead Consultant for study of affiliate transactions and cost allocations between an RBHC and its affiliated RBOC. Scope of analysis included all services provided to the RBOC by the RBHC through its service company. Study required the assessment of services following the "Rio Grande Test": necessity, duplication, placement, and cost allocation of the corporate-provided services. Report filed in a state regulatory proceeding.

- Engagement Director, Lead Consultant and Expert Witness for analysis of an RBOC's productivity improvement initiatives and development of productivity offset used in intra-state telephone rates, performed on behalf of a state regulatory commission. Scope of work included analysis of empirical total factor productivity and development of adjusted TFP based on projections associated with RBOC restructuring and ongoing performance improvement and re-engineering initiatives. Work included detailed

analysis of efficiency improvement initiatives in network deployment, operations, customer service and marketing.

- Engagement Director and Lead Consultant for comprehensive analysis of affiliate relationships, cost allocations and transfer pricing, performed on behalf of an RBOC. Scope included all regulated and unregulated affiliates as well as corporate support functions. Scope of work included service, cost and information transfers, organizational and management controls and the allocation of common and corporate costs provided by affiliates to the regulated operating companies. Scope also included assessing the effectiveness and accuracy of the company's cost allocation processes. Report was filed before several state regulatory commissions and the Federal Communications Commission.

- Engagement Director and Lead Consultant for analysis of universal service and provider-of-last-resort options which could be applied to U.S. telecommunications industry, performed on behalf of an RBOC. Scope of work included development of support options and quantification of funding from multiple classes of telecommunications providers. Report was filed in response to a Notice of Proposed Rulemaking (NOPR) by the Federal Communications Commission.

- Engagement Director and Lead Consultant for strategy development and market positioning study for an infrastructure support company, providing project management services to the telecommunications, collocation and data center industries. Scope of work included market and competitive analyses, and development of service offerings and prices.

- Engagement Director and Lead Consultant for multiple management and operations and focused regulatory audits of several telecommunications carriers and utilities conducted on behalf of numerous state regulatory commissions. Scope of regulatory studies included: analysis of ILEC management and operations performance; assessment of ILEC programs in support of commission objectives concerning the development of competition in the local exchange; analysis of ILEC affiliate structures and transfer pricing; analysis of cross-subsidization; analysis of the effects of introduction of alternative regulatory frameworks upon ILEC investment levels and network deployment plans, operational performance, cost structures, service offerings and quality of service.

Reports were used by regulatory commissions in regulatory proceedings and/or in policy deliberations.

- Engagement Director and Lead Consultant for a study of ILEC preparedness for and potential consequences of increasing competition in a local exchange telecommunications market, performed on behalf of a state regulatory commission. Scope of work included analyses of consumer and business market segments for basic and advanced (*i.e.*, broadband) telecommunications services, ILEC strategic and marketing plans, and the role of pricing flexibility and alternative regulatory framework in developing pricing flexibility and other ends. Work included detailed modeling of revenue projections, margins, and contributions by geographic and product lines, as well as assessment of ILEC network, strategic, and marketing planning processes. Report used in commission network competition proceedings.

- Project Manager and Lead Consultant for a study of the impact of alternative regulatory frameworks on ILEC deployment of advanced telecommunications services, performed on behalf of a state regulatory commission. Scope of work included empirical analysis of changes in ILEC planning, service deployment and service pricing. Work involved detailed review of ILEC network and service plans, and modeling of status quo and alternative ILEC strategies.

- Project Manager and Lead Consultant of a study of the impact of competition and open network access cost on intraLATA toll prices, performed for an RBOC. Scope of work included analysis of margins and contributions for ILEC voice services.

- Engagement Director and Lead Consultant of study of publishing spin-off options, performed for an RBOC. Scope of work included valuation of yellow page profits, considering current regulatory imputation of yellow pages revenues and costs into ILEC rates.

Utility-Telecom

- Engagement Director and Practice Leader for multiple projects and utility clients concerning the development of telecommunications strategies. Scope of work included analysis of numerous business and technology options, including: long-haul and regional transport, metropolitan area networks, dense metro build-outs, retail competitive local

exchange carriers, wireless services and integrated retail service providers. Analysis included detailed business case modeling (including customer, competitor and pricing analysis), customer and demographic analysis, and preliminary network design and costing. Work also included development of business structure, partnerships and joint-venture options, and market segmentation and targeting.

- Engagement Director for multiple projects and utility clients concerning development of infrastructure support to telecommunications carriers. Scope included optimization of utility assets and resources, including dark fiber construction, pole attachments by ILEC, CLEC and CATVs, attachment to utility transmission towers by wireless operators, and wireless collocation opportunities. Work included geographic-specific market and financial projections and business case analysis.

- Engagement Director and Lead Consultant for utility telecommunications integration strategy, performed on behalf of a major U.S. electric utility. Scope of work included analysis of multiple lines of telecommunications businesses, including transport, wholesale metro access, wireless operations, and infrastructure support. Work included determination of synergies, development of stand-alone and integrated balance sheets and income statements, and determination of shareholder value impact.

- Lead Technical Advisor to an Asian electric utility concerning strategies to deploy a broadband telecommunications network in Asia. Scope of work included analysis of telecommunications options and experiences of U.S. and European electric utilities in entering the telecommunications market. Work also included development of transfer pricing methodologies regarding the use of utility assets, resources and easements by the telecommunications affiliate.

- Engagement Director of comprehensive business case analysis of electric utility entry into the "last mile" broadband market, performed on behalf of a major U.S. electric utility. Scope of work included consideration of telephony, internet, CATV, video-on-demand and other areas of content, as well as demand side management, metering and essential inter-utility services. Work included analyses of technology alternatives and detailed business case modeling, including customer and geographic segmentation, pricing scenarios and elasticity analysis.

Utility

- Engagement Director, Lead Consultant on multiple studies of prospective merger savings and divestiture losses for electric and gas utilities. Scope of work included analyses involved in determining the operating and capital impacts of mergers under multiple scenarios, and also involved the anticipated economic inefficiencies resulting from forced divestiture. Reports authored included studies of merger efficiencies and reports concerning Economic Loss Studies included in U-1 filings before the U.S. Securities and Exchange Commission. Economic Loss Studies are required under PUHCA Section 11 (b) (1) Clauses A, B, and C when utility merger results in the establishment of a registered holding company with electric and gas businesses. Work in these areas included detailed analyses of current and hypothetical future electric and gas utility operations.

- Engagement Director and Lead Consultant for shareholder value study for a U.S. electric utility. Scope of work included segmentation of core and affiliate businesses, revenue and operating and capital cost analysis, revenue and cost projections, cost-of-capital and determination of contribution to shareholder value. Work was critical element of utility holding company strategy and 5-year financial plan.

- Project Manager and Lead Consultant for multiple financial analyses and economic feasibility studies of new business opportunities for electric and gas utilities. Scope of work included development of detailed business case analyses for new technology commercialization, including, and fuel cell and distributed generation technologies and alternative fuel transportation, such as natural gas vehicles (NGVs) and electric vehicles. Analyses included assessment of technology-future, capital requirements, and cost structure, as well as detailed demand projections, customer segmentation analysis, and take-rate and revenue projections.

- Engagement Director and Advisor To Board for a comprehensive strategic analysis of a major Generation and Transmission cooperative and its member electric distribution cooperatives. Scope included asset valuation of G&T generation and transmission assets, development of risk management strategy, determination of roles and relationships between G&T and member cooperatives, development of merger and acquisition options, and outlook for retail electric markets. Work included detailed financial and economic modeling, based on scenario analyses.

- Engagement Director and Advisor To Board for comprehensive strategic planning project for major Generation and Transmission cooperative and its member electric distribution cooperatives. Scope included analysis of power supply, joint power plant ownership and purchased power contracts, as well as T&D Board of Director organization and governance. Work included development of corporate financial model and capital budgeting process.

- Engagement Director and Lead Consultant for study of the applicability of alternative regulatory frameworks used in the local exchange telecommunications industry to the electric utility industry, performed on behalf of a U.S. electric utility. Scope of work included review of ILEC regulatory frameworks in all U.S. states and at the inter-state level, development of comparability matrix aligning ILEC metrics with electric utility metrics, development of multiple hypothetical alternative regulatory frameworks, and quantification of associated hypothetical rates, balance sheets and income statements.

- Project Manager and Lead Consultant of a pricing and regulatory framework strategy project, performed for the electric business unit of a major east coast combination utility. Engagement involved research and analysis of regulatory and pricing frameworks (interstate and intrastate) applied to energy and telecommunications companies in the U.S. and in countries which recently privatized those markets. Frameworks were then compared to electric business unit current and prospective products and customers. Project resulted in recommendation of pricing framework which best accomplished short- and long-term objectives.

- Engagement Director, Lead Consultant and Expert Witness for multiple studies of affiliate transfer pricing, corporate overhead allocation, cost allocation, and cross-subsidization, performed on behalf of electric utilities and regulatory commissions. Scope of work included assessment of cost allocation methodologies, affiliate and service level agreements and determination of cross-subsidization. Work involved assessment of utility cost allocation systems and design of and/or selection of cost allocators. Work also involved rebuttal of testimony concerning affiliate transfer pricing in state regulatory proceedings.

- Engagement Director and Lead Consultant of affiliate transfer pricing analysis and market test study for a U.S. multi-state gas utility company. Scope of work included performing a market test of affiliate services provided to the utility, based on commission

asymmetrical transfer pricing rule, requiring that affiliate services provided to the utility be transferred at the lower of fully allocated costs or the market prices associated with external provision, and provision of services from the utility to its unregulated affiliates to be transferred at the higher of those two metrics. Work included definition of affiliate services, determination of fully allocated costs, and acquisition of market-based prices. Report used in state regulatory proceeding.

- Engagement Director for project developing comprehensive business separation and affiliate safeguards regarding flow of information, systems access, marketing controls, employee and intellectual transfers and cost allocations for a large U.S. utility. Scope of work included all aspects of regulated and unregulated operations, including energy (electric and gas) trading, service company functions, and retail marketing. Project was initiated to ensure efficient compliance with regulatory commission affiliate standards.

- Lead Consultant for multiple retrospective analyses of major utility capital investment. Scope of work included analysis of ongoing capital cost estimates and access to capital for financing. Report was filed by the utilities as part of their defense in shareholder and derivative litigation.

- Consultant and Lead Analyst on cost-of-service and economic feasibility studies, performed on behalf of multiple electric and gas utilities. Scope of work included forecasting of electric demand and consumption, classification of utility operating and capital costs, development of depreciation and determination of cost of capital. Reports were used in utility rate cases before state and federal regulatory commissions.

- Consultant and Lead Analyst on asset valuation project on generation, transmission and distribution assets for a U.S. municipal electric utility. Scope of work included determination of original, trended original and replacement costs, as well as development of depreciation costs. Report was used in development of utility 10-year financial plan and in developing electric rates.

- Consultant and Lead Analyst for valuation of utility assets, performed on behalf of a U.S. gas utility. Scope of work included development of original, trended original and replacement costs, as well as development of depreciation costs using average and unit summation methods. Report was used as part of proceeding on municipal special franchise taxes.

- Engagement Advisor of shareholder value analysis-based strategic planning for an east coast electric utility. Engagement required analysis of new and potential markets for core and non-core utility services, pricing strategies, underlying costs, and regulatory options. Project resulted in an integrated strategy focusing market objectives with pricing and regulatory objectives.

- Technical Advisor advising consulting team responsible for developing affiliate, business separation and cost allocation case for a southeastern U.S. electric utility holding company. Case involved defense of the need for affiliate services, the fairness of pricing, and the appropriateness of cost allocations as applied to the service company's work orders.

- Lead Consultant for a comprehensive process analysis for the marketing, sales and customer service functions of a U.S. electric utility. Scope of work market forecasting, market strategy, marketing management, and product and geographic management. Work included economic analysis of marketing function, bench marking, determination of financial and performance metrics, design of marketing process, and architecture for supporting information systems.

- Lead Consultant for a comprehensive performance improvement and process re-engineering project of the customer service, energy efficiency, and marketing functions for a U.S. electric utility company. Scope of work included the market research and planning, marketing programs, sales, and energy efficiency functions. Work included the design and modeling of marketing and energy efficiency business processes, as well as quantification of impact of improvement opportunities on utility performance. Work also included revenue and margin analysis of marketing initiatives, geographic impacts, value analysis, and interaction of the utility's strategic planning and marketing planning.

- Lead Consultant for an organizational study for a U.S. utility. Scope of work included the finance, accounting, administrative and corporate support functions. Work included determining functional roles, relationships and interactions; bench marking and determining best industry practices; designing process flow options; determining capital and resource requirements associated with process improvement; and quantification of cost/benefits.

INDUSTRY EXPERIENCE

Economist, New York Power Authority

Performed multiple cost-of-service analyses for NYPA and NYPA-regulated municipal and cooperative electric utilities.
Performed load forecasts and demand analysis.

Developed regulatory framework for New York municipal electric utilities, including assessment of reporting requirements and regulations.

Developed competitive pricing strategies, implemented stabilization plans, and analyzed rate shocks.

Performed management audits of NYPA-served municipal and rural cooperative electric systems.

Developed NYPA's competitive intelligence used to determine industrial marketing strategies and power contract negotiations.

TESTIMONY

Before the U.S. House of Representatives Committee on Energy and Commerce and the U.S. Senate Committee on Commerce, Science and Transportation regarding the value of wireless spectrum in the 700 MHz band. Letters, May 18, 2005.

Before the Federal Communications Commission in the matter of *Virginia Cable Telecommunications Association v. Virginia Electric and Power Company, d/b/a Dominion Virginia Power and Dominion North Carolina Power*, PA No. 01-005, December 21, 2001.

Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the combination of Energy East Corporation with RGS Energy Group, Inc. (June 20, 2001) in Exhibit J-1, entitled "Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Rochester Gas And Electric Corporation," May 15, 2001.

Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the acquisition by Sierra

Pacific Resources of Portland General Electric Company, 2000 in Exhibit H-1, entitled "Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Sierra Pacific Resources," January 31, 2000.

Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the combination of Energy East Corporation with CMP Group, Inc. and with CTG Resources, Inc. in Exhibit J-1, entitled "Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Energy East," October 29, 1999.

Before the Supreme Court of the State of New York, County of Niagara, Supplemental Affidavit in *Village of Bergen, et al. vs. Power Authority of the State of New York*, February 1999.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the North Carolina Utilities Commission, Docket No. P-100, SUB 133D, Filed March 9, 1998; *In Re: Proceeding to Determine Permanent Pricing for Unbundled Network Elements*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the North Carolina Utilities Commission, Docket No. P-100, SUB 133D, Filed December 15, 1997; *In Re: Proceeding to Determine Permanent Pricing for Unbundled Network Elements*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the South Carolina Public Service Commission, Docket No. 97-374-C, Filed November 25, 1997; *In Re: Proceeding to Review BellSouth Telecommunications, Inc.'s Cost Studies for Unbundled Network Elements*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Florida Public Service Commission, Docket Nos. 960757-TP/960833-TP/960846-TP/960916-TP/971140-TP, Filed November 13, 1997; *In Re: Petition of AT&T, MCI, and MFS for Arbitration with BellSouth Concerning Interconnection, Rates, Terms and Conditions of a Proposed Agreement*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the South Carolina Public Service Commission, Docket No. 97-374-C, Filed November 3, 1997; *In Re: Proceeding to Review BellSouth Telecommunications, Inc.'s Cost Studies for Unbundled Network Elements*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Tennessee Regulatory Authority, Docket No. 97-01262, Filed October 17, 1997; *In Re: Contested Cost Proceeding to Establish Final Cost Based Rates for Interconnection and Unbundled Network Elements*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Tennessee Regulatory Authority, Docket No. 97-01262, Filed October 10, 1997; *In Re: Contested Cost*

Proceeding to Establish Final Cost Based Rates for Interconnection and Unbundled Network Elements.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Alabama Public Service Commission, Docket No. 26029, Filed September 12, 1997; *In Re: Generic Proceeding: Consideration of TELRIC Studies*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Georgia Public Service Commission, Docket No. 7061-U, Filed September 8, 1997; *In Re: Review of Cost Studies, Methodologies and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services*.

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Louisiana Public Service Commission, Docket Nos. U-22022/22093, Filed September 5, 1997; *In Re: Review of Consideration of BellSouth Telecommunications, Inc.'s TSLRIC and LRIC Cost Studies to Determine Cost of Interconnection Services and Unbundled Network Components, to Establish Reasonable, Non-Discriminatory, Cost-Based Tariff Rates*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Alabama Public Service Commission, Docket No. 26029, Filed August 29, 1997; *In Re: Generic Proceeding: Consideration of TELRIC Studies*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Louisiana Public Service Commission, Docket Nos. U-22022/22093, Filed July 11, 1997; *In Re: Review of Consideration of BellSouth Telecommunications, Inc.'s TSLRIC and LRIC Cost Studies to Determine Cost of Interconnection Services and Unbundled Network Components, to Establish Reasonable, Non-Discriminatory, Cost-Based Tariff Rates*.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Georgia Public Service Commission, Docket No. 7061-U, Filed April 30, 1997; *In Re: Review of Cost Studies, Methodologies and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services*.

Before the Virginia State Corporation Commission on behalf of United Telephone - Southeast, Inc. and Centel Corporation, May 1994.

Before the Tennessee Public Service Commission on behalf of United Telephone - Southeast, Inc., Docket No. 93-04818, January 28, 1994.

Before the Florida Public Service Commission on behalf of Southern Bell Telephone & Telegraph Company, Docket No. 920260-TL, December 10, 1993.

Before the Tennessee Public Service Commission on behalf of South Central Bell, Docket Nos. 92-13527 and 93-00311, March 22 and March 29, 1993.

PUBLIC REPORTS

Analysis/Market Test of 1997 Affiliate Transactions, performed on behalf of Columbia Gas of Virginia and provided to the Virginia State Corporation Commission in its annual review of affiliate transactions, May 7, 1998. Updated in letter reports: April 27, 2000 and May 29, 2001.

Management Audit of GTE, performed on behalf of the Kentucky Public Service Commission, January 1997.

Analysis of Cost Allocation Methodology, performed on behalf of BellSouth Telecommunications in the matter of Allocation of Costs Associated with Local Exchange Carrier Provision of Video Programming Services before the Federal Communications Commission, FCC CC No. 96-112, May 31, 1996.

Stratified Management Audit of GTE, performed on behalf of the Pennsylvania Public Service Commission, 1995.

Potential Performance Gains Study of New York Telephone Company, performed on behalf of the New York Public Service Commission, August 1992; and, New York Telephone Company Potential Performance Gains Study - Track II: Reengineering Analysis, March 1994.

Analysis of Proposed Use of Estimated Fair Market Value, performed on behalf of BellSouth Telecommunications before the Federal Communications Commission, FCC CC No. 93-251, January 10, 1994.

Management Audit of Washington Gas Light, performed on behalf of the Maryland Public Service Commission, 1990.

Incentive Regulation Review of South Central Bell, performed on behalf of the Kentucky Public Service Commission, October 1990.

Management Audit of the Alabama Gas Corporation, performed on behalf of the Alabama Public Service Commission, 1989.

Management Audit of the Alabama Power Company, performed on behalf of the Alabama Public Service Commission, 1989.

PAPERS AND PRESENTATIONS

"Structural Simulation of Facility Sharing: Unbundling Policies and Investment Strategy in Local Exchange Markets," White Paper, July 2005 (with Glenn A. Woroch, Lisa V. Wood, Daniel L. McFadden, Nauman Ilias, and Paul C. Liu).

"Betting Against The Odds? Why broadband over power lines (BPL) can't stand alone as a high-speed Internet offering." *Public Utilities Fortnightly*, April 2005, pp. 41-45 (with Kenneth J. Martinian).

"The Impact of the Number of Mobile Operators on Consumer Benefit," White Paper, March 2005 (with Kenneth J. Martinian and Carlos Lapuerta).

"Wholesale Pricing and Local Exchange Competition", Info, Volume 6, Number 5, 2004, pp. 318-325 (with Lisa V. Wood and David E. M. Sappington).

"Regulatory Performance Measurement Plans and the Development of Competitive Local Exchange Telecommunications Markets", Working Paper, November 2003 (with David E. M. Sappington, Lisa V. Wood and Glenn A. Woroch).

Presenter of "Utilicoms in the U.S. Market: Outside of the Telecom Bubble", March 2002

Presenter of "FCC Pole Attachment Rates: Rebutting Some of the Presumptions", March 2002, Updated March 2003

Chairperson and presenter of "Cost Model Principles" at *The New Investment Theory of Real Options and Its Implications for the Cost Models in Telecommunications Conference*, Columbia University, New York City, New York, on October 2, 1998.

"Business Opportunities: In The Restructured Electricity Industry," presented at the *Business Opportunities and the Restructuring of the Electric Utility Industry - The Future Is Now! Conference*, Chicago, Illinois, on June 25, 1997.

"Utility Marketing Strategies: In Transition," presented at the *3rd Annual Utility Strategic Marketing Conference: Shaping the Competitive Environment*, Orlando, Florida, on April 16, 1996.

"Telecommunications: Enabler and New Business Opportunity," presented at the *3rd Annual Utility Strategic Marketing Conference: Shaping the Competitive Environment*, Orlando, Florida, on April 16, 1996.

"Electric Utilities As Telecommunications Providers," presented at the *Telecommunications Opportunities For Utilities Conference*, Los Angeles, California, on November 7, 1995.

"Assessing Market Potential: Utility Products," presented at the *Western Energy & Communication Association Fall Conference*, Los Angeles, California, on September 23, 1993.