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January 23, 2015

**Via Electronic Filing**

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Marlene Dortch
Secretary
Federal Communications Commission
445 Twelfth Street SW
Washington, DC 20554

**Re: Applications of Comcast Corporation, Time Warner Cable Inc., Charter Communications, Inc., Time Warner Entertainment-Advance/Newhouse Partnership, and SpinCo for Consent to Assign Licenses or Transfer Control of Licensees, MB Docket No. 14-57**

Dear Ms. Dortch:

Please find attached the redacted version of the initial response of Google Inc. (Google) to the Commission's letter dated December 23, 2014, in the above-referenced proceeding.[1] Google continues to collect materials that may be responsive to the letter. As explained in conversations with Commission staff, however, Google's agreements with its business partners contain confidentiality provisions that may limit or bar Google from providing requested information.

Under separate cover today, Google filed with the Commission staff a version of these responses that contain Highly Confidential Information pursuant to the Commission's Protective Orders in this proceeding.[2]

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[1] *See* Letter to David C. Drummond, Sr. VP, Corporate Development & Chief Legal Officer, Google Inc., from Julie Veach, Chief, Wireline Competition Bureau, FCC (dated Dec. 23, 2014). Google received the letter on December 29, 2014. We also note that the letter's reference "commercial wireline carriers" does not encompass Google.

[2] *See* Amended Joint Protective Order, MB Docket No. 14-57, DA 14-1604, ¶ 2 (rel. Nov. 4, 2014) and Modified Joint Protective Order, MB Docket No. 14-57, DA 14-1464, ¶ 2 (rel. Oct. 7, 2014).

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Please feel free to contact me if you have any questions.

Sincerely,

Megan Anne Stull

Megan Anne Stull
*Counsel*
*Google Inc.*

**Response of Google Inc.**
**to the Commission's Letter dated December 23, 2014**
**in MB Docket No. 14-57**

*5.b. Identify all firms that have bid, negotiated, or otherwise sought to provide service to the Company to deliver its YouTube service to consumers in the United States during the relevant period, including but not limited to transit or CDN services, and whether the option would be available to the Company on commercially reasonable terms. Describe the service and provider options and the benefits, restrictions, detriments and risks associated with each option, and any reasons that the service could not be obtained from each provider on commercially reasonable terms, and identify the option(s) and provider(s) selected and the reasons that the Company selected the option(s) it used to deliver its YouTube service.*

**Response:**

Google operates its own backbone and content delivery network for the delivery of its services to users, including YouTube. YouTube is not handled separately from other Google services, so accordingly Google does not enter into interconnection or CDN arrangements specifically for YouTube traffic.

With respect to Google traffic generally, Google believes informal, settlement-free peering is the optimal arrangement for interconnection because it has low transaction costs and reflects the mutual benefit that interconnection offers to content providers and Internet service providers (ISPs). Historically and currently, nearly all peering arrangements have been completed without written contracts or payments. This norm helps sustain the Internet as an efficient, low-friction, and well-interconnected set of networks.

Consistent with best practice, Google maintains an open, settlement-free Peering Policy (available at https://peering.google.com/about/peering_policy.html) that Google offers to any network operator that is interested, subject to only a few basic technical, commercial, and legal requirements. Google currently has thousands of peering partners worldwide, and exchanges traffic on a settlement-free basis with nearly all of them, utilizing more than 70 public Internet exchange points and more than 60 private peering interconnection facilities.

Peering arrangements can reduce the cost and increase the quality of interconnection. Furthermore, direct peering with at least some major ISPs is essential to Google.
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Operators (both content and access) should be free to use transit connectivity if they do not wish to enter into a peering arrangement. When peering is not established between networks, however, market mechanisms can protect Internet users only if content providers are able to secure affordable, high-quality interconnection with each last-mile ISP through transit or third-party peering arrangements, such that the ISP cannot abuse its gatekeeper position. In particular, transit must not be constrained or congested. This relies on ISPs having sufficient diverse transit capacity such that there are reasonable quality alternative routes for content and application providers to reach an ISP's users, without having to enter into direct peering relationships with every operator.

Google conducts negotiations for transit capacity in the U.S. on a relatively frequent basis with a large number of wholesale transit providers. Google currently obtains transit from **BEGIN HIGHLY CONFIDENTIAL [[**
**]] END HIGHLY CONFIDENTIAL**. In each instance, Google weighs on a case-by-case basis the cost of transit, the cost of direct paid peering, and the performance, scalability, and long-term sustainability associated with each, and routes traffic accordingly.

*6.*

a. *For each Person contained on the list attached as Attachment B, state whether the Person could provide transit services, in whole or in part, to deliver the Company's CDN traffic terminating in the United States during the Relevant Period. Briefly describe the benefits, restrictions, detriments and risks associated with each service, and any reasons that the service could not be obtained from each Person on commercially reasonable terms, including but not limited to price and limited capacity. Identify any other Person that the Company believes could provide transit service to the Company for its CDN traffic to be terminated in the United States, during the Relevant Period who is not listed on Attachment B.*

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**Response:**

Google does not use transit services from most of the entities listed in Attachment B. For a discussion of Google's transit relationships, see the response to Question 5.b.

b. *Identify all firms that have bid, negotiated, or otherwise sought to provide transit service to the Company for the Company's CDN traffic terminating in the United States during the relevant period, and whether the option would be available to the Company on commercially reasonable terms. Describe the benefits, restrictions, detriments and risks associated with each option, and any reasons that the service could not be obtained from each provider on commercially reasonable terms, and identify the provider(s) selected and the reasons that the Company selected these provider(s).*

**Response:**

Google negotiates rates with a number of different transit providers, as detailed in the response to Question 5.b, and commissions ports on an as-needed basis.

It should be noted that while wholesale transit providers can make available substantial transit capacity to content and application providers such as Google, the user experience that results from delivering traffic to ISPs also depends on the connectivity that the particular ISP has to the rest of the Internet. If the ISP has limited transit or peering connectivity to the rest of the Internet, there may be congestion on these interconnects and a poor user experience. In this situation, connectivity is limited no matter how much transit capacity a content provider has purchased. This effect was noted in the recent Measurement Lab report on transit and interconnection.[3]

c. *For any non- ministerial changes to the Company's transit arrangements relating to the Company's CDN service with any ISP since January 1, 2012, describe the change and the reasons for the change and identify the Person who initiated the change.*

**Response:**

Consistent with the response in Section 6.b., within the relevant period, Google has negotiated rates and commissioned ports with a number of transit providers as required for its traffic volumes and flows.

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[3] M-Lab, *ISP Interconnection and its Impact on Consumer Internet Performance*, Oct. 28, 2014, at 4, 30, *available at* http://www.measurementlab.net/static/observatory/M-Lab_Interconnection_Study_US.pdf.

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*12. Explain and provide documents that discuss the current and projected minimum and optimum broadband download speed needed by consumers to effectively view Video Programming using the Company's YouTube service at various resolutions (e.g., standard definition, high definition, and ultra-high definition), the download speeds that the Company recommends to consumers and plans to or is likely to recommend in the future, what features consumers can access with certain download speeds that they cannot access with slower speeds or less bandwidth), and how demand for the Company's YouTube service is affected by available broadband speeds. Include in your explanation any factors or features other than download speed that could materially affect the viewing experience (e.g. latency, packet loss) and how you define "standard definition," "high definition," and "ultra-high definition."*

**Response:**

The Google Video Quality Report ("VQR") (https://www.google.com/get/videoqualityreport/) summarizes factors that can influence the video quality experienced by YouTube users. Through the VQR's public portal, users can determine level of video quality and the viewing capabilities that they can expect to receive through a broadband connection purchased from an ISP in their specific geographical market. The VQR website also provides information regarding recommended and requisite download speeds for the various resolutions available on YouTube services. Definitions of "lower definition," standard definition," and "YouTube HD Verified," as well as the procedure for assigning ratings, can be found in the VQR section located in the upper right-hand corner titled "The Methodology" (https://www.google.com/get/videoqualityreport/#methodology).

Practical tips to improve video quality are available on YouTube's blog at http://youtube-global.blogspot.com/2014/05/find-out-if-your-internet-service.html, and numerous resources are available within YouTube's Help Center (*see, e.g.,* https://support.google.com/youtube/checklist/3480866?hl=en).

Google has no current plans to revise the VQR site's discussion of these issues. Development of new technologies will affect video delivery over time, however. For example, more efficient video codecs can reduce the bandwidth required for a particular quality of video. Conversely, new video technologies such as 3D and 4K can result in an increase in bandwidth required. At present Google does not have broadly defined bitrates for these services, because codecs and other technologies are at an early stage of development.

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*13. Describe or provide documents sufficient to show the effects that an ISP's network management practices have on the delivery of the Company's YouTube service and CDN service, including but not limited to Comcast's network practices reflected in Request for Comment (RFC) 6057 http://tools.ietf.org/html/rfc6057 (describing how heavy users' packets are deprioritized during times of CMTS congestion), http://xfinity.comcast.net/terms/network/update/ and TWC's network management practices described on its website http://help.twcable.com/description_of_network_management_practices.html.*

**Response:**

While network management practices may be necessary at times to protect an operator's network and optimize performance for certain classes of services (but not an individual content provider's services), Google believes that in the long run it is more cost-effective to provide an abundance of bandwidth, rather than invest in platforms to segment, manage, and prioritize user traffic. With respect to ISPs' current network management practices, Google lacks visibility into the application of those practices, so Google cannot determine the effect they have on the delivery of services demanded by users.

For this reason, any traffic management done by consumer ISPs should be transparent to users, as recommended in the BITAG report on network management practices, available at http://www.bitag.org/documents/BITAG_-_Congestion_Management_Report.pdf. Importantly, however, transparency of network management will facilitate meaningful user choice only if ISPs operate in a competitive market.

*14. Describe or provide documents sufficient to show whether the terms of the Company's interconnection arrangements with ISPs that offer Internet backbone services are different from the terms of the Company's interconnection arrangements with ISPs that do not offer internet backbone services.*

**Response:**

As discussed in response to Question 5.b, Google has an open peering policy, subject to certain technical, commercial and legal requirements. In common with industry standards,[4] the vast majority of Google's peering arrangements are non-contractual and

[4] Dennis Weller and Bill Woodcock, *OECD Digital Economy Papers No. 207: Internet Traffic Exchange: Market Developments and Policy Challenges*, Jan. 2013, *available at*

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based on industry norms. Where a contract is required by one or both parties, Google prefers to use a standard agreement, which is attached as Bates Numbers [COMC00000001 - COMC00000006]. Google's interconnection agreements contain confidentiality provisions that may limit their production in the instant proceeding.

*15. Identify all video programming that the Company sought the right to distribute as part of any prospective OVD service contemplated by the Company, but was ultimately unable to obtain rights to distribute on terms acceptable to the Company, which you have reason to believe was related to a provision in another video programming provider's agreement with another MVPD or OVD. Include in your response the specific circumstances leading to your belief. Identify any contractual clauses, including but not limited to "Most Favored Nations" clauses, "alternative distribution methods" clauses, or other contractual limitations that were identified as a reason for prohibiting or limiting distribution of the Video Programming by the any contemplated OVD service. Provide documents discussing the implications or strategic significance for any contemplated OVD service of clauses in contracts between the licensors of Video Programming and MVPDs that may limit the Company's ability to distribute the Video Programming.*

**Response:**

Google does not have materials responsive to Question 15.

*16. Submit documents discussing any potential effects of the Proposed Transactions on the Company or any other person, including but not limited to the inputs and results of any economic modeling commissioned by the Company, as well as other documents or information given to or relied upon by any economic expert or other third party engaged by the Company to analyze the Proposed Transactions.*

**Response:**

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http://www.oecd-ilibrary.org/science-and-technology/internet-traffic-exchange_5k918gpt130q-en.

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